SCPI Command Reference Volume 2

Agilent Technologies
E4428C/38C ESG Signal Generators

This guide applies to the following signal generator models:

E4428C ESG Analog Signal Generator

E4438C ESG Vector Signal Generator

Due to our continuing efforts to improve our products through firmware and hardware revisions, signal generator design and operation may vary from descriptions in this guide. We recommend that you use the latest revision of this guide to ensure you have up-to-date product information. Compare the print date of this guide (see bottom of page) with the latest revision, which can be downloaded from the following website:

http://www.agilent.com/find/esg

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6 Digital Signal Interface Module Commands

This chapter provides SCPI descriptions for commands available with the N5102A Digital Signal Interface Module. Refer to the *E4428C/38C ESG Signal Generators User's Guide* and *E4428C/38C ESG Signal Generators Key and Data Field Reference* for more information on the N5102A module.

Digital Subsystem—Option 003 and 004 ([:SOURce])

:DIGital:CLOCk:CPS 1|2|4

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:CLOCk:CPS 1|2|4
:DIGital:CLOCk:CPS?
```

This command selects the number of clock cycles per sample. The command is used with parallel or parallel interleaved port configurations. If this command is executed with a serial port configuration or an IF signal type, the parameter value is changed, but it is not used by the interface module until the port configuration is changed to parallel or parallel interleaved, *and* the signal type is changed to IQ.

The query returns the currently set value. Regardless of the port configuration, you must query all four states (clocks per sample, port configuration, data direction, and signal type) to know the interface module's current setup.

Example

```
:DIG:CLOC:CPS 2
```

The preceding example sets two clock cycles for each sample.

***RST** 1

Range 1,2,or 4

Key Entry **Clocks Per Sample**

:DIGital:CLOCk:PHASe

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:CLOCk:PHASe <val>
:DIGital:CLOCk:PHASe?
```

This command sets the phase for the clock relative to the leading edge transition of the data. At 0 degrees the clock and leading edge of the data signal are aligned. Any phase value between 0 and 360 degrees can be used in the command, however, the signal generator rounds up or down to get 90, 180, 270 and 0 degree settings. For example, entering 140 degrees will cause the signal generator to use the 180 degree setting.

If this command is executed when the clock rate is less than 10 MHz or greater than 200 MHz, the resolution changes to 180 degrees, and the maximum phase defaults to 180 degrees.

Example

```
:DIG:CLOC:PHAS 90DEG
```

The preceding example sets the clock phase to 90 degrees. The clock signal leading edge transition will be delayed by 1/4 of a clock period relative to the leading edge data transition.

***RST** +0.00000000E+000

Range 0 – 360 deg

Key Entry **Clock Phase**

:DIGital:CLOCk:POLarity

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:CLOCk:POLarity POSitive|NEGative
:DIGital:CLOCk:POLarity?
```

This command sets the alignment for the clock signal to positive or negative. Positive selects the leading edge transition of the clock signal to align with the leading edge data transition and negative selects the falling edge transition of the clock signal to align with the leading edge of the data.

Example

```
:DIG:CLOC:POL NEG
```

The preceding example sets the clock falling edge transition to align with the leading edge data transition.

***RST** POS

Key Entry **Clock Polarity**

:DIGital:CLOCk:RATE

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:CLOCk:RATE <val>
:DIGital:CLOCk:RATE?
```

This command sets the clock rate. If an external clock is used, the rate set with this command must match the external clock rate. Only clock phase settings of 0 or 180 degrees are valid for a clock rate setting below 10 MHz or above 200 MHz. The variable `<val>` is a expressed in hertz

Example

```
:DIG:CLOC:RATE 200MHZ
```

The preceding example sets the clock rate to 200 megahertz.

***RST** +1.00000000E+008

Range 1 kHz–400 MHz

Key Entry **Clock Rate**

:DIGital:CLOCk:REFerence:FREQuency

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:CLOCk:REFerence:FREQuency <freq>
:DIG:CLOC:REF:FREQ?
```

This command allows you to specify the frequency of the external reference supplied to the Freq Ref connector. This command is valid only when the clock source is set to internal.

If this command is executed when the clock source is not set to internal, the parameter value is changed, but it is not used by the signal generator until the clock source is changed to internal.

Because a query returns the currently set value, regardless of the clock source, you must query both states (reference frequency and clock source) to know the signal generator's current setup.

Example

```
:DIG:CLOC:REF:FREQ 50MHZ
```

The preceding example specifies a 50 megahertz external reference frequency.

***RST** +1.00000000E+007

Range 1kHz–100 MHz

Key Entry **Reference Frequency**

:DIGital:CLOCk:SKEW

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:CLOCk:SKEW <val>
:DIGital:CLOCk:SKEW?
```

This command sets the clock signal skew value. The skew is a fine-tune adjustment for the course tune clock phase function and helps to align the clock with valid data states. This is useful at high clock rates and available only for clock frequencies above 10 megahertz. The variable `<val>` is a expressed in nanoseconds.

Example

```
:DIG:CLOC:SKEW 2NS
```

The preceding example sets the clock skew to 2 nanoseconds.

***RST** +0.00000000E+000

Range –5ns to 5ns

Key Entry **Clock Skew**

:DIGital:CLOCk:SOURce

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:CLOCk:SOURce INTernal|EXTernal|DEVice
:DIG:CLOC:SOURce?
```

This command selects one of three possible clock sources.

Example

```
:DIG:CLOC:SOUR DEV
```

The preceding example uses the “Device Interface Connector” input clock.

***RST** INT

Key Entry **Clock Source**

:DIGital:DATA:ALIGnment

Supported	E4438C Option with option 003 or 004 or both

```
:DIGital:DATA:ALIGnment MSB|LSB
:DIGital:DATA:ALIGment?
```

This command selects the bit alignment for a word less than 16 bits in length. The MSB (most significant bit) selection maintains the MSB of the word on the same data line while the LSB (least significant bit) will move depending on the word size. The opposite effect occurs when the alignment is set to LSB.

Example

```
:DIG:DATA:ALIG MSB
```

The preceding example sets the MSB word format.

***RST**	LSB
Key Entry	**Word Alignment**

:DIGital:DATA:BORDer

Supported	E4438C Option with option 003 or 004 or both

```
:DIGital:DATA:BORDer MSB|LSB
:DIGital:DATA:BORD?
```

This command selects the bit order for data transmitted through the N5102A module. Data can be in least significant (LSB) bit first or most significant (MSB) bit first.

Example

```
:DIG:DATA:BORD MSB
```

The preceding example specifies data in MSB first format.

***RST**	LSB
Key Entry	**Bit Order**

:DIGital:DATA:DIRection

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:DATA:DIRection OUTPut|INPut
:DIGital:DATA:DIRection?
```

This command selects an input or output direction for data flow through the N5102A module.

Example

```
:DIG:DATA:DIR INP
```

The preceding example selects input as the direction of data flow.

***RST**	OUTP (unless only Option 004 is installed)
Key Entry	**Direction**

:DIGital:DATA:IGain

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:DATA:IGain <val>
:DIGital:DATA:IGain?
```

This command adjust the gain of the I data in the N5102A module. The adjustment does not affect the Q data.

The variable `<val>` is a expressed as a percentage delta from 100%. The offset is an adjustment to the analog level that is represented by the digital sample. The analog voltage is limited to a 16-bit data sample.

Example

```
:DIG:DATA:IG 10
```

The preceding example sets the I data gain to 10%.

***RST**	+0.00000000E+000
Range	–12.5 through 12.5
Key Entry	**I Gain**

:DIGital:DATA:INEGate

Supported	E4438C Option with option 003 or 004 or both

```
:DIGital:DATA:INEGate OFF|ON|0|1
:DIGital:DATA:INEGate?
```

This command enables or disables the negation of the I data sample. Negation changes the sample by expressing it in two's complement form, multiplying by negative one, and converting back to the selected numeric format. This can be done for I samples, Q samples, or both.

The sample or word represents a quantized analog voltage level. This analog voltage can be added or multiplied. For a 16-bit sample, the range is from 0 to 65535 in offset binary or -32768 to +32767 in 2's complement mode.

Example

```
:DIG:DATA:INEG ON
```

The preceding example enables negation of the I data.

***RST**	0
Key Entry	**Negate I**

:DIGital:DATA:IOFFset

Supported	E4438C Option with option 003

```
:DIGital:DATA:IOFFset <val>
:DIGital:DATA:IOFFset?
```

This command adjusts the DC offset for I data. The command is available for the N5102A module output mode. The variable `<val>` is a expressed as a +/– 100% of the full scale value.

Example

```
:DIG:DATA:IOFF 40
```

The preceding example sets the I offset to 40% of full scale.

***RST**	+0.00000000E+000
Range	–100 to +100
Key Entry	**I Offset**

:DIGital:DATA:IQSWap

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:DATA:IQSWap OFF|ON|0|1
:DIGital:DATA:IQSWap?
```

This command enables or disables swapping of the I and Q data. When enabled, the I data is sent to the N5102A’s Q bus and the Q data is sent to the I bus.

Example

```
:DIG:DATA:IQSW ON
```

The preceding example enables swapping of I and Q data.

***RST** 0

Key Entry **Swap IQ**

:DIGital:DATA:NFORmat

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:DATA:NFORMat OBINary|TCOMplement
:DIGital:DATA:NFORMat?
```

This command selects the binary format used to represent the transmitted data values. The selections are offset binary or 2’s complement.

Example

```
:DIG:DATA:NFOR OBIN
```

The preceding example selects the offset binary format to represent data values.

***RST** TCOM

Key Entry **Numeric Format**

:DIGital:DATA:POLarity:FRAMe

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:DATA:POLarity:FRAMe POSitive|NEGative
:DIGital:DATA:POLarity:FRAMe?
```

This command selects the polarity of the frame marker for serial transmission. The frame marker indicates the beginning of each sample or byte of data. The command is valid for serial transmission only.

POS	This choice selects a positive polarity. The frame marker is high for the first data sample.
NEG	This choice selects a negative polarity. The frame marker is low for the first data sample.

Example

```
:DIG:DATA:POL:FRAM NEG
```

The preceding example selects a negative polarity for the frame marker.

***RST** POS

Key Entry **Frame Polarity**

:DIGital:DATA:POLarity:IQ

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:DATA:POLarity:IQ POSitive|NEGative
:DIGital:DATA:POLarity:IQ?
```

This command selects the logic level for I and Q data. Positive selects a high logic level at the output as a digital one and negative selects a low logic level at the output as a digital one.

POS	This choice selects a logic high level as digital one.
NEG	This choice selects a logic low level as a digital one.

Example

```
:DIG:DATA:POL:IQ NEG
```

The preceding example sets low level logic.

***RST** POS

Key Entry **IQ Polarity**

:DIGital:DATA:QGain

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:DATA:QGain <val>
:DIGital:DATA:QGain?
```

This command adjusts the gain for Q data in the N5102A module. The adjustment does not affect the I data.

The variable `<val>` is a expressed as a percentage delta from 100%. The offset is an adjustment to the analog level that is represented by the digital sample. The analog voltage is limited to a 16-bit data sample.

Example

```
:DIG:DATA:QG 10
```

The preceding example increases the gain for Q data by 10%.

***RST**	+0.00000000E+000
Range	–12.5 through 12.5
Key Entry	**Q Gain**

:DIGital:DATA:QNEGate

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:DATA:QNEGate OFF|ON|0|1
:DIGital:DATA:QNEGate?
```

This command enables or disables the negation of the Q data sample. Negation changes the sample by expressing it in two's complement form, multiplying by negative one, and converting back to the selected numeric format.

The sample or word represents a quantized analog voltage level. This analog voltage can be added or multiplied. For a 16-bit sample, the range is from 0 to 65535 in offset binary or -32768 to +32767 in 2's complement mode.

Example

```
:DIG:DATA:QNEG ON
```

The preceding example enables negation of the Q data.

***RST**	0
Key Entry	**Negate Q**

:DIGital:DATA:QOFFset

Supported E4438C Option with option 003

```
:DIGital:DATA:QOFFset <val>
:DIGital:DATA:QOFFset?
```

This command adjusts the DC offset for Q data. The command is available for the N5102A module output mode. The variable `<val>` is a expressed as a +/– 100% of the full scale value.

Example

```
:DIG:DATA:QOFF 40
```

The preceding example sets the Q offset to 40% of full scale.

***RST** +0.00000000E+000

Range –100 through 100

Key Entry **Q Offset**

:DIGital:DATA:ROTation

Supported E4438C Option with option 003

```
:DIGital:DATA:ROTation <val>
:DIGital:DATA:ROTation?
```

This command rotates the IQ data in the IQ plane. This command is valid for the N5102A output mode. The variable `<val>` is expressed in degrees with a range from 0 to 360.

Example

```
:DIG:DATA:ROT 45
```

The preceding example rotates the IQ constellation 45 degrees.

***RST** +1.00000000E+000

Range 0–360

Key Entry **Rotation**

:DIGital:DATA:SCALing

Supported E4438C Option with option 003

```
:DIGital:DATA:SCALing <val>
:DIGital:DATA:SCALing?
```

This command enables scaling of the I and Q data to the level indicated by the `<val>` variable. This command is valid for the N5102A output mode. The variable `<val>` is expressed as a percentage.

Example

```
:DIG:DATA:SCAL 50
```

The preceding example scales the I and Q data to amplitude to 50%.

***RST** +1.00000000E+002

Range –100 through 100

Key Entry **Scaling**

:DIGital:DATA:SIZE

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:DATA:SIZE <val>
:DIGital:DATA:SIZE?
```

This command selects the number of bits in each sample. A sample can have a maximum word length of 16 bits.

Example

```
:DIG:DATA:SIZE 8
```

The preceding example sets the sample word size to eight bits.

***RST** +1.600000000E+001

Range 4–16

Key Entry **Word Size**

:DIGital:DATA:STYPe

Supported E4438C Option with option 003

```
:DIGital:DATA:STYPe IQ|IF
:DIGital:DATA:STYPe?
```

This command selects the output format for the IQ data. The IQ selection outputs digital I and Q data. Whereas the IF (intermediate frequency) selection modulates the I and Q data onto the IF frequency. The IF is calculated as 1/4 the clock sample rate. This command is valid only for the N5102A output mode.

IQ This choice outputs I and Q digital data.

IF This choice outputs a modulated signal.

Example

```
:DIG:DATA:STYP IF
```

The preceding example sets the I and Q output data to modulate the intermediate frequency.

***RST** IQ

Key Entry **Signal Type**

:DIGital:DATA:TYPE

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:DATA:TYPE SAMPles|PFSamples
:DIGital:DATA:TYPE?
```

This command selects filtered baseband data or unfiltered baseband data as the transmitted data type.

If this command is executed while an ARB modulation format is active, the parameter choice is changed, but it is not *used* by the interface module until a real-time modulation format is turned on.

Because a query returns the current choice, regardless of whether or not an ARB format is active, you must query both states (data type and the modulation format) to know the signal generator's current setup.

SAMPles This choice selects DAC samples as the data transmitted.

PFSamples This choice selects pre-filtered samples which are unfiltered I and Q data.

Example

```
:DIG:DATA:TYPE PFS
```

The preceding example sets the data type to pre-filtered I and Q data.

***RST**	SAMP
Key Entry	**Data Type**

:DIGital:DIAGnostic:LOOPback

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:DIAGnostic:LOOPback? DIGBus|CABLe|N5102A|DEVice
```

This command selects and executes a loop back test that validates the integrity of digital data. Refer to the E4428C/38C ESG Signal Generators Key and Data Field Reference for more information.

DIGBus	This choice selects a loop back test on the ESG Digital Bus connector at the signal generator side.
CABLe	This choice selects a loop back test using the Digital Bus Loop Back Fixture test board.
N5102A	This choice selects a loop back test for the N5102A module.
DEVice	This choice selects a loop back test using the LOOP BACK TEST SINGLE ENDED IO DUAL 40 PIN board.

Example

```
:DIG:DIAG:LOOP? DEV
```

The preceding example runs the diagnostic test on the Single Ended IO Dual 40 Pin device and returns a pass or fail condition.

***RST**	Device Intfc
Key Entry	**Loop Back Test Type**

:DIGital:LOGic[:TYPE]

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:LOGic[:TYPE] LVDS|LVTT1|CMOS15|CMOS18|CMOS25|CMOS33|SSI
:DIGital:LOGic[:TYPE]?
```

This command selects the logic data type used by the device being tested.

LVDS	This choice selects low voltage differential signaling as the logic data type.

LVTT1	This choice selects a low voltage TTL signal as the logic data type.
CMOS15	This choice selects a 1.5 volt CMOS signal as the logic data type.
CMOS18	This choice selects a 1.8 volt CMOS signal as the logic data type.
CMOS25	This choice selects a 2.5 volt CMOS signal as the logic data type.
CMOS33	This choice selects a 3.3 volt CMOS signal as the logic data type.
SSI	This key sets the logic type of the device interface to SSI. This logic type uses single ended I/O and a 3.3 volt supply. This is a special serial interface.

Example

```
:DIG:LOG CMOS15
```

The preceding example selects 1.5 volt CMOS as the logic data type.

***RST** CMOS33

Key Entry **Logic Type**

:DIGital:PCONfig

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:PCONfig PARallel|SERial|PINTIQ|PINTQI
:DIGital:PCONfig?
```

This command selects the data transmission type used for communication between the N5102A module and the device under test. Refer to the E4428C/38C ESG Signal Generators Key and Data Field Reference for more information.

PARallel	This choice selects parallel data transmission.
SERial	This choice selects serial data transmission.
PINTIQ	This choice selects parallel interleaving data transmission. The I data is transmitted on the rising clock edge and the Q data on the falling edge.
PINTQI	This choice selects parallel interleaving data transmission. The Q data is transmitted on the rising clock edge and the I data on the falling edge.

Example

```
:DIG:PCON PINTQI
```

The preceding example selects parallel interleaving format

***RST** PAR

Key Entry **Port Config**

:DIGital:PRESet:PTHRough

Supported E4438C Option with option 003 or 004 or both

```
:DIGital:PRESet:PTHRough
```

This command sets up the preset condition for the N5102A module and allows transmission of data through the module with no modifications. The command is valid only when a modulation format is active.

Example

```
:DIG:PRES:PTHR
```

The preceding example sets the N5102A module to a preset condition and allows data to pass through unmodified.

Key Entry **Pass Through Preset**

:DIGital[:STATe]

Supported E4438C Option with option 003 or 004 or both

```
:DIGital[:STATe] 0|1|OFF|ON
:DIGital[:STATe]?
```

This command enables or disables the operating state of the N5102A module.

Example

```
:DIG ON
```

The preceding example turns on the N5102A module.

***RST** OFF

Key Entry **N5102A Off On**

7 Bit Error Rate Test (BERT) Commands

This chapter provides SCPI description for commands dedicated to BERT testing using the E4438C ESG Vector Signal Generator. This chapter contains the following sections:

Calculate Subsystem–Option UN7 and 300 (:CALCulate:BERT)

:BTS:LOOPback:EDGE:ETCH:F43:COMParator:CRITeria:ERATe

Supported E4438C with Option 300

`:CALCulate:BERT:BTS:LOOPback:EDGE:ETCH:F43:COMParator:CRITeria:`
`ERATe` <val>
`:CALCulate:BERT:BTS:LOOPback:EDGE:ETCH:F43:COMParator:CRITeria:ERATe?`

This command sets the error rate pass/fail threshold value.

The variable <val> is a decimal notation representing a percentage value.

***RST** +1.00000000E-001

Range 0.0–1.0

Key Entry Error Rate

:BTS:LOOPback:EDGE:ETCH:F43:COMParator:CRITeria[:SELect]

Supported E4438C with Option 300

`:CALCulate:BERT:BTS:LOOPback:EDGE:ETCH:F43:COMParator:`
`CRITeria[:SELect] ERATe`|NOLimit
`:CALCulate:BERT:BTS:LOOPback:EDGE:ETCH:F43:COMParator:CRITeria[:SELect]?`

This command determines which of the following pass/fail limit (comparator) criteria is applied to the measurement.

ERATe This choice reports, on the front panel display of the signal generator, the pass or fail status compared to the specified threshold for the error rate.

NOLimit This choice disables the pass/fail indication.

***RST** NOLimit

Key Entry **Error Rate** **No Limits**

:BTS:LOOPback:EDGE:MCS5:COMParator:CRITeria:ERATe

Supported E4438C with Option 300

:CALCulate:BERT:BTS:LOOPback:EDGE:MCS5:COMParator:CRITeria:ERATe <val>
:CALCulate:BERT:BTS:LOOPback:EDGE:MCS5:COMParator:CRITeria:ERATe?

This command sets the error rate pass/fail threshold value.

The variable <val> is a decimal notation representing a percentage value.

***RST** +1.00000000E-001

Range 0.0–1.0

Key Entry **Error Rate**

:BTS:LOOPback:EDGE:MCS5:COMParator:CRITeria[:SELect]

Supported E4438C with Option 300

:CALCulate:BERT:BTS:LOOPback:EDGE:MCS5:COMParator:
CRITeria[:SELect] ERATe|NOLimit
:CALCulate:BERT:BTS:LOOPback:EDGE:MCS5:COMParator:CRITeria[:SELect]?

This command determines which of the following pass/fail limit (comparator) criteria is applied to the measurement.

ERATe This choice reports, on the front panel display of the signal generator, the pass or fail status compared to the specified threshold for the error rate.

NOLimit This choice disables the pass/fail indication.

***RST** NOLimit

Key Entry **Error Rate** **No Limits**

:BTS:LOOPback:EDGE:MCS9:COMParator:CRITeria:ERATe

Supported E4438C with Option 300

:CALCulate:BERT:BTS:LOOPback:EDGE:MCS9:COMParator:CRITeria:ERATe <val>
:CALCulate:BERT:BTS:LOOPback:EDGE:MCS9:COMParator:CRITeria:ERATe?

This command sets the error rate pass/fail threshold value.

The variable <val> is a decimal notation representing a percentage value.

***RST** +1.00000000E-001

Range 0.0–1.0

Key Entry **Error Rate**

:BTS:LOOPback:EDGE:MCS9:COMParator:CRITeria[:SELect]

Supported E4438C with Option 300

`:CALCulate:BERT:BTS:LOOPback:EDGE:MCS9:COMParator:`
`CRITeria[:SELect] ERATe`|NOLimit
`:CALCulate:BERT:BTS:LOOPback:EDGE:MCS9:COMParator:CRITeria[:SELect]?`

This command determines which of the following pass/fail limit (comparator) criteria is applied to the measurement.

ERATe This choice reports, on the front panel display of the signal generator, the pass or fail status compared to the specified threshold for the error rate.

NOLimit This choice disables the pass/fail indication.

***RST** NOLimit

Key Entry **Error Rate** **No Limits**

:BTS:LOOPback:EDGE:UNCoded:COMParator:CRITeria:ERATe

Supported E4438C with Option 300

`:CALCulate:BERT:BTS:LOOPback:EDGE:UNCoded:COMParator:CRITeria:`
`ERATe` <val>
`:CALCulate:BERT:BTS:LOOPback:EDGE:UNCoded:COMParator:CRITeria:ERATe?`

This command sets the error rate pass/fail threshold value.

The variable <val> is a decimal notation representing a percentage value.

***RST** +2.00000000E-002

Range 0.0–1.0

Key Entry **Error Rate**

:BTS:LOOPback:EDGE:UNCoded:COMParator:CRITeria[:SELect]

Supported E4438C with Option 300

`:CALCulate:BERT:BTS:LOOPback:EDGE:UNCoded:COMParator:`
`CRITeria[:SELect] ERATe`|NOLimit
`:CALCulate:BERT:BTS:LOOPback:EDGE:Uncoded:COMParator:CRITeria[:SELect]?`

This command determines which of the following pass/fail limit (comparator) criteria is applied to the measurement.

ERATe This choice reports, on the front panel display of the signal generator, the pass or fail status compared to the specified threshold for the error rate.

NOLimit This choice disables the pass/fail indication.

***RST** NOLimit

Key Entry **Error Rate** **No Limits**

:BTS:LOOPback:GSM:CS1:COMParator:CRITeria:ERATe

Supported E4438C with Option 300

`:CALCulate:BERT:BTS:LOOPback:GSM:CS1:COMParator:CRITeria:`
`ERATe` <val>
`:CALCulate:BERT:BTS:LOOPback:GSM:CS1:COMParator:CRITeria:ERATe?`

This command sets the error rate pass/fail threshold value.

The variable <val> is a decimal notation representing a percentage value.

***RST** +1.00000000E-001

Range 0.0–1.0

Key Entry **Error Rate**

:BTS:LOOPback:GSM:CS1:COMParator:CRITeria[:SELect]

Supported E4438C with Option 300

`:CALCulate:BERT:BTS:LOOPback:GSM:CS1:COMParator:`
`CRITeria[:SELect] ERATe`|NOLimit
`:CALCulate:BERT:BTS:LOOPback:GSM:CS1:COMParator:CRITeria[:SELect]?`

This command determines which of the following pass/fail limit (comparator) criteria is applied to the measurement.

ERATe	This choice reports, on the front panel display of the signal generator, the pass or fail status compared to the specified threshold for the error rate.
NOLimit	This choice disables the pass/fail indication.

***RST** NOLimit

Key Entry **Error Rate** **No Limits**

:BTS:LOOPback:GSM:CS4:COMParator:CRITeria:ERATe

Supported E4438C with Option 300

`:CALCulate:BERT:BTS:LOOPback:GSM:CS4:COMParator:CRITeria:`
`ERATe` <val>
`:CALCulate:BERT:BTS:LOOPback:GSM:CS4:COMParator:CRITeria:ERATe?`

This command sets the error rate pass/fail threshold value.

The variable <val> is a decimal notation representing a percentage value.

***RST** +1.00000000E-001

Range 0.0–1.0

Key Entry **Error Rate**

:BTS:LOOPback:GSM:CS4:COMParator:CRITeria[:SELect]

Supported E4438C with Option 300

`:CALCulate:BERT:BTS:LOOPback:GSM:CS4:COMParator:`
`CRITeria[:SELect] ERATe`|NOLimit
`:CALCulate:BERT:BTS:LOOPback:GSM:CS4:COMParator:CRITeria[:SELect]?`

This command determines which of the following pass/fail limit (comparator) criteria is applied to the measurement.

ERATe	This choice reports, on the front panel display of the signal generator, the pass or fail status compared to the specified threshold for the error rate.
NOLimit	This choice disables the pass/fail indication.
***RST**	NOLimit
Key Entry	**Error Rate** **No Limits**

:BTS:LOOPback:GSM:MCS1:COMParator:CRITeria:ERATe

Supported E4438C with Option 300

```
:CALCulate:BERT:BTS:LOOPback:GSM:MCS1:COMParator:CRITeria:
ERATe <val>
:CALCulate:BERT:BTS:LOOPback:GSM:MCS1:COMParator:CRITeria:ERATe?
```

This command sets the error rate pass/fail threshold value.

The variable <val> is a decimal notation representing a percentage value.

***RST**	+1.00000000E-001
Range	0.0–1.0
Key Entry	**Error Rate**

:BTS:LOOPback:GSM:MCS1:COMParator:CRITeria[:SELect]

Supported E4438C with Option 300

```
:CALCulate:BERT:BTS:LOOPback:GSM:MCS1:COMParator:
CRITeria[:SELect] ERATe|NOLimit
:CALCulate:BERT:BTS:LOOPback:GSM:MCS1:COMParator:CRITeria[:SELect]?
```

This command determines which of the following pass/fail limit (comparator) criteria is applied to the measurement.

ERATe	This choice reports, on the front panel display of the signal generator, the pass or fail status compared to the specified threshold for the error rate.
NOLimit	This choice disables the pass/fail indication.
***RST**	ERAT
Key Entry	**Error Rate** **No Limits**

:BTS:LOOPback:GSM:COMParator:CRITeria:CIB

Supported E4438C with Option 300

`:CALCulate:BERT:BTS:LOOPback:GSM:COMParator:CRITeria:CIB` <val>
`:CALCulate:BERT:BTS:LOOPback:GSM:COMParator:CRITeria:CIB?`

This command sets the Class II residual bit error rate pass/fail threshold value.

The variable <val> is a decimal notation representing a percentage value.

***RST** +4.00000000E-003

Range 0.0–1.0

Key Entry **Class Ib RBER**

:BTS:LOOPback:GSM:COMParator:CRITeria:CII

Supported E4438C with Option 300

`:CALCulate:BERT:BTS:LOOPback:GSM:COMParator:CRITeria:CII` <val>
`:CALCulate:BERT:BTS:LOOPback:GSM:COMParator:CRITeria:CII?`

This command sets the Class Ib residual bit error rate pass/fail threshold value.

The variable <val> is a decimal notation representing a percentage value.

***RST** +2.00000000E-002

Range 0.0–1.0

Key Entry **Class II RBER**

:BTS:LOOPback:GSM:COMParator:CRITeria:FERasure

Supported E4438C with Option 300

`:CALCulate:BERT:BTS:LOOPback:GSM:COMParator:CRITeria:FERasure` <val>
`:CALCulate:BERT:BTS:LOOPback:GSM:COMParator:CRITeria:FERasure?`

This command sets the frame erasure rate pass/fail threshold value.

The variable <val> is a decimal notation representing a percentage value.

***RST** +1.00000000E-003

Range 0.0–1.0

Key Entry **Frame Erasure**

:BTS:LOOPback:GSM:COMParator:CRITeria[:SELect]

Supported E4438C with Option 300

`:CALCulate:BERT:BTS:LOOPback:GSM:COMParator:CRITeria[:SELect] FERasure|`
CLIB|CLII|ANY|NOLimit
`:CALCulate:BERT:BTS:LOOPback:GSM:COMParator:CRITeria[:SELect]?`

This command determines which of the following pass/fail limit (comparator) criteria is applied to the measurement.

FERasure This choice reports, on the front panel display of the signal generator, the pass or fail status compared to the specified threshold for frame erasure ratio.

CLIB This choice reports, on the front panel display of the signal generator, the pass or fail status compared to the specified threshold for the number of Class Ib errors detected in the measurement.

CLII This choice reports, on the front panel display of the signal generator, the pass or fail status compared to the specified threshold for the number of Class II errors detected in the measurement.

ANY This choice reports, on the front panel display of the signal generator, the pass or fail status compared to all of the specified comparator criteria.

NOLimit This choice disables the pass/fail indication.

***RST** NOLimit

Key Entry **Frame Erasure** **Class Ib RBER** **Class II RBER** **Exceeds Any Limit**

No Limits

[:BASeband]:COMParator:MODE

Supported E4438C with Option UN7

```
:CALCulate:BERT[:BASeband]:COMParator:MODE CEND|FHOLd
:CALCulate:BERT[:BASeband]:COMParator:MODE?
```

This command selects the pass/fail judgement mode of the comparator function.

CEND This choice selects the cycle end mode and each BER measurement result is compared with the limit value to make a pass/fail assessment at the end of a cycle.

FHOLd This choice selects the fail hold mode and only one fail judgement is allowed during that BER measurement loop. Any failed judgement after the first failure is ignored.

***RST**	CEND
Key Entry	**Cycle End** **Fail Hold**
Remarks	For automated tests, the results of this command can be accessed from the rear panel BER TEST OUT pin on the AUX I/O connector. For more information about the rear panel AUX I/O connector pin configuration, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

[:BASeband]:COMParator:THReshold

Supported E4438C with Option UN7

```
:CALCulate:BERT[:BASeband]:COMParator:THReshold <val>
:CALCulate:BERT[:BASeband]:COMParator:THReshold?
```

This command specifies the threshold value for the pass/fail judgement function.

The variable <val> is a decimal notation representing a percentage value.

***RST**	+1.00000000E-002
Range	0.0000001–1.00
Key Entry	**Pass/Fail Limits**
Remarks	This command is valid only while the BER pass/fail command is active. Refer to "[:BASeband]:COMParator[:STATe]" on page 406.

[:BASeband]:COMParator[:STATe]

Supported E4438C with Option UN7

```
:CALCulate:BERT[:BASeband]:COMParator[:STATe] ON|OFF|1|0
:CALCulate:BERT[:BASeband]:COMParator[:STATe]?
```

This command enables or disables the pass/fail judgement function.

***RST**	0
Key Entry	**Pass/Fail Off On**

[:BASeband]:DISPlay:MODE:

Supported E4438C with Option UN7

```
:CALCulate:BERT[:BASeband]:DISPlay:MODE PERCent|SCIentific
:CALCulate:BERT[:BASeband]:DISPlay:MODE?
```

This command selects the display mode for the bit error rate (BER) measurement.

PERCent	This choice reports measurement results as a percentage.
SCIentific	This choice reports measurement results in scientific notation.
***RST**	PERC
Key Entry	**BER Display % Exp**

[:BASeband]:DISPlay:UPDate:

Supported E4438C with Option UN7

```
:CALCulate:BERT[:BASeband]:DISPlay:UPDate CEND|CONT
:CALCulate:BERT[:BASeband]:DISPlay:UPDate?
```

This command selects the display update mode during bit error rate (BER) measurements.

CEND	This choice selects the cycle end mode and the previous BER measurement result is displayed during the current measurement cycle.
CONT	This choice selects the continuous mode and the display shows the real-time intermediate results during that BER measurement cycle.
***RST**	CONT
Key Entry	**Update Display Cycle End Cont**

Data Subsystem–Option UN7 and 300 (:DATA)

:BERT:BTS:LOOPback:EDGE:ETCH:F43[:DATA]

Supported E4438C with Option 300

`:DATA:BERT:BTS:LOOPback:EDGE:ETCH:F43[:DATA]? IEC|IEBC|DEFC|BCO|IER|IABer|ALL|TEC|TEBC|TDEFc|TBCO|TER|TABer|TALL|JUDGe|STOP|SCAuse`

This data query returns the measurement result value for each variable.

IEC|IEBC|DEFC|BCO|IER|IABer are intermediate values, so during the measurement, these variables are updated as well as the display information.

At the end of the measurement, the final values are stored to: TEC|TEBC|TDEFc|TBCO|TER|TABer variables. These variables and JUDGe|STOP|SCAuse are not updated until the next BER measurement is completed.

IEC	This choice provides the intermediate error count with the following range: <Integer> 0 to 1500000.
IEBC	This choice provides the intermediate non-erased bit error blocks with the following range: <Integer> 0 to 1500000.
DEFC	This choice provides the intermediate downlink error frame count with the following range: <Integer> 0 to 750000.
BCO	This choice provides the intermediate block or bit count with the following range: <Integer> 0 to 1500000 (block).
IER	This choice provides the intermediate error ratio with the following range: <Real> 0 to 1 (0 to 100%).
IABer	This choice provides the intermediate average BER within blocks that have errors. The range is as follows: <Real> 0 to 1.
ALL	This choice returns all intermediate values (IEC, IEBC, DEFC, BCO, IER, and IABer) at the same time.
TEC	This choice provides the total error count with the following range: <Integer> 0 to 1500000 (block).
TEBC	This choice provides the total non-erased bit error blocks count with the following range: <Integer> 0 to 1500000.
TDEFc	This choice provides the total downlink error frame count with the following range: <Integer> 0 to 65535.

TBCO	This choice provides the total block count with the following range: <Integer> 0 to 1500000 (block).
TER	This choice provides the total error ratio with the following range: <Real> 0 to 1 (0 to 100%).
TABer	This choice provides the total average BER within blocks that have errors. The range is as follows: <Real> 0 to 1.
TALL	This choice returns all total values (TEC, TEBC, TDEFc, TBCO, TER, TABer, JUDGe, STOP, and SCAuse) at the same time. If accidental TCH synchronization loss caused the measurement to stop, `TSLoss` is returned.
JUDGe	This choice provides the pass or fail string. If pass/fail criteria is NOLimit, `NONE` is returned.
STOP	This choice checks to see if the stop threshold is met and returns one of the following values: <Enumerated set> `TRUE FALSE`. When threshold to stop criteria is NONE, `FALSE` is returned.
SCAuse	This choice provides the stop cause by returning one of the following values: <Enumerated set> `NONE Ebit EBLock TSL`. If accidental TCH synchronization loss caused the measurement to stop, `TSL` is returned.

:BERT:BTS:LOOPback:EDGE:MCS5[:DATA]

Supported E4438C with Option 300

```
:DATA:BERT:BTS:LOOPback:EDGE:MCS5[:DATA]? IEC|IEBC|DEFC|BCO|IER|IABer|
ALL|TEC|TEBC|TDEFc|TBCO|TER|TABer|TALL|JUDGe|STOP|SCAuse
```

This data query returns the measurement result value for each variable.

IEC|IEBC|DEFC|BCO|IER|IABer are intermediate values, so during the measurement, these variables are updated as well as the display information. ALL returns all intermediate values at the same time.

At the end of the measurement, the final values are stored to: TEC|TEBC|TDEFc|TBCO|TER|TABer variables. These variables and JUDGe|STOP|SCAuse are not updated until the next BER measurement is completed.

For more information on the parameters, refer to page 408.

:BERT:BTS:LOOPback:EDGE:MCS9[:DATA]

Supported E4438C with Option 300

`:DATA:BERT:BTS:LOOPback:EDGE:MCS9[:DATA]? IEC|IEBC|DEFC|BCO|IER|IABer|ALL|TEC|TEBC|TDEFc|TBCO|TER|TABer|TALL|JUDGe|STOP|SCAuse`

This data query returns the measurement result value for each variable.

IEC|IEBC|DEFC|BCO|IER|IABer are intermediate values, so during the measurement, these variables are updated as well as the display information. ALL returns all intermediate values at the same time.

At the end of the measurement, the final values are stored to: TEC|TEBC|TDEFc|TBCO|TER|TABer variables. These variables and JUDGe|STOP|SCAuse are not updated until the next BER measurement is completed.

For more information on the parameters, refer to page 408.

:BERT:BTS:LOOPback:EDGE:UNCoded[:DATA]

Supported E4438C with Option 300

`:DATA:BERT:BTS:LOOPback:EDGE:UNCoded[:DATA]? IEC|IEBC|DEFC|BCO|IER|IABer|ALL|TEC|TEBC|TDEFc|TBCO|TER|TABer|TALL|JUDGe|STOP|SCAuse`

This data query returns the measurement result value for each variable.

IEC|IEBC|DEFC|BCO|IER|IABer are intermediate values, so during the measurement, these variables are updated as well as the display information. ALL returns all intermediate values at the same time.

At the end of the measurement, the final values are stored to: TEC|TEBC|TDEFc|TBCO|TER|TABer variables. These variables and JUDGe|STOP|SCAuse are not updated until the next BER measurement is completed.

For more information on the parameters, refer to page 408.

:BERT:BTS:LOOPback:GSM[:DATA]

Supported E4438C with Option 300

`:DATA:BERT:BTS:LOOPback:GSM[:DATA]? IBC|IIC|FEC|DFEC|FRC|IBBer|ALL|TEC|TEBC|TDEFc|TBCO|TER|TABer|TALL|JUDGe|STOP|SCAuse`

This data query returns the measurement result value for each variable.

`IBC|IIC|FEC|DEFC|FRC|IBBer|IIBer|FER` are intermediate values, so during the measurement, these variables are updated as well as the display information. `ALL` returns intermediate values at the same time.

At the end of the measurement, the final values are stored to: `TIBC|TIIC|TFEC|TDEFc|TFRC|TIBBer|TIIBer|TFER` variables. These variables and `JUDGe|JCAuse|STOP|SCAuse` are not updated until the next BER measurement is completed. `TALL` returns all of the total values at the same time.

IBC	This choice provides the intermediate class Ib error count with the following range: <Integer> 0 to 792000000.
IIC	This choice provides the intermediate class II error count with the following range: <Integer> 0 to 468000000.
FEC	This choice provides the intermediate frame erasure count with the following range: <Integer> 0 to 6000000.
DEFC	This choice provides the intermediate downlink error frame count with the following range: <Integer> 0 to 65535.
FRC	This choice provides the intermediate frame count with the following range: <Integer> 0 to 6000000.
IBBer	This choice provides the intermediate class Ib error ratio with the following range: <Real> 0 to 1 (0 to 100%).
IIBer	This choice provides the intermediate class II error ratio with the following range: <Real> 0 to 1 (0 to 100%).
FER	This choice provides the intermediate frame erasure ratio with the following range: <Real> 0 to 1 (0 to 100%).
ALL	This choice provides all intermediate values (IBC, IIC, FEC, DEFC, FRC, IBBer, IIBer, FER) at the same time.
TIBC	This choice provides the total class Ib bit error count with the following range: <Integer> 0 to 792000000.
TIIC	This choice provides the total class II bit error count with the following range: <Integer> 0 to 468000000.
TFEC	This choice provides the total frame erasure count with the following range: <Integer> 0 to 6000000.
TDEFc	This choice provides the total downlink error frame count with the following range: <Integer> 0 to 65535.
TFRC	This choice provides the total frame count with the following range: <Integer> 0 to 6000000.
TIBBer	This choice provides the total class Ib error ratio with the following range: <Real> 0 to 1 (0 to 100%).

TIIBer	This choice provides the total class II error ratio with the following range: <Real> 0 to 1 (0 to 100%).
TFER	This choice provides the total frame erasure ratio with the following range: <Real> 0 to 1 (0 to 100%).
TALL	This choice returns all total values (TIBC TIIC TFEC TDEFc TFRC TIBBer TIIBer TFER JUDGe JCAuse STOP SCAuse) at the same time. If accidental TCH synchronization loss caused the measurement to stop, `TSLoss` is returned.
JUDGe	This choice provides the comparator result (TEST OUT) with the following values: <Enumerated set> FAIL PASS NONE. If pass/fail criteria is NOLimit, `NONE` is returned
JCAuse	This choice provides which limit was met to cause the comparator result by returning one of the following values: <Enumerated set> NOLimit FER CIB CII
STOP	This choice checks to see if the stop threshold is met and returns one of the following values: <Enumerated set> `TRUE FALSE`. When threshold to stop criteria is NONE, `FALSE` is returned.
SCAuse	This choice provides the stop cause by returning one of the following values: <Enumerated set> NONE FE CIB CII TSLoss. If accidental TCH synchronization loss caused the measurement to stop, `TSLoss` is returned.

:BERT:BTS:LOOPback:GSM:CS1[:DATA]

Supported E4438C with Option 300

```
:DATA:BERT:BTS:LOOPback:GSM:CS1[:DATA]? IEC|IEBC|DEFC|BCO|IER|
IABer|ALL|TEC|TEBC|TDEFc|TBCO|TER|TABer|TALL|JUDGe|STOP|SCAuse
```

This data query returns the measurement result value for each variable.

IEC|IEBC|DEFC|BCO|IER|IABer are intermediate values, so during the measurement, these variables are updated as well as the display information. ALL returns all intermediate values at the same time.

At the end of the measurement, the final values are stored to: TEC|TEBC|TDEFc|TBCO|TER|TABer variables. These variables and JUDGe|STOP|SCAuse are not updated until the next BER measurement is completed.

For more information on the parameters, refer to page 408.

:BERT:BTS:LOOPback:GSM:CS4[:DATA]

Supported E4438C with Option 300

```
:DATA:BERT:BTS:LOOPback:GSM:CS4[:DATA]? IEC|IEBC|DEFC|BCO|IER|
IABer|ALL|TEC|TEBC|TDEFc|TBCO|TER|TABer|TALL|JUDGe|STOP|SCAuse
```

This data query returns the measurement result value for each variable.

IEC|IEBC|DEFC|BCO|IER|IABer are intermediate values, so during the measurement, these variables are updated as well as the display information. ALL returns all intermediate values at the same time.

At the end of the measurement, the final values are stored to: TEC|TEBC|TDEFc|TBCO|TER|TABer variables. These variables and JUDGe|STOP|SCAuse are not updated until the next BER measurement is completed.

For more information on the parameters, refer to page 408.

:BERT:BTS:LOOPback:GSM:MCS1[:DATA]

Supported E4438C with Option 300

```
:DATA:BERT:BTS:LOOPback:GSM:MCS1[:DATA]? IEC|IEBC|DEFC|BCO|IER|
IABer|ALL|TEC|TEBC|TDEFc|TBCO|TER|TABer|TALL|JUDGe|STOP|SCAuse
```

This data query returns the measurement result value for each variable.

IEC|IEBC|DEFC|BCO|IER|IABer are intermediate values, so during the measurement, these variables are updated as well as the display information. ALL returns all intermediate values at the same time.

At the end of the measurement, the final values are stored to: TEC|TEBC|TDEFc|TBCO|TER|TABer variables. These variables and JUDGe|STOP|SCAuse are not updated until the next BER measurement is completed.

For more information on the parameters, refer to page 408.

:BERT:AUXout

Supported E4438C with Option UN7

```
:DATA:BERT[:BASeband]:AUXout ERRor|REFerence|PN9
:DATA:BERT[:BASeband]:AUXout?
```

This command selects a pre-defined output signal configuration for pins on the AUX I/O rear panel connector. Refer to Table 7-1 for the output pin configuration and signal type.

ERRor This choice selects the bit error rate (BER) information output.

REFerence This choice selects the reference information output.

PN9 This choice selects a pseudo-random data output.

Table 7-1 AUX I/O pin configurations

Pin#	**ERRor**	**REFerence**	**PN9**
1	BER Meas End	BER Data Out	PN9 Data
4	BER Sync Loss	Sync Start	No signal
20	BER Test Out	BER Clock Out	PN9 Clock
21	BER Error Out	BER Error Out	BER Error Out
22	BER No Data	Reference Data	No signal

BER Meas End A signal at this pin indicates the status of the bit error rate (BER) measurements. BER measurements are being executed when the signal is high.

BER Sync loss A low signal at this pin indicates that the synchronization is lost. This signal is valid only when the signal at the BER Meas End pin is high.

BER Test Out A signal at this pin indicates the test result of the bit error rate measurements. The result is guaranteed at the falling edge of the BER Meas End signal. The result is pass when the signal is low; the result is fail when the signal is high. The signal is also high when the pass/fail judgment is set to off.

BER Error Out A signal at this pin indicates the number of the error bits. The output is normally low. One pulse signal (pulse width matches the input clock) indicates one error bit. Pulses for the error bits of one measurement cycle are not synchronized with the rear panel connector BER CLK IN signal and are output when the BER Meas End signal is high.

BER No Data A low signal at this pin indicates the no data status. The no data status is reported when there has been no clock inputs for more than 3 seconds or there has been no data change for more than 200 bits. This signal is valid only when the signal of the BER Meas End output signal is high.

BER Clock Out The BER Clock Out signal monitors the rear panel BER CLK IN signal after polarity control, delay control, and gate control (if applicable) have taken place.

BER Data Out This is a data stream for the bit error rate measurements. The clock signal is used to trigger the reading of the data.

Sync Start This signal indicates the timing when the PN generator starts to generate a PN sequence. This signal can also indicate if the hardware is triggering a PN synchronization or making a measurement when the signal is high.

PN9 Clock	This signal is the clock signal for the PN9 Data. The falling edge of the PN9 Clock indicates the center of PN9 Data. The PN9 Clock rate is 37.5Mbits per second.
PN9 Data	This signal is PN9 data for the self-loopback test.
Reference Data	This signal uses the pseudo-random bit stream as the reference signal.
***RST**	ERRor
Key Entry	**Error Out** **Reference Out** **PN9 Out**

[:DATA]

Supported E4438C with Option UN7

```
:DATA[:DATA]? BEC|BITC|BER|ALL|TBEC|TBIT|TBER|JUDGe
```

This query returns the data measurement for the selected variable.

BEC	This choice provides the intermediate bit error count result.
BITC	This choice provides the intermediate bit count result.
BER	This choice provides the intermediate bit error rate result.
ALL	This choice provides the values of the bit error count, bit error rate, and bit count in the following format: <bit count>, <error count>, <bit error rate>
TBEC	This choice provides the total bit error count at the end of each cycle.
TBIT	This choice provides the total bit count at the end of each cycle.
TBER	This choice provides the total bit error rate at the end of each cycle.
JUDGe	This choice provides the pass or fail string.

Input Subsystem–Option UN7 (:INPut:BERT[: BASeband])

:CGATe:DELay:CLOCk

Supported E4438C with Option UN7

```
:INPut:BERT[:BASeband]:CGATe:DELay:CLOCk <val>
:INPut:BERT[:BASeband]:CGATe:DELay:CLOCk?
```

This command sets the number of delay bits for the signal applied to the BER GATE IN rear panel connector.

One bit corresponds with one bit of delay for the input clock.

***RST** 1

Range 1–16384

Key Entry **Gate Clk Delay**

Remarks The gate delay mode must be set to CLOCk for this command to work. Refer to ":CGATe:DELay:MODE". Also, the gate and gate delay must be enabled for this command to work. Refer to ":CGATe[:STATe]" on page 418 and ":CGATe:DELay[:STATe]" on page 417.

:CGATe:DELay:MODE

Supported E4438C with Option UN7

```
:INPut:BERT[:BASeband]:CGATe:DELay:MODE TIME|CLOCk
:INPut:BERT[:BASeband]:CGATe:DELay:MODE:?
```

This command selects the operating mode of the gate delay.

TIME This choice selects the time mode which makes it possible to set the gate time delay in absolute time and the resolution.

CLOCk This choice selects the clock mode which enables you to set the gate delay by a set number of bits.

***RST** TIME

Key Entry **Gate Mode Time Clk**

Remarks The gate state and gate delay state must be enabled for this command to work. Refer to ":CGATe[:STATe]" on page 418 and ":CGATe:DELay[:STATe]" on page 417.

:CGATe:DELay:TIME

Supported E4438C with Option UN7

```
:INPut:BERT[:BASeband]:CGATe:DELay:TIME <val><unit>
:INPut:BERT[:BASeband]:CGATe:DELay:TIME?
```

This command sets the delay time of the gate signal. The gate delay time must be the multiple of the minimum resolution value and if not, the delay resolution is automatically rounded to the nearest multiplied value of the gate time delay value.

The variable <val> is expressed in units of seconds (s), milliseconds (ms), microseconds (μs), and nanoseconds (ns).

***RST** +2.67000000E–008

Range 2.67 ns–1.0 s

Key Entry **Gate Time Delay**

Remarks **Gate Delay Off On** must be set to **On** and **Gate Mode Time Clk** set to **Time** for this command to work. Refer to ":CGATe:DELay[:STATe]" on page 417 and ":CGATe:DELay:MODE" on page 416.

To set the resolution, refer to ":CLOCk:DELAy:RESolution" on page 418.

:CGATe:DELay[:STATe]

Supported E4438C with Option UN7

```
:INPut:BERT[:BASeband]:CGATe:DELay[:STATe] ON|OFF|1|0
:INPut:BERT[:BASeband]:CGATe:DELay[:STATe]?
```

This command enables or disables the operating state of the gate delay.

ON This choice enables the gate delay adjustment function.

OFF This choice disables the gate delay adjustment function.

***RST** 0

Key Entry **Gate Delay Off On**

Remarks The gate must be enabled for this command to work. To enable the gate, refer to ":CGATe[:STATe]" on page 418.

:CGATe:POLarity

Supported E4438C with Option UN7

```
:INPut:BERT[:BASeband]:CGATe:POLarity POSitive|NEGative
:INPut:BERT[:BASeband]:CGATe:POLarity?
```

This command sets the input polarity of the gate signal supplied to the BER GATE IN rear panel connector.

POS	With this choice, the signal is valid when the gate signal is high.
NEG	With this choice, the signal is valid when the gate signal is low.
***RST**	POS
Key Entry	**Gate Polarity Neg Pos**

:CGATe[:STATe]

Supported E4438C with Option UN7

```
:INPut:BERT[:BASeband]:CGATe[:STATe] ON|OFF|1|0
:INPut:BERT[:BASeband]:CGATe[:STATe]?
```

This command sets the operating state of the clock gate function.

ON	This choice enables the clock gate function.
OFF	This choice disables the clock gate function.
***RST**	0
Key Entry	**Gate Off On**

:CLOCk:DELAy:RESolution

Supported E4438C with Option UN7

```
:INPut:BERT[:BASeband]:CLOCk:DELay:RESolution <val><unit>
:INPut:BERT[:BASeband]:CLOCk:DELay:RESolution?
```

This command sets the resolution of the clock delay. The minimum resolution is 13.3 ns and it corresponds to 1/75 MHz. The 75 MHz is the sampling clock for the BERT board. The input value must be a multiple of the minimum resolution. If the set value is not a multiple value, the delay resolution is automatically rounded to the nearest multiple value with reference to the set value.

***RST**	+1.33000000E–008
Range	13.3ns–80µs

Key Entry **Resolution**

Remarks The clock delay or the gate delay must be enabled for this command to work. Refer to ":CLOCk:DELAy[:STATe]" on page 419 and ":CGATe:DELay[:STATe]" on page 417. A change in the resolution value can affect both the clock and the gate delay time automatically.

:CLOCk:DELAy:TIME

Supported E4438C with Option UN7

```
:INPut:BERT[:BASeband]:CLOCk:DELay:TIME <val><unit>
:INPut:BERT[:BASeband]:CLOCk:DELay:TIME?
```

This command sets the clock signal delay time.

The variable <val> is expressed in units of seconds (s), milliseconds (ms), microseconds (μs), and nanoseconds (ns).

***RST** +2.67000000E–008

Range 26.7ns–999.9967600ms

Key Entry **Clock Time Delay**

Remarks The clock delay must be enabled for this command to work. Refer to ":CLOCk:DELAy[:STATe]" on page 419.

:CLOCk:DELAy[:STATe]

Supported E4438C with Option UN7

```
:INPut:BERT[:BASeband]:CLOCk:DELay[:STATe] ON|OFF|1|0
:INPut:BERT[:BASeband]:CLOCk:DELay[:STATe]?
```

This command sets the operating state of the clock delay function.

ON This choice enables the clock delay adjustment.

OFF This choice disables the clock delay adjustment.

***RST** 0

Key Entry **Clock Delay Off On**

:CLOCk:POLarity

Supported E4438C with Option UN7

```
:INPut:BERT[:BASeband]:CLOCk:POLarity POSitive|NEGative
:INPut:BERT[:BASeband]:CLOCk:POLarity?
```

This command sets the input polarity of the clock signal supplied to the BER CLK IN rear panel connector.

POS With this choice, the signal is valid when the clock signal is high.

NEG With this choice, the signal is valid when the clock signal is low.

***RST** POS

Key Entry **Clock Polarity Neg Pos**

:DATA:POLarity

Supported E4438C with Option UN7

```
:INPut:BERT[:BASeband]:DATA:POLarity POSitive|NEGative
:INPut:BERT[:BASeband]:DATA:POLarity?
```

This command sets the input polarity of the data signal supplied to the BER DATA IN rear panel connector.

POS With this choice, the signal is valid when the data signal is high.

NEG With this choice, the signal is valid when the data signal is low.

***RST** POS

Key Entry **Data Polarity Neg Pos**

:IMPedance

Supported E4438C with Option UN7

```
:INPut:BERT[:BASeband]:IMPedance OHM_75|HIGH
:INPut:BERT[:BASeband]:IMPedance?
```

This command sets the input termination mode of the BER CLK IN, BER DATA IN, and BER GATE IN rear panel connectors.

***RST** HIGH

Key Entry **Impedance 75 Ohm High**

:THReshold

Supported E4438C with Option UN7

```
:INPut:BERT[:BASeband]:THReshold V0_7|V1_4|V1_65|V2_5
:INPut:BERT[:BASeband]:THReshold?
```

This command sets the threshold voltage level of the BER CLK IN, BER DATA IN, and BER GATE IN rear panel connectors.

V0_7	This choice selects 0.7 volts (normal TTL) as the turn-on voltage for the input signal.
V1_4	This choice selects 1.4 volts (Schmit TTL) as the turn-on voltage for the input signal.
V1_65	This choice selects 1.65 volts (CMOS 3.3 volts is the maximum operating range) as the turn-on voltage for the input signal.
V2_5	This choice selects 2.5 volts (CMOS 5 volts is the maximum operating range) as the turn-on voltage for the input signal.

***RST** V1_4

Key Entry **0.7V** **1.4V** **1.65V** **2.5V**

Measure Subsystem–Option 300 (:MEASure[:SCALar]:BERT:BTS:LOOPback)

:EDGE:MCS5[:SENSitivity]

Supported E4438C with Option 300

```
:MEASure[:SCALAR]:BERT:BTS:LOOPback:EDGE:MCS5[:SENSitivity]?
<high amplitude><unit>,<low amplitude><unit>,<pass amplitude><unit>,
<error sensitivity limit>,<block count>,<initial block count>
```

This query returns either PASS or FAIL and the result for the measured sensitivity level. When this command is executed before the signal generator is synchronized with the BTS, the message “`Fail, –999.00`” is displayed.

There are two other status errors that may be returned; `SERR` or `DERR`.

`SERR` This indicates that RF synchronization is lost during search and the search is aborted.

`DERR` This indicates that a downlink error occurred during search and the search is aborted.

When these errors are returned, the sensitivity search returns a value of –1.0.

This command can be used in both the BER% measurement or the sensitivity search mode. After this command is executed, the measurement mode is in the sensitivity search mode.

Remarks The trigger source must be set to IMMediate to execute this command. If the trigger source selection is BUS, error “-214 Trigger deadlock” is generated and no data is returned.

:EDGE:MCS9[:SENSitivity]

Supported E4438C with Option 300

```
:MEASure[:SCALAR]:BERT:BTS:LOOPback:EDGE:MCS9[:SENSitivity]?
<high amplitude><unit>,<low amplitude><unit>,<pass amplitude><unit>,
<error sensitivity limit>,block count>,<initial block count>
```

This query returns either PASS or FAIL and the result for the measured sensitivity level. When this command is executed before the signal generator is synchronized with the BTS, the message “`Fail, –999.00`” is displayed.

There are two other status errors that may be returned; SERR or DERR.

SERR	This indicates that RF synchronization is lost during search and the search is aborted.
DERR	This indicates that a downlink error occurred during search and the search is aborted.

When these errors are returned, the sensitivity search returns a value of –1.0.

This command can be used in both the BER% measurement or the sensitivity search mode. After this command is executed, the measurement mode is in the sensitivity search mode.

Remarks The trigger source must be set to IMMediate to execute this command. If the trigger source selection is BUS, error "-214 Trigger deadlock" is generated and no data is returned.

:EDGE:UNCoded[:SENSitivity]

Supported E4438C with Option 300

```
:MEASure[:SCALAR]:BERT:BTS:LOOPback:EDGE:UNCoded[:SENSitivity]?
<high amplitude><unit>,<low amplitude><unit>,<pass amplitude><unit>,
<error sensitivity limit>,<block count>,<initial block count>
```

This query returns either PASS or FAIL and the result for the measured sensitivity level. When this command is executed before the signal generator is synchronized with the BTS, the message "Fail, –999.00" is displayed.

There are two other status errors that may be returned; SERR or DERR.

SERR	This indicates that RF synchronization is lost during search and the search is aborted.
DERR	This indicates that a downlink error occurred during search and the search is aborted.

When these errors are returned, the sensitivity search returns a value of –1.0.

This command can be used in both the BER% measurement or the sensitivity search mode. After this command is executed, the measurement mode is in the sensitivity search mode.

Remarks The trigger source must be set to IMMediate to execute this command. If the trigger source selection is BUS, error "-214 Trigger deadlock" is generated and no data is returned.

:GSM[:SENSitivity]

Supported E4438C with Option 300

```
:MEASure[:SCALAR]:BERT:BTS:LOOPback:GSM[:SENSitivity]?
<high amplitude><unit>,<low amplitude><unit>,<pass amplitude><unit>,
<error sensitivity limit>,<block count>,<initial block count>
```

This query returns either PASS or FAIL and the result for the measured sensitivity level. When this command is executed before the signal generator is synchronized with the BTS, the message "`Fail, –999.00`" is displayed.

There are two other status errors that may be returned; `SERR` or `DERR`.

`SERR` This indicates that RF synchronization is lost during search and the search is aborted.

`DERR` This indicates that a downlink error occurred during search and the search is aborted.

When these errors are returned, the sensitivity search returns a value of –1.0.

This command can be used in both the BER% measurement or the sensitivity search mode. After this command is executed, the measurement mode is in the sensitivity search mode.

Remarks The trigger source must be set to IMMediate to execute this command. If the trigger source selection is BUS, error "-214 Trigger deadlock" is generated and no data is returned.

Sense Subsystem–Options UN7 and 300 ([:SOURce]:SENSe:BERT)

:BTS:LOOPback:EDGE:ETCH:F43:BLOCk:COUNt

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:BLOCk:COUNt <val>
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:BLOCk:COUNt?
```

This command specifies the total number of blocks to be measured.

***RST** +600

Range 1–1500000

Key Entry **Block Count**

:BTS:LOOPback:EDGE:ETCH:F43:CONTain

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:CONTain ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:CONTain?
```

This command enables or disables the BER measurement for ETCH/F43 channels in addition to the BLER measurement.

ON With this choice, data bits of the specified number of blocks are measured.

OFF This choice disables the measurement.

***RST** 1

Key Entry **BER Mode Off On**

:BTS:LOOPback:EDGE:ETCH:F43:STOP:CRITeria:EBLock

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:STOP:CRITeria:EBLock <val>
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:STOP:CRITeria:EBLock?
```

This command specifies the number of erased blocks that contain bit errors for the threshold limit to stop the measurement.

***RST** +60

Range 0–1500000

Key Entry **Block Erasure**

:BTS:LOOPback:EDGE:ETCH:F43:STOP:CRITeria[:SELect]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:STOP:CRITeria[:SELect] EBLock|
NONE
:SENSe:BERT:BTS:LOOPback:EDGE:ETCH:F43:STOP:CRITeria[:SELect]?
```

This command determines which of the following threshold criteria is used to prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no later than 200 ms after the threshold is exceeded.

EBLock This choice enables you to specify the number of erased blocks.

NONE This choice disables the stop measurement threshold criteria function.

***RST** NONE

Key Entry **Block Erasure** **No Thresholds**

:BTS:LOOPback:EDGE:FTRigger:EXTernal:DELay

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:FTRigger:EXTernal:DELay <val>
:SENSe:BERT:BTS:LOOPback:EDGE:FTRigger:EXTernal:DELay?
```

This command specifies the delay time of the external frame trigger. This delay is the offset from the beginning of timeslot 0.

The variable <val> is expressed in symbols with a resolution of 0.25.

***RST** +0.00000000E+000

Range –1250 to 1250

Key Entry **Ext Frame Trigger Delay**

Remarks Refer to the *E4428C/38C ESG Signal Generators User's Guide* for information on how to calculate the delay value.

:BTS:LOOPback:EDGE:FTRigger:EXTernal:POLarity

Supported E4438C with Option 300

:SENSe:BERT:BTS:LOOPback:EDGE:FTRigger:EXTernal:POLarity POSitive|NEGative
:SENSe:BERT:BTS:LOOPback:EDGE:FTRigger:EXTernal:POLarity?

This command specifies the external frame trigger polarity.

POS This selects the reference edge to be the rising edge of the pulse.

NEG This selects the reference edge to be the falling edge of the pulse.

***RST** POS

Key Entry **External Frame Trigger Polarity Neg Pos**

:BTS:LOOPback:EDGE:FTRigger[SELect]

Supported E4438C with Option 300

:SENSe:BERT:BTS:LOOPback:EDGE:FTRigger[:SELect] INTernal|EXTernal
:SENSe:BERT:BTS:LOOPback:EDGE:FTRigger[:SELect]?

This command specifies the frame trigger source to be used by the baseband generator.

INTernal This choice enables internal triggering.

EXTernal This choice enables the triggering by an externally applied signal at the rear panel connector.

***RST** INT

Key Entry Frame Trigger Source Int Ext

Remarks To enable this command, the frame trigger synchronization source must be PDCH. Refer to ":BTS:LOOPback:EDGE:SYNC[:SOURce]" on page 438.

:BTS:LOOPback:EDGE:MCS5:BLOCk:COUNt

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:BLOCk:COUNt <value>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:BLOCk:COUNt?
```

This command specifies the total number of blocks to be measured.

***RST** +600

Range 1–1500000

Key Entry **Block Count**

:BTS:LOOPback:EDGE:MCS5:CONTain

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:CONTain ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:CONTain?
```

This command enables or disables the BER measurement for MCS-5 channels in addition to the BLER measurement.

ON With this choice, data bits of the specified number of blocks are measured.

OFF This choice disables the measurement.

***RST** 1

Key Entry **BER Mode Off On**

:BTS:LOOPback:EDGE:MCS5:ESENsitivity

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:ESENsitivity <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:ESENsitivity?
```

This command specifies the target error rate when performing a sensitivity search.

The variable <val> is a decimal notation representing a percentage value.

***RST** +1.00000000E–001

Range 1E–6 to 1

Key Entry **Target BER %**

:BTS:LOOPback:EDGE:MCS5:HAMPlitude

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:HAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:HAMPlitude?
```

This command specifies the maximum amplitude level for performing a sensitivity search. The high amplitude value can not be lower than the low amplitude value.

The variable <val> is expressed in units of dBm.

***RST** –9.00000000E+001

Range –136 to 20

Key Entry **High Amplitude**

:BTS:LOOPback:EDGE:MCS5:LAMPlitude

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:LAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:LAMPlitude?
```

This command specifies the minimum amplitude level for performing a sensitivity search. The low amplitude value can not be higher than the high amplitude value.

The variable <val> is expressed in units of dBm.

***RST** –1.10000000E+002

Range –136.0 to 20

Key Entry **Low Amplitude**

:BTS:LOOPback:EDGE:MCS5:PAMPlitude

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:PAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:PAMPlitude?
```

This command specifies the threshold amplitude for pass/fail comparator results when performing a sensitivity search.

The variable <val> is expressed in units of dBm.

***RST** –1.01000000E+002

Range –136.0 to 20

Key Entry **Pass Amplitude**

:BTS:LOOPback:EDGE:MCS5:SBLock:COUNt

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:SBLock:COUNt <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:SBLock:COUNt?
```

This command specifies the total number of blocks for each measurement during the sensitivity search.

***RST** +1200

Range 1–1500000

Key Entry **Block Count**

:BTS:LOOPback:EDGE:MCS5:SBLock:INITial

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:SBLock:INITial <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:SBLock:INITial?
```

This command specifies the total number of blocks to be measured at the beginning of each measurement during the sensitivity search.

***RST** +600

Range 1–1500000

Key Entry **Initial Block Count**

:BTS:LOOPback:EDGE:MCS5:STOP:CRITeria:EBLock

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:STOP:CRITeria:EBLock <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:STOP:CRITeria:EBLock?
```

This command specifies the number of erased blocks that contain bit errors for the threshold limit to stop the measurement.

***RST** +60

Range 0–1500000

Key Entry **Block Erasure**

:BTS:LOOPback:EDGE:MCS5:STOP:CRITeria[:SELect]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:STOP:CRITeria[:SELect] EBLock|NONE
:SENSe:BERT:BTS:LOOPback:EDGE:MCS5:STOP:CRITeria[:SELect]?
```

This command determines which of the following threshold criteria is used to prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no later than 200 ms after the threshold is exceeded.

EBLock This choice enables you to specify the number of erased blocks or bit errors.

NONE This choice disables the stop measurement threshold criteria function.

Key Entry **Block Erasure** **No Thresholds**

:BTS:LOOPback:EDGE:MCS9:BLOCk:COUNt

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:BLOCk:COUNt <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:BLOCk:COUNt?
```

This command specifies the total number of blocks to be measured.

Only even values can be entered. If odd numbers are entered, the value increments by one to make it an even value.

***RST** +600

Range 2–1500000

Key Entry **Block Count**

:BTS:LOOPback:EDGE:MCS9:CONTain

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:CONTain ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:CONTain?
```

This command enables or disables the BER measurement for MCS-9 channels in addition to the BLER measurement.

ON With this choice, data bits of the specified number of blocks are measured.

OFF This choice disables the measurement.

***RST** 1

Key Entry **BER Mode Off On**

:BTS:LOOPback:EDGE:MCS9:ESENsitivity

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:ESENsitivity <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:ESENsitivity?
```

The variable <val> is a decimal notation representing a percentage value.

***RST** +1.00000000E-001

Range 1E–6 to 1

Key Entry **Target BER %**

:BTS:LOOPback:EDGE:MCS9:HAMPlitude

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:HAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:HAMPlitude?
```

This command specifies the maximum amplitude level for performing a sensitivity search. The high amplitude value can not be lower than the low amplitude value.

The variable <val> is expressed in units of dBm.

***RST** –8.00000000E+001

Range –136.0 to 20

Key Entry **High Amplitude**

:BTS:LOOPback:EDGE:MCS9:LAMPlitude

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:LAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:LAMPlitude?
```

This command specifies the minimum amplitude level for performing a sensitivity search. The low amplitude value can not be higher than the high amplitude value.

The variable <val> is expressed in units of dBm.

***RST** –1.00000000E+002

Range –136.0 to 20

Key Entry **Low Amplitude**

:BTS:LOOPback:EDGE:MCS9:PAMPlitude

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:PAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:PAMPlitude?
```

This command specifies the threshold amplitude for pass/fail comparator results when performing a sensitivity search.

The variable <val> is expressed in units of dBm.

***RST** –9.15000000E+001

Range –136.0 to 20

Key Entry **Pass Amplitude**

:BTS:LOOPback:EDGE:MCS9:SBLock:COUNt

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:SBLock:COUNt <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:SBLock:COUNt?
```

This command specifies the total number of blocks to be measured at each measurement during the sensitivity search.

Only even values can be entered. If odd numbers are entered, the value increments by one to make it an even value.

***RST** +1200

Range 2–1500000

Key Entry **Block Count**

:BTS:LOOPback:EDGE:MCS9:SBLock:INITial

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:SBLock:INITial <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:SBLock:INITial?
```

This command specifies the total number of blocks to be measured at the beginning of each measurement during the sensitivity search.

Only even values can be entered. If odd numbers are entered, the value increments by one to make it an even value.

***RST** +600

Range 2–1500000

Key Entry **Initial Block Count**

:BTS:LOOPback:EDGE:MCS9:STOP:CRITeria:EBLock

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:STOP:CRITeria:EBLock <val>
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:STOP:CRITeria:EBLock?
```

This command specifies the number of erased blocks that contain bit errors for the threshold limit to stop the measurement.

***RST** +60

Range 0–1500000

Key Entry **Block Erasure**

:BTS:LOOPback:EDGE:MCS9:STOP:CRITeria[:SELect]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:STOP:CRITeria[:SELect] EBLock|NONE
:SENSe:BERT:BTS:LOOPback:EDGE:MCS9:STOP:CRITeria[:SELect]?
```

This command determines which of the following threshold criteria is used to prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no later than 200 ms after the threshold is exceeded.

EBLock This choice enables you to specify the number of non-erased blocks that contain bit errors.

NONE This choice disables the stop measurement threshold criteria function.

***RST** NONE

Key Entry **Block Erasure** **No Thresholds**

:BTS:LOOPback:EDGE:MEASurement:STOP

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MEASurement:STOP
```

This command immediately stops any current measurement and releases the PRBS synchronization. After the synchronization is released, a new PRBS synchronization is attempted.

Key Entry **Stop Measurement**

:BTS:LOOPback:EDGE:MEASurement:TSLot

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MEASurement:TSLot 0|1|2|3|4|5|6|7
:SENSe:BERT:BTS:LOOPback:EDGE:MEASurement:TSLot?
```

This command specifies the timeslot number in which the measurement is to be performed.

The following EDGE timeslot configuration conditions will generate error message "-221 Settings Conflict":

- If the specified timeslot does not have one of the BLER/BER measurable channel types, which are uncoded, E-TCH/43.2NT, MCS-9, and MCS-5.
- If the specified timeslot type is not set to "NORMal."

***RST** +0

Key Entry **Timeslot**

Remarks This command couples the selected timeslot number with the EDGE configuration.

Changing the timeslot configuration with EDGE on will not generate an error message if EDGE BERT is off and the timeslot is off.

:BTS:LOOPback:EDGE:MEASurement[:MODE]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:MEASurement[:MODE] BLER|SSEarch
:SENSe:BERT:BTS:LOOPback:EDGE:MEASurement[:MODE]?
```

This command specifies the measurement mode.

BLER This choice specifies BLER% as the measurement mode.

SSEarch This choice specifies sensitivity search as the measurement mode.

***RST** BLER

Key Entry **Measurement Mode BLER% Search**

Remarks If the BLER% measurement is already running, this command will abort the BLER% measurement.

:BTS:LOOPback:EDGE:SINVert

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:SINVert ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:EDGE:SINVert?
```

This command sets the operating state of the spectrum inverting function.

ON This choice specifies that the EDGE demodulator invert the spectrum of the received RF signal.

OFF This choice leaves the spectrum of the received RF signal unaffected.

***RST** 1

Key Entry **Spectrum Invert Off On**

:BTS:LOOPback:EDGE:SYNC:AGAin

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:SYNC:AGAin
```

This command adjusts the input signal level of the internal demodulator. Use this adjustment when switching from BCH synchronization to PDCH synchronization.

Key Entry **Adjust Gain**

Remarks This command is ignored unless the status displays "Waiting for PDCH."

:BTS:LOOPback:EDGE:SYNC:RF

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:SYNC:RF
```

This command releases the current synchronization with the BTS and immediately starts to try to synchronize to either a BCH or PDCH signal as selected with the `SYNC[:SOURce]` command. This command will also stop the current measurement.

Key Entry **Synchronize to BCH/PDCH**

:BTS:LOOPback:EDGE:SYNC[:SOURce]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:SYNC[:SOURce] BCH|PDCH
:SENSe:BERT:BTS:LOOPback:EDGE:SYNC[:SOURce]?
```

This command specifies the synchronization source from the BTS under test.

BCH This choice specifies the traffic channel as the synchronization source.

PDCH This choice specifies the packet data channel as the synchronization source.

***RST** BCH

Key Entry **Sync Source BCH PDCH**

:BTS:LOOPback:EDGE:TRIGger[:SOURce]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:TRIGger[:SOURce] IMMediate|KEY|EXT|BUS
:SENSe:BERT:BTS:LOOPback:EDGE:TRIGger[:SOURce]?
```

This command determines the trigger source for the EDGE loopback bit error rate measurement.

IMMediate This choice begins the measurement directly after synchronization has been achieved.

KEY This choice begins the measurement when the front panel **Trigger** key is pressed, provided that synchronization has been achieved. If synchronization has not occurred, the trigger is ignored.

EXT This choice begins the measurement as soon as a trigger signal is applied to the rear panel connector provided that synchronization has been achieved. If synchronization has not occurred, the trigger is ignored.

BUS This choice enables GPIB triggering using the *TRG or GET command or LAN and RS-232 triggering using the *TRG command.

***RST** KEY

Key Entry **Immediate** **Trigger Key** **Ext** **Bus**

Remarks An inherent variable delay will always exist when starting a measurement because the measurement must await the start of the next speech frame after the trigger. The delay can vary between 0 and 23 ms (5 frames) depending on where the trigger falls within the TDMA multiframe.

A trigger is ignored unless the EDGE loopback operating state is turned on.

:BTS:LOOPback:EDGE:ULINk:OFFSet

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:ULINk:OFFSet <val>
:SENSe:BERT:BTS:LOOPback:EDGE:ULINk:OFFSet?
```

This command specifies, in symbols, the amount of compensation for the insertion of equipment such as fading simulators into the uplink RF path.

***RST** +0

Range –500 to 10000

Key Entry **Uplink Timing Advance**

:BTS:LOOPback:EDGE:UNCoded:BIT:COUNt

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:BIT:COUNt <value>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:BIT:COUNt?
```

This command specifies the total number of bits to be measured for the uncoded channel.

***RST** +139200

Range 1392–2147483647

Key Entry **Bit Count**

:BTS:LOOPback:EDGE:UNCoded:ESENsitivity

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:ESENsitivity <val>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:ESENsitivity?
```

This command specifies the target error rate when performing a sensitivity search.

***RST** +2.00000000E-002

Range 1E–6 to 1

Key Entry **Target BER %**

:BTS:LOOPback:EDGE:UNCoded:HAMPlitude

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:HAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:HAMPlitude?
```

This command specifies the maximum amplitude level for performing a sensitivity search. The high amplitude value can not be lower than the low amplitude value.

The variable <val> is expressed in units of dBm.

***RST** –8.50000000E+001

Range –136.0 to 20

Key Entry **High Amplitude**

:BTS:LOOPback:EDGE:UNCoded:LAMPlitude

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:LAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:LAMPlitude?
```

This command specifies the minimum amplitude level for performing a sensitivity search. The low amplitude value can not be higher than the high amplitude value.

The variable <val> is expressed in units of dBm.

***RST** –1.05000000E+002

Range –136.0 to 20

Key Entry **Low Amplitude**

:BTS:LOOPback:EDGE:UNCoded:PAMPlitude

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:PAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:PAMPlitude?
```

This command specifies the threshold amplitude for pass/fail comparator results when performing a sensitivity search.

The variable <val> is expressed in units of dBm.

***RST** –9.50000000E+001

Range –136.0 to 20

Key Entry **Pass Amplitude**

:BTS:LOOPback:EDGE:UNCoded:SBIT:COUNt

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:SBIT:COUNt <val>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:SBIT:COUNt?
```

This command specifies the total number of bits to be measured during a sensitivity search for the uncoded channel.

***RST** +139200

Range 1392–2147483647

Key Entry **Bit Count**

:BTS:LOOPback:EDGE:UNCoded:SBIT:INITial

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:SBIT:INITial <val>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:SBIT:INITial?
```

This command specifies the total number of bits to be measured at the beginning of the sensitivity search for the uncoded channel.

***RST** +13920

Range 1392–2147483647

Key Entry **Initial Bit Count**

:BTS:LOOPback:EDGE:UNCoded:STOP:CRITeria:EBIT

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:STOP:CRITeria:EBIT <val>
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:STOP:CRITeria:EBIT?
```

This command specifies the number of block erasures or bit errors, depending on the measurement channel type, for the threshold limit to stop the measurement.

***RST** +2784

Range 0–2147483647

Key Entry **Error Count**

:BTS:LOOPback:EDGE:UNCoded:STOP:CRITeria[:SELect]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:STOP:CRITeria[:SELect] EBIT|NONE
:SENSe:BERT:BTS:LOOPback:EDGE:UNCoded:STOP:CRITeria[:SELect]?
```

This command determines which of the following threshold criteria is used to prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no later than 200 ms after the threshold is exceeded.

EBIT This choice enables you to specify the number of bit errors.

NONE This choice disables the stop measurement threshold criteria function.

***RST** NONE

Key Entry **Error Count** **No Thresholds**

:BTS:LOOPback:EDGE[:STATe]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:EDGE[:STATe] ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:EDGE[:STATe]?
```

This command sets the operating state of the EDGE loopback bit error rate (BER) function.

ON This choice enables the EDGE loopback BER function.

OFF This choice disables the EDGE loopback BER function.

***RST** 0

Key Entry **EDGE BERT Off On**

Remarks Although you can configure the measurement parameters while the operating state is off, any command triggers sent will be ignored until the operating state is turned on.

:BTS:LOOPback:GSM:CS1:BLOCk:COUNt

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS1:BLOCk:COUNt <val>
:SENSe:BERT:BTS:LOOPback:GSM:CS1:BLOCk:COUNt?
```

This command specifies the total number of blocks to be measured.

***RST** +600

Range 1–1500000

Key Entry **Block Count**

:BTS:LOOPback:GSM:CS1:CONTain

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS1:CONTain ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:GSM:CS1:CONTain?
```

This command enables or disables the BER measurement for CS-1 channels in addition to the BLER measurement.

ON With this choice, data bits of the specified number of blocks are measured.

OFF This choice disables the BER measurement.

***RST** 1

Key Entry **BER Mode Off On**

:BTS:LOOPback:GSM:CS1:STOP:CRITeria:EBLock

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS1:STOP:CRITeria:EBLock <val>
:SENSe:BERT:BTS:LOOPback:GSM:CS1:STOP:CRITeria:EBLock?
```

This command specifies the number of erased blocks that contain bit errors for the threshold limit to stop the measurement.

***RST** +60

Range 0–1500000

Key Entry **Block Erasure**

:BTS:LOOPback:GSM:CS1:STOP:CRITeria[:SELect]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS1:STOP:CRITeria[:SELect] EBLock|NONE
:SENSe:BERT:BTS:LOOPback:GSM:CS1:STOP:CRITeria[:SELect]?
```

This command determines which of the following threshold criteria is used to prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no later than 200 ms after the threshold is exceeded.

EBLock This choice enables you to specify the number of erased blocks.

NONE This choice disables the stop measurement threshold criteria function.

***RST** NONE

Key Entry **Block Erasure** **No Thresholds**

:BTS:LOOPback:GSM:CS4:BLOCk:COUNt

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS4:BLOCk:COUNt <value>
:SENSe:BERT:BTS:LOOPback:GSM:CS4:BLOCk:COUNt?
```

This command specifies the total number of blocks to be measured.

***RST** +600

Range 1 to 1500000

Key Entry **Block Count**

:BTS:LOOPback:GSM:CS4:CONTain

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS4:CONTain ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:GSM:CS4:CONTain?
```

This command enables or disables the BER measurement for CS-4 channels in addition to the BLER measurement.

ON With this choice, data bits of the specified number of blocks are measured.

OFF This choice disables the BER measurement.

***RST** 1

Key Entry **BER Mode Off On**

:BTS:LOOPback:GSM:CS4:STOP:CRITeria:EBLock

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS4:STOP:CRITeria:EBLock <val>
:SENSe:BERT:BTS:LOOPback:GSM:CS4:STOP:CRITeria:EBLock?
```

This command specifies the threshold limit to stop the measurement which is the number of erased blocks that contain bit errors.

***RST** +60

Range 0–1500000

Key Entry **Block Erasure**

:BTS:LOOPback:GSM:CS4:STOP:CRITeria[:SELect]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:CS4:STOP:CRITeria[:SELect] EBLock|NONE
:SENSe:BERT:BTS:LOOPback:GSM:CS4:STOP:CRITeria[:SELect]?
```

This command determines which of the following threshold criteria is used to prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no later than 200 ms after the threshold is exceeded.

EBLock This choice enables you to specify the number of erased blocks.

NONE This choice disables the stop measurement threshold criteria function.

***RST** NONE

Key Entry **Block Erasure** **No Thresholds**

:BTS:LOOPback:GSM:ESENsitivity

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:ESENsitivity <val>
:SENSe:BERT:BTS:LOOPback:GSM:ESENsitivity?
```

This command specifies the target error rate when performing a sensitivity search.

***RST** +2.00000000E-002

Range 1E–6 to 1

Key Entry **Target BER%**

:BTS:LOOPback:GSM:FRAMe:CIB

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:FRAMe:CIB?
```

This query returns the total number of Class Ib bits to be measured which are calculated from the total number of frames specified to be measured.

:BTS:LOOPback:GSM:FRAMe:CII

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:FRAMe:CII?
```

This query returns the total number of Class II bits to be measured which are calculated from the total number of frames specified to be measured.

:BTS:LOOPback:GSM:FRAMe:COUNt

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:FRAMe:COUNt <val>
:SENSe:BERT:BTS:LOOPback:GSM:FRAMe:COUNt?
```

This command determines the length of the measurement specified by the total number of frames included in one measurement.

***RST** +100

Range 1–6000000

Key Entry **Frame Count**

:BTS:LOOPback:GSM:HAMPlitude

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:HAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:GSM:HAMPlitude?
```

This command specifies the maximum amplitude level for performing a sensitivity search.

The variable <val> is expressed in units of dBm.

***RST** –9.00000000E+001

Range –136.0 to 20

Key Entry **High Amplitude**

:BTS:LOOPback:GSM:LAMPlitude

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:LAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:GSM:LAMPlitude?
```

This command specifies the minimum amplitude level for performing a sensitivity search.

The variable <val> is expressed in units of dBm.

***RST** –1.15000000E+002

Range –136.0 to 20

Key Entry **Low Amplitude**

:BTS:LOOPback:GSM:MCS1:BLOCk:COUNt

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:BLOCk:COUNt <val>
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:BLOCk:COUNt?
```

This command specifies the total number of blocks to be measured.

***RST** +600

Range 1–1500000

Key Entry **Block Count**

:BTS:LOOPback:GSM:MCS1:CONTain

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:CONTain ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:CONTain?
```

This command enables or disables the BER measurement for MCS-1 channels in addition to the BLER measurement.

ON With this choice, data bits of the specified number of blocks are measured.

OFF This choice disables the BER measurement.

***RST** 1

Key Entry **BER Mode Off On**

:BTS:LOOPback:GSM:MCS1:STOP:CRITeria:EBLock

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:STOP:CRITeria:EBLock <val>
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:STOP:CRITeria:EBLock?
```

This command specifies the number of erased blocks that contain bit errors for the threshold limit to stop the measurement.

***RST** +60

Range 0–1500000

Key Entry **Block Erasure**

:BTS:LOOPback:GSM:MCS1:STOP:CRITeria[:SELect]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:STOP:CRITeria[:SELect] EBLock|NONE
:SENSe:BERT:BTS:LOOPback:GSM:MCS1:STOP:CRITeria[:SELect]?
```

This command determines which of the following threshold criteria is used to prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no later than 200 ms after the threshold is exceeded.

EBLock This choice enables you to specify the number of erased blocks.

NONE This choice disables the stop measurement threshold criteria function.

***RST** NONE

Key Entry **Block Erasure** **No Thresholds**

:BTS:LOOPback:GSM:MEASurement:STOP

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:MEASurement:STOP
```

This command stops any current measurement and releases the current PRBS synchronization. After the synchronization is released, a new PRBS synchronization is attempted.

Key Entry **Stop Measurement**

:BTS:LOOPback:GSM:MEASurement:TSLot

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:MEASurement:TSLot 0|1|2|3|4|5|6|7
```
:SENSe:BERT:BTS:LOOPback:GSM:MEASurement:TSLot?

This command specifies the timeslot number in which the measurement is to be performed. This command couples the selected timeslot number with the GSM configuration.

The following GSM timeslot configuration conditions will generate error message “-221 Settings Conflict”:

- If the specified timeslot E field fails to designate either MPN9 or MPN15.
- If the specified timeslot is not set to “Normal.”

***RST** +0

Key Entry **Timeslot**

Remarks Changing the timeslot configuration with GSM on will not generate error messages if GSM BERT is off and the timeslot is off.

:BTS:LOOPback:GSM:MEASurement[:MODE]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:MEASurement[:MODE] BER|SSEarch
:SENSe:BERT:BTS:LOOPback:GSM:MEASurement[:MODE]?
```

This command specifies the measurement mode.

BER This choice specifies BER% as the measurement mode.

SSEarch This choice specifies sensitivity search as the measurement mode.

***RST** BER

Key Entry **Measurement Mode BER% Search**

Remarks If the BER% measurement is already running, this command will abort the BER% measurement.

:BTS:LOOPback:GSM:PAMPlitude

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:PAMPlitude <val>
:SENSe:BERT:BTS:LOOPback:GSM:PAMPlitude?
```

This command specifies the threshold amplitude for pass/fail comparator results when performing a sensitivity search.

The variable <val> is expressed in units of dBm.

***RST** –1.04000000E+002

Range –136.0 to 20

Key Entry **Pass Amplitude**

:BTS:LOOPback:GSM:SFRame:COUNt

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:SFRame:COUNt <val>
:SENSe:BERT:BTS:LOOPback:GSM:SFRame:COUNt?
```

This command specifies the total number of frames to be measured for the final measurements during the sensitivity search.

***RST** +100

Range 1–6000000

Key Entry Frame Count

:BTS:LOOPback:GSM:SFRame:INITial

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:SFRame:INITial <val>
:SENSe:BERT:BTS:LOOPback:GSM:SFRame:INITial?
```

This command specifies the number of frames to be measured while sensitivity search is running rough searching to gain search speed. It is the first phase of sensitivity search.

***RST** +26

Range 1–6000000

Key Entry **Initial Frame Count**

:BTS:LOOPback:GSM:SINVert

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:SINVert ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:GSM:SINVert?
```

This command sets the operating state of the spectrum inverting function.

ON This choice specifies that the GSM demodulator invert the spectrum of the received RF signal.

OFF This choice leaves the spectrum of the received RF signal unaffected.

***RST** 1

Key Entry **Spectrum Invert Off On**

:BTS:LOOPback:GSM:STOP:CRITeria:CIB

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria:CIB <val>
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria:CIB?
```

This command specifies the threshold number of Class Ib errors to stop the measurement.

***RST** 300

Range 0–1000000

Key Entry **Class Ib Bit Error**

Remarks Refer to ":BTS:LOOPback:GSM:STOP:CRITeria[:SELect]" on page 452 for information on the use of the file variables.

:BTS:LOOPback:GSM:STOP:CRITeria:CII

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria:CII <val>
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria:CII?
```

This command specifies the threshold number of Class II errors to stop the measurement.

***RST** 300

Range 0–1000000

Key Entry **Class II Bit Error**

Remarks Refer to ":BTS:LOOPback:GSM:STOP:CRITeria[:SELect]" on page 452 for information on the use of the file variables.

:BTS:LOOPback:GSM:STOP:CRITeria:FERasure

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria:FERasure <val>
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria:FERasure?
```

This command specifies the threshold number of erased frames to stop the measurement.

***RST** 120

Range 0–1000000

Key Entry **Frame Erasure**

Remarks Refer to ":BTS:LOOPback:GSM:STOP:CRITeria[:SELect]" for information on the use of the file variables.

:BTS:LOOPback:GSM:STOP:CRITeria[:SELect]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria[:SELect] FERasure|CIB|CII|
ANY|NONE
:SENSe:BERT:BTS:LOOPback:GSM:STOP:CRITeria[:SELect]?
```

This command sets the threshold criteria used to prematurely stop the measurement prior to the normal measurement end. In each case, the measurement will terminate no later than 200 ms after the threshold is exceeded.

FERasure	This selection ends the measurement when the number of erased frames exceeds the specified threshold.
CIB	This selection ends the measurement when the number of Class Ib errors detected exceeds the specified threshold.
CII	This selection ends the measurement when the number of Class II errors detected exceeds the specified threshold.
ANY	This selection ends the measurement when any of the above stop measurement threshold criteria is exceeded.
NONE	This selection disables the stop measurement threshold criteria function, so that the measurement runs for the specified number of speech frames.

***RST** NONE

Key Entry **Frame Erasure** **Class Ib Bit Error** **Class II Bit Error** **Exceeds Any Thresholds** **No Thresholds**

:BTS:LOOPback:GSM:SYNC:RF

Supported E4438C with Option 300

`:SENSe:BERT:BTS:LOOPback:GSM:SYNC:RF`

This command releases the current synchronization with the BTS and immediately starts to try to synchronize to either a BCH or TCH signal as selected with the `SYNC[:SOURce]` command. This command will also stop the current measurement.

Key Entry **Synchronize to BCH/TCH**

Remarks The test equipment can use a BCH signal from the BTS to determine the required transmit timeslot, frame and multiframe timing. The BCH signal is always transmitted in timeslot 0 and contains multiframe information. Use BCH when a BCH subset is present
which contains SCH bursts with a properly coded T2 parameter.

Use TCH when providing a TCH/FS training sequence from the BTS. However, only one timeslot from the BTS can be active at a time and you must specify to the receiver which timeslot is being received since it has no absolute reference (unlike a BCH signal, which is always transmitted in timeslot 0).

:BTS:LOOPback:GSM:SYNC[:SOURce]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:SYNC[:SOURce] BCH|TCH
:SENSe:BERT:BTS:LOOPback:GSM:SYNC[:SOURce]?
```

This command specifies the synchronization source from the BTS under test.

BCH	This choice specifies the broadcast channel as the synchronization source.
TCH	This choice specifies the traffic channel as the synchronization source.
***RST**	BCH
Key Entry	**Sync Source BCH TCH**

:BTS:LOOPback:GSM:TRIGger[:SOURce]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:TRIGger[:SOURce] IMMediate|KEY|EXT|BUS
:SENSe:BERT:BTS:LOOPback:GSM:TRIGger[:SOURce]?
```

This command determines the trigger source for the GSM loopback bit error rate measurement.

IMMediate	This choice begins the measurement directly after synchronization has been achieved.
KEY	This choice begins the measurement when the front panel **Trigger** key is pressed, provided that synchronization has been achieved. If synchronization has not occurred, the trigger is ignored.
EXT	This choice begins the measurement as soon as a trigger signal is applied to the rear panel connector provided that synchronization has been achieved. If synchronization has not occurred, the trigger is ignored.
BUS	This choice enables GPIB triggering using the *TRG or GET command or LAN and RS-232 triggering using the *TRG command.
***RST**	KEY
Key Entry	**Immediate** **Trigger Key** **Ext** **Bus** **Aux**
Remarks	An inherent variable delay will always exist when starting a measurement because the measurement must await the start of the next speech frame after the trigger. The delay can vary between 0 and 23 ms (5 frames) depending on where the trigger falls within the TDMA multiframe. A trigger is ignored unless the GSM loopback operating state is turned on.

:BTS:LOOPback:GSM:ULINk:OFFSet

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM:ULINk:OFFSet <value>
:SENSe:BERT:BTS:LOOPback:GSM:ULINk:OFFSet?
```

This command specifies the amount of compensation for the insertion of equipment such as fading simulators into the uplink RF path.

***RST** +0

Range –500 to 10000

Key Entry **Uplink Timing Advance**

:BTS:LOOPback:GSM[:STATe]

Supported E4438C with Option 300

```
:SENSe:BERT:BTS:LOOPback:GSM[:STATe] ON|OFF|1|0
:SENSe:BERT:BTS:LOOPback:GSM[:STATe]?
```

This command enables (1) or disables (0) the operating state of the GSM loopback bit error rate function. Although you can configure the measurement parameters while the operating state is off, any command triggers sent will be ignored until the operating state is turned on.

***RST** 0

Key Entry **GSM BERT Off On**

[:BASeband]:PRBS:FUNCtion:SPIGnore:DATA

Supported E4438C with Option UN7

```
:SENSe:BERT[:BASeband]:PRBS:FUNCtion:SPIGnore:DATA ALL_0|ALL_1
:SENSe:BERT[:BASeband]:PRBS:FUNCtion:SPIGnore:DATA?
```

This command selects the bit parameter of the special pattern ignore function.

ALL_0 This choice ignores a bit pattern of 160 or more consecutive 0’s.

ALL_1 This choice ignores a bit pattern of 160 or more consecutive 1’s.

***RST** ALL_0

Key Entry **Spcl Pattern 0’s 1’s**

Remarks This command is valid only when the special pattern ignore function is enabled (On). Refer to “[:BASeband]:PRBS:FUNCtion:SPIGnore[:STATe]”. The special pattern of 160 or more 1’s or 0’s can appear at any position in the bit stream.

[:BASeband]:PRBS:FUNCtion:SPIGnore[:STATe]

Supported E4438C with Option UN7

```
:SENSe:BERT[:BASeband]:PRBS:FUNCtion:SPIGnore[:STATe] ON|OFF|1|0
:SENSe:BERT[:BASeband]:PRBS:FUNCtion:SPIGnore[:STATe]?
```

This command enables (1) or disables (0) the special pattern ignore function.

ON This choice detects 160 or more consecutive bits of 0’s or 1’s in the incoming bit stream and ignores these bits when making BER measurements. To select 0’s or 1’s refer to “[:BASeband]:PRBS:FUNCtion:SPIGnore:DATA”

OFF This choice disables the special pattern ignore mode for the BER measurement.

***RST** 0

Key Entry **Spcl Pattern Ignore Off On**

[:BASeband]:PRBS[:DATA]

Supported E4438C with Option UN7

```
:SENSe:BERT[:BASeband]:PRBS[:DATA] PN9|PN11|PN15|PN20|PN23
:SENSe:BERT[:BASeband]:PRBS[:DATA]?
```

This command selects the incoming data pattern for making BER measurements.

PN9–PN23 These choices select an internally generated pseudo-random pattern for BER measurements.

***RST** PN9

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23**

[:BASeband]:RSYNc:THReshold

Supported E4438C with Option UN7

```
:SENSe:BERT[:BASeband]:RSYNc:THReshold <val>
:SENSe:BERT[:BASeband]:RSYNc:THReshold?
```

This command specifies the threshold level for the resynchronizing function.

***RST** 0.40

Range 0.05–0.40

Key Entry **Resync Limits**

Remarks This command is valid only when the BERT resynchronizing function is on. Refer to “[:BASeband]:RSYNc[:STATe]” on page 457.

[:BASeband]:RSYNc[:STATe]

Supported E4438C with Option UN7

```
:SENSe:BERT[:BASeband]:RSYNc[:STATe] ON|OFF|1|0
:SENSe:BERT[:BASeband]:RSYNc[:STATe]?
```

This command sets the operating state of the resynchronization function.

ON This choice enables the resynchronization function.

OFF This choice disables the resynchronization function.

***RST** 1

Key Entry **BERT Resync Off On**

[:BASeband]:STATe

Supported E4438C with Option UN7

```
:SENSe:BERT[:BASeband]:STATe ON|OFF|1|0
:SENSe:BERT[:BASeband]:STATe?
```

This command sets the operating state of the bit error rate test (BERT) measurement.

ON This choice enables the BERT measurement.

OFF This choice disables the BERT measurement.

***RST** 0

Key Entry **BERT Off On**

[:BASeband]:STOP:CRITeria:EBIT

Supported E4438C with Option UN7

```
:SENSe:BERT[:BASeband]:STOP:CRITeria:EBIT <val>
:SENSe:BERT[:BASeband]:STOP:CRITeria:EBIT?
```

This command specifies the threshold limit to stop the measurement.

***RST** 100

Range 0–1000000000

Key Entry **Error Count**

Remarks	When the stop mode criteria is set to EBIT, the signal generator monitors the error bits and when it exceeds the set value, the signal generator stops the current BER measurement and waits for the next trigger. EBIT must be the selection for this command to work. To select EBIT refer to "[:BASeband]:STOP:CRITeria[:SELect]".

[:BASeband]:STOP:CRITeria[:SELect]

Supported E4438C with Option UN7

```
:SENSe:BERT[:BASeband]:STOP:CRITeria[:SELect] EBIT|NONE
:SENSe:BERT[:BASeband]:STOP:CRITeria[:SELect]?
```

This command determines which threshold criteria is used to prematurely stop the measurement.

EBIT	This choice enables a specified number of bit errors to prematurely stop the measurement.
NONE	This choice disables the stop measurement threshold criteria function.
***RST**	NONE
Key Entry	**Error Count** **No Thresholds**
Remarks	The measurement will terminate no later than 200 ms after the threshold is exceeded.

[:BASeband]:TBITs

Supported E4438C with Option UN7

```
:SENSe:BERT[:BASeband]:TBITs <val>
:SENSe:BERT[:BASeband]:TBITs?
```

This command specifies the total bit count to be measured in one measurement cycle.

***RST**	+10000
Range	100–4294967295
Key Entry	**Total Bits**

[:BASeband]:TRIGger:BDELay

Supported E4438C with Option UN7

```
:SENSe:BERT[:BASeband]:TRIGger:BDELay <val>
:SENSe:BERT[:BASeband]:TRIGger:BDELay?
```

This command specifies the number of bits to delay the trigger signal.

***RST** 0

Range 0–65535

Key Entry **Delay Bits**

Remarks This command is valid only when the trigger bit delay function is on. Refer to "[:BASeband]:TRIGger:BDELay:STATe".

[:BASeband]:TRIGger:BDELay:STATe

Supported E4438C with Option UN7

```
:SENSe:BERT[:BASeband]:TRIGger:BDELay:STATe ON|OFF|1|0
:SENSe:BERT[:BASeband]:TRIGger:BDELay:STATe?
```

This command sets the operating state of the trigger delay function.

ON This choice enables the trigger delay function.

OFF This choice disables the trigger delay function.

***RST** 0

Key Entry **Bit Delay Off On**

Remarks This command needs to be set to ON before the number of bits for the trigger delay can be set. Refer to "[:BASeband]:TRIGger:BDELay".

[:BASeband]:TRIGger:COUNt

Supported E4438C with Option UN7

```
:SENSe:BERT[:BASeband]:TRIGger:COUNt <val>
:SENSe:BERT[:BASeband]:TRIGger:COUNt?
```

This command sets the number of times the bit error rate test (BERT) measurements will repeat.

***RST** 1

Range 0–65535

Key Entry **Cycle Count**

Remarks	With 0 set, the BER measurements are repeated until you set the BERT operating state is set to off. Refer to “[:BASeband]:STATe” on page 457.

[:BASeband]:TRIGger:POLarity

Supported	E4438C with Option UN7

```
:SENSe:BERT[:BASeband]:TRIGger:POLarity POSitive|NEGative
:SENSe:BERT[:BASeband]:TRIGger:POLarity?
```

This command selects the polarity of the trigger signal.

POSitive	This choice triggers on the rising edge of the input data signal.
NEGative	This choice triggers on the falling edge of the input data signal.
***RST**	POS
Key Entry	**Aux I/O Trigger Polarity Pos Neg**
Key Entry	**Aux I/O Trigger Polarity Pos Neg**

[:BASeband]:TRIGger[:SOURce]

Supported	E4438C with Option UN7

```
:SENSe:BERT[:BASeband]:TRIGger[:SOURce] IMMediate|KEY|EXT|BUS|AUX
:SENSe:BERT[:BASeband]:TRIGger[:SOURce]?
```

This command selects the triggering type for starting the bit error rate test (BERT) measurements.

IMMediate	This choice begins the measurement directly after synchronization has been achieved.
KEY	This choice begins the measurement when the front panel **Trigger** key is pressed, provided that synchronization has been achieved. If synchronization has not occurred, the trigger is ignored.
EXT	This choice begins the measurement as soon as a trigger signal is applied to the rear panel connector provided that synchronization has been achieved. If synchronization has not occurred, the trigger is ignored.
BUS	This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.
AUX	This choice triggers an event using the rear panel AUX I/O connector pin #22. Refer to the *E4428C/38C ESG Signal Generators User’s Guide*.
***RST**	KEY
Key Entry	**Immediate** **Trigger Key** **Ext** **Bus** **Aux I/O**

8 Receiver Test Digital Commands

This chapter provides SCPI descriptions for commands dedicated to digital real-time testing using the E4438C ESG Vector Signal Generator. This chapter contains the following sections:

All Subsystem–Option 001/601or 002/602 ([:SOURce])

:RADio:ALL:OFF

Supported E4438C with Option 001/601or 002/602

`[:SOURce]:RADio:ALL:OFF`

This command disables all digital modulation personalities on a particular baseband.

Remarks This command does not affect analog modulation.

AWGN Real-Time Subsystem–Option 403 ([:SOURce]:RADio:AWGN:RT)

:BWIDth

Supported E4438C with Option 403

```
[:SOURce]:RADio:AWGN:RT:BWIDth <val>
[:SOURce]:RADio:AWGN:RT:BWIDth?
```

This command adjusts the real-time AWGN bandwidth value.

The variable <val> is expressed in units of Hertz (Hz–MHz).

***RST** +1.00000000E+006

Range 5E4–8E7

Key Entry **Bandwidth**

[:STATe]

Supported E4438C with Option 403

```
[:SOURce]:RADio:AWGN:RT[:STATe] ON|OFF|1|0
[:SOURce]:RADio:AWGN:RT[:STATe]?
```

This command enables or disables the operating state of real-time AWGN.

***RST** 0

Key Entry **Real-time AWGN Off On**

Bluetooth Subsystem–Option 406 ([:SOURce]:RADio:BLUEtooth:ARB)

:AMADdr

Supported E4438C with Option 406406

```
[:SOURce]:RADio:BLUEtooth:ARB:AMADdr <val>
[:SOURce]:RADio:BLUEtooth:ARB:AMADdr?
```

This command sets the 3-bit active member address (AM_ADDR).

***RST** +1

Range 0–7

Key Entry **AM_ADDR**

Remarks In a piconet, one or more slaves are connected to a single master; a temporary 3-bit address (AM_ADDR) is used to identify each active slave.

:BDADdr

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:BDADdr <val>
[:SOURce]:RADio:BLUEtooth:ARB:BDADdr?
```

This command sets the unique hexadecimal Bluetooth device address (BD_ADDR) with up to 48 bits.

***RST** #H000000000008

Range #H0–#HFFFFFFFFFFFF

Key Entry **BD_ADDR**

Remarks The address is derived from the IEEE802 standard.

:BURSt[:STATe]

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:BURSt[:STATe] ON|OFF|1|0
[:SOURce]:RADio:BLUEtooth:ARB:BURSt[:STATe]?
```

This command enables or disables the burst function.

ON(1) This choice will ramp up the signal power prior to transmitting the packet and ramp it down after the end of the packet transmission.

OFF(0)	This choice provides a linked series of packet transmissions with no power ramping.
***RST**	1
Key Entry	**Burst Off On**

:CGDelay

Supported	E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:CGDelay <val>
[:SOURce]:RADio:BLUEtooth:ARB:CGDelay?
```

This command sets the number of symbols to shift the output symbol clock (EVENT 1 rear panel connector) and gate (EVENT 2 rear panel connector) signals relative to the Bluetooth signal. The shifting of these signals is used to compensate for any packet delay through the DUT during BER tests.

***RST**	+0.00000000E+000
Range	0.0–24999.9
Key Entry	**Clock/Gate Delay**
Remarks	This command is only effective with a continuous PN9 (CPN9) payload data and is intended for bit error rate testing (BERT, Option UN7). Refer to “:DATA” on page 465 for selecting the CPN9 data choice.
	When the clock and gate delay is set to zero (0), the rising edge of the symbol clock lines up with the middle of each symbol and the gate is high during the user payload field (PN9 data).

:DATA

Supported	E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:DATA TPN9|CPN9|<val>
[:SOURce]:RADio:BLUEtooth:ARB:DATA?
```

This command sets the user payload data type; user payload data is the voice or data information (less the payload header) that is carried in a packet.

TPN9	This choice places a truncated PN9 sequence consisting of 216 bits into a single packet.
CPN9	This choice places 8 continuous PN9 sequences into 19 packets, followed by one packet with no user payload. This ensures that the SEQN bit is properly alternated which is a requirement to filter out packet re-transmission at the destination.

<val>	This variable lets you set your own 8 bit data pattern for a single packet. A change in the user payload data type resets the eight bit pattern to a value of 00000000.
***RST**	TPN9
Range	<val>: #B0–#B11111111 or 0–255
Key Entry	**Truncated PN9** **Continuous PN9** **8 Bit Pattern**
Remarks	The PN9 sequence (511 bits) is standard based. The sequence begins with the first one of nine consecutive ones.

:IQ:EXTernal:FILTer

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:IQ:EXTernal:FILTer 40e6|THRough
[:SOURce]:RADio:BLUEtooth:ARB:IQ:EXTernal:FILTer?
```

This command selects the filter or through path for I/Q signals routed to the rear panel I and Q outputs. Selecting a filter with this command will automatically set ":IQ:EXTernal:FILTer:AUTO" on page 466 to OFF (0) mode.

40e6	This choice applies a 40 MHz baseband filter.
THRough	This choice bypasses filtering.
***RST**	THR
Key Entry	**40.000 MHz** **Through**

:IQ:EXTernal:FILTer:AUTO

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:IQ:EXTernal:FILTer:AUTO ON|OFF|1|0
[:SOURce]:RADio:BLUEtooth:ARB:IQ:EXTernal:FILTer:AUTO?
```

This command enables or disables the automatic selection of the filters for I/Q signals routed to the rear panel I/Q outputs.

ON (1)	This choice will automatically select a digital modulation filter optimized for the current signal generator settings.
OFF (0)	This choice disables the auto feature which lets you select a digital modulation filter or through path. Refer to ":IQ:EXTernal:FILTer" on page 466 for selecting a filter or through path.
***RST**	1
Key Entry	**I/Q Output Filter Manual Auto**

:HEADer:CLEar

Supported E4438C with Option 406

`[:SOURce]:RADio:BLUEtooth:ARB:HEADer:CLEar`

This command clears the header information from the header file used by this format.

Key Entry **Clear Header**

Remarks The **Bluetooth Off On** softkey must be set to On for this command to function.

:HEADer:SAVE

Supported E4438C with Option 406

`[:SOURce]:RADio:BLUEtooth:ARB:HEADer:SAVE`

This command saves the header information to the header file used by this format.

Key Entry **Save Setup To Header**

Remarks The **Bluetooth Off On** must be set to On for this command to function.

:IMPairments

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments ON|OFF|1|0
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments?
```

This command enables or disables the Bluetooth signal impairment function.

ON(1) This choice enables the current impairment settings.

OFF(0) This choice disables the impairments.

***RST** 0

Key Entry **Impairments Off On**

:IMPairments:AWGN

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:AWGN ON|OFF|1|0
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:AWGN?
```

This choice enables or disables the additive white gaussian noise (AWGN) impairment.

***RST** 0

Key Entry **AWGN Off On**

Remarks The AWGN impairment is not added to the signal until the Bluetooth signal impairment function is enabled. Refer to ":IMPairments" for enabling the impairments.

:IMPairments:AWGN:CNR

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:AWGN:CNR <val>
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:AWGN:CNR?
```

This command sets the carrier to noise ratio expressed in a 1 MHz bandwidth for the additive white gaussian noise (AWGN) impairment.

The variable <val> is expressed in units of decibels (dB).

***RST** +21

Range 10–40

Key Entry **C/N[1MHz]**

Remarks The value set by this command does not affect the Bluetooth signal until both the AWGN impairment and the Bluetooth signal impairment function are enabled. Refer to ":IMPairments:AWGN" on page 468 for more information.

:IMPairments:AWGN:NSEed

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:AWGN:NSEed <val>
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:AWGN:NSEed?
```

This command sets the noise seed value for the additive white gaussian noise (AWGN) impairment.

***RST** +1

Range 1–65535

Key Entry **Noise Seed**

Remarks A change in the seed value changes the noise pattern.

The value set by this command does not affect the Bluetooth signal until both the AWGN impairment and the Bluetooth signal impairment function are enabled. Refer to “:IMPairments:AWGN” on page 468 for more information.

:IMPairments:DDEViation

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:DDEViation <val>
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:DDEViation?
```

This command sets the maximum linear or sinusoidal carrier frequency drift deviation during the Bluetooth packet transmission.

The variable <val> is expressed in units of kilohertz (–kHz to kHz) with a minimum resolution of 1 kHz.

***RST** +0.00000000E+000

Range –1E5 to –1E3, 0, 1E3 to 1E5

Key Entry **Drift Deviation**

Remarks Refer to “:IMPairments:FDType” on page 470 for selecting either a linear or sinusoidal frequency drift.

The value set by this command does not affect the Bluetooth signal until the Bluetooth signal impairment function is enabled. Refer to “:IMPairments” on page 467 for more information.

:IMPairments:FDType

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:FDType LINear|SINE
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:FDType?
```

This command sets the carrier frequency drift impairment type that will occur during the length of the Bluetooth packet transmission.

LINear This choice enables the carrier frequency to drift linearly from the signal generator carrier frequency setting to the value entered for the frequency drift.

SINE This choice enables the carrier frequency to drift sinusoidally above and below the signal generator carrier frequency setting. For example, if the carrier signal generator setting is 2.4 GHz and the drift value was 100 kHz, the carrier frequency would sinusoidally drift to 2.4001 GHz, back to 2.4 GHz and continue drifting to frequency values less than 2.4 GHz until the packet transmission ends. With a negative drift value, the carrier frequency deviation would begin drifting toward
2.3999 GHz at the beginning of the drift cycle.

***RST** SINE

Key Entry **Freq Drift Type Linear Sine**

Remarks To set a drift value, refer to “:IMPairments:DDEViation” on page 469.

The value set by this command does not affect the Bluetooth signal until the Bluetooth signal impairment function is enabled. Refer to “:IMPairments” on page 467 for more information.

The carrier frequency value on the signal generator display does not change during the drift impairment.

:IMPairments:FOFFset

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:FOFFset <val>
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:FOFFset?
```

This command sets a carrier frequency offset impairment value as part of a Bluetooth setup.

The variable <val> is expressed in units of kilohertz (–kHz to kHz) with a minimum resolution of 1 kHz.

***RST** +0.00000000E+000

Range –1E5 to –1E3, 0, 1E3 to 1E5

Key Entry **Freq Offset**

Remarks The value set by this command does not affect the Bluetooth signal until the Bluetooth signal impairment function is enabled. Refer to ":IMPairments" on page 467 for more information.

The carrier frequency value on the signal generator display does not change during the offset impairment.

:IMPairments:MINDex

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:MINDex <val>
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:MINDex?
```

This command sets the modulation index impairment value for the Bluetooth waveform.

***RST** +3.15000000E–001

Range 2.5E–1 to 4E–1

Key Entry **Mod Index**

Remarks The value set by this command does not affect the Bluetooth signal until the Bluetooth signal impairment function is enabled. Refer to ":IMPairments" on page 467 for more information.

Only the peak-to-peak frequency deviation is changed by this command; the bit rate (1 MHz) remains constant. The modulation index is derived from the following formula:

$$\text{Mod Index} = \frac{\text{Peak-to-Peak Frequency Deviation}}{\text{Bit Rate}}$$

:IMPairments:STERror

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:STERror <val>
[:SOURce]:RADio:BLUEtooth:ARB:IMPairments:STERror?
```

This command sets the symbol timing error impairment value for the Bluetooth waveform.

The variable <val> is expressed in units of parts per million (ppm) and in units of hertz (Hz). A 20 ppm timing error corresponds to a 20 Hz shift in the symbol rate. The range value indicated below applies to both units of measurement.

***RST** +0

Range –50 to 50

Key Entry **Symbol Timing Err**

Remarks The value set by this command does not affect the Bluetooth signal until the Bluetooth signal impairment function is enabled. Refer to ":IMPairments" on page 467 for more information.

:IQ:MODulation:ATTen

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:IQ:MODulation:ATTen <val>
[:SOURce]:RADio:BLUEtooth:ARB:IQ:MODulation:ATTen?
```

This command attenuates the I/Q signals being modulated through the signal generator RF path.

The variable <val> is expressed in units of decibels (dB).

ON (1) This choice enables the attenuation auto mode which optimizes the modulator attenuation for the current conditions.

OFF (0) This choice holds the attenuator at its current setting or at a selected value. Refer to ":IQ:MODulation:ATTen" on page 472 for setting the attenuation value.

***RST** +2.00000000E+000

Range 0–40

Key Entry **Modulator Atten Manual Auto**

:IQ:MODulation:ATTen:AUTO

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:IQ:MODulation:ATTen:AUTO ON|OFF|1|0
[:SOURce]:RADio:BLUEtooth:ARB:IQ:MODulation:ATTen:AUTO?
```

This command enables or disables the I/Q attenuation auto mode.

***RST** 1

Key Entry **Modulator Atten Manual Auto**

:IQ:MODulation:FILTer

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:IQ:MODulation:FILTer 2.1e6|40e6|THRough
[:SOURce]:RADio:BLUEtooth:ARB:IQ:MODulation:FILTer?
```

This command enables you to select a filter or through path for I/Q signals modulated onto the RF carrier. Selecting a filter with this command will set ":IQ:MODulation:ATTen:AUTO" on page 473 to OFF(0) mode.

2.1E6 This choice applies a 2.1 MHz baseband filter to the I/Q signals.

40E6 This choice applies a 40 MHz baseband filter to the I/Q signals.

THRough This choice bypasses filtering.

***RST** THR

Key Entry **2.100 MHz** **40.000 MHz** **Through**

:IQ:MODulation:FILTer:AUTO

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:IQ:MODulation:FILTer:AUTO ON|OFF|1|0
[:SOURce]:RADio:BLUEtooth:ARB:IQ:MODulation:FILTer:AUTO?
```

This command enables or disables the automatic selection of the filters for I/Q signals modulated onto the RF carrier.

ON(1) This choice will automatically select a digital modulation filter.

OFF(0) This choice disables the auto feature which lets you select a digital modulation filter or through path. Refer to ":IQ:MODulation:FILTer" on page 473 for selecting a filter or through path.

***RST** 1

Key Entry **I/Q Mod Filter Manual Auto**

:MDEStination:AAMPlitude

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:MDEStination:AAMPlitude NONE|M1|M2|M3|M4
[:SOURce]:RADio:BLUEtooth:ARB:MDEStination:AAMPlitude?
```

This command routes the selected marker to the Alternate Amplitude function. The `NONE` parameter clears the marker for the Alternate Amplitude function.

***RST** NONE

Key Entry **None** **Marker 1** **Marker 2** **Marker 3** **Marker 4**

:MDEStination:ALCHold

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:MDEStination:ALCHold NONE|M1|M2|M3|M4
[:SOURce]:RADio:BLUEtooth:ARB:MDEStination:ALCHold?
```

This command routes the selected marker to the ALC Hold function. The `NONE` parameter clears the marker for the ALC Hold function.

***RST** NONE

Key Entry **None** **Marker 1** **Marker 2** **Marker 3** **Marker 4**

:MDEStination:PULSe

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:MDEStination:PULSe NONE|M1|M2|M3|M4
[:SOURce]:RADio:BLUEtooth:ARB:MDEStination:PULSe?
```

This command routes the selected marker to the Pulse/RF Blanking function. The `NONE` parameter clears the marker for the Pulse/RF Blanking function.

***RST** NONE

Key Entry **None** **Marker 1** **Marker 2** **Marker 3** **Marker 4**

:MPOLarity:MARKer1|2|3|4

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:MPOLarity:MARKer1|2|3|4 NEGative|POSitive
[:SOURce]:RADio:BLUEtooth:ARB:MPOLarity:MARKer1|2|3|4?
```

This command sets the polarity for the selected marker. For a positive marker polarity, the marker signal is high during the marker points. For a negative marker polarity, the marker signal is high during the period of no marker points.

Example

```
:RAD:ARB:MPOL:MARK3 NEG
```

The preceding example sets the polarity for marker 3 to negative.

***RST** POS

Key Entry **Marker 1 Polarity Neg Pos** **Marker 2 Polarity Neg Pos** **Marker 3 Polarity Neg Pos** **Marker 4 Polarity Neg Pos**

:MPOLarity:MARKer1

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:MPOLarity:MARKer1 NEGative|POSitive
[:SOURce]:RADio:BLUEtooth:ARB:MPOLarity?
```

This command sets the polarity for marker 1.

***RST** POS

Key Entry **Marker 1 Polarity Neg Pos**

:MPOLarity:MARKer2

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:MPOLarity:MARKer2 NEGative|POSitive
[:SOURce]:RADio:BLUEtooth:ARB:MPOLarity:MARKer2?
```

This command sets the polarity for marker 2.

***RST** POS

Key Entry **Marker 2 Polarity Neg Pos**

:MPOLarity:MARKer3

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:MPOLarity:MARKer3 NEGative|POSitive
[:SOURce]:RADio:BLUEtooth:ARB:MPOLarity:MARKer3?
```

This command sets the polarity for marker 3.

***RST** POS

Key Entry **Marker 3 Polarity Neg Pos**

:MPOLarity:MARKer4

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:MPOLarity:MARKer4 NEGative|POSitive
[:SOURce]:RADio:BLUEtooth:ARB:MPOLarity:MARKer4?
```

This command sets the polarity for marker 4.

***RST** POS

Key Entry **Marker 4 Polarity Neg Pos**

:PACKet

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:PACKet DH1
[:SOURce]:RADio:BLUEtooth:ARB:PACKet?
```

This command selects a DH1 packet.

***RST** DH1

Choices DH1

Key Entry **Packet (DH1)**

Remarks A DH1 packet covers a single timeslot.

:REFernce:EXTernal:FREQuency

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:REFerence:EXTernal:FREQuency <val>
[:SOURce]:RADio:BLUEtooth:ARB:REFerence:EXTernal:FREQuency?
```

This command sets the lock frequency of the internal ARB waveform clock to match the externally applied ARB waveform clock reference at the BASEBAND GEN REF IN connector.

The variable <val> is expressed in units of hertz (Hz–MHz).

***RST** +1.00000000+007

Range 2.5E5–1E8

Key Entry **Reference Freq**

Remarks Use this command when EXTernal is the ARB waveform clock reference source. Refer to ":REFerence[:SOURce]" on page 477 for selecting either the internal or an external source.

:REFerence[:SOURce]

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:REFerence[:SOURce] INTernal|EXTernal
[:SOURce]:RADio:BLUEtooth:ARB:REFerence[:SOURce]?
```

This command selects either an internal or external reference for the ARB waveform clock.

***RST** INT

Key Entry **ARB Reference Ext Int**

Remarks If the EXTernal choice is selected, the frequency of the external reference must be entered into the signal generator and the signal must be applied to the BASEBAND GEN REF IN connector. Refer to ":REFernce:EXTernal:FREQuency" on page 477 for entering the frequency value.

:RSYMbols

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:RSYMbols <val>
[:SOURce]:RADio:BLUEtooth:ARB:RSYMbols?
```

This command controls how long it takes the RF burst to ramp up at the beginning of the packet transmission and down at the end.

The variable <val> is expressed in symbols (1 symbol interval equals 1 µs).

***RST** +6

Range 1–10

Key Entry **Burst Power Ramp**

:SCLock:RATE

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB:SCLock:RATE <val>
[:SOURce]:RADio:BLUEtooth:ARB:SCLock:RATE?
```

This command sets the sample clock rate for the Bluetooth modulation format.

The variable <val> is expressed in units of hertz.

***RST** +1.00000000E+008

Range 1–1E8

Key Entry **ARB Sample Clock**

[:STATe]

Supported E4438C with Option 406

```
[:SOURce]:RADio:BLUEtooth:ARB[:STATe] ON|OFF|1|0
[:SOURce]:RADio:BLUEtooth:ARB[:STATe]?
```

This command enables or disables the Bluetooth waveform generator.

***RST** 0

Key Entry **Bluetooth Off On**

CDMA2000 BBG Subsystem–Option 401 ([:SOURce]:RADio:CDMA2000[:BBG])

:LMODe

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:LMODe FORWard|RT12|RA12|RT34|RE34|RC34
[:SOURce]:RADio:CDMA2000[:BBG]:LMODe?
```

This command selects either forward or reverse link Real Time CDMA2000.

FORWard This choice selects the forward link mode.

RT12 This choice selects the reverse traffic channel for radio configurations one and two.

RA12 This choice selects the reverse access channel for radio configurations one and two.

RT34 This choice selects the reverse traffic channel for radio configurations three and four.

RE34 This choice selects the reverse enhanced access channel for radio configurations three and four.

RC34 This choice selects the reverse common control channel for radio configurations three and four.

***RST** FORW

Key Entry **Link Forward Reverse** **RadioConfig 1/2 Traffic** **RadioConfig 1/2 Access** **RadioConfig 3/4 Traffic** **RadioConfig 3/4 Enhanced Access** **RadioConfig 3/4 Common Control**

[:FORWard]:BBCLock

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:BBCLock INT[1]|EXT[1]
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:BBCLock?
```

This command selects the baseband data clock source for the forward link.

***RST** INT

Field Entry `BBG Data Clock`

Remarks If the EXT choice is selected, the external frequency must be entered and the signal must be applied to the BASEBAND GEN REF IN rear panel connector.

[:FORWard]:CHIPrate

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:CHIPrate <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:CHIPrate?
```

This command adjusts the chip rate value.

The variable <val> is expressed in units of chips per second (cps–Mcps).

***RST** +1.22880000E+006

Range 1E3–1.3E6

Field Entry `Chip Rate`

Remarks The default value (1.228800 Mcps) is in accordance with the IS-2000 specification.

[:FORWard]:ESDelay

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:ESDelay <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:ESDelay?
```

This command modifies the even second clock pulse.

***RST** +2.00000000E+001

Range 0.5–128.0

Field Entry `Even Second Delay`

Remarks The even second clock pulse sets the delay to align the RF with the trigger.

When the noise function is set to ON, this value will increase. Refer to "[:FORWard]:NOISe[:STATe]" on page 506 for more information.

[:FORWard]:FILTer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer RNYQuist|NYQuist|
GAUSsian|RECTangle|IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|
"<user FIR>"|
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer?
```

This command specifies the filter type.

IS95 This choice selects a filter that meets the criteria of the IS-95 standard.

IS95_EQ This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.

IS95_MOD This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.

IS95_MOD_EQ This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.

AC4Fm This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.

UGGaussian This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.

"<user FIR>" This variable is any filter file that you have stored into memory.

***RST** IS95_EQ

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 MOD w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

[:FORWard]:FILTer:ALPHa

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer:ALPHa <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer:ALPHa?
```

This command changes the Nyquist or root Nyquist filter's alpha value.

The filter alpha value can be set to the minimum level (0), the maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +2.20000000E–001

Range 0.000–1.000

Key Entry **Filter Alpha**

Remarks To change the current filter type, refer to "[:FORWard]:FILTer" on page 481.

[:FORWard]:FILTer:BBT

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer:BBT <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time filter value.

The filter BbT value can be set to the minimum level (0), the maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +5.00000000E–001

Range 0.000–1.000

Key Entry **Filter BbT**

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to "[:FORWard]:FILTer" on page 481.

[:FORWard]:FILTer:CHANnel

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer:CHANnel EVM|ACP
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FILTer:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM	This choice provides the most ideal passband.
ACP	This choice improves stopband rejection.
***RST**	EVM
Key Entry	**Optimize FIR For EVM ACP**
Remarks	To change the current filter type, refer to “[:FORWard]:FILTer” on page 481.

[:FORWard]:LCSTate

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:LCSTate <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:LCSTate?
```

This command sets the long code seed used to generate the long code for the forward link.

***RST**	#H00000000000
Range	#H0–#H3FFFFFFFFFF
Field Entry	`Long Code State`
Remarks	The storage register for the long code state allows a 42-bit binary number to be entered.

[:FORWard]:FFCH:DATA

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:DATA PN9|PN15|FIX4|
"<file name>"|EXT
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:DATA?
```

This command configures the data field for the forward fundamental channel.

***RST**	PN9
Key Entry	**PN9 PN15 FIX4 User File Ext**
Remarks	Refer to “File Name Variables” on page 13 for information on the file name syntax.

[:FORWard]:FFCH:DATA:FIX4

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:DATA:FIX4 <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:DATA:FIX4?
```

This command selects a fixed 4-bit data pattern to be repeated as necessary to fill the selected data area.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

[:FORWard]:FFCH:EBNO

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:EBNO <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:EBNO?
```

This command sets the ratio of energy per bit to noise power spectral density (expressed in dB) for the forward fundamental channel.

***RST** +0.00000000E+000

Range

$$\text{min EbNo: } 10\log_{10}\left[\frac{\text{Chip Rate}}{1000(\text{Bit Rate})}\right] + \text{Normalized Power} + \text{RCFactor}$$

$$\text{max EbNo: } 10\log_{10}\left[\frac{1000(\text{Chip Rate})}{\text{Bit Rate}}\right] + \text{Normalized Power} + \text{RCFactor}$$

Normalized Power is the channel amplitude after adjusting the code power to 0 dB. Refer to “[:FORWard]:PADJust” on page 508 for adjusting the code domain power.

RCFactor is dependent on the selected radio configuration. The following table shows the RCFactor by radio configuration.

RC	RCFactor
1	$10\log_{10}\left[\frac{1}{2}\left(\frac{11}{11+\frac{9600}{\text{Bit Rate}}}\right)\right]$
2	$10\log_{10}\left[\frac{1}{2}\left(\frac{23}{23+\frac{14400}{\text{Bit Rate}}}\right)\right]$

RC	RCFactor
3, 4	$10\log_{10}\left[\dfrac{11}{11+\dfrac{9600}{\text{Bit Rate}}}\right]$
5	$10\log_{10}\left[\dfrac{11}{11+\dfrac{14400}{\text{Bit Rate}}}\right]$

Field Entry `EbNo`

Remarks Changes to the EbNo values also change the EcNo values for all other channels in the current link (forward or reverse).

Queries of this command are only valid for the current operating state.

[:FORWard]:FFCH:FOFFset

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:FOFFset <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:FOFFset?
```

This command sets the frame offset value for the forward fundamental channel.

***RST** +0

Range 0–15

Field Entry `Frame Offset`

Remarks Changing this value also changes the frame offset value for the forward supplemental channels (FSCH1 and FSCH2).

[:FORWard]:FFCH:LCMask

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:LCMask?
```

This command outputs the contents of the long code mask field for the forward fundamental channel.

***RST** #H31800000000

Remarks This value is shared by the forward supplemental channels (FSCH1 and FSCH2).

[:FORWard]:FFCH:LCMask:ESN

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:LCMask:ESN <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:LCMask:ESN?
```

This command sets the permuted electronic serial number (ESN) for the long code mask, which is used to identify a particular mobile.

***RST** #H00000000

Range #H0–#HFFFFFFFF

Field Entry `Permuted ESN`

Remarks Changing this value also changes the permuted ESN for the long code mask in the forward supplemental channels (FSCH1 and FSCH2).

[:FORWard]:FFCH:LCMask:HEADer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:LCMask:HEADer <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:LCMask:HEADer?
```

This command sets the header for the long code mask, which is used to identify a particular mobile.

***RST** #H318

Range 000–3FF

Field Entry `Header`

Remarks Changing this value also changes the header for the long code mask in the forward supplemental channels (FSCH1 and FSCH2).

[:FORWard]:FFCH:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:POWer?
```

This command sets the power for the forward fundamental channel.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry `Power`

[:FORWard]:FFCH:PRAMp

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:PRAMp ON|OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:PRAMp?
```

This command sets the power puncturing operating state for the forward fundamental channel.

***RST** 1

Field Entry `Ramp`

[:FORWard]:FFCH:PRTime

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:PRTime <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:PRTime?
```

This command sets the power ramp time indicator values for the forward fundamental channel.

Power frame indicators are used to command the mobile (increasing or decreasing power). For example, if 4 is the selected value, it will cause the mobile to respond with 4 sequential power increases, then 4 power decreases. This pattern will continue indefinitely.

The variable <val> is expressed in

***RST** +1

Range 1–80

Field Entry `Ramp Time`

[:FORWard]:FFCH:QOF

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:QOF <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:QOF?
```

This command sets the quasi-orthogonal function channel value.

***RST** +0

Range 0–3

Field Entry `QOF`

[:FORWard]:FFCH:RATE

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:RATE 1.2kbps|1.5kbps|
1.8kbps|2.4kbps|2.7kbps|3.6kbps|4.8kbps|7.2kbps|9.6kbps|14.4kbps
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:RATE?
```

This command sets the data rate for the forward paging channel.

The variable <val> is expressed in units of bits per second (bps–Mbps).

***RST** +9.60000000E+003

Range 1.2E3–1.44E4

Field Entry `Bit Rate`

[:FORWard]:FFCH:RCONfig

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:RCONfig <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:RCONfig?
```

This command sets the radio configuration value for the forward fundamental channel.

***RST** +3

Range 1–5

Field Entry `Radio Config`

[:FORWard]:FFCH:WALSh

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:WALSh <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH:WALSh?
```

Execute this command to set the Walsh code for the forward fundamental channel.

***RST** +10

Range RC1,2,3, & 5: 0–63 RC4: 0–127

Field Entry `Walsh`

[:FORWard]:FFCH[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH[:STATe] ON|OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FFCH[:STATe]?
```

This command enables or disables the operating state of the forward fundamental channel.

***RST** 0

Field Entry `State`

[:FORWard]:FPCH:DATA

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:DATA DEFault|"<file name>"
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:DATA?
```

This command configures the data field for the forward paging channel.

***RST** DEFAULT

Key Entry **Default** **User File**

Remarks A user-defined file can have a maximum length of 512 bytes.

Refer to “File Name Variables” on page 13 for information on the file name syntax.

[:FORWard]:FPCH:EBNO

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:EBNO <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:EBNO?
```

This command sets the ratio of energy per bit to noise power spectral density (expressed in dB) for the forward paging channel.

***RST** +0.00000000E+000

Range

$$min\ EbNo: 10\log_{10}\left[\frac{\text{Chip Rate}}{1000(\text{Bit Rate})}\right] + \text{Normalized Power}$$

$$max\ EbNo: 10\log_{10}\left[\frac{1000(\text{Chip Rate})}{\text{Bit Rate}}\right] + \text{Normalized Power}$$

Normalized Power is the channel amplitude after adjusting the code power to 0 dB. Refer to “[:FORWard]:PADJust” on page 508 for adjusting the code domain power.

Field Entry `EbNo`

Remarks Changes to the EbNo values also change the EcNo values for all other channels in the current link (forward or reverse).

Queries of this command are only valid for the current operating state.

[:FORWard]:FPCH:LCMask

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:LCMask?
```

This command outputs the contents of the long code mask field for the forward paging channel.

***RST** +0.00000000E+000

[:FORWard]:FPCH:LCMask:F1

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:LCMask:F1 <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:LCMask:F1?
```

This command sets the value of field one for the forward paging channel long code mask.

***RST** #H18CD

Range #H0–#H1FFF

Field Entry `Field 1`

[:FORWard]:FPCH:LCMask:F2

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:LCMask:F2 <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:LCMask:F2?
```

This command sets the value of field two for the forward paging channel long code mask.

***RST** #H00

Range #H00–#H1F

Field Entry `Field 2`

[:FORWard]:FPCH:LCMask:F3

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:LCMask:F3 <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:LCMask:F3?
```

This command sets the value of field three for the forward paging channel long code mask.

***RST** #H000

Range #H0–#HFFF

Field Entry `Field 3`

[:FORWard]:FPCH:MESSage

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:MESSage <bit_count>,
<datablock>
```

This command sends a bit count and a data block (to queue up messaging), generated as a one-time paging message (asynchronous paging message), to the paging channel.

After a one-time paging message is generated, the signal generator reverts to synchronous paging file messages.

[:FORWard]:FPCH:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:POWer?
```

Execute this command to set the power for the forward paging channel.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry `Power`

[:FORWard]:FPCH:RATE

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:RATE 4.8kbps|9.6kbps
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:RATE?
```

This command sets the data rate for the forward paging channel.

The variable <val> is expressed in units of bits per second (bps–Mbps).

***RST** +9.60000000E+003

Field Entry `Bit Rate`

[:FORWard]:FPCH:WALSh

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:WALSh <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH:WALSh?
```

This command sets the Walsh code for the forward paging channel.

***RST** +1

Range 0–63

Field Entry `Walsh`

[:FORWard]:FPCH[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH[:STATe] ON|OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPCH[:STATe]?
```

Execute this command to set the operating state for the forward paging channel.

***RST** 0

Field Entry `State`

[:FORWard]:FPICh:ECNO

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPICh:ECNO <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPICh:ECNO?
```

This command sets the ratio of energy per chip to the noise power spectral density (expressed in dB) for the forward pilot channel.

***RST** +0.00000000E+000

Range min EcNo: –30 + Normalized Power

max EcNo: 30 + Normalized Power

Normalized Power is the channel amplitude after adjusting the code power to 0 dB. Refer to “[:FORWard]:PADJust” on page 508 for adjusting the code domain power.

Field Entry `EcNo`

Remarks Changes to the EcNo values also change the EbNo values for all other channels in the current link (forward or reverse).

Queries of this command are only valid for the current operating state.

[:FORWard]:FPICh:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPICh:POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPICh:POWer?
```

This command sets the power for the forward pilot channel.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry `Power`

[:FORWard]:FPICh[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPICh[:STATe] ON|OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FPICh[:STATe]?
```

This command enables or disables the operating state of the forward pilot channel.

***RST** 1

Field Entry `State`

[:FORWard]:FSCH[1]|2:DATA

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:DATA PN9|PN15|FIX4|
"<file name>"|EXT
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:DATA?
```

This command configures the data field for the forward supplemental traffic channels.

***RST** PN9

Key Entry **PN9** **PN15** **FIX4** **User File** **EXT**

[:FORWard]:FSCH[1]|2:DATA:FIX4

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:DATA:FIX4 <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:DATA:FIX4?
```

This command selects a fixed 4-bit data pattern that repeats as necessary to fill the selected data area.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

[:FORWard]:FSCH[1]|2:EBNO

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:EBNO <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:EBNO?
```

This command sets the ratio of energy per bit to noise power spectral density (expressed in dB) for the reverse access channel.

***RST** +0.00000000E+000

Range

$$\text{min EbNo: } 10\log_{10}\left[\frac{\text{Chip Rate}}{1000(\text{Bit Rate})}\right] + \text{Normalized Power}$$

$$\text{max EbNo: } 10\log_{10}\left[\frac{1000(\text{Chip Rate})}{\text{Bit Rate}}\right] + \text{Normalized Power}$$

Normalized Power is the channel amplitude after adjusting the code power to 0 dB. Refer to "[:FORWard]:PADJust" on page 508 for adjusting the code domain power.

Field Entry `EbNo`

Remarks Changes to the EbNo values also change the EcNo values for all other channels in the current link (forward or reverse).

Queries of this command are only valid for the current operating state.

[:FORWard]:FSCH[1]|2:FOFFset

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:FOFFset <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:FOFFset?
```

This command sets the frame offset value for the forward supplemental traffic channels.

***RST** +0

Range 0–15

Field Entry `Frame Offset`

Remarks Changing this value also changes the frame offset value for the forward fundamental channel (FFCH).

[:FORWard]:FSCH[1]|2:LCMask

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:LCMask?
```

This query outputs the contents of the long code mask field for the forward supplemental traffic channels.

***RST** 0

Remarks This value is shared with the forward fundamental channel (FFCH).

[:FORWard]:FSCH[1]|2:LCMask:ESN

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:LCMask:ESN <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:LCMask:ESN?
```

This command defines the permuted electronic serial number (ESN) for the long code mask, which is used to identify a particular mobile.

***RST** #H00000000

Range #H0–#HFFFFFFFF

Field Entry `Permuted ESN`

Remarks Changing this value also changes the permuted ESN for the long code mask in the forward fundamental channel (FFCH).

[:FORWard]:FSCH[1]|2:LCMask:HEADer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:LCMask:HEADer <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:LCMask:HEADer?
```

This command sets the header for the long code mask, which is used to identify a particular mobile.

***RST** #H318

Range 000–3FF

Field Entry `Header`

Remarks Changing this value also changes the header for the long code mask in the forward fundamental channel (FFCH).

[:FORWard]:FSCH[1]|2:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:POWer?
```

This command sets the power for the forward supplemental traffic channels.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry Power

[:FORWard]:FSCH[1]|2:QOF

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:QOF <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:QOF?
```

This command sets the quasi-orthogonal function value for the forward supplemental traffic channels.

***RST** +0

Range 0–3

Field Entry QOF

[:FORWard]:FSCH[1]|2:RATE

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:RATE 19.2kbps|
28.8kbps|38.4kbps|57.6kbps|76.8kbps|115.2kbps|153.6kbps|230.4kbps|
307.2kbps
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:RATE?
```

This command sets the data rate for the forward supplemental traffic channels.

***RST** +1.92000000E+004

Field Entry Bit Rate

Remarks Values preceded by an asterisk indicate data rate values that are eligible for turbo coding.

[:FORWard]:FSCH[1]|2:RCONfig

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:RCONfig 3|4|5
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:RCONfig?
```

This command sets the radio configuration value for the forward supplemental channels.

***RST** +3

Field Entry Radio Config

[:FORWard]:FSCH[1]|2:TCODe

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:TCODe ON|OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:TCODe?
```

This command enables or disables the turbo coding operating state for the forward supplemental traffic channels.

***RST** 0

Field Entry Turbo Coding

Remarks Turbo coding is available for all data rates, excluding the following radio configurations (highest data rate of each radio configuration):

RC3: 153.6
RC4: 307.2
RC5: 230.4

To change the data rate for the forward supplemental traffic channel, refer to "[:FORWard]:FSCH[1]|2:RATE" on page 497.

[:FORWard]:FSCH[1]|2:WALSh

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:WALSh <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2:WALSh?
```

This command sets the Walsh code for the forward supplemental traffic channels.

***RST** FSCH1: 12 FSCH2: 14

Range	*RC3*	*RC4*	*RC5*
	Data Rate=19.2: 0–31	Data Rate=19.2: 0–63	Data Rate=28.8: 0–31
	Data Rate=38.4: 0–15	Data Rate=38.4: 0–31	Data Rate=57.6: 0–15
	Data Rate=76.8: 0–7	Data Rate=76.8: 0–15	Data Rate=115.2: 0–7
	Data Rate=307.2: 0–3	Data Rate=153.6: 0–7	Data Rate=230.4: 0–3
		Data Rate=307.2: 0–3	

Field Entry `Walsh`

[:FORWard]:FSCH[1]|2[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2[:STATe] ON|OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSCH[1]|2[:STATe]?
```

This command enables or disables the operating state of the forward supplemental traffic channel.

***RST** 0

Field Entry `State`

[:FORWard]:FSYNc:CFRequency

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:CFRequency <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:CFRequency?
```

This command directs the mobile station to a CDMA channel having a primary paging channel.

***RST** +50

Range 0–2047

Field Entry `CDMA Freq`

[:FORWard]:FSYNc:DAYLt

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:DAYLt 1|0
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:DAYLt?
```

This command sets the daylight savings time offset for the forward synchronization channel, where 1 = on and 0 = off.

***RST** +0

Field Entry `DAYLT`

[:FORWard]:FSYNc:EBNO

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:EBNO <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:EBNO?
```

This command sets the ratio of energy per bit to noise power spectral density (expressed in dB) for the quick paging channel.

***RST** +0.00000000E+000

Range

$$min\ EbNo: 10\log_{10}\left[\frac{\text{Chip Rate}}{1000(\text{Bit Rate})}\right] + \text{Normalized Power}$$

$$max\ EbNo: 10\log_{10}\left[\frac{1000(\text{Chip Rate})}{\text{Bit Rate}}\right] + \text{Normalized Power}$$

Normalized Power is the channel amplitude after adjusting the code power to 0 dB. Refer to “[:FORWard]:PADJust” on page 508 for adjusting the code domain power.

Field Entry `EbNo`

Remarks Changes to the EbNo values also change the EcNo values for all other channels in the current link (forward or reverse).

Queries of this command are only valid for the current operating state.

[:FORWard]:FSYNc:ECFRequency

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:ECFRequency <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:ECFRequency?
```

This command direct the mobile station to a CDMA channel having a primary paging channel. The mobile tunes to the `Ext CDMA Freq` field when it has a protocol revision level of 6 or greater, and it supports either the quick paging channel or radio configurations greater than 2. Otherwise, the mobile tunes to the `CDMA Freq` field for the CDMA channel.

This command sets the extended CDMA frequency for the forward synchronization channel.

***RST** +0

Range 0–2047

Field Entry `Ext CDMA Freq`

[:FORWard]:FSYNc:LPSec

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:LPSec <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:LPSec?
```

This command sets the leap seconds value for the forward synchronization channel.

***RST** +0

Range 0–255

Field Entry `Leap Seconds`

[:FORWard]:FSYNc:LTMoff

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:LTMoff <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:LTMoff?
```

This command sets the current local time offset from the basestation for the forward synchronization channel, where 1= 30 minutes, 2= 60 minutes, 3= 90 minutes, and so on.

***RST** +0

Range 0–63

Field Entry `LTM OFF`

[:FORWard]:FSYNc:MPREv

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:MPREv <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:MPREv?
```

This command sets the minimum protocol revision level for the forward synchronization channel.

***RST** +1

Range 0–255

Field Entry `P Rev Min`

[:FORWard]:FSYNc:MSGType

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:MSGType <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:MSGType?
```

This command sets the message type value for the forward synchronization channel.

***RST** +1

Range 0–255

Field Entry `Message Type`

[:FORWard]:FSYNc:NID

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:NID <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:NID?
```

This command sets the network identification value for the forward synchronization channel.

***RST** +1

Range 0–65535

Key Entry **Network ID**

[:FORWard]:FSYNc:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:POWer?
```

This command sets the power for the forward synchronization channel.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry `Power`

[:FORWard]:FSYNc:PRATe

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:PRATe <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:PRATe?
```

This command sets the base station paging rate for the forward supplemental channel.

***RST** +0

Range 0–3

Field Entry `PRAT`

[:FORWard]:FSYNc:PREV

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:PREV <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:PREV?
```

This command sets the protocol revision level for the forward synchronization channel.

***RST** +1

Range 0–255

Field Entry `P Rev`

[:FORWard]:FSYNc:RESErved

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:RESErved <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:RESErved?
```

This command sets the reserved field value for the forward synchronization channel.

***RST** +0

Range 0–7

Key Entry **Reserved**

Remarks Currently, base stations and mobiles ignore reserved bits, so the reserved field should be set to “0” with the query returning the same value.

[:FORWard]:FSYNc:SID

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SID <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SID?
```

This command sets the system identification for the forward synchronization channel.

***RST** +7

Range 0–32767

Field Entry `System ID`

[:FORWard]:FSYNc:STYPe

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:STYPe IS95|JSTD8|IS2000
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:STYPe?
```

This command selects the forward synchronization channel type.

IS95 This choice selects a channel type that is compatible with the IS95 CDMA standard.

JSTD8 This choice selects a channel type that is compatible with PCS CDMA standard personal station requirements for 1.9 to 2.0 GHz.

IS2000 This choice selects a channel type that is compatible with the IS2000 CDMA standard.

***RST** JSTD8

Key Entry **IS95** **JSTD8** **IS2000**

[:FORWard]:FSYNc:SYSTime

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SYSTime <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:SYSTime?
```

This command sets the system time value for the forward synchronization channel.

***RST** #H000000000

Range #H0–#HFFFFFFFFF

Field Entry `Time`

[:FORWard]:FSYNc:WALSh

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:WALSh <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc:WALSh?
```

This command sets the Walsh code for the forward synchronization channel.

***RST** +32

Range 0–63

Field Entry `Walsh`

[:FORWard]:FSYNc[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc[:STATe] ON|OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:FSYNc[:STATe]?
```

This command enables or disables the operating state for the forward synchronization channel.

***RST** 0

Field Entry `State`

[:FORWard]:NOISe:CN

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:NOISe:CN <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:NOISe:CN?
```

This command sets the carrier to noise ratio for the forward link.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –30 to 30

Key Entry **C/N**

Remarks The carrier to noise ratio is the ratio of the carrier power to in-channel noise power.

A change to the carrier to noise ratio will change all EbNo/EcNo field values.

[:FORWard]:NOISe[:STATe]

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:NOISe[:STATe] ON|OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:NOISe[:STATe]?
```

This command enables or disables the noise function for the CDMA2000 baseband forward link.

NOTE When this command is enabled, an immediate increase in the Even Second Delay value will occur. The Even Second Delay value will increase by an increment of 11.5 chips. The chip increase will be seen in the appropriate fields on the display.

Changes to Even Second Delay and Trigger Advance will not affect synchronization; automatic compensation is performed internally.

***RST** 0

Key Entry **Noise Off On**

Remarks Both the carrier and noise power value will be adjusted to match the specified carrier to noise ratio. Refer to "[:FORWard]:NOISe:CN" on page 505 to change the carrier to noise ratio.

The noise function can only be turned on with Option 403 installed.

[:FORWard]:OCNS:EBNO

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio[1]|2|3|4:CDMA2000[:BBG][:FORWard]:OCNS:EBNO <val>
[:SOURce]:RADio[1]|2|3|4:CDMA2000[:BBG][:FORWard]:OCNS:EBNO?
```

This command sets the energy per bit to noise power (EbNo) density ratio for the forward link orthogonal channel noise simulator (OCNS).

The variable <val> is expressed in units of decibels (dB).

Range

$$\text{min EbNo: } 10\log_{10}\left(\frac{\text{Chip Rate}}{1000(\text{Bit Rate})}\right) + \text{Normalized Power}$$

$$\text{max EbNo: } 10\log_{10}\left(\frac{1000(\text{Chip Rate})}{\text{Bit Rate}}\right) + \text{Normalized Power}$$

The OCNS bit rate is fixed at 19.2 kilo-bits per second.

The Normalized Power is the channel amplitude after adjusting the code domain power to 0 dB. Refer “[:FORWard]:PADJust” on page 508.

Range

$$\text{min EbNo: } 10\log_{10}\left(\frac{\text{Chip Rate}}{1000(\text{Bit Rate})}\right) + \text{Normalized Power}$$

$$\text{max EbNo: } 10\log_{10}\left(\frac{1000(\text{Chip Rate})}{\text{Bit Rate}}\right) + \text{Normalized Power}$$

The OCNS bit rate is fixed at 19.2 kilo-bits per second.

The Normalized Power is the channel amplitude after adjusting the code domain power to 0 dB. Refer “[:FORWard]:PADJust” on page 508.

Field Entry EbNo

Remarks EbNo is available for all channels except the pilot channel.

The noise function must be turned on for this setting to work. Refer to “[:FORWard]:NOISe[:STATe]” on page 506 for turning on the noise.

[:FORWard]:OCNS:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:OCNS:POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:OCNS:POWer?
```

This command sets the power level for the orthogonal channel noise simulator.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry Power

[:FORWard]:OCNS:WALSh

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:OCNS:WALSh <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:OCNS:WALSh?
```

This command sets the Walsh code for the orthogonal channel noise simulator.

***RST** +61

Range 0–63

Field Entry `Walsh`

[:FORWard]:OCNS[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:OCNS[:STATe] ON|OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:OCNS[:STATe]?
```

This command turns the orthogonal channel noise simulator on or off.

***RST** 0

Field Entry `State`

[:FORWard]:PADJust

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:PADJust EQUal|SCALe
```

This command sets the code domain power (the relative power in each of the channels).

EQUal Sets all channels to equal power, and the total power to 0 dB.

SCALe Scales all of the current channel powers so that the total power equals 0 dB, keeping the previous power ratios between the individual channels.

Key Entry **Equal Powers** **Scale To 0dB**

[:FORWard]:POLarity

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:POLarity NORMal|INVerted
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:POLarity?
```

This command sets the rotation direction for the phase modulation vector.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Field Entry `Phase Polarity`

[:FORWard]:QPCH:CCI

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH:CCI <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH:CCI?
```

This command selects the configuration change indicator for the quick paging channel.

***RST** +3

Range 0–3

Field Entry `Change`

[:FORWard]:QPCH:EBNO

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH:EBNO <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH:EBNO?
```

This command sets the ratio of energy per bit to noise power spectral density (expressed in dB) for the quick paging channel.

***RST** +0.00000000E+000

Range

$$min\ EbNo: 10\log_{10}\left[\frac{\text{Chip Rate}}{1000(\text{Bit Rate})}\right] + \text{Normalized Power}$$

$$max\ EbNo: 10\log_{10}\left[\frac{1000(\text{Chip Rate})}{\text{Bit Rate}}\right] + \text{Normalized Power}$$

Normalized Power is the channel amplitude after adjusting the code power to

0 dB. Refer to “[:FORWard]:PADJust” on page 508 for adjusting the code domain power.

Field Entry `EbNo`

Remarks Changes to the EbNo values also change the EcNo values for all other channels in the current link (forward or reverse).

Queries of this command are only valid for the current operating state.

[:FORWard]:QPCH:PI

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH:PI <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH:PI?
```

This command selects the paging slots for the quick paging channel.

***RST** +0

Field Entry `Paging Indicator`

Remarks When the bit rate is 2400, a value of 191 turns all paging slots on.

When the bit rate is 4800, a value of 383 turns all paging slots on.

When the bit rate is either 2400 or 4800, a value of –1 turns all paging slots off.

To change the bit rate value, refer to “[:FORWard]:QPCH:RATE” on page 511.

[:FORWard]:QPCH:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH:POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH:POWer?
```

This command sets the power value for the quick paging channel.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry `Power`

[:FORWard]:QPCH:RATE

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH:RATE 2.4kbps|4.8kbps
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH:RATE?
```

This command sets the bit rate for the quick paging channel.

***RST** +4.80000000E+003

Field Entry `Bit Rate`

[:FORWard]:QPCH:WALSh

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH:WALSh <val>
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH:WALSh?
```

This command sets the Walsh code for the quick paging channel.

***RST** +80

Range 0–127

Field Entry `Walsh`

[:FORWard]:QPCH[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH[:STATe] ON|OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:QPCH[:STATe]?
```

This command enables or disables the operating state of the quick paging channel.

***RST** 0

Field Entry `State`

[:FORWard]:SRATe

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:FORWard]:SRATe?
```

This command returns the value of the current spreading rate.

***RST** +1

:PNOFfset

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:PNOFfset <val>
[:SOURce]:RADio:CDMA2000[:BBG]:PNOFfset?
```

This command sets the current pseudorandom number (PN) offset value.

***RST** +1

Range 0–511

Field Entry `PN Offset`

Remarks The PN offset value is the time offset in the short code assigned to each basestation, allotting a unique identity for each.

:REVerse:BBCLock

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BBCLock INT[1]|EXT[1]
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:BBCLock?
```

This command selects the data clock source.

***RST** INT

Key Entry **Internal** **External**

Remarks If the EXT choice is selected, the REFerence selection will automatically be set to internal. The external data clock source must be connected to the DATA CLOCK front panel BNC input connector, and its frequency must match the specified chip rate.

:REVerse:CHIPrate

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:CHIPrate <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:CHIPrate?
```

Execute this command to adjust the chip rate.

The variable <val> is expressed in units of chips per second (cps–Mcps).

***RST** +1.22880000E+006

Range 1E3–1.3E6

Field Entry `Chip Rate`

Remarks The default value (1.228800 Mcps) is in accordance with the IS-2000 specification.

:REVerse:ESDelay

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:ESDelay <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:ESDelay?
```

This command modifies the even second clock pulse.

***RST** +2.75000000E+001

Range 0.5–128.0

Field Entry `Even Second Delay`

Remarks The even second clock pulse sets the delay to align the RF with the trigger.

When the noise function is set to ON, this value will increase. Refer to ":REVerse:NOISe[:STATe]" on page 518 for more information.

:REVerse:FILTer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer RNYQuist|NYQuist|GAUSsian|
RECTangle|IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|
"<user FIR>"
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer?
```

This command specifies the filter type for the reverse link.

IS95 This choice selects a filter that meets the criteria of the IS-95 standard.

IS95_EQ This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.

IS95_MOD This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.

IS95_MOD_EQ This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.

AC4Fm This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.

UGGaussian This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.

"<user FIR>" This variable is any filter file that you have stored into memory.

***RST** IS95

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 MOD w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:REVerse:FILTer:ALPHa

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer:ALPHa <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer:ALPHa?
```

This command changes the alpha value on the Nyquist or root Nyquist filter.

The filter alpha value can be set to the minimum level (0), the maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +2.20000000E–001

Range 0.000–1.000

Key Entry **Filter Alpha**

Remarks This command is effective only after choosing the root Nyquist or Nyquist filter. It does not effect other types of filters.

To change the current filter type, refer to ":REVerse:FILTer" on page 514.

:REVerse:FILTer:BBT

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer:BBT <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time filter value.

The filter BbT value can be set to the minimum level (0), the maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +5.00000000E–001

Range 0.500–1.000

Key Entry **Filter BbT**

Remarks This command is effective only after choosing the Gaussian filter. It does not effect other types of filters.

To change the current filter type, refer to ":REVerse:FILTer" on page 514.

:REVerse:FILTer:CHANnel

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer:CHANnel EVM|ACP
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:FILTer:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** EVM

Key Entry **Optimize FIR For EVM ACP**

Remarks To change the current filter type, refer to ":REVerse:FILTer" on page 514.

:REVerse:LCMask

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:LCMask <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:LCMask?
```

This command specifies a unique serial number code to identify a mobile station.

***RST** #H00000000000

Range #H0–#H3FFFFFFFFFF

Field Entry `Long Code Mask`

:REVerse:LCSTate

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:LCSTate <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:LCSTate?
```

This command sets a unique code to address a mobile station.

***RST** #H00000000000

Range #H0–#H3FFFFFFFFFF

Field Entry `Long Code State`

Remarks The storage register for the long code state allows a 42-bit binary number to be entered.

:REVerse:PADJust

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:PADJust EQUal|SCALe
```

Execute this command to set the code domain power.

EQUal	Sets all channels to equal power, and the total power to 0 dB.
SCALe	Scales all of the current channel powers so that the total power equals 0 dB, keeping the previous power ratios between the individual channels.
Key Entry	**Equal Powers** **Scale To 0dB**

:REVerse:POLarity[:ALL]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:POLarity[:ALL] NORMal|INVerted
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:POLarity[:ALL]?
```

This command sets the phase polarity to either normal or inverted.

NORMal	This choice selects normal phase polarity.
INVerted	This choice inverts the internal Q signal.
***RST**	NORM
Key Entry	**Normal** **Inverted**

:REVerse:NOISe:CN

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:NOISe:CN <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:NOISe:CN?
```

This command sets the carrier to noise ratio for the reverse link.

The variable <val> is expressed in units of decibels (dB).

***RST**	+0.00000000E+000
Range	–30 to 30

Key Entry C/N

Remarks The carrier to noise ratio is the ratio of the carrier power to in-channel noise power, expressed in decibels (dB).

A change to the carrier to noise ratio will only align the EbNo/EcNo field values in the active operating mode.

:REVerse:NOISe[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:NOISe[:STATe] ON|OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:NOISe[:STATe]?
```

This command enables or disables the noise function for the baseband reverse link.

NOTE When this command is enabled, an immediate increase in the Even Second Delay and Trigger Advance values will occur. The Even Second Delay value will increase by an increment of 11.5 chips and the Trigger Advance value will increase by an increment of 12 chips. The chip increase will be seen in the appropriate field on the display.

Changes to Even Second Delay and Trigger Advance will not affect synchronization; automatic compensation is performed internally.

***RST** 0

Key Entry **Noise Off On**

Remarks Both the carrier and noise power value will be adjusted to match the specified carrier to noise ratio. Refer to ":REVerse:NOISe:CN" on page 517 to change the carrier to noise ratio.

The noise function can only be turned on with Option 403 installed.

:REVerse:RC12:ACCess:RACH:DATA

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH:DATA PN9|PN15|
FIX4|"<file name>"
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH:DATA?
```

Execute this command to configure the data field for the reverse access channel.

***RST** PN9

Key Entry **PN9** **PN15** **FIX4** **User File**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

:REVerse:RC12:ACCess:RACH:DATA:FIX4

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH:DATA:FIX4 <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH:DATA:FIX4?
```

This command selects a fixed 4-bit data pattern to be repeated as necessary to fill the selected data area.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry FIX4

:REVerse:RC12:ACCess:RACH:EBNO

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH:EBNO <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH:EBNO?
```

This command sets the ratio of energy per bit to noise power spectral density (expressed in dB) for the reverse access channel.

***RST** +0.00000000E+000

Range

$$min\ EbNo: 10\log_{10}\left[\frac{\text{Chip Rate}}{1000(\text{Bit Rate})}\right] + \text{Normalized Power}$$

$$max\ EbNo: 10\log_{10}\left[\frac{1000(\text{Chip Rate})}{\text{Bit Rate}}\right] + \text{Normalized Power}$$

Normalized Power is the channel amplitude after adjusting the code power to 0 dB. Refer to ":REVerse:PADJust" on page 517 for adjusting the code domain power.

Field Entry `EbNo`

Remarks Changes to the EbNo values also change the EcNo values for all other channels in the current link (forward or reverse).

Queries of this command are only valid for the current operating state.

:REVerse:RC12:ACCess:RACH:FLENgth

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH:FLENgth?
```

This command queries the frame length for the reverse access channel.

The frame length is expressed as seconds (ms).

***RST** +20

Field Entry `Frame Length`

:REVerse:RC12:ACCess:RACH:FOFFset

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH:FOFFset <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH:FOFFset?
```

This command sets the frame offset value for the reverse access channel.

***RST** +0

Range 0–15

Field Entry `Frame Offset`

:REVerse:RC12:ACCess:RACH:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH:POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH:POWer?
```

This command sets the power for the reverse access channel.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry `Power`

:REVerse:RC12:ACCess:RACH:RCONfig

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH:RCONfig 1|2
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH:RCONfig?
```

This command select the radio configuration value for the reverse access channel.

***RST** +1

Field Entry `Radio Config`

:REVerse:RC12:ACCess:RACH:RATE

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH:RATE?
```

This command queries the data rate for the reverse access channel.

***RST** +4.80000000E+003

Field Entry `Bit Rate`

:REVerse:RC12:ACCess:RACH[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH[:STATe] ON|OFF|
1|0
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:ACCess:RACH[:STATe]?
```

This command enables or disables the operating state for the reverse access channel.

***RST** +1

Field Entry `State`

:REVerse:RC12:TRAFfic:RSCH:DATA

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:TRAFfic:RSCH:DATA PN9|PN15|
FIX4|"<file name>"
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:TRAFfic:RSCH:DATA?
```

This command configures the data field for the reverse supplemental traffic channel.

***RST** PN9

Key Entry **PN9** **PN15** **FIX4** **User File**

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:REVerse:RC12:TRAFfic:RSCH:DATA:FIX4

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:TRAFfic:RSCH:DATA:FIX4 <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:TRAFfic:RSCH:DATA:FIX4?
```

This command sets a fixed 4-bit data pattern that repeats as necessary to fill the selected data area.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

:REVerse:RC12:TRAFfic:RSCH:FLENgth

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:TRAFfic:RSCH:FLENgth?
```

This command queries the frame length value for the reverse supplemental traffic channel.

***RST** +20

:REVerse:RC12:TRAFfic:RSCH:FOFFset

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:TRAFfic:RSCH:FOFFset <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:TRAFfic:RSCH:FOFFset?
```

This command sets the frame offset value for the reverse supplemental traffic channel.

***RST** +0

Range 0–15

Field Entry `Frame Offset`

:REVerse:RC12:TRAFfic:RSCH:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:TRAFfic:RSCH:POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:TRAFfic:RSCH:POWer?
```

This command sets the power for the reverse supplemental traffic channel.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry `Power`

:REVerse:RC12:TRAFfic:RSCH:RATE

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:TRAFfic:RSCH:RATE 1.2kbps|
1.8kbps|2.4kbps|3.6kbps|4.8kbps|7.2kbps|9.6kbps|14.4kbps
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:TRAFfic:RSCH:RATE?
```

This command sets the data rate for the reverse supplemental traffic channel.

***RST** +9.60000000E+003

Field Entry `Bit Rate`

:REVerse:RC12:TRAFfic:RSCH:RCONfig

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:TRAFfic:RSCH:RCONfig 1|2
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:TRAFfic:RSCH:RCONfig?
```

This command sets the data rate for the reverse supplemental traffic channel.

***RST** +1

Field Entry `Radio Config`

:REVerse:RC12:TRAFfic:RSCH[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:TRAFfic:RSCH[:STATe] ON|OFF|
1|0
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC12:TRAFfic:RSCH[:STATe]?
```

This command sets the operating state for the reverse supplemental traffic channel.

***RST** 0

Field Entry `State`

:REVerse:RC34:CCONtrol:RCCCh:DATA

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:DATA PN9|
PN15|FIX4|"<file name>"
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:DATA?
```

This command configures the data field for the reverse common control channel.

***RST** PN9

Key Entry **PN9** **PN15** **FIX4** **User File**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

:REVerse:RC34:CCONtrol:RCCCh:DATA:FIX4

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:DATA:
FIX4 <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:DATA:FIX4?
```

This command selects a fixed 4-bit data pattern to be repeated as necessary to fill the selected data area.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

:REVerse:RC34:CCONtrol:RCCCh:EBNO

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:EBNO <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:EBNO?
```

This command sets the ratio of energy per bit to noise power spectral density (expressed in dB) for the reverse common control channel.

***RST** +0.00000000E+000

Range

$$min\ EbNo\text{: } 10\log_{10}\left[\frac{\text{Chip Rate}}{1000(\text{Bit Rate})}\right] + \text{Normalized Power}$$

$$max\ EbNo\text{: } 10\log_{10}\left[\frac{1000(\text{Chip Rate})}{\text{Bit Rate}}\right] + \text{Normalized Power}$$

Normalized Power is the channel amplitude after adjusting the code power to 0 dB. Refer to ":REVerse:PADJust" on page 517 for adjusting the code domain power.

Field Entry EbNo

Remarks Changes to the EbNo values also change the EcNo values for all other channels in the current link (forward or reverse).

Queries of this command are only valid for the current operating state.

:REVerse:RC34:CCONtrol:RCCCh:FLENgth

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:FLENgth 5|10|
20
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:FLENgth?
```

This command sets the frame length value for the reverse common control channel.

The frame length is expressed as seconds (ms).

***RST** +20

Field Entry `Frame Length`

:REVerse:RC34:CCONtrol:RCCCh:FOFFset

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:FOFFset <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:FOFFset?
```

This command sets the frame offset value for the reverse common control channel.

The frame offset value is expressed as seconds (ms).

***RST** +0

Range	Frame Length=5:	0–3
	Frame Length=10:	0–7
	Frame Length=20:	0–20

Field Entry `Frame Offset`

:REVerse:RC34:CCONtrol:RCCCh:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:POWer?
```

This command sets the power for the reverse common control channel.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry `Power`

:REVerse:RC34:CCONtrol:RCCCh:RCONfig

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:RCONfig 3|4
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:RCONfig?
```

This command selects the radio configuration value for the reverse common control channel.

***RST** +3

Field Entry `Radio Config`

:REVerse:RC34:CCONtrol:RCCCh:RATE

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:RATE 9.6kbps|
19.2kbps|38.4kbps
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:RATE?
```

This command adjusts the data rate value for the reverse common control channel.

***RST** +9.60000000E+003

Field Entry `Bit Rate`

:REVerse:RC34:CCONtrol:RCCCh:WALSh

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh:WALSh?
```

This command queries the Walsh code for the reverse common control channel.

***RST** +2

Field Entry `Walsh`

:REVerse:RC34:CCONtrol:RCCCh[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh[:STATe] ON|
OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RCCCh[:STATe]?
```

This command sets the operating state for the reverse common control channel.

***RST** 0

Field Entry `State`

:REVerse:RC34:CCONtrol:RPICh:ECNO

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RPICh:ECNO <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RPICh:ECNO?
```

This command sets the ratio of energy per chip to the noise power spectral density (expressed in dB) for the reverse common control pilot channel.

***RST** +0.00000000E+000

Range min EcNo: –30 + Normalized Power

max EcNo: 30 + Normalized Power

Normalized Power is the channel amplitude after adjusting the code power to 0 dB. Refer to “:REVerse:PADJust” on page 517 for adjusting the code domain power.

Field Entry `EcNo`

Remarks Changes to the EcNo values also change the EbNo values for all other channels in the current link (forward or reverse).

Queries of this command are only valid for the current operating state.

:REVerse:RC34:CCONtrol:RPICh:GRATe

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RPICh:GRATe FULL|
HALF|QUARter
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RPICh:GRATe?
```

This command configures the gating data field for the reverse common control pilot channel.

FULL This choice transmits all sixteen power control bits.

HALF This choice transmits eight power control bits.

QUARter This choice transmits four power control bits.

***RST** FULL

Key Entry **Full** **Half** **Quarter**

:REVerse:RC34:CCONtrol:RPICh:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RPICh:POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RPICh:POWer?
```

This command sets the power for the reverse common control pilot channel.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry `Power`

:REVerse:RC34:CCONtrol:RPICh:WALSh

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RPICh:WALSh?
```

This command queries the Walsh code for the reverse common control pilot channel.

***RST** +0

Field Entry `Walsh`

:REVerse:RC34:CCONtrol:RPICh[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RPICh[:STATe] ON|
OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:CCONtrol:RPICh[:STATe]?
```

This command sets the operating state for the reverse common control pilot channel.

***RST** 1

Field Entry `State`

:REVerse:RC34:EACCess:REACh:DATA

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh:DATA PN9|PN15|
FIX4|"<file name>"
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh:DATA?
```

This command configures the data field for the reverse enhanced access channel.

***RST** PN9

Key Entry **PN9** **PN15** **FIX4** **User File**

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:REVerse:RC34:EACCess:REACh:DATA:FIX4

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh:DATA:
FIX4 <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh:DATA:FIX4?
```

This command selects a fixed 4-bit data pattern to be repeated as necessary to fill the selected data area.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

:REVerse:RC34:EACCess:REACh:EBNO

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh:EBNO <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh:EBNO?
```

This command sets the ratio of energy per bit to noise power spectral density (expressed in dB) for the reverse enhanced access channel.

***RST** +0.00000000E+000

Range

$$min\ EbNo:\ 10\log_{10}\left[\frac{\text{Chip Rate}}{1000(\text{Bit Rate})}\right] + \text{Normalized Power}$$

$$max\ EbNo:\ 10\log_{10}\left[\frac{1000(\text{Chip Rate})}{\text{Bit Rate}}\right] + \text{Normalized Power}$$

Normalized Power is the channel amplitude after adjusting the code power to 0 dB. Refer to ":REVerse:PADJust" on page 517 for adjusting the code domain power.

Field Entry `EbNo`

Remarks Changes to the EbNo values also change the EcNo values for all other channels in the current link (forward or reverse).

Queries of this command are only valid for the current operating state.

:REVerse:RC34:EACCess:REACh:FOFFset

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh:FOFFset <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh:FOFFset?
```

This command sets the frame offset value for the reverse enhanced access channel.

***RST** +0

Range Frame Length=5: 0–3 Frame Length=10: 0–7

Frame Length=20: 0–15

Field Entry `Frame Offset`

:REVerse:RC34:EACCess:REACh:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh:POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh:POWer?
```

This command sets the power level for the reverse enhanced access channel.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry `Power`

:REVerse:RC34:EACCess:REACh:RCONfig

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh:RCONfig 3|4
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh:RCONfig?
```

This command sets the radio configuration for the reverse enhanced access channel.

***RST** +3

Field Entry `Radio Config`

:REVerse:RC34:EACCess:REACh:RATE

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh:RATE 9.6kbps|
19.2kbps|38.4kbps
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh:RATE?
```

This command adjusts the data rate value for the reverse enhanced access channel.

***RST** +9.60000000E+003

Field Entry `Bit Rate`

:REVerse:RC34:EACCess:REACh:WALSh

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh:WALSh?
```

This command queries the Walsh code for the reverse enhanced access channel.

***RST** +2

Field Entry `Walsh`

:REVerse:RC34:EACCess:REACh[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh[:STATe] ON|
OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:REACh[:STATe]?
```

This command sets the operating state for the reverse enhanced access channel.

***RST** 0

Field Entry `State`

:REVerse:RC34:EACCess:RPICh:ECNO

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:RPICh:ECNO <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:RPICh:ECNO?
```

This command sets the ratio of energy per chip to the noise power spectral density (expressed in dB) for the reverse enhanced access pilot channel.

***RST** +0.00000000E+000

Range min EcNo: –30 + Normalized Power

max EcNo: 30 + Normalized Power

Normalized Power is the channel amplitude after adjusting the code power to 0 dB. Refer to ":REVerse:PADJust" on page 517 for adjusting the code domain power.

Field Entry `EcNo`

Remarks Changes to the EcNo values also change the EbNo values for all other channels in the current link (forward or reverse).

Queries of this command are only valid for the current operating state.

:REVerse:RC34:EACCess:RPICh:GRATe

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:RPICh:GRATe FULL|
HALF|QUARter
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:RPICh:GRATe?
```

This command configures the gating data field for the reverse enhanced access pilot channel.

FULL This choice transmits all sixteen power control bits.

HALF This choice transmits eight power control bits.

QUARter This choice transmits four power control bits.

***RST** FULL

Key Entry **Full** **Half** **Quarter**

:REVerse:RC34:EACCess:RPICh:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:RPICh:POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:RPICh:POWer?
```

This command sets the power for the reverse enhanced access pilot channel.

The variable <val> is expressed in unit of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry `Power`

:REVerse:RC34:EACCess:RPICh:WALSh

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:RPICh:WALSh?
```

This command queries the Walsh code for the reverse enhanced access pilot channel.

***RST** +0

Field Entry `Walsh`

:REVerse:RC34:EACCess:RPICh[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:RPICh[:STATe] ON|
OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:EACCess:RPICh[:STATe]?
```

This command sets the operating state for the reverse enhanced access pilot channel.

***RST** 1

Field Entry `State`

:REVerse:RC34:TRAFfic:RDCCh:DATA

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh:DATA PN9|
PN15|FIX4|"<file name>"
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh:DATA?
```

This command configures the data field for the reverse traffic dedicated control channel.

***RST** PN9

Key Entry **PN9** **PN15** **FIX4** **User File**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

:REVerse:RC34:TRAFfic:RDCCh:DATA:FIX4

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh:DATA:
FIX4 <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh:DATA:FIX4?
```

This command selects a fixed 4-bit data pattern to be repeated as necessary to fill the selected data area.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

:REVerse:RC34:TRAFfic:RDCCh:EBNO

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh:EBNO <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh:EBNO?
```

This command sets the ratio of energy per bit, per the noise power spectral density (expressed in dB) for the reverse traffic dedicated control channel.

***RST** +0.00000000E+000

Range

$$\text{min EbNo: } 10\log_{10}\left[\frac{\text{Chip Rate}}{1000(\text{Bit Rate})}\right] + \text{Normalized Power}$$

$$\text{max EbNo: } 10\log_{10}\left[\frac{1000(\text{Chip Rate})}{\text{Bit Rate}}\right] + \text{Normalized Power}$$

Normalized Power is the channel amplitude after adjusting the code power to 0 dB. Refer to ":REVerse:PADJust" on page 517 for adjusting the code domain power.

Field Entry EbNo

Remarks Changes to the EbNo values also change the EcNo values for all other channels in the current link (forward or reverse).

Queries of this command are only valid for the current operating state.

:REVerse:RC34:TRAFfic:RDCCh:FLENgth

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh:FLENgth 5|20
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh:FLENgth?
```

This command sets the frame length value for the reverse traffic dedicated control channel.

The frame length is expressed as seconds (ms).

***RST** +20

Field Entry Frame Length

:REVerse:RC34:TRAFfic:RDCCh:FOFFset

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh:FOFFset <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh:FOFFset?
```

This command sets the frame offset value for the reverse traffic dedicated control channel.

***RST**	+0			
Range	Frame Length=5:	0–3	Frame Length=20:	0–7
Field Entry	`Frame Offset`			

:REVerse:RC34:TRAFfic:RDCCh:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh:POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh:POWer?
```

This command sets the power for the reverse traffic dedicated control channel.

The variable <val> is expressed in units of decibels (dB).

***RST** +0

Range –40 to 0

Field Entry `Power`

:REVerse:RC34:TRAFfic:RDCCh:RATE

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh:RATE?
```

This command queries the data rate for the reverse traffic dedicated control channel.

***RST**	Frame Length=5:	RC3/4= +9.60000000E+003
	Frame Length=10:	RC3= +9.60000000E+003
	Frame Length=20:	RC3= +1.44000000E+004
Field Entry	`Bit Rate`	

:REVerse:RC34:TRAFfic:RDDCh:RCONfig

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDDCh:RCONfig 3|4
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDDCh:RCONfig?
```

This command selects the radio configuration value for the reverse traffic dedicated control channel.

***RST** +3

Field Entry `Radio Config`

:REVerse:RC34:TRAFfic:RDCCh:WALSh

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh:WALSh?
```

This command queries the Walsh code for the reverse traffic dedicated control channel.

***RST** +8

Range 0–15

Field Entry `Walsh`

:REVerse:RC34:TRAFfic:RDCCh[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh[:STATe] ON|
OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RDCCh[:STATe]?
```

This command sets the operating state for the reverse traffic dedicated control channel.

***RST** 0

Field Entry `State`

:REVerse:RC34:TRAFfic:RFCH:DATA

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:DATA PN9|PN15|
FIX4|"<file name>"
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:DATA?
```

This command configures the data field for the reverse fundamental traffic channel.

***RST** PN9

Key Entry **PN9** **PN15** **FIX4** **User File**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

:REVerse:RC34:TRAFfic:RFCH:DATA:FIX4

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:DATA:FIX4 <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:DATA:FIX4?
```

This command selects a fixed 4-bit data pattern to be repeated as necessary to fill the selected data area.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

:REVerse:RC34:TRAFfic:RFCH:EBNO

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:EBNO <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:EBNO?
```

This command sets the ratio of energy per bit, per the noise power spectral density (expressed in dB) for the reverse fundamental traffic channel.

***RST** +0.00000000E+000

Range

$$min\ EbNo: 10\log_{10}\left[\frac{\text{Chip Rate}}{1000(\text{Bit Rate})}\right] + \text{Normalized Power}$$

$$max\ EbNo: 10\log_{10}\left[\frac{1000(\text{Chip Rate})}{\text{Bit Rate}}\right] + \text{Normalized Power}$$

Normalized Power is the channel amplitude after adjusting the code power to 0 dB. Refer to ":REVerse:PADJust" on page 517 for adjusting the code domain power.

Field Entry EbNo

Remarks Changes to the EbNo values also change the EcNo values for all other channels in the current link (forward or reverse).

Queries of this command are only valid for the current operating state.

:REVerse:RC34:TRAFfic:RFCH:FLENgth

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:FLENgth 5|20
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:FLENgth?
```

This command sets the frame length value for the reverse fundamental traffic channel.

The frame length is expressed as seconds (ms).

***RST** +20

Field Entry `Frame Length`

:REVerse:RC34:TRAFfic:RFCH:FOFFset

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:FOFFset <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:FOFFset?
```

This command sets the frame offset value for the reverse fundamental traffic channel.

***RST** +0

Range Frame Length=5: 0–3
Frame Length=20: 0–15

Field Entry `Frame Offset`

:REVerse:RC34:TRAFfic:RFCH:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:POWer?
```

This command sets the power for the reverse fundamental traffic channel.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry `Power`

:REVerse:RC34:TRAFfic:RFCH:RCONfig

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:RCONfig 3|4
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:RCONfig?
```

This command sets the radio configuration value for the reverse fundamental traffic channel.

***RST** +3

Field Entry `Radio Config`

:REVerse:RC34:TRAFfic:RFCH:RATE

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:RATE 1.2kbps|
1.5kbps|1.8kbps|2.7kbps|3.6kbps|4.8kbps|7.2kbps|9.6kbps|14.4kbps
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:RATE?
```

This command sets the data rate value for the reverse fundamental traffic channel.

***RST** +9.60000000E+003

Field Entry `Bit Rate`

:REVerse:RC34:TRAFfic:RFCH:WALSh

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH:WALSh?
```

This command queries the Walsh code for the reverse fundamental traffic channel.

***RST** +4

Field Entry `Walsh`

:REVerse:RC34:TRAFfic:RFCH[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH[:STATe] ON|OFF|
1|0
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RFCH[:STATe]?
```

This command sets the operating state for the reverse fundamental traffic channel.

***RST** 0

Field Entry `State`

:REVerse:RC34:TRAFfic:RSCH[1]|2:DATA

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:DATA PN9|
PN15|FIX4|"<file name>"
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:DATA?
```

This command configures the data field for the reverse supplemental channels.

***RST** PN9

Key Entry **PN9** **PN15** **FIX4** **User File**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

:REVerse:RC34:TRAFfic:RSCH[1]|2:DATA:FIX4

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:DATA:
FIX4 <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:DATA:FIX4?
```

This command sets a fixed 4-bit data pattern that repeats as necessary to fill the selected data area.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

:REVerse:RC34:TRAFfic:RSCH[1]|2:DATA:EBNO

Supported E4438C with Options 401 and 403

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:EBNO <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:EBNO?
```

This command sets the ratio of energy per bit to noise power spectral density (expressed in dB) for the reverse supplemental traffic channels.

***RST** +0.00000000E+000

Range

$$min\ EbNo: 10\log_{10}\left[\frac{\text{Chip Rate}}{1000(\text{Bit Rate})}\right] + \text{Normalized Power}$$

$$max\ EbNo: 10\log_{10}\left[\frac{1000(\text{Chip Rate})}{\text{Bit Rate}}\right] + \text{Normalized Power}$$

Normalized Power is the channel amplitude after adjusting the code power to 0 dB. Refer to “:REVerse:PADJust” on page 517 for adjusting the code domain power.

Field Entry `EbNo`

Remarks Changes to the EbNo values also change the EcNo values for all other channels in the current link (forward or reverse).

Queries of this command are only valid for the current operating state.

:REVerse:RC34:TRAFfic:RSCH[1]|2:FLENgth

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:
FLENgth 20|40|80
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:FLENgth?
```

This command sets the frame length value for the reverse supplemental channels.

***RST** +20

Field Entry `Frame Length`

:REVerse:RC34:TRAFfic:RSCH[1]|2:FOFFset

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:
FOFFset <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:FOFFset?
```

This command sets the frame offset value for the reverse supplemental channels.

***RST** +0

Range 0–63

Range Frame Length=20: 0–15 Frame Length=40: 0–31

Frame Length=80: 0–63

Field Entry `Frame Offset`

:REVerse:RC34:TRAFfic:RSCH[1]|2:POWer

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:
POWer <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:POWer?
```

This command sets the power level for the reverse supplemental channels.

The variable <val> is expressed in units of decibels (dB).

***RST** +0.00000000E+000

Range –40 to 0

Field Entry `Power`

:REVerse:RC34:TRAFfic:RSCH[1]|2:RCONfig

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:RCONfig 3|
4
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:RCONfig?
```

This command selects the radio configuration value for the reverse supplemental channels.

***RST** +3

Field Entry `Radio Config`

:REVerse:RC34:TRAFfic:RSCH[1]|2:RATE

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:
RATE 1.2ksbps|1.350kbps|1.5kbps|1.8kbps|2.4kbps|2.7kbps|3.6kbps|4.8kbps|
7.2kbps|9.6kbps|14.4kbps
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:RATE?
```

Execute this command to set the data rate for the reverse supplemental channels.

***RST** +9.60000000E+003

Field Entry `Bit Rate`

Remarks To change the frame length value, refer to ":REVerse:RC34:TRAFfic:RSCH[1]|2:FLENgth" on page 543

:REVerse:RC34:TRAFfic:RSCH[1]|2:TCODe

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:TCODe ON|
OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:TCODe?
```

This command enables or disables the operating state of the turbo coding function for the reverse supplemental channels.

***RST** 0

Field Entry `Turbo Coding`

Remarks To ensure that this function is being executed with the correct data rate, refer to ":REVerse:RC34:TRAFfic:RSCH[1]|2:RATE" on page 544.

:REVerse:RC34:TRAFfic:RSCH[1]|2:WALSh

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH1:WALSh <1|2>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH2:WALSh <2|6>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2:WALSh?
```

This command sets the Walsh code value for the reverse supplemental channels.

***RST** Channel 1: +1 Channel 2: +2

Field Entry `Walsh`

:REVerse:RC34:TRAFfic:RSCH[1]|2[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|
2[:STATe] ON|OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:RC34:TRAFfic:RSCH[1]|2[:STATe]?
```

This command enables or disables the operating state of the reverse supplemental channels.

***RST** 0

Field Entry `State`

:REVerse:REFerence:EXTernal:FREQuency

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:REFerence:EXTernal:
FREQuency <val><unit>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:REFerence:EXTernal:FREQuency?
```

This command sets the expected frequency of the external reference signal.

***RST** +1.96608000E+007

Range 1–100 MHz

Field Entry `Ext BBG Ref Freq`

Remarks This setting must match the frequency of the signal that is supplied to the BASEBAND GEN REF IN rear panel BNC connector.

:REVerse:REFerence[:SOURce]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:REFerence[:SOURce] INTernal|
EXTernal
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:REFerence[:SOURce]?
```

This command selects the reference clock source.

EXTernal This choice sets the instrument to use an external reference signal. The external reference frequency must be entered and the signal must be applied to the BASEBAND GEN REF IN rear panel connector.

INTernal This choice sets the instrument to use the internal reference.

***RST** INT

Field Entry `BBG Reference`

Remarks If the EXT choice is selected, the BBCLock selection will automatically be set to internal.

:REVerse:TADVance

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:TADVance <val>
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:TADVance?
```

This command selects the number of chips to advance the trigger time slot for the reverse link.

***RST**	+28
Range	0–2457599
Field Entry	Trigger Advance
Remarks	When the noise function is set to ON, this value will increase. Refer to ":REVerse:NOISe[:STATe]" on page 518 for more information.

:REVerse:TEDGe

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:TEDGe RISing|FALLing
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:TEDGe?
```

This command selects a falling or rising trigger edge state for the reverse link.

RISing	This choice selects a trigger on the rising edge of the signal applied to the PATT TRIG IN rear panel connector.
FALLing	This choice selects a trigger on the falling edge of the signal applied to the PATT TRIG IN rear panel connector.
***RST**	FALL
Key Entry	**Rising** **Falling**

:REVerse:SRATe

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG]:REVerse:SRATe?
```

This command returns the value of the current spreading rate for the reverse channel.

***RST** +1

[:STATe]

Supported E4438C with Option 401

```
[:SOURce]:RADio:CDMA2000[:BBG][:STATe] ON|OFF|1|0
[:SOURce]:RADio:CDMA2000[:BBG][:STATe]?
```

This command enables or disables the CDMA2000 baseband generator modulation format.

***RST**	0
Key Entry	CDMA2000 Off On

Custom Subsystem–Option 001/601or 002/602 ([:SOURce]:RADio:CUSTom)

:ALPha

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:ALPHa <val>
[:SOURce]:RADio:CUSTom:ALPHa?
```

This command changes the Nyquist or root Nyquist filter's alpha value.

The filter alpha value can be set to a minimum level (0), a maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +3.50000000E–001

Range 0.000–1.000

Key Entry **Filter Alpha**

Remarks To change the current filter type, refer to ":FILTer" on page 561.

:ASK

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio[1]|2|3|4:CUSTom:ASK[:DEPTh] <val>
[:SOURce]:RADio[1]|2|3|4:CUSTom:ASK[:DEPTh]?
```

This command changes the depth for the amplitude shift keying (ASK) modulation. Depth is set as a percentage of the full power on level.

***RST** +???

Range 0–100

Key Entry **ASK**

Remarks The modulation is applied to the I signal, the Q value is always kept at zero.

:BBCLock

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:BBCLock INT[1]|EXT[1]
[:SOURce]:RADio:CUSTom:BBCLock?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1] This choice selects the signal generator internal data clock.

EXT[1] This choice selects an external data clock input.

***RST** INT

Key Entry **BBG Data Clock Ext Int**

Remarks A data clock or continuous symbol sync input must be supplied when external mode is used.

This will be ignored if the external reference is set to EXTernal. To change the external reference type, refer to “:EREFerence” on page 560.

:BBT

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:BBT <val>
[:SOURce]:RADio:CUSTom:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

***RST** +5.00000000E–001

Range 0.100–1.000

Key Entry **Filter BbT**

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to “:FILTer” on page 561.

:BRATe

Supported E4438C with Option 402

```
[:SOURce]:RADio:CUSTom:BRATe <val>
[:SOURce]:RADio:CUSTom:BRATe?
```

This command sets the bit rate in bits per second (bps–Mbps). The maximum bit rate is dependent on the modulation type and filter as shown in the following tables.

The IQ digital data stream is shaped by a FIR filter. The filter length and associated latency and frequency response are dependent on the bit rate as shown in the following tables. The signal generator selects the filter length.

For higher bit rates, the signal generator may truncate the FIR filter length (if the minimum filter size allows it). This will impact the relative timing of the modulated data, as well as the actual filter response (see the symbol rate command ":SRATe" on page 565). Refer to ":FILTer" on page 561 for information on filter symbol widths.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 564.

When the bit rate is changed, the ESG reconfigures the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the bit rate: lower bit rates require more time.

***RST** +4.68000000E+004

Range

Modulation Type	Bit Rate Range for PRAM or External Serial Data		
	16 Symbol Wide Filter	*32 Symbol Wide Filter*	*64 Symbol Wide Filter*
BPSK, FSK2, MSK	1bps–50Mbps	1bps–25Mbps	1bps–12.5Mbps
C4FM, OQPSK, FSK4	2bps–50Mbps	2bps–25Mbps	2bps–12.5Mbps
OQPSKI95, QPSK			
P4QPPSK, QPSKIS95			
GRAYQPSK, QAM4			
D8PSK, EDGE, FSK8, PSK8	3bps–50Mbps	3bps–25Mbps	3bps–12.5Mbps

FSK16, PSK16, QAM16	4bps–50Mbps	4bps–25Mbps	4bps–12.5Mbps
QAM32	5bps–50Mbps	5bps–25Mbps	5bps–12.5Mbps
QAM64	6bps–50Mbps	6bps–25Mbps	6bps–12.5Mbps
QAM128	7bps–50Mbps	7bps–25Mbps	7bps–12.5Mbps
QAM256	8bps–50Mbps	8bps–25Mbps	8bps–12.5Mbps

NOTE Using I/Q skew will half the minimum number of symbols for the selected filter.

The previous table lists the range for PRAM or external serial data in the Custom format.

The Custom format has two modes for processing data, serial and parallel. When the data-rate exceeds 50 Mbps, the signal generator processes the data in parallel mode (symbol by symbol) versus serial mode where the data is processed bit by bit. This capability exits when using a continuous data stream, which means it does not apply to a PRAM file. The following table shows the various data rates by modulation type and filter width.

Range

Modulation Type	Bit Rate Range for Internal Data		
	16 Symbol Wide Filter	*32 Symbol Wide Filter*	*64 Symbol Wide Filter*
BPSK, FSK2, MSK	1bps–50Mbps	1bps–25 Mbps	1bps–12.5Mbps
C4FM, OQPSK, FSK4	2bps–100Mbps	2bps–50Mbps	2bps–25Mbps
OQPSKI95, QPSK			
P4QPPSK, QPSKIS95			
GRAYQPSK, QAM4			
D8PSK, EDGE, FSK8, PSK8	3bps–150Mbps	3bps–75Mbps	3bps–37.5Mbps
FSK16, PSK16, QAM16	4bps–200Mbps	4bps–100Mbps	4bps–50Mbps
QAM32	5bps–250Mbps	5bps–125Mbps	5bps–62.5Mbps
QAM64	6bps–300Mbps	6bps–150Mbps	6bps–75Mbps
QAM128	7bps–350Mbps	7bps–175Mbps	7bps–87.5Mbps
QAM256	8bps–400Mbps	8bps–200Mbps	8bps–100Mbps

NOTE Using I/Q skew will half the minimum number of symbols for the selected filter.

Key Entry **Symbol Rate**

:BURSt:SHAPe:FALL:DELay

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:FALL:DELay <val>
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:FALL:DELay?
```

This command sets the burst shape fall delay.

The variable `<val>` is expressed in bits.

***RST** +0.00000000E+000

Range –22.3750 to 99

Key Entry **Fall Delay**

Remarks To change the modulation type, refer to “:MODulation[:TYPE]” on page 564. Refer to “:SRATe” on page 565 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FDELay” on page 553 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FALL:TIME

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:FALL:TIME <val>
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:FALL:TIME?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits.

***RST** +1.00000000E+001

Range 0.1250–255.8750

Key Entry **Fall Time**

Remarks To change the modulation type, refer to ":MODulation[:TYPE]" on page 564. Refer to ":SRATe" on page 565 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FTIMe" on page 553 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

:BURSt:SHAPe:FDELay

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:FDELay <val>
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:FDELay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range –22.3750 to 99

Key Entry **Fall Delay**

Remarks To change the modulation type, refer to ":MODulation[:TYPE]" on page 564. Refer to ":SRATe" on page 565 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:DELay" on page 552 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

:BURSt:SHAPe:FTIMe

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:FTIMe <val>
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:FTIMe?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range 0.1250–255.8750

Key Entry **Fall Time**

Remarks To change the modulation type, refer to “:MODulation[:TYPE]” on page 564. Refer to “:SRATe” on page 565 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:TIME” on page 552 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RDELay

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:RDELay <val>
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:RDELay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range –17.3750 to 99

Key Entry **Rise Delay**

Remarks To change the modulation type, refer to “:MODulation[:TYPE]” on page 564. Refer to “:SRATe” on page 565 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:DELay” on page 554 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RISE:DELay

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:RISE:DELay <val>
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:RISE:DELay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range –17.3750 to 99

Key Entry **Rise Delay**

Remarks To change the modulation type, refer to “:MODulation[:TYPE]” on page 564. Refer to “:SRATe” on page 565 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RDELay” on page 554 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RISE:TIME

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:RISE:TIME <val>
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:RISE:TIME?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits.

***RST** +1.00000000E+001

Range 0.1250–121.5000

Key Entry **Rise Time**

Remarks To change the modulation type, refer to “:MODulation[:TYPE]” on page 564. Refer to “:SRATe” on page 565 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RTIMe” on page 556 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RTIMe

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:RTIMe <val>
[:SOURce]:RADio:CUSTom:BURSt:SHAPe:RTIMe?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits.

***RST** +1.00000000E+001

Range 0.1250–121.5000

Key Entry **Rise Time**

Remarks To change the modulation type, refer to “:MODulation[:TYPE]” on page 564. Refer to “:SRATe” on page 565 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:TIME” on page 555 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe[:TYPE]

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:BURSt:SHAPe[:TYPE] SINE|"<file name>"
[:SOURce]:RADio:CUSTom:BURSt:SHAPe[:TYPE]?
```

This command specifies the burst shape ("<file name>").

SINE This choice selects a state that is defined by the burst rise and fall *RST values, as the default burst shape type.

"<file name>" This choice selects a user designated file from signal generator memory (non-volatile).

***RST** SINE

Key Entry **Sine** **User File**

:CHANnel

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:CHANnel EVM|ACP
[:SOURce]:RADio:CUSTom:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** ACP

Key Entry **Optimize FIR For EVM ACP**

Remarks To change the current filter type, refer to “:FILTer” on page 561.

:DATA

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:DATA PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|
EXT|P4|P8|P16|P32|P64|PRAM
[:SOURce]:RADio:CUSTom:DATA?
```

This command sets the data pattern for unframed transmission.

***RST** PN23

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **Ext**

4 1’s & 4 0’s **8 1’s & 8 0’s** **16 1’s & 16 0’s** **32 1’s & 32 0’s**

64 1’s & 64 0’s **PRAM File**

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:DATA:FIX4

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:DATA:FIX4 <val>
[:SOURce]:RADio:CUSTom:DATA:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the modulation type, symbol rate, filter, and burst shape selected for the custom modulation format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must be already be defined as the data type.

:DATA:PRAM

Supported E4438C with Option 001/601or 002/602001/601or 002/602

```
[:SOURce]:RADio:CUSTom:DATA:PRAM "<file_name>"
[:SOURce]:RADio:CUSTom:DATA:PRAM?
```

This command selects a pattern RAM (PRAM) file as the pattern data type for a custom communications format.

`"<file_name>"` This variable designates the PRAM file in WFM1. Refer to “File Name Variables” on page 13 for information on the file name syntax.

Key Entry **PRAM File**

Remarks Selecting this data source forces the burst source to `INTernal` to allow framing control.

The PRAM file must reside in the signal generator’s volatile memory (WFM1) in order to be accessed by this command. For more information on PRAM files, refer to “:DATA:PRAM:FILE:BLOCk” on page 112.

:DENCode

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:DENCode ON|OFF|1|0
[:SOURce]:RADio:CUSTom:DENCode?
```

This command enables or disables the differential data encoding function.

***RST** 0

Key Entry **Diff Data Encode Off On**

Remarks Executing this command encodes the data bits prior to modulation; each modulated bit is 1 if the data bit is different from the previous one, or 0 if the data bit is the same as the previous one.

:EDATa:DELay

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:EDATa:DELay?
```

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

Remarks When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

:EDCLock

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:EDCLock SYMBol|NORMal
[:SOURce]:RADio:CUSTom:EDCLock?
```

This command sets the external data clock use.

SYMBol This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

NORMal This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

***RST** NORM

Key Entry **Ext Data Clock Normal Symbol**

Remarks Both choices have no effect in internal clock mode. Refer to ":BBCLock" on page 549 to select EXT as the data clock type.

:EREFerence

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:EREFerence INTernal|EXTernal
[:SOURce]:RADio:CUSTom:EREFerence?
```

This command selects either an internal or external bit-clock reference for the data generator.

***RST** INT

Key Entry **BBG Ref Ext Int**

Remarks If the EXTernal choice is selected, the external frequency value must be applied to the BASEBAND GEN REF IN rear panel connector.

Refer to ":EREFerence:VALue" on page 560 to enter the external reference frequency.

:EREFerence:VALue

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:EREFerence:VALue <val>
[:SOURce]:RADio:CUSTom:EREFerence:VALue?
```

This command conveys the expected reference frequency value of an externally applied reference to the signal generator.

The variable <val> is expressed in units of Hertz (Hz–MHz).

***RST** +1.30000000E+007

Range 2.5E5–1E8

Key Entry **Ext BBG Ref Freq**

Remarks The value specified by this command is effective only when you are using an external ARB reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to ":EREFerence" on page 560 to select EXTernal as the reference for the bit clock reference of the data generator.

:FILTer

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:FILTer RNYQuist|NYQuist|GAUSsian|RECTangle|IS95|
IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
[:SOURce]:RADio:CUSTom:FILTer?
```

This command selects the pre-modulation filter type.

IS95	This choice selects a filter that meets the criteria of the IS-95 standard.
IS95_EQ	This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.
IS95_MOD	This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
IS95_MOD_EQ	This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
AC4Fm	This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
UGGaussian	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
`"<user FIR>"`	This variable is any filter file that you have stored into memory. Refer to “File Name Variables” on page 13 for information on the file name syntax.

The following table shows the filter type and minimum number of symbols. Refer to “:SRATe” on page 565 for information on symbol rate. User-defined filters are not truncated. Internal filters are typically run with 16 or 32 symbols unless the minimum size is larger.

Filter	Minimum Number of Symbols
Gaussian, Nyquist, Root Nyquist, Rectangle	0
Edge	5
UN3/4 GSM Gaussian	8
IS-95, IS-95 w/EQ	16
IS-95 Mod, IS-95 Mod w/EQ	24
IS-2000	27
APCO 25 C4FM	32

***RST** RNYQ

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

:IQ:SCALe

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:IQ:SCALe <val>
[:SOURce]:RADio:CUSTom:IQ:SCALe?
```

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

***RST** +70

Range 1–200

Key Entry **I/Q Scaling**

Remarks This command has no effect with MSK or FSK modulation.

:MODulation:FSK[:DEViation]

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:MODulation:FSK[:DEViation] <val>
[:SOURce]:RADio:CUSTom:MODulation:FSK[:DEViation]?
```

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

***RST** +4.00000000E+002

Range 0–2E7

Key Entry **Freq Dev**

Remarks To change the modulation type, refer to “:MODulation[:TYPE]” on page 564.

Refer to “:SRATe” on page 565 for a list of the minimum and maximum symbol rate values.

To set an asymmetric FSK deviation value, refer to the *E4428C/38C ESG Signal Generators User’s Guide* for more information.

:MODulation:MSK[:PHASe]

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:MODulation:MSK[:PHASe] <val>
[:SOURce]:RADio:CUSTom:MODulation:MSK[:PHASe]?
```

This command sets the MSK phase deviation value.

The variable <val> is expressed in units of degrees.

***RST** +9.00000000E+001

Range 0–100

Key Entry **Phase Dev**

:MODulation:UFSK

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:MODulation:UFSK "<file name>"
[:SOURce]:RADio:CUSTom:MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

Key Entry **User FSK**

Remarks The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to “:MODulation[:TYPE]” on page 564 to change the current modulation type.

Refer to “File Name Variables” on page 13 for information on the file name syntax.

:MODulation:UIQ

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:MODulation:UIQ "<file name>"
[:SOURce]:RADio:CUSTom:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

Key Entry **User I/Q**

Remarks The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to “:MODulation[:TYPE]” on page 564 to change the current modulation type.

Refer to “File Name Variables” on page 13 for information on the file name syntax.

:MODulation[:TYPE]

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:MODulation[:TYPE] BPSK|QPSK|IS95QPSK|GRAYQPSK|
OQPSK|IS95OQPSK|P4DQPSK|PSK8|PSK16|D8PSK|MSK|FSK2|FSK4|FSK8|FSK16|C4FM|
QAM4|QAM16|QAM32|QAM64|QAM128|QAM256|UIQ|UFSK
[:SOURce]:RADio:CUSTom:MODulation[:TYPE]?
```

This command sets the modulation type for the Custom personality.

***RST**	P4DQPSK
Key Entry	**BPSK** **QPSK** **IS-95 QPSK** **Gray Coded QPSK** **OQPSK** **IS-95 OQPSK** **π/4 DQPSK** **8PSK** **16PSK** **D8PSK** **MSK** **2-Lvl FSK** **4-Lvl FSK** **8-Lvl FSK** **16-Lvl FSK** **C4FM** **4QAM** **16QAM** **32QAM** **64QAM** **128QAM** **256QAM** **User I/Q** **User FSK**

:POLarity[:ALL]

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:POLarity[:ALL] NORMal|INVerted
[:SOURce]:RADio:CUSTom:POLarity[:ALL]?
```

This command sets the rotation direction of the phase modulation vector.

NORMal	This choice selects normal phase polarity.
INVerted	This choice inverts the internal Q signal.
***RST**	NORM
Key Entry	**Phase Polarity Normal Invert**

:SRATe

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:SRATe <val>
[:SOURce]:RADio:CUSTom:SRATe?
```

This command sets the transmission symbol rate. Symbol rate is the bit rate divided by the bits per symbol. A change in the symbol rate affects the bit rate. Refer to ":BRATe" on page 550 for information on bit rate.

The variable `<val>` is expressed in units of symbols per second (sps–Msps) and the maximum symbol rate depends on the filter. Refer to ":FILTer" on page 561 for minimum filter symbol widths.

The filter may have to be truncated down to 32 or 16 symbols wide to acheive the highest symbol rate. The signal generator's internal filters are not truncated below their minimum filter length and user-defined FIR filters are not truncated. If the filter cannot be truncated then the symbol rate is limited to the maximum rate of the narrowest filter size possible.

The relative timing of the modulated data, as well as the actual filter response is affected when the filter is truncated.

When the symbol rate changes, the ESG reconfigures the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the symbol rate: lower symbol rates require more time.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 564.

***RST** +2.43000000E+004

The following table shows the symbol range for internal Custom data operation.

Range	16 Symbol Wide Filter	32 Symbol Wide Filter	64 Symbol Wide Filter
	1sps–50Msps	1sps–25Msps	1sps–12.5Msps

The limits shown in the following table apply to Custom PRAM and Custom external serial data.

Range	Modulation Type	Symbol Rate For PRAM and External Serial Data		
		16 Symbol Wide Filter	*32 Symbol Wide Filter*	*64 Symbol Wide Filter*
	BPSK, FSK2, MSK	1sps–50Msps	1sps–25Msps	1sps–12.5Msps
	C4FM, OQPSK, FSK4	2sps–25Msps	2sps–12.5Msps	2sps–6.25Msps
	OQPSKI95, QPSK			
	P4QPPSK, QPSKIS95			
	GRAYQPSK, QAM4			
	D8PSK, EDGE, FSK8, PSK8	3sps–16.666666666 Msps	3sps–8.333333333 Msps	3sps–4.166666666Msps
	FSK16, PSK16, QAM16	4sps–12.5Msps	4sps–6.25Msps	4sps–3.125Msps
	QAM32	5sps–10Msps	5sps–5Msps	5sps–2.5Msps
	QAM64	6sps–8.333333333 Msps	6sps–4.166666666 Msps	6sps–2.083333333 Msps
	QAM128	7sps–7.142857142 Msps	7sps–3.571428572 Msps	7sps–1.785714285 Msps
	QAM256	8sps–6.25Msps	8sps–3.125 Msps	8sps–1.5625 Msps

Key Entry **Symbol Rate**

:STANdard:SELect

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:STANdard:SELect NONE|AC4Fm|ACQPsk|BLUEtooth|CDPD
[:SOURce]:RADio:CUSTom:STANdard:SELect?
```

This command selects a predefined setup for Custom (with the appropriate defaults) and/or clears the selection.

NONE	This choice clears the current predefined Custom format.
AC4Fm	This choice sets up an Association of Public Safety Communications Officials (APCO) compliant, compatible 4-level frequency modulation (C4FM) format.
ACQPsk	This choice sets up an Association of Public Safety Communications Officials (APCO) compliant, compatible quadrature phase shift keying (CQPSK) format.
BLUEtooth	This choice sets up a Bluetooth (2-level frequency shift keying) format.
CDPD	This choice sets up a minimum shift keying Cellular Digital Packet Data (CDPD) format.

***RST** NONE

Key Entry **None** **APCO 25w/C4FM** **APCO 25 w/CQPSK** **Bluetooth** **CDPD**

:TRIGger:TYPE

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:TRIGger:TYPE CONTinuous|SINGle|GATE
[:SOURce]:RADio:CUSTom:TRIGger:TYPE?
```

This command sets the trigger type.

CONTinuous	The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to ":TRIGger:TYPE:CONTinuous[:TYPE]" on page 568.
SINGle	The framed data sequence plays once for every trigger received.
GATE	An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

***RST** CONT

Key Entry **Continuous** **Single** **Gated**

:TRIGger:TYPE:CONTinuous[:TYPE]

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:TRIGger:TYPE:CONTinuous[:TYPE] FREE|TRIGger|RESet
[:SOURce]:RADio:CUSTom:TRIGger:TYPE:CONTinuous[:TYPE]?
```

This commands selects the waveform’s response to a trigger signal while using the continuous trigger mode.

For more information on triggering and to select the continuous trigger mode, see “:TRIGger:TYPE” on page 567.

The following list describes the waveform’s response to each of the command choices:

FREE Turning the ARB format on immediately triggers the waveform. The waveform repeats until you turn the format off, select another trigger, or choose another waveform file.

TRIGger The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously until you turn the format off, select another trigger, or choose another waveform file.

RESet The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously. Subsequent triggers reset the waveform to the beginning. For a waveform sequence, this means to the beginning of the first segment in the sequence.

***RST** FREE

Key Entry **Free Run** **Trigger & Run** **Reset & Run**

:TRIGger:TYPE:GATE:ACTive

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:TRIGger:TYPE:GATE:ACTive LOW|HIGH
[:SOURce]:RADio:CUSTom:TRIGger:TYPE:GATE:ACTive?
```

This command selects the active state (gate polarity) of the gate while using the gating trigger mode.

The LOW and HIGH selections correspond to the low and high states of an external trigger signal. For example, when you select HIGH, the active state occurs during the high of the trigger signal. When the active state occurs, the ESG stops the waveform playback at the last played sample point, then restarts the playback at the next sample point when the inactive state occurs. For more information on triggering and to select gating as the trigger mode, see “:TRIGger:TYPE” on page 567.

The following list describes the ESG’s gating behavior for the polarity selections:

LOW The waveform playback stops when the trigger signal goes low (active state) and restarts when the trigger signal goes high (inactive state).

HIGH The waveform playback stops when the trigger signal goes high (active state) and restarts when the trigger signal goes low (inactive state).

***RST** HIGH

Key Entry **Gate Active Low High**

:TRIGger[:SOURce]

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio:CUSTom:TRIGger[:SOURce]?
```

This command sets the trigger source.

For more information on triggering, see “:TRIGger:TYPE” on page 567. The following list describes the command choices:

KEY This choice enables manual triggering by pressing the front-panel **Trigger** hardkey.

EXT An externally applied signal triggers the waveform. This is the only choice that works with gating. The following conditions affect an external trigger:

- The input connector selected for the trigger signal. You have a choice between the rear-panel PATTERN TRIG IN connector or the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector. To make the connector selection, see “:TRIGger[:SOURce]:EXTernal[:SOURce]” on page 571.

  For more information on the connectors and on connecting the cables, see the *E4428C/38C ESG Signal Generators User’s Guide*.

- The trigger signal polarity:

  — gating mode, see “:TRIGger:TYPE:GATE:ACTive” on page 568
  — continuous and single modes, see “:TRIGger[:SOURce]:EXTernal:SLOPe” on page 571

- The time delay between when the ESG receives a trigger and when the waveform responds to the trigger. There are two parts to setting the delay:

  — setting the amount of delay, see “:TRIGger[:SOURce]:EXTernal:DELay” on page 570
  — turning the delay on, see “:TRIGger[:SOURce]:EXTernal:DELay:STATe” on page 570

BUS	This choice enables triggering over the GPIB or LAN using the `*TRG` or `GET` commands or the AUXILIARY INTERFACE (RS-232) using the `*TRG` command.

***RST** KEY

Key Entry **Trigger Key** **Ext** **Bus**

:TRIGger[:SOURce]:EXTernal:DELay

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:TRIGger[:SOURce]:EXTernal:DELay <val>
[:SOURce]:RADio:CUSTom:TRIGger[:SOURce]:EXTernal:DELay?
```

This command sets the number of bits to delay the ESG's response to an external trigger.

The bit delay is a delay between when the ESG receives the trigger and when it responds to the trigger. The delay uses the clocks of the bit-clock to time the delay. After the ESG receives the trigger and the set number of delay bits (clocks) occurs, the ESG transmits the data pattern.

The delay occurs after you enable the state. See ":TRIGger[:SOURce]:EXTernal:DELay:STATe" on page 570. You can set the number of bits either before or after enabling the state.

For more information on configuring an external trigger source and to select external as the trigger source, see ":TRIGger[:SOURce]" on page 569.

***RST** +0

Range 0–1048575

Key Entry **Ext Delay Bits**

:TRIGger[:SOURce]:EXTernal:DELay:STATe

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:TRIGger[:SOURce]:EXTernal:DELay:STATe ON|OFF|1|0
[:SOURce]:RADio:CUSTom:TRIGger[:SOURce]:EXTernal:DELay:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

For setting the delay time, see ":TRIGger[:SOURce]:EXTernal:DELay" on page 570, and for more information on configuring an external source, see":TRIGger[:SOURce]" on page 569.

***RST** 0

Key Entry **Ext Delay Off On**

:TRIGger[:SOURce]:EXTernal:SLOPe

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:TRIGger[:SOURce]:EXTernal:SLOPe POSitive|NEGative
[:SOURce]:RADio:CUSTom:TRIGger[:SOURce]:EXTernal:SLOPe?
```

This command sets the polarity for an external trigger signal while using the continuous, single triggering mode. To set the polarity for gating, see ":TRIGger:TYPE:GATE:ACTive" on page 568.

The POSitive and NEGative selections correspond to the high (positive) and low (negative) states of the external trigger signal. For example, when you select POSitive, the waveform responds (plays) during the high state of the trigger signal. When the ESG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest.

For more information on configuring an external trigger source and to select external as the trigger source, see ":TRIGger[:SOURce]" on page 569.

***RST** NEG

Key Entry **Ext Polarity Neg Pos**

:TRIGger[:SOURce]:EXTernal[:SOURce]

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom:TRIGger[:SOURce]:EXTernal[:SOURce] EPT1|EPT2|
EPTRIGGER1|EPTRIGGER2
[:SOURce]:RADio:CUSTom:TRIGger[:SOURce]:EXTernal[:SOURce]?
```

This command selects which PATTERN TRIG IN connection the ESG uses to accept an externally applied trigger signal when external is the trigger source selection.

For more information on configuring an external trigger source and to select external as the trigger source, see ":TRIGger[:SOURce]" on page 569. For more information on the rear-panel connectors, see the *E4428C/38C ESG Signal Generators User's Guide*.

The following list describes the command choices:

EPT1	This choice is synonymous with EPTRIGGER1 and selects the PATTERN TRIG IN rear-panel connector.
EPT2	This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
EPTRIGGER1	This choice is synonymous with EPT1 and selects the PATTERN TRIG IN rear-panel connector.
EPTRIGGER2	This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.

***RST** EPT1

Key Entry **Patt Trig In 1** **Patt Trig In 2**

[:STATe]

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:CUSTom[:STATe] ON|OFF|1|0
[:SOURce]:RADio:CUSTom[:STATe]?
```

This command enables or disables the Custom modulation.

***RST** 0

Key Entry Custom Off On

Remarks Although the Custom modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

DECT Subsystem–Option 402 ([:SOURce]:RADio:DECT)

:ALPha

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:ALPHa <val>
[:SOURce]:RADio:DECT:ALPHa?
```

This command changes the Nyquist or root Nyquist filter's alpha value.

The filter alpha value can be set to the minimum level (0), the maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +5.00000000E–001

Range 0.000–1.000

Key Entry **Filter Alpha**

Remarks To change the current filter type, refer to ":FILTer" on page 585.

:BBCLock

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:BBCLock INT[1]|EXT[1]
[:SOURce]:RADio:DECT:BBCLock?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1] This choice selects the signal generator internal data clock.

EXT[1] This choice selects an external data clock input.

***RST** INT

Key Entry **BBG Data Clock Ext Int**

Remarks A data clock or continuous symbol sync input must be supplied when external mode is used.

:BBT

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:BBT <val>
[:SOURce]:RADio:DECT:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

***RST** +5.00000000E–001

Range 0.100–1.000

Key Entry **Filter BbT**

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to ":FILTer" on page 585.

:BRATe

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:BRATe <val><units>
[:SOURce]:RADio:DECT:BRATe?
```

This command sets the bit rate in bits per second (bps–Mbps). The maximum bit rate is dependent on the modulation type and filter as shown in the following tables

The IQ digital data stream is shaped by a FIR filter. The filter length and associated latency and frequency response are dependent on the bit rate as shown in the following tables. The signal generator selects a filter length.

For higher bit rates, the FIR filter length may be truncated (if the minimum filter size allows it) which will impact the relative timing of the modulated data, as well as the actual filter response (see the symbol rate command ":SRATe" on page 658). Refer to ":FILTer" on page 585 for information on filter symbol widths.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 588.

When the bit rate is changed, the ESG reconfigures the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the bit rate: lower bit rates require more time.

***RST** +1.15200000E+004

Range

Modulation Type	**Bit Rate Range**		
	16 Symbol Wide Filter	*32 Symbol Wide Filter*	*64 Symbol Wide Filter*
BPSK, FSK2, MSK	1bps–50Mbps	1bps–25Mbps	1bps–12.5Mbps
C4FM, OQPSK, FSK4	2bps–50Mbps	2bps–25Mbps	2bps–12.5Mbps
OQPSKI95, QPSK			
P4QPPSK, QPSKIS95			
GRAYQPSK, QAM4			
D8PSK, EDGE, FSK8, PSK8	3bps–50Mbps	3bps–25Mbps	3bps–12.5Mbps
FSK16, PSK16, QAM16	4bps–50Mbps	4bps–25Mbps	4bps–12.5Mbps
QAM32	5bps–50Mbps	5bps–25Mbps	5bps–12.5Mbps
QAM64	6bps–50Mbps	6bps–25Mbps	6bps–12.5Mbps
QAM128	7bps–50Mbps	7bps–25Mbps	7bps–12.5Mbps
QAM256	8bps–50Mbps	8bps–25Mbps	8bps–12.5Mbps

Key Entry **Symbol Rate**

:BURSt:PN9

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:BURSt:PN9 NORMal|QUICk
[:SOURce]:RADio:DECT:BURSt:PN9?
```

This command controls the software PN9 generation.

NORMal This choice produces a maximum length PN9 sequence.

QUICk This choice produces a truncated PN9 sequence.

***RST** NORM

Key Entry **PN9 Mode Normal Quick**

Remarks Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

:BURSt:SHAPe:FALL:DELay

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:BURSt:SHAPe:FALL:DELay <val>
[:SOURce]:RADio:DECT:BURSt:SHAPe:FALL:DELay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range –10.5625 to 99

Key Entry **Fall Delay**

Remarks To change the modulation type, refer to “:MODulation[:TYPE]” on page 588. Refer to “:SRATe” on page 658 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FDELay” on page 577 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FALL:TIME

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:BURSt:SHAPe:FALL:TIME <val>
[:SOURce]:RADio:DECT:BURSt:SHAPe:FALL:TIME?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits.

***RST** +1.00000000E+001

Range 0.0625–127.9375

Key Entry **Fall Time**

Remarks To change the modulation type, refer to “:MODulation[:TYPE]” on page 588. Refer to “:SRATe” on page 658 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FTIMe” on page 577 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FDELay

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:BURSt:SHAPe:FDELay <val>
[:SOURce]:RADio:DECT:BURSt:SHAPe:FDELay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range –10.5625 to 99

Key Entry **Fall Delay**

Remarks To change the modulation type, refer to ":MODulation[:TYPE]" on page 588. Refer to ":SRATe" on page 658 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:DELay" on page 576 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

:BURSt:SHAPe:FTIMe

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:BURSt:SHAPe:FTIMe <val>
[:SOURce]:RADio:DECT:BURSt:SHAPe:FTIMe?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits.

***RST** +1.00000000E+001

Range 0.0625–127.9375

Key Entry **Fall Time**

Remarks To change the modulation type, refer to “:MODulation[:TYPE]” on page 588. Refer to “:SRATe” on page 658 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:TIME” on page 576 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RDELay

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:BURSt:SHAPe:RDELay <val>
[:SOURce]:RADio:DECT:BURSt:SHAPe:RDELay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range –0.5625 to 99

Key Entry **Rise Delay**

Remarks To change the modulation type, refer to “:MODulation[:TYPE]” on page 588. Refer to “:SRATe” on page 658 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:DELay” on page 578 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RISE:DELay

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:BURSt:SHAPe:RISE:DELay <val>
[:SOURce]:RADio:DECT:BURSt:SHAPe:RISE:DELay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits.

***RST** +0.00000000E+000

Range –0.5625 to 99

Key Entry **Rise Delay**

Remarks To change the modulation type, refer to ":MODulation[:TYPE]" on page 588. Refer to ":SRATe" on page 658 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RDELay" on page 578 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

:BURSt:SHAPe:RISE:TIME

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:BURSt:SHAPe:RISE:TIME <val>
[:SOURce]:RADio:DECT:BURSt:SHAPe:RISE:TIME?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits.

***RST** +1.00000000E+001

Range 0.0625–10.6250

Key Entry **Rise Time**

Remarks To change the modulation type, refer to ":MODulation[:TYPE]" on page 588. Refer to ":SRATe" on page 658 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RTIMe" on page 580 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

:BURSt:SHAPe:RTIMe

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:BURSt:SHAPe:RTIMe <val>
[:SOURce]:RADio:DECT:BURSt:SHAPe:RTIMe?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits.

***RST** +1.00000000E+001

Range 0.0625–10.6250

Key Entry **Rise Time**

Remarks To change the modulation type, refer to ":MODulation[:TYPE]" on page 588. Refer to ":SRATe" on page 658 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:TIME" on page 579 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

:BURSt:SHAPe[:TYPE]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:BURSt:SHAPe[:TYPE] SINE|"<file name>"
[:SOURce]:RADio:DECT:BURSt:SHAPe[:TYPE]?
```

This command specifies the burst shape as either `SINE` or a user-defined file (`"<file name>"`).

SINE This choice selects a state that is defined by the burst rise and fall *RST values, as the default burst shape type.

"<file name>" This choice selects a user-defined file from signal generator memory (non-volatile).

***RST** SINE

Key Entry **Sine** **User File**

:BURSt[:STATe]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:BURSt[:STATe] ON|OFF|1|0
[:SOURce]:RADio:DECT:BURSt[:STATe]?
```

This command enables or disables the burst function.

ON (1) This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

OFF (0) This choice enables the transmission of unframed data.

***RST** 0

Key Entry **Data Format Pattern Framed**

:CHANnel

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:CHANnel EVM|ACP
[:SOURce]:RADio:DECT:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM This choice provides the most ideal passband.

ACP This choice improves stopband rejection.

***RST** EVM

Key Entry **Optimize FIR For EVM ACP**

Remarks To change the current filter type, refer to “:FILTer” on page 585.

:DATA

Supported E4438C with Option 402

`[:SOURce]:RADio:DECT:DATA PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64|PRAM`
`[:SOURce]:RADio:DECT:DATA?`

This command sets the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file) for unframed data transmission.

***RST** PN23

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **Ext**
4 1's & 4 0's **8 1's & 8 0's** **16 1's & 16 0's** **32 1's & 32 0's**
64 1's & 64 0's **PRAM File**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

:DATA:FIX4

Supported E4438C with Option 402

`[:SOURce]:RADio:DECT:DATA:FIX4 <val>`
`[:SOURce]:RADio:DECT:DATA:FIX4?`

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the modulation type, symbol rate, filter, and burst shape selected for the DECT modulation format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type. To change the data type, refer to ":DATA" on page 582.

:DATA:PRAM

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:DATA:PRAM "<file_name>"
[:SOURce]:RADio:DECT:DATA:PRAM?
```

This command selects a pattern RAM (PRAM) file as the pattern data type for the DECT (Digital Enhanced Cordless Telecommunications) format.

`"<file_name>"` This variable designates the PRAM file in WFM1. No directory path name is needed. Refer to "File Name Variables" on page 13 for information on the file name syntax.

Key Entry **PRAM File**

Remarks Selecting this data source forces the burst source to `INTernal` to allow framing control.

The PRAM file must reside in the signal generator's volatile memory (WFM1) in order to be accessed by this command. For more information on PRAM files, refer to ":DATA:PRAM:FILE:BLOCk" on page 112.

:DEFault

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:DEFault
```

This command returns all of the DECT modulation format parameters to factory settings. It does not affect any other signal generator parameters.

Key Entry **Restore Dect Factory Default**

:EDATa:DELay

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:EDATa:DELay?
```

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

Remarks When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

:EDCLock

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:EDCLock SYMBol|NORMal
[:SOURce]:RADio:DECT:EDCLock?
```

This command sets the external data clock use.

SYMBol This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

NORMal This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

***RST** NORM

Key Entry **Ext Data Clock Normal Symbol**

Remarks Both choices have no effect in internal clock mode. Refer to “:BBCLock” on page 573 to select EXT as the data clock type.

:EREFerence

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:EREFerence INT|EXT
[:SOURce]:RADio:DECT:EREFerence?
```

This command selects either an internal or external bit-clock reference for the data generator.

***RST** INT

Key Entry **BBG Ref Ext Int**

Remarks If the EXT choice is selected, the external source’s frequency value must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

Refer to, “:EREFerence:VALue” on page 585 to enter the external reference frequency setting.

:EREFerence:VALue

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:EREFerence:VALue <val>
[:SOURce]:RADio:DECT:EREFerence:VALue?
```

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

***RST**	+1.30000000E+007
Range	2.5E5–1E8
Key Entry	**Ext BBG Ref Freq**
Remarks	The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector. Refer to ":EREFerence" on page 584 to select EXT (external source) as the reference for the bit-clock.

:FILTer

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:FILTer RNYQuist|NYQuist|GAUSsian|RECTangle|IS95|
IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
[:SOURce]:RADio:DECT:FILTer?
```

This command specifies the pre-modulation filter type.

IS95	This choice selects a filter that meets the criteria of the IS-95 standard.
IS95_EQ	This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.
IS95_MOD	This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
IS95_MOD_EQ	This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
AC4Fm	This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.

UGGaussian	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
"<user FIR>"	This variable is any filter file that you have stored into memory.
***RST**	GAUS
Key Entry	**Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **UN3/4 GSM Gaussian** **APCO 25 C4FM** **User FIR**
Remarks	Refer to "File Name Variables" on page 13 for information on the file name syntax.

:IQ:SCALe

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:IQ:SCALe <val>
[:SOURce]:RADio:DECT:IQ:SCALe?
```

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

***RST**	+100
Range	1–200
Key Entry	**I/Q Scaling**
Remarks	This command has no effect with MSK or FSK modulation.

:MODulation:FSK[:DEViation]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:MODulation:FSK[:DEViation] <val>
[:SOURce]:RADio:DECT:MODulation:FSK[:DEViation]?
```

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

***RST**	+2.88000000E+005
Range	0–2E7

Key Entry **Freq Dev**

Remarks To change the modulation type, refer to ":MODulation[:TYPE]" on page 588.

Refer to ":SRATe" on page 658 for a list of the minimum and maximum symbol rate values.

To set an asymmetric FSK deviation value, refer to the *E4428C/38C ESG Signal Generators User's Guide* for more information.

:MODulation:MSK[:PHASe]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:MODulation:MSK[:PHASe] <val>
[:SOURce]:RADio:DECT:MODulation:MSK[:PHASe]?
```

This command sets the MSK phase deviation value.

The variable <val> is expressed in units of degrees.

***RST** +9.00000000E+001

Range 0–100

Key Entry **Phase Dev**

:MODulation:UFSK

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:MODulation:UFSK "<file name>"
[:SOURce]:RADio:DECT:MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

Key Entry **User FSK**

Remarks The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 588 to change the current modulation type.

Refer to "File Name Variables" on page 13 for information on the file name syntax.

:MODulation:UIQ

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:MODulation:UIQ "<file name>"
[:SOURce]:RADio:DECT:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

Key Entry **User I/Q**

Remarks The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 588 to change the current modulation type.

Refer to "File Name Variables" on page 13 for information on the file name syntax.

:MODulation[:TYPE]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:MODulation[:TYPE] BPSK|QPSK|IS95QPSK|GRAYQPSK|
OQPSK|IS95OQPSK|P4DQPSK|PSK8|PSK16|D8PSK|MSK|FSK2|FSK4|FSK8|FSK16|C4FM|
QAM4|QAM16|QAM32|QAM64|QAM128|QAM256|UIQ|UFSK
[:SOURce]:RADio:DECT:MODulation[:TYPE]?
```

This command sets the modulation type for the DECT personality.

***RST** FSK2

Key Entry **BPSK** **QPSK** **IS-95 QPSK** **Gray Coded QPSK** **OQPSK**

IS-95 OQPSK **π/4 DQPSK** **8PSK** **16PSK** **D8PSK** **MSK** **2-Lvl FSK**

4-Lvl FSK **8-Lvl FSK** **16-Lvl FSK** **C4FM** **4QAM** **16QAM** **32QAM**

64QAM **128QAM** **256QAM** **User I/Q** **User FSK**

:POLarity[:ALL]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:POLarity[:ALL] NORMal|INVerted
[:SOURce]:RADio:DECT:POLarity[:ALL]?
```

This command sets the rotation direction of the phase modulation vector.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Key Entry **Phase Polarity Normal Invert**

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11[:TYPE]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11[:TYPE]
CUSTom|TRAFfic|LCAPacity|ZTRaffic|ZLCapacity
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11[:TYPE]?
```

This command specifies the timeslot type for the selected timeslot in the portable part link.

***RST** Timeslot 0: TRAF Timeslots 1–4: CUST

Key Entry **Custom** **Traffic Bearer** **Low Capacity** **Traffic Bearer with Z field** **Low Capacity with Z field**

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom PN9|
PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|FDEV1_HS|FDEV1_FS|FDEV2_FS|
FACCuracy|DM1|DM0|P4|P8|P16|P32|P64
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom?
```

This command customizes the selected custom timeslot for a portable part link.

***RST** PN9

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **Ext** **FDEV1_HS** **FDEV1_FS** **FDEV2_FS** **FACC** **DM1** **DM0** **4 1's & 4 0's** **8 1's & 8 0's** **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom:FIX4

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom:
FIX4 <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern which is used in the portable part custom data field of the selected timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type. To change the data type, refer to ":PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom" on page 589.

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:A

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:
A <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:A?
```

This command customizes the A field for the selected low-capacity timeslot in the portable part link.

***RST** #H0000FFFF0000FFFF

Range #H0–#HFFFFFFFFFFFFFFFF

Key Entry **A field**

Remarks The A field carries signaling data (48 bits) and error correction (16 bits).

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:P

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:
P <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:P?
```

This command customizes the preamble (P) field of the selected low-capacity timeslot in the portable part link.

***RST** #H5555

Range #H0–#HFFFF

Key Entry **P**

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:S

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:
S <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:S?
```

This command customizes the synchronization pattern of the selected low-capacity timeslot in the portable part link.

***RST** #H1675

Range #H0–#HFFFF

Key Entry **S**

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity[:B]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
LCAPacity[:B] PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|FDEV1_HS|
FDEV1_FS|FDEV2_FS|FACCuracy|DM1|DM0|P4|P8|P16|P32|P64
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
LCAPacity[:B]?
```

This command sets the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file) for the B field of the selected portable part low-capacity timeslot.

***RST** PN9

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **Ext** **FDEV1_HS**

FDEV1_FS **FDEV2_FS** **FACC** **DM1** **DM0** **4 1's & 4 0's**

8 1's & 8 0's **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity[:B]:FIX4

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
LCAPacity[:B]:FIX4 <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
LCAPacity[:B]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected portable part low-capacity timeslot B field.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type. Refer to ":PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity[:B]" on page 592 to change the data type.

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:POWer

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:
POWer MAIN|DELTa
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:
POWer?
```

This command defines the RF output power level for the selected timeslot.

MAIN This choice specifies RF output as the main power level.

DELTa This choice specifies RF output as the alternative power level.

***RST** MAIN

Key Entry **Timeslot Ampl Main Delta**

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:STATe

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:STATe ON|OFF|
1|0
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:STATe?
```

This command enables or disables the operating state of the selected portable part timeslot.

***RST** Timeslot 0: 1 Timeslots 1–11: 0

Key Entry **Timeslot Off On**

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:A

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:
A <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:A?
```

This command customizes the A field for the selected traffic bearer timeslot in the portable part link. The A field carries signaling data (48 bits) and error correction
(16 bits).

***RST** #H0000FFFF0000FFFF

Range #H0–#HFFFFFFFFFFFFFFFF

Key Entry **A field**

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:P

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:
P <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:P?
```

This command customizes the preamble (P) field of the selected traffic bearer timeslot in the portable part link.

***RST** #H5555

Range #H0–#HFFFF

Key Entry **P**

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:S

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:
S <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:
S?
```

This command sets the synchronization pattern for the selected traffic bearer timeslot in the portable part link.

***RST** #H1675

Range #H0–#HFFFF

Key Entry **S**

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic[:B]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
TRAFfic[:B] PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|FDEV1_HS|
FDEV1_FS|FDEV2_FS|FACCuracy|DM1|DM0|P4|P8|P16|P32|P64
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic[:B]?
```

This command sets the B field data pattern for the selected traffic bearer timeslot in the portable part link.

***RST** PN9

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **Ext** **FDEV1_HS** **FDEV1_FS** **FDEV2_FS** **FACC** **DM1** **DM0** **4 1's & 4 0's** **8 1's & 8 0's** **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic[:B]:FIX4

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic[:B]:
FIX4 <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic[:B]:
FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the portable part traffic bearer B field of the selected timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:A

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:
A <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:A?
```

This command customizes the A field for the selected low-capacity with Z field timeslot in the portable part link.

The A field carries signaling data (48 bits) and error correction (16 bits).

***RST** #H0000FFFF0000FFFF

Range #H0–#HFFFFFFFFFFFFFFFF

Key Entry **A**

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:P

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:
P <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:P?
```

This command customizes the preamble (P) field of the selected low-capacity with Z field timeslot in the portable part link.

***RST** #H5555

Range #H0–#HFFFF

Key Entry **P**

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:A

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:
S <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:S?
```

This command customizes the synchronization pattern of the selected low-capacity with Z field timeslot in the portable part link.

***RST** #H1675

Range #H0–#HFFFF

Key Entry **S**

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity[:B]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
ZLCapacity[:B] PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|FDEV1_HS|
FDEV1_FS|FDEV2_FS|FACCuracy|DM1|DM0|P4|P8|P16|P32|P64
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
ZLCapacity[:B]?
```

This command sets the data pattern for the B field of the selected portable part low-capacity with Z field timeslot.

***RST** PN9

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **Ext** **FDEV1_HS**

FDEV1_FS **FDEV2_FS** **FACC** **DM1** **DM0** **4 1's & 4 0's**

8 1's & 8 0's **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity[:B]:FIX4

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
ZLCapacity[:B]:FIX4 <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
ZLCapacity[:B]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the portable part low-capacity with Z field B field of the selected timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:A

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:
A <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:A?
```

This command customizes the A field for the selected traffic bearer with Z field timeslot in the portable part link. The A field carries signaling data (48 bits) and error correction (16 bits).

***RST** #H0000FFFF0000FFFF

Range #H0–#HFFFFFFFFFFFFFFFF

Key Entry **A field**

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:P

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:
P <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:P?
```

This command customizes the preamble (P) field of the selected traffic bearer with Z field timeslot in the portable part link.

***RST** #H5555

Range #H0–#HFFFF

Key Entry **P**

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:S

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:
S <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:S?
```

This command sets the synchronization pattern for the selected traffic bearer with Z field timeslot in the portable part link.

***RST** #H1675

Range #H0–#HFFFF

Key Entry **S**

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic[:B]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
ZTRaffic[:B] PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|FDEV1_HS|
FDEV1_FS|FDEV2_FS|FACCuracy|DM1|DM0|P4|P8|P16|P32|P64
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic[:B]?
```

This command sets the B field data pattern for the selected traffic bearer with Z field timeslot in the portable part link.

***RST** PN9

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **Ext** **FDEV1_HS**
FDEV1_FS **FDEV2_FS** **FACC** **DM1** **DM0** **4 1's & 4 0's**
8 1's & 8 0's **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic[:B]:FIX4

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic[:B]:
FIX4 <val>
[:SOURce]:RADio:DECT:PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic[:B]:
FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the portable part traffic bearer with Z field B field of the selected timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type. Refer to ":PPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic[:B]" on page 599 to change the data type.

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11[:TYPE]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11[:TYPE]
CUSTom|DUMM[1]|DUMM2|TRAFfic|LCAPacity|ZTRaffic|ZLCapacity
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11[:TYPE]?
```

This command selects the timeslot type for the selected timeslot in the radio fixed part link.

***RST** Timeslot 0: TRAF Timeslots 1–4: CUST

Key Entry **Custom** **Dummy Bearer 1** **Dummy Bearer 2** **Traffic Bearer** **Low Capacity** **Traffic Bearer with Z field** **Low Capacity with Z field**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom PN9|
PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|FDEV1_HS|FDEV1_FS|FDEV2_FS|
FACCuracy|DM1|DM0|P4|P8|P16|P32|P64
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom?
```

This command sets the data pattern for the data field of the selected custom timeslot in the radio fixed part link.

***RST** PN9

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **Ext** **FDEV1_HS** **FDEV1_FS** **FDEV2_FS** **FACC** **DM1** **DM0** **4 1's & 4 0's** **8 1's & 8 0's** **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom:FIX4

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom:
FIX4 <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom:
FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected radio fixed part custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type. Refer to ":RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:CUSTom" on page 600 to change the data type.

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM2:A

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM2:
A <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM2:A?
```

This command customizes the A field for the selected dummy 2 timeslot in the radio fixed part link.

***RST** #H0000FFFF0000FFFF

Range #H0–#HFFFFFFFFFFFFFFFF

Key Entry **A field**

Remarks The A field carries signaling data (48 bits) and error correction (16 bits).

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM2:P

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM2:
P <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM2:P?
```

This command customizes the preamble (P) field for the selected dummy 2 timeslot in the radio fixed part link.

***RST** #HAAAA

Range #H0–#HFFFF

Key Entry **P**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM2:S

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM2:
S <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM2:S?
```

This command customizes the synchronization (S) field of the selected dummy 2 timeslot in the radio fixed part link.

***RST** #HE98A

Range #H0–#HFFFF

Key Entry **S**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM[1]:A

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM[1]:
A <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM[1]:A?
```

This command customizes the A field for the selected dummy 1 timeslot in the radio fixed part link.

***RST** #H0000FFFF0000FFFF

Range #H0–#HFFFFFFFFFFFFFFFF

Key Entry **A field**

Remarks The 64-bit A field carries signaling data (48 bits) and error correction (16 bits).

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM[1]:P

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM[1]:
P <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM[1]:P?
```

This command customizes the preamble (P) field for the selected dummy 1 timeslot in the radio fixed part link.

***RST** #HAAAA

Range #H0–#HFFFF

Key Entry **P**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM[1]:S

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM[1]:
S <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:DUMM[1]:S?
```

This command customizes the synchronization (S) field of the selected dummy 1 timeslot in the radio fixed part link.

***RST** #HE98A

Range #H0–#HFFFF

Key Entry **S**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:A

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:
A <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:A?
```

This command customizes the A field for the selected low-capacity timeslot in the radio fixed part link.

***RST** #H0000FFFF0000FFFF

Range #H0–#HFFFFFFFFFFFFFFFF

Key Entry **A field**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:P

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:
P <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:P?
```

This command customizes the preamble (P) field of the selected low-capacity timeslot in the portable part link.

***RST** #HAAAA

Range #H0–#H1111

Key Entry **P**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:S

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:
S <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:S?
```

This command customizes the synchronization pattern of the selected low-capacity timeslot in the portable part link.

***RST** #HE98A

Range #H0–#H1111

Key Entry **S**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity[:B]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
LCAPacity[:B] PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|FDEV1_HS|
FDEV1_FS|FDEV2_FS|FACCuracy|DM1|DM0|P4|P8|P16|P32|P64
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
LCAPacity[:B]?
```

This command sets the data pattern for the B field of the selected portable part low-capacity timeslot.

***RST** PN9

Key Entry	**PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **Ext** **FDEV1_HS** **FDEV1_FS** **FDEV2_FS** **FACC** **DM1** **DM0** **4 1's & 4 0's** **8 1's & 8 0's** **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's**
Remarks	Refer to "File Name Variables" on page 13 for information on the file name syntax.

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity[:B]:FIX4

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
LCAPacity[:B]:FIX4 <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
LCAPacity[:B]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected radio fixed part low-capacity timeslot B field.

***RST**	#B0000
Range	#B0000–#B1111 or 0–15
Key Entry	**FIX4**
Remarks	FIX4 must already be defined as the data type.

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:LCAPacity:POWer

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:POWer MAIN|
DELTa
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:POWer?
```

This command defines the RF output power level for the selected timeslot.

MAIN	This choice specifies RF output as the main power level.
DELTa	This choice specifies RF output as the alternative power level.
***RST**	MAIN
Key Entry	**Timeslot Ampl Main Delta**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:STATe

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:STATe ON|
OFF|1|0
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:STATe?
```

This command enables or disables the operating state of the selected timeslot in the radio fixed part.

***RST** Timeslot 0: 1 Timeslots 1–11: 0

Key Entry **Timeslot Off On**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:A

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:
A <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:A?
```

This command customizes the A field for the selected traffic bearer timeslot in the portable part link.

***RST** #H0000FFFF0000FFFF

Range #H0–#HFFFFFFFFFFFFFFFF

Key Entry **A field**

Remarks The A field carries signaling data (48 bits) and error correction (16 bits).

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:P

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:
P <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:P?
```

This command customizes the preamble (P) field of the selected traffic bearer timeslot in the radio fixed part link.

***RST** #HAAAA

Range #H0–#HFFFF

Key Entry **P**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:S

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:
S <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic:S?
```

This command customizes the synchronization (S) field of the selected traffic bearer timeslot in the radio fixed part link.

***RST** #HE98A

Range #H0–#HFFFF

Key Entry **S**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic[:B]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
TRAFfic[:B] PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|FDEV1_HS|
FDEV1_FS|FDEV2_FS|FACCuracy|DM1|DM0|P4|P8|P16|P32|P64
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic[:B]?
```

This command sets the B field’s data pattern for the selected traffic bearer timeslot in the radio fixed part during framed data transmission.

***RST** PN9

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **Ext** **FDEV1_HS**
FDEV1_FS **FDEV2_FS** **FACC** **DM1** **DM0** **4 1’s & 4 0’s**
8 1’s & 8 0’s **16 1’s & 16 0’s** **32 1’s & 32 0’s** **64 1’s & 64 0’s**

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic[:B]:FIX4

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic[:B]
:FIX4 <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic[:B]:
FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected radio fixed part traffic bearer timeslot B field.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type, refer to ":RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:TRAFfic[:B]" on page 607.

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:A

Supported E4438C with Option 402

```
[:SOURce]:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:
A <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:
A?
```

This command customizes the A field for the selected low-capacity with Z field timeslot in the radio fixed part link. The A field carries signaling data (48 bits) and error correction (16 bits).

***RST** #H0000FFFF0000FFFF

Range #H0–#HFFFFFFFFFFFFFFFF

Key Entry **A field**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:P

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:
P <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:
P?
```

This command customizes the preamble (P) field of the selected low-capacity with Z field timeslot in the radio fixed part link.

***RST** #HAAAA

Range #H0–#HFFFF

Key Entry **P**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:S

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:
S <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity:
S?
```

This command customizes the synchronization (S) field of the selected low-capacity with Z field timeslot in the radio fixed part link.

***RST** #HE98A

Range #H0–#HFFFF

Key Entry **S**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity[:B]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
ZLCapacity[:B] PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|FDEV1_HS|
FDEV1_FS|FDEV2_FS|FACCuracy|DM1|DM0|P4|P8|P16|P32|P64
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
ZLCapacity[:B]?
```

This command sets the B field’s data pattern for the selected low-capacity with Z field timeslot in the radio fixed part during framed data transmission.

***RST** PN9

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **Ext** **FDEV1_HS** **FDEV1_FS** **FDEV2_FS** **FACC** **DM1** **DM0** **4 1’s & 4 0’s** **8 1’s & 8 0’s** **16 1’s & 16 0’s** **32 1’s & 32 0’s** **64 1’s & 64 0’s**

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZLCapacity[:B]:FIX4

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
ZLCapacity[:B]:FIX4 <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
ZLCapacity[:B]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected radio fixed part low-capacity with Z field timeslot B field.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:A

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:
A <val>
 [:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:A?
```

This command customizes the A field for the selected traffic bearer timeslot in the radio fixed part link. The A field carries signaling data (48 bits) and error correction (16 bits).

***RST** #H0000FFFF0000FFFF

Range #H0–#HFFFFFFFFFFFFFFFF

Key Entry **A field**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:P

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:
P <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:P?
```

This command customizes the preamble (P) field of the selected traffic bearer with Z field timeslot in the radio fixed part link.

***RST** #HAAAA

Range #H0–#HFFFF

Key Entry **P**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:S

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:
S <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic:S?
```

This command customizes the synchronization (S) field of the selected traffic bearer with Z field timeslot in the radio fixed part link.

***RST** #HE98A

Range #H0–#HFFFF

Key Entry **S**

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic[:B]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
ZTRaffic[:B] PN9|PN15|FIX4|"<file name>"|EXT|FDEV1_HS|FDEV1_FS|
FDEV2_FS|FACCuracy|DM1|DM0|P4|P8|P16|P32|P64
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
ZTRaffic[:B]?
```

This command sets the B field data pattern for the selected traffic bearer with Z field timeslot in the portable part link.

***RST** PN9

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **Ext** **FDEV1_HS**
FDEV1_FS **FDEV2_FS** **FACC** **DM1** **DM0** **4 1's & 4 0's**
8 1's & 8 0's **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:ZTRaffic[:B]:FIX4

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
ZTRaffic[:B]:FIX4 <val>
[:SOURce]:RADio:DECT:RFPart:SLOT0|[1]|2|3|4|5|6|7|8|9|10|11:
ZTRaffic[:B]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected radio fixed part traffic bearer with Z field timeslot B field.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

:SECondary:RECall

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:SECondary:RECall
```

This command recalls the secondary frame configuration, overwriting the current state.

Key Entry **Recall Secondary Frame State**

Remarks To save a secondary frame state, refer to “:SECondary:SAVE” on page 612.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to “:SECondary[:STATe]” on page 613.

:SECondary:SAVE

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:SECondary:SAVE
```

This command saves the current frame configuration as the secondary frame with the filename `DECT_SECONDARY_FRAME`.

Key Entry **Save Secondary Frame State**

Remarks To recall the secondary frame (saved in non-volatile signal generator memory), refer to “:SECondary:RECall” on page 612.

:SECondary:TRIGger[:SOURce]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:SECondary:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio:DECT:SECondary:TRIGger[:SOURce]?
```

This command selects the type of triggering for the secondary frame.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 620.

BUS This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

Key Entry **Trigger Key** **Ext** **Bus**

:SECondary[:STATe]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:SECondary[:STATe] ON|OFF|1|0
[:SOURce]:RADio:DECT:SECondary[:STATe]?
```

This command enables or disables the ability to switch to the secondary frame.

***RST** 0

Key Entry **Secondary Frame Off On**

Remarks A frame must already be saved as the secondary frame in order to turn the secondary state function on.

To save a frame as the secondary frame, refer to ":SECondary:SAVE" on page 612.

:SOUT

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:SOUT FRAME|SLOT|ALL
[:SOURce]:RADio:DECT:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

FRAME This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

SLOT This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

ALL This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

***RST** FRAME

Key Entry **Begin Frame** **Begin Timeslot #** **All Timeslots**

:SOUT:OFFSet

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:SOUT:OFFSet <val>
[:SOURce]:RADio:DECT:SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed in bits.

***RST** +0

Range –479 to 479

Key Entry **Sync Out Offset**

Remarks Negative values move the synchronization output signal earlier; positive values move it later.

To change the output of the EVENT1 rear panel connector to SLOT, refer to ":SOUT" on page 614.

:SOUT:SLOT

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:SOUT:SLOT <val>
[:SOURce]:RADio:DECT:SOUT:SLOT?
```

This command selects the timeslot that will trigger a 1-bit signal at the EVENT 1 rear panel connector.

***RST** +1

Range Radio Fixed Part Link: 0–12 Portable Part Link: 1–11

Key Entry **Begin Timeslot #**

Remarks To change the output of the EVENT1 rear panel connector to SLOT, refer to “:SOUT” on page 614.

:SRATe

Supported E4438C with Option 001/601or 002/602

```
[:SOURce]:RADio:DECT:SRATe <val>
[:SOURce]:RADio:DECT:SRATe?
```

This command sets the transmission symbol rate. Symbol rate is the bit rate divided by the bits per symbol. A change in the symbol rate affects the bit rate. Refer to “:BRATe” on page 574 for information on bit rate.

The variable `<val>` is expressed in units of symbols per second (sps–Msps) and the maximum symbol rate depends on the filter. Refer to “:FILTer” on page 585 for minimum filter symbol width

The filter may have to be truncated down to 32 or 16 symbols wide to acheive the highest symbol rate. The signal generator’s internal filters are not truncated below their minimum filter length and user-defined FIR filters are not truncated. If the filter cannot be truncated then the symbol rate is limited to the maximum rate of the narrowest filter size possible.

The relative timing of the modulated data, as well as the actual filter response is affected when the filter is truncated.

When the symbol rate changes, the ESG reconfigures the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the symbol rate: lower symbol rates require more time.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 588.

***RST** +1.15200000E+006

Range

Modulation Type	Symbol Rate Range		
	16 Symbol Wide Filter	*32 Symbol Wide Filter*	*64 Symbol Wide Filter*
BPSK, FSK2, MSK	1sps–50Msps	1sps–25Msps	1sps–12.5Msps
C4FM, OQPSK, FSK4	2sps–25Msps	2sps–12.5Msps	2sps–6.25Msps
OQPSKI95, QPSK			
P4QPPSK, QPSKIS95			
GRAYQPSK, QAM4			
D8PSK, EDGE, FSK8, PSK8	3sps–16.666666666 Msps	3sps–8.333333333 Msps	3sps–4.166666666Msps
FSK16, PSK16, QAM16	4sps–12.5Msps	4sps–6.25Msps	4sps–3.125Msps
QAM32	5sps–10Msps	5sps–5Msps	5sps–2.5Msps
QAM64	6sps–8.333333333 Msps	6sps–4.166666666 Msps	6sps–2.083333333 Msps
QAM128	7sps–7.142857142 Msps	7sps–3.571428572 Msps	7sps–1.785714285 Msps
QAM256	8sps–6.25Msps	8sps–3.125 Msps	8sps–1.5625 Msps

NOTE Using I/Q skew will half the minimum number of symbols for the selected filter.

Key Entry **Symbol Rate**

:TRIGger:TYPE

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:TRIGger:TYPE CONTinuous|SINGle|GATE
[:SOURce]:RADio:DECT:TRIGger:TYPE?
```

This command sets the trigger type.

CONTinuous The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to ":TRIGger:TYPE:CONTinuous[:TYPE]" on page 617.

SINGle The framed data sequence plays once for every trigger received.

GATE — An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

***RST** CONT

Key Entry **Continuous** **Single** **Gated**

:TRIGger:TYPE:CONTinuous[:TYPE]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:TRIGger:TYPE:CONTinuous[:TYPE] FREE|TRIGger|RESet
[:SOURce]:RADio:DECT:TRIGger:TYPE:CONTinuous[:TYPE]?
```

This commands selects the waveform's response to a trigger signal while using the continuous trigger mode.

For more information on triggering and to select the continuous trigger mode, see ":TRIGger:TYPE" on page 616.

The following list describes the waveform's response to each of the command choices:

FREE — Turning the ARB format on immediately triggers the waveform. The waveform repeats until you turn the format off, select another trigger, or choose another waveform file.

TRIGger — The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously until you turn the format off, select another trigger, or choose another waveform file.

RESet — The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously. Subsequent triggers reset the waveform to the beginning. For a waveform sequence, this means to the beginning of the first segment in the sequence.

***RST** FREE

Key Entry **Free Run** **Trigger & Run** **Reset & Run**

:TRIGger:TYPE:GATE:ACTive

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:TRIGger:TYPE:GATE:ACTive LOW|HIGH
[:SOURce]:RADio:DECT:TRIGger:TYPE:GATE:ACTive?
```

This command selects the active state (gate polarity) of the gate while using the gating trigger mode.

The LOW and HIGH selections correspond to the low and high states of an external trigger signal. For example, when you select HIGH, the active state occurs during the high of the trigger signal. When the active state occurs, the ESG stops the waveform playback at the last played sample point, then restarts the playback at the next sample point when the inactive state occurs. For more information on triggering and to select gating as the trigger mode, see ":TRIGger:TYPE" on page 616.

The following list describes the ESG's gating behavior for the polarity selections:

LOW The waveform playback stops when the trigger signal goes low (active state) and restarts when the trigger signal goes high (inactive state).

HIGH The waveform playback stops when the trigger signal goes high (active state) and restarts when the trigger signal goes low (inactive state).

***RST** HIGH

Key Entry **Gate Active Low High**

:TRIGger[:SOURce]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio:DECT:TRIGger[:SOURce]?
```

This command sets the trigger source.

For more information on triggering, see ":TRIGger:TYPE" on page 616. The following list describes the command choices:

KEY This choice enables manual triggering by pressing the front-panel **Trigger** hardkey.

EXT An externally applied signal triggers the waveform. This is the only choice that works with gating. The following conditions affect an external trigger:

- The input connector selected for the trigger signal. You have a choice between the rear-panel PATTERN TRIG IN connector or the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector. To make the connector selection, see ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 620.

  For more information on the connectors and on connecting the cables, see the *E4428C/38C ESG Signal Generators User's Guide*.

- The trigger signal polarity:
  - — gating mode, see ":TRIGger:TYPE:GATE:ACTive" on page 618
  - — continuous and single modes, see ":TRIGger[:SOURce]:EXTernal:SLOPe" on page 620
- The time delay between when the ESG receives a trigger and when the waveform responds to the trigger. There are two parts to setting the delay:
  - — setting the amount of delay, see ":TRIGger[:SOURce]:EXTernal:DELay" on page 619
  - — turning the delay on, see ":TRIGger[:SOURce]:EXTernal:DELay:STATe" on page 621

BUS	This choice enables triggering over the GPIB or LAN using the `*TRG` or `GET` commands or the AUXILIARY INTERFACE (RS-232) using the `*TRG` command.
***RST**	KEY
Key Entry	**Trigger Key** **Ext** **Bus**

:TRIGger[:SOURce]:EXTernal:DELay

Supported   E4438C with Option 402

```
[:SOURce]:RADio:DECT:TRIGger[:SOURce]:EXTernal:DELay <val>
[:SOURce]:RADio:DECT:TRIGger[:SOURce]:EXTernal:DELay?
```

This command sets the number of bits to delay the ESG's response to an external trigger.

The bit delay is a delay between when the ESG receives the trigger and when it responds to the trigger. The delay uses the clocks of the bit-clock to time the delay. After the ESG receives the trigger and the set number of delay bits (clocks) occurs, the ESG transmits the data pattern.

The delay occurs after you enable the state. See ":TRIGger[:SOURce]:EXTernal:DELay:STATe" on page 621. You can set the number of bits either before or after enabling the state.

For more information on configuring an external trigger source and to select external as the trigger source, see ":TRIGger[:SOURce]" on page 618.

***RST**	+0
Range	0–1048575
Key Entry	**Ext Delay Bits**

:TRIGger[:SOURce]:EXTernal:SLOPe

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:TRIGger[:SOURce]:EXTernal:SLOPe POSitive|NEGative
[:SOURce]:RADio:DECT:TRIGger[:SOURce]:EXTernal:SLOPe?
```

This command sets the polarity for an external trigger signal while using the continuous, single triggering mode. To set the polarity for gating, see ":TRIGger:TYPE:GATE:ACTive" on page 618.

The POSitive and NEGative selections correspond to the high (positive) and low (negative) states of the external trigger signal. For example, when you select POSitive, the waveform responds (plays) during the high state of the trigger signal. When the ESG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest.

For more information on configuring an external trigger source and to select external as the trigger source, see ":TRIGger[:SOURce]" on page 618.

***RST** NEG

Key Entry **Ext Polarity Neg Pos**

:TRIGger[:SOURce]:EXTernal[:SOURce]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:TRIGger[:SOURce]:EXTernal[:SOURce] EPT1|EPT2|
EPTRIGGER1|EPTRIGGER2
[:SOURce]:RADio:DECT:TRIGger[:SOURce]:EXTernal[:SOURce]?
```

This command selects which PATTERN TRIG IN connection the ESG uses to accept an externally applied trigger signal when external is the trigger source selection.

For more information on configuring an external trigger source and to select external as the trigger source, see ":TRIGger[:SOURce]" on page 618. For more information on the rear-panel connectors, see the *E4428C/38C ESG Signal Generators User's Guide*.

The following list describes the command choices:

EPT1 This choice is synonymous with EPTRIGGER1 and selects the PATTERN TRIG IN rear-panel connector.

EPT2 This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.

EPTRIGGER1 This choice is synonymous with EPT1 and selects the PATTERN TRIG IN rear-panel connector.

EPTRIGGER2 This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.

***RST** EPT1

Key Entry **Patt Trig In 1** **Patt Trig In 2**

:TRIGger[:SOURce]:EXTernal:DELay:STATe

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT:TRIGger[:SOURce]:EXTernal:DELay:STATe ON|OFF|1|0
[:SOURce]:RADio:DECT:TRIGger[:SOURce]:EXTernal:DELay:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

For setting the delay time, see ":TRIGger[:SOURce]:EXTernal:DELay" on page 619, and for more information on configuring an external source, see":TRIGger[:SOURce]" on page 618.

***RST** 0

Key Entry **Ext Delay Off On**

[:STATe]

Supported E4438C with Option 402

```
[:SOURce]:RADio:DECT[:STATe] ON|OFF|1|0
[:SOURce]:RADio:DECT[:STATe]?
```

This command enables or disables the DECT modulation format.

***RST** 0

Key Entry **Dect Off On**

Remarks Although the DECT modulation is enabled with this command, the RF carrier is not modulated unless you enable the modulation by pressing the front panel **Mod On/Off** hardkey.

EDGE Subsystem–Option 402 ([:SOURce]:RADio:EDGE)

:ALPHa

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:ALPHa <val>
[:SOURce]:RADio:EDGE:ALPHa?
```

This command changes the Nyquist or root Nyquist filter’s alpha value.

The filter alpha value can be set to the minimum level (0), the maximum level (1), or in between by using fractional numeric values (0.001–0.999).

***RST** +5.00000000E–001

Range 0.000–1.000

Key Entry **Filter Alpha**

Remarks To change the current filter type, refer to “:FILTer” on page 634.

:BBCLock

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:BBCLock INT[1]|EXT[1]
[:SOURce]:RADio:EDGE:BBCLock?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1] This choice selects the signal generator internal data clock.

EXT[1] This choice selects an external data clock input.

***RST** INT

Key Entry **Ext Data Clock Ext Int**

Remarks A data clock or continuous symbol sync input must be supplied when

external mode is used.

This will be ignored if the external reference is set to EXTernal. To change the external reference type, refer to “:EREFerence” on page 633.

:BBT

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:BBT <val>
[:SOURce]:RADio:EDGE:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

***RST** +3.00000000E–001

Range 0.100–1.000

Key Entry **Filter BbT**

Remarks This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to “:FILTer” on page 634.

:BURSt:SHAPe:FALL:DELay

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FALL:DELay <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FALL:DELay?
```

This command sets the period of time that the start of the burst fall is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –16.2000 to 99

Key Entry **Fall Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 637. Refer to “:SRATe” on page 658 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:FDELay” on page 624 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FDELay

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FDELay <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FDELay?
```

This command sets the period of time that the start of the burst fall is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –16.2000 to 99

Key Entry **Fall Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 637. Refer to “:SRATe” on page 658 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:DELay” on page 623 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FALL:TIME

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FALL:TIME <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FALL:TIME?
```

This command sets the period of time where the burst decreases from full power to minimum power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +1.00000000E+001

Range 0.2000–409.2000

Key Entry **Fall Time**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 637. Refer to “:SRATe” on page 658 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:FTIMe” on page 625 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:FTIMe

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FTIMe <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:FTIMe?
```

This command sets the period of time where the burst decreases from full power to minimum power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range 0.2000–409.2000

Key Entry **Fall Time**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 637. Refer to ":SRATe" on page 658 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:TIME" on page 625 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

:BURSt:SHAPe:RDELay

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RDELay <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RDELay?
```

This command sets the period of time that the start of the burst rise is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –7.2000 to 99

Key Entry **Rise Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 637. Refer to ":SRATe" on page 658 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:DELay" on page 627 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

:BURSt:SHAPe:RISE:DELay

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RISE:DELay <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RISE:DELay?
```

This command sets the period of time that the start of the burst rise is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +0.00000000E+000

Range –7.2000 to 99

Key Entry **Rise Delay**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 637. Refer to “:SRATe” on page 658 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:RDELay” on page 626 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

:BURSt:SHAPe:RISE:TIME

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RISE:TIME <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RISE:TIME?
```

This command sets the period of time where the burst increases from a minimum power to full power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +1.00000000E+001

Range 0.2000–16.4000

Key Entry **Rise Time**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 637. Refer to ":SRATe" on page 658 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:RTIMe" on page 628 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

:BURSt:SHAPe:RTIMe

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RTIMe <val>
[:SOURce]:RADio:EDGE:BURSt:SHAPe:RTIMe?
```

This command sets the period of time where the burst increases from a minimum power to full power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

***RST** +1.00000000E+001

Range 0.2000–16.4000

Key Entry **Rise Time**

Remarks The setting enabled by this command is not affected by signal generator power-on, preset, or `*RST`.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 637. Refer to ":SRATe" on page 658 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:TIME" on page 627 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

:BURSt:SHAPe[:TYPE]

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:BURSt:SHAPe[:TYPE] SINE|"<file name>"
[:SOURce]:RADio:EDGE:BURSt:SHAPe[:TYPE]?
```

This command sets the burst shape type.

SINE — This choice selects a burst shape defined by the burst rise and fall *RST values.

"<file name>" — This choice selects a user-defined file from signal generator memory.

***RST** SINE

Key Entry **Sine** **User File**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

:BURSt[:STATe]

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:BURSt[:STATe] ON|OFF|1|0
[:SOURce]:RADio:EDGE:BURSt[:STATe]?
```

This command enables or disables the burst function.

ON (1) — This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

OFF (0) — This choice enables the transmission of unframed data.

***RST** 0

Key Entry **Data Format Pattern Framed**

:CHANnel

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:CHANnel EVM|ACP
[:SOURce]:RADio:EDGE:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM	This choice provides the most ideal passband.
ACP	This choice improves stopband rejection.
***RST**	ACP
Key Entry	**Optimize FIR For EVM ACP**
Remarks	To change the current filter type, refer to ":FILTer" on page 634.

:DATA

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:DATA PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|
P4|P8|P16|P32|P64|PRAM
[:SOURce]:RADio:EDGE:DATA?
```

This command sets the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file) for unframed data transmission.

***RST**	PN9
Key Entry	**PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **Ext** **4 1's & 4 0's** **8 1's & 8 0's** **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's** **PRAM File**
Remarks	Refer to "File Name Variables" on page 13 for information on the file name syntax.

:DATA:PRAM

Supported E4438C with Option 402

`[:SOURce]:RADio:EDGE:DATA:PRAM "<file_name>"`
`[:SOURce]:RADio:EDGE:DATA:PRAM?`

This command selects a pattern RAM (PRAM) file as the pattern data type for the EDGE (Enhanced Data GSM Environment) format.

`"<file_name>"` This variable designates the PRAM file in WFM1. Refer to "File Name Variables" on page 13 for information on the file name syntax.

Key Entry **PRAM File**

Remarks Selecting this data source forces the burst source to `INTernal` to allow framing control.

The PRAM file must reside in the signal generator's volatile memory (WFM1) in order to be accessed by this command. For more information on PRAM files, refer to ":DATA:PRAM:FILE:BLOCk" on page 112

:DATA:FIX4

Supported E4438C with Option 402

`[:SOURce]:RADio:EDGE:DATA:FIX4 <val>`
`[:SOURce]:RADio:EDGE:DATA:FIX4?`

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the modulation type, symbol rate, filter, and burst shape selected for the EDGE modulation format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks `FIX4` must already be defined as the data type.

To change the data type, refer to ":DATA" on page 630.

:DEFault

Supported E4438C with Option 402

`[:SOURce]:RADio:EDGE:DEFault`

This command returns all of the EDGE modulation format parameters to factory settings. It does not affect any other signal generator parameters.

Key Entry **Restore EDGE Factory Default**

:EDATa:DELay

Supported E4438C with Option 402

`[:SOURce]:RADio:EDGE:EDATa:DELay?`

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

***RST** +0.00000000E+000

Remarks When the EDGE format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

:EDCLock

Supported E4438C with Option 402

`[:SOURce]:RADio:EDGE:EDCLock SYMBol|NORMal`
`[:SOURce]:RADio:EDGE:EDCLock?`

This command sets the external data clock use.

SYMBol This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

NORMal This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

***RST** NORM

Key Entry **Ext Data Clock Normal Symbol**

Remarks Both choices have no effect in internal clock mode. Refer to “:BBCLock” on page 622 to select EXT as the data clock type.

:EREFerence

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:EREFerence INT|EXT
[:SOURce]:RADio:EDGE:EREFerence?
```

This command selects either an internal or external bit-clock reference for the data generator.

***RST** INT

Key Entry **BBG Ref Ext Int**

Remarks If the EXT choice is selected, the external source's frequency value must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

Refer to, ":EREFerence:VALue" on page 633 to enter the external reference frequency setting.

:EREFerence:VALue

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:EREFerence:VALue <val>
[:SOURce]:RADio:EDGE:EREFerence:VALue?
```

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

***RST** +1.30000000E+007

Range 2.5E5–1E8

Key Entry **Ext BBG Ref Freq**

Remarks The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to ":EREFerence" on page 633 to select EXT (external source) as the reference for the bit-clock.

:FILTer

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:FILTer RNYQuist|NYQuist|GAUSsian|RECTangle|IS95|
IS95_EQ|IS95_MOD|IS95_MOD_EQ|EDGE|AC4Fm|UGGaussian|"<user FIR>"
[:SOURce]:RADio:EDGE:FILTer?
```

This command selects the pre-modulation filter type.

IS95 This choice selects a filter that meets the criteria of the IS-95 standard.

IS95_EQ This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.

IS95_MOD This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.

IS95_MOD_EQ This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.

EDGE This choice selects Laurant’s decomposition of a Gaussian filter with a 0.300 fixed BbT.

AC4Fm This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.

UGGaussian This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.

"<user FIR>" This variable is any filter file that you have stored into memory.

***RST** EDGE

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ**
IS-95 Mod **IS-95 Mod w/EQ** **EDGE** **APCO 25 C4FM**
UN3/4 GSM Gaussian **User FIR**

Remarks Refer to “File Name Variables” on page 13 for information on the file name syntax.

:IQ:SCALe

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:IQ:SCALe <val>
[:SOURce]:RADio:EDGE:IQ:SCALe?
```

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

***RST** +113

Range 1–200

Key Entry **I/Q Scaling**

Remarks This command has no effect with MSK or FSK modulation.

:MODulation:FSK[:DEViation]

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:MODulation:FSK[:DEViation] <val>
[:SOURce]:RADio:EDGE:MODulation:FSK[:DEViation]?
```

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

***RST** +4.00000000E+002

Range 0–2E7

Key Entry **Freq Dev**

Remarks To change the modulation type, refer to “:MODulation[:TYPE]” on page 637.

Refer to “:SRATe” on page 658 for a list of minimum and maximum symbol rate values.

To set an asymmetric FSK deviation value, refer to the *E4428C/38C ESG Signal Generators User’s Guide* for more information.

:MODulation:MSK[:PHASe]

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:MODulation:MSK[:PHASe] <val>
[:SOURce]:RADio:EDGE:MODulation:MSK[:PHASe]?
```

This command sets the MSK phase deviation value.

The variable <val> is expressed in units of degrees.

***RST** +9.00000000E+001

Range 0–100

Key Entry **Phase Dev**

:MODulation:UFSK

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:MODulation:UFSK "<file name>"
[:SOURce]:RADio:EDGE:MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

Key Entry **User FSK**

Remarks The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 637 to change the current modulation type.

Refer to "File Name Variables" on page 13 for information on the file name syntax.

:MODulation:UIQ

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:MODulation:UIQ "<file name>"
[:SOURce]:RADio:EDGE:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

Key Entry **User I/Q**

Remarks The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to ":MODulation[:TYPE]" on page 637 to change the current modulation type.

Refer to "File Name Variables" on page 13 for information on the file name syntax.

:MODulation[:TYPE]

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:MODulation[:TYPE] BPSK|QPSK|IS95QPSK|GRAYQPSK|
OQPSK|IS95OQPSK|P4DQPSK|PSK8|PSK16|D8PSK|MSK|FSK2|FSK4|FSK8|FSK16|C4FM|
QAM4|QAM16|QAM32|QAM64|QAM128|QAM256|EDGE|UIQ|UFSK
[:SOURce]:RADio:EDGE:MODulation[:TYPE]?
```

This command sets the modulation type for the EDGE personality.

***RST** EDGE

Key Entry **BPSK** **QPSK** **IS-95 QPSK** **Gray Coded QPSK** **OQPSK** **IS-95 OQPSK** **π/4 DQPSK** **8PSK** **16PSK** **D8PSK** **MSK** **2-Lvl FSK** **4-Lvl FSK** **8-Lvl FSK** **16-Lvl FSK** **C4FM** **4QAM** **16QAM** **32QAM** **64QAM** **128QAM** **256QAM** **EDGE** **User I/Q** **User FSK**

:POLarity[:ALL]

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:POLarity[:ALL] NORMal|INVerted
[:SOURce]:RADio:EDGE:POLarity[:ALL]?
```

This command sets the rotation direction for the phase modulation vector.

NORMal This choice selects normal phase polarity.

INVerted This choice inverts the internal Q signal.

***RST** NORM

Key Entry **Phase Polarity Normal Invert**

:SECondary:RECall

Supported E4438C with Option 402

`[:SOURce]:RADio:EDGE:SECondary:RECall`

This command recalls the secondary frame configuration, overwriting the current frame.

Key Entry **Recall Secondary Frame State**

Remarks To save a secondary frame state, refer to ":SECondary:SAVE" on page 638.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to ":SECondary[:STATe]" on page 639.

:SECondary:SAVE

Supported E4438C with Option 402

`[:SOURce]:RADio:EDGE:SECondary:SAVE`

This command saves the current frame configuration as the secondary frame with the filename `EDGE_SECONDARY_FRAME`.

Key Entry **Save Secondary Frame State**

Remarks To recall the secondary frame (saved in non-volatile signal generator memory), refer to ":SECondary:RECall" on page 638.

:SECondary:TRIGger[:SOURce]

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SECondary:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio:EDGE:SECondary:TRIGger[:SOURce]?
```

This command selects the type of triggering for the secondary frame.

KEY This choice enables triggering by pressing the front panel **Trigger** hardkey.

EXT This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connection, refer to ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 665.

BUS This choice enables GPIB triggering using the `*TRG` or `GET` command or LAN and RS-232 triggering using the `*TRG` command.

Key Entry **Trigger Key** **Ext** **Bus**

:SECondary[:STATe]

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SECondary[:STATe] ON|OFF|1|0
[:SOURce]:RADio:EDGE:SECondary[:STATe]?
```

This command enables or disables the ability to switch to the secondary frame.

***RST** 0

Key Entry **Secondary Frame Off On**

Remarks A frame must already be saved as the secondary frame in order to turn the secondary state function on.

To save a frame as the secondary frame, refer to ":SECondary:SAVE" on page 638.

:SLOT0|[1]|2|3|4|5|6|7:CUSTom

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:CUSTom PN9|PN11|PN15|PN20|
PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:CUSTom?
```

This command sets the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file) for framed data transmission.

***RST** PN9

Key Entry **PN9** **PN15** **FIX4** **User File** **Ext** **4 1's & 4 0's** **8 1's & 8 0's**

16 1's & 16 0's **32 1's & 32 0's** **64 1's & 64 0's**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

Refer to ":SLOT0|[1]|2|3|4|5|6|7[:TYPE]" on page 656

:SLOT0|[1]|2|3|4|5|6|7:CUSTom:FIX4

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:CUSTom:FIX4 <val>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:CUSTom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected custom timeslot.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be defined as the data type.

To change the data type, refer to ":SLOT0|[1]|2|3|4|5|6|7:CUSTom" on page 639.

:SLOT0|[1]|2|3|4|5|6|7:CUSTom:GUARd

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:CUSTom:
GUARd <24 or 27 bit_pattern>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:CUSTom:GUARd?
```

This command defines the hexadecimal value for the guard time field in the selected custom timeslot.

***RST** Timeslots 0 & 4: #H7FFFFFF

Timeslots: 1, 2, 3, 5, 6, &7: #H0FFFFFF

Range Timeslots 0 & 4: #H0–#H7FFFFFF

Timeslots: 1, 2, 3, 5, 6, &7: #H0–#H0FFFFFF

Key Entry **G**

Remarks The guard time field is always modulated (but not bursted), even when the timeslot is off.

If the guard time and `T2` symbols of the current timeslot and the `T1` symbols of the next timeslot do not match, the burst shape may not be smooth (even if the current timeslot is turned off).

To change the current timeslot type, refer to ":SLOT0|[1]|2|3|4|5|6|7[:TYPE]" on page 656.

:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption PN9|PN15|
FIX4|"<file name>"|P4|P8|P16|P32|P64|TCHFS|CS1|CS4|DMCS1|UMCS1
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption?
```

This command selects the data pattern type or the multiframe channel (structure) for the selected GMSK timeslot.

There are two types of multiframe structures, a 26 and a 52 frame structure. The 26 frame structure has the following attributes:

- frame 12 contains the slow associated control channel (SACCH)
- frame 25 is idle and incorporates RF blanking

The 52 frame structure has the following attributes:

- frames 12 and 38 contain tail and control bits with the payload bits set to zero.
- Frames 25 and 51 are idle and incorporate RF blanking.

PN9, PN15	These choices are standard PN sequences. For bursted data, the PN sequences continuously repeat from one timeslot in a frame to the matching timeslot in the next frame.
FIX4	This choice selects a repeating 4-bit pattern.
"<file name>"	This choice selects a user-defined data file from signal generator memory. The file must supply enough bits to fill the desired number of timeslots. In timeslots where there is not enough bits to fill the encryption fields, the ESG ignores the data.
P4	This choice selects a data pattern with four ones followed by four zeros. The pattern repeats as needed to fill the encryption fields.
P8	This choice selects a data pattern with eight ones followed by eight zeros. The pattern repeats as needed to fill the encryption fields.
P16	This choice selects a data pattern with 16 ones followed by 16 zeros. The pattern repeats as needed to fill the encryption fields.
P32	This choice selects a data pattern with 32 ones followed by 32 zeros. The pattern repeats as needed to fill the encryption fields.
P64	This choice selects a data pattern with 64 ones followed by 64 zeros. The pattern repeats as needed to fill the encryption fields.
TCHFS	This multiframe choice selects a traffic channel with full rate speech (TCH/FS).

CS-1	This multiframe choice selects the packet data traffic channel that uses the packet data block type 1 coding scheme in accordance with the 3GPP standard GSM 05.03.
CS4	This multiframe choice selects the packet data traffic channel that uses the packet data block type 4 coding scheme in accordance with the 3GPP standard GSM 05.03.
DMCS1	This multiframe choice selects the downlink packet data traffic channel that uses the packet data block type 5 modulation and coding scheme in accordance with the 3GPP standard GSM 05.03.
UMCS1	This multiframe choice selects the uplink packet data traffic channel that uses the packet data block type 5 modulation and coding scheme in accordance with the 3GPP standard GSM 05.03.

***RST** PN9

Key Entry **PN9** **PN15** **FIX4** **User File** **Ext** **4 1's & 4 0's** **8 1's & 8 0's** **16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's** **TCH/FS** **CS-1** **CS-4** **Downlink MCS-1** **Uplink MCS-1**

:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:CS1:DATA

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:CS1:DATA PN9|
PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:CS1:DATA?
```

This command selects the encryption field data for the selected GMSK timeslot that uses the packet data block type 1 coding scheme.

***RST** PN9

Key Entry **PN9** **PN15**

Remarks Refer to ":SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption" on page 641 for selecting the coding scheme.

:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:CS4:DATA

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:CS4:DATA PN9|
PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:CS4:DATA?
```

This command selects the encryption field data for the selected GMSK timeslot that uses the packet data block type 4 coding scheme.

***RST** PN9

Key Entry **PN9** **PN15**

Remarks Refer to ":SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption" on page 641 for selecting the coding scheme.

:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:DLINk:MCS1:DATA

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:DLINk:MCS1:
DATA PN9|PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:DLINk:MCS1:
DATA?
```

This command selects the encryption field data for the selected GMSK timeslot that uses the downlink packet data block type 5 modulation and coding scheme.

***RST** PN9

Key Entry **PN9** **PN15**

Remarks Refer to ":SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption" on page 641 for selecting the coding scheme.

:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:FIX4

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:FIX4 <val>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:FIX4?
```

This command sets the encryption field with a 4-bit binary repeating data pattern for the selected GMSK timeslot.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

***RST** #B0000

Range 0–15

Key Entry **FIX4**

Remarks Refer to ":SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption" on page 641 for selecting the data type.

:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:TCH:FS:DATA

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:TCH:FS:
DATA PN9|PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:TCH:FS:DATA?
```

This command sets the encryption field data for the selected GMSK timeslot configured as the traffic channel with full speech (TCH/FS).

***RST** PN9

Key Entry **PN9** **PN15**

Remarks Refer to ":SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption" on page 641 for selecting the TCH/FS.

:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:ULINk:MCS1:DATA

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:ULINk:MCS1:
DATA {PN9}|PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption:ULINk:MCS1:
DATA?
```

This command selects the encryption field data for the selected GMSK timeslot that uses the uplink packet data block type 5 modulation and coding scheme.

***RST** PN9

Key Entry **PN9** **PN15**

Remarks Refer to ":SLOT0|[1]|2|3|4|5|6|7:GMSK:ENCRyption" on page 641 for selecting the coding scheme.

:SLOT0|[1]|2|3|4|5|6|7:GMSK:STEal

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:STEal 0|1
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:STEal?
```

This command specifies the stealing bit (1-bit S field) for the selected GMSK timeslot. The single bit defines the value for both stealing (S) fields.

The stealing flag field accepts values in binary, hexadecimal, or decimal format, however the query returns only hexadecimal values.

***RST** #H0

Key Entry **S**

:SLOT0|[1]|2|3|4|5|6|7:GMSK:TSEQuence

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:TSEQuence TSC0|TSC1|
TSC2|TSC3|TSC4|TSC5|TSC6|TSC7|<26-bit pattern>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:GMSK:TSEQuence?
```

This command changes the 26-bit training sequence (TS) for the selected GMSK timeslot.

The query returns the current training sequence hexadecimal value. Use the following table to match the hexadecimal values to the training sequences of TSC0–TSC7.

Training Sequence	Hexadecimal Value
TSC0	0970897
TSC1	0B778B7
TSC2	10EE90E
TSC3	11ED11E
TSC4	06B906B
TSC5	13AC13A
TSC6	29F629F
TSC7	3BC4BBC

***RST** #H0970897

Range *<26-bit pattern>*: #H0–#H3FFFFFF

Key Entry **TSC0** **TSC1** **TSC2** **TSC3** **TSC4** **TSC5** **TSC6** **TSC7**
Custom TS

:SLOT0|[1]|2|3|4|5|6|7:MULTislot

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:MULTislot ON|OFF|1|0
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:MULTislot?
```

This command turns bursting (ramping) on or off between the selected timeslot and the next higher numbered adjacent timeslot.

ON (1) This choice turns ramping off between timeslots.

OFF (0) This choice turns ramping on between timeslots.

***RST** 0

Key Entry **Multislot Off On**

Remarks Turning multislot on between an EDGE and GMSK timeslot may produce undesired spectral content. The undesired spectral content is a byproduct of the transition between two different modulation types without ramping.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption

Supported E4438C with Options 402 or 416

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption PN9|PN11|
PN15|PN20|PN23|FIX4|"<filename>"|EXT|P4|P8|P16|P32|P64|DMCS9|UMCS9|DMCS5
|UMCS5|ETCHF43|UNCoded|EBCH1|EBCH2
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption?
```

This command selects the data pattern type or the multiframe channel (structure) for the selected normal timeslot.

There are two types of multiframe structures, a 26 and a 52 frame structure. The 26 frame structure has the following attributes:

- frame 12 contains the slow associated control channel (SACCH)
- frame 25 is idle and incorporates RF blanking

The 52 frame structure has the following attributes:

- frames 12 and 38 contain tail and control bits with the payload bits set to zero.

- Frames 25 and 51 are idle and incorporate RF blanking.

PN9–23	These choices are standard PN sequences. For bursted data, the PN sequences continuously repeat from one timeslot in a frame to the matching timeslot in the next frame.
FIX4	This choice selects a repeating 4-bit binary pattern.
`"<filename>"`	This choice selects a user-defined data file from signal generator memory. The file must supply enough bits to fill the desired number of timeslots. In timeslots where there are not enough bits to fill the encryption fields, the ESG ignores the data.
EXT	This choice selects an external user signal as the modulating data stream. Connect the externally supplied serial data signal to the front panel DATA BNC connector.

NOTE The EXT selection is not available when configuring both GMSK and EDGE normal timeslots for the same signal.

P4	This choice selects a data pattern with four ones followed by four zeros. The pattern repeats as needed to fill the encryption fields.
P8	This choice selects a data pattern with eight ones followed by eight zeros. The pattern repeats as needed to fill the encryption fields.
P16	This choice selects a data pattern with 16 ones followed by 16 zeros. The pattern repeats as needed to fill the encryption fields.
P32	This choice selects a data pattern with 32 ones followed by 32 zeros. The pattern repeats as needed to fill the encryption fields.
P64	This choice selects a data pattern with 64 ones followed by 64 zeros. The pattern repeats as needed to fill the encryption fields.
DMCS9	This multiframe choice selects the downlink packet data traffic channel that uses the packet data block type 13 modulation and coding scheme in accordance with the 3GPP standard GSM 05.03.
UMCS9	This multiframe choice selects the uplink packet data traffic channel that uses the packet data block type 13 modulation and coding scheme in accordance with the 3GPP standard GSM 05.03.
DMCS5	This multiframe choice selects the downlink packet data traffic channel that uses the packet data block type 9 modulation and coding scheme in accordance with the 3GPP standard GSM 05.03.
UMCS5	This multiframe choice selects the uplink packet data traffic channel that uses the packet data block type 9 modulation and coding scheme in accordance with the 3GPP standard GSM 05.03.

ETCH43	This multiframe choice selects an enhanced circuit switched full rate traffic channel with a user data rate of 43.2k-bits per second
Uncoded	This choice selects an uncoded channel.
EBCH1	This multiframe choice selects a *non-combined* broadcast channel for timeslot zero. Use this selection when timeslot zero is the only multiframe timeslot within the frame (timeslots 0–7). Trying to use a multiframe choice for another timeslot (timeslots 1–7) when timeslot zero is configured as a BCH, will create a settings conflict error.
EBCH2	This multiframe choice selects a *combined* broadcast channel for timeslot zero. Use this selection when timeslot zero is the only multiframe timeslot within the frame (timeslots 0–7). Trying to use a multiframe choice for another timeslot (timeslots 1–7) when timeslot zero is configured as a BCH, will create a settings conflict error.

***RST** PN9

Key Entry **PN9** **PN11** **PN15** **PN20** **PN23** **FIX4** **User File** **EXT**
4 1's & 4 0's **8 1's & 8 0's** **16 1's & 16 0's** **32 1's & 32 0's**
64 1's & 64 0's **Downlink MCS-9** **Uplink MCS-9** **Downlink MCS-5**
Uplink MCS-5 **E-TCH/F43.2** **Uncoded**

Remarks Refer to "File Name Variables" on page 13 for information on the file name syntax.

To change the current timeslot type, refer to ":SLOT0|[1]|2|3|4|5|6|7[:TYPE]" on page 656.

:SLOT0:NORMal:ENCRyption:BCH:BCC

Supported E4438C with Option 416416

```
[:SOURce]:RADio:EDGE:SLOT0:NORMal:ENCRyption:BCH:BCC <val>
[:SOURce]:RADio:EDGE:SLOT0:NORMal:ENCRyption:BCH:BCC?
```

This command sets the broadcast control code (BCC) which is used to indicate what training sequence is being used by the basestation in the forward channels. This code will allow the mobile station to decode the other channels in the broadcast channel.

***RST** 0

Range 0–7

:SLOT0:NORMal:ENCRyption:BCH:CELLid

Supported E4438C with Option 416

```
[:SOURce]:RADio:EDGE:SLOT0:NORMal:ENCRyption:BCH:CELLid <val>
[:SOURce]:RADio:EDGE:SLOT0:NORMal:ENCRyption:BCH:CELLid?
```

This command sets the cell identification. The purpose of the cell identity information element is to identify a cell within a location area.

***RST** 0

Range 0–65535

:SLOT0:NORMal:ENCRyption:BCH:LAC

Supported E4438C with Option 416

```
[:SOURce]:RADio:EDGE:SLOT0:NORMal:ENCRyption:BCH:LAC <val>
[:SOURce]:RADio:EDGE:SLOT0:NORMal:ENCRyption:BCH:LAC?
```

This command sets the location area code (LAC). The location area code provides 16 bits to allow the administrator to define a location.

***RST** 0

Range 0–65535

:SLOT0:NORMal:ENCRyption:BCH:MCC

Supported E4438C with Option 416

```
[:SOURce]:RADio:EDGE:SLOT0:NORMal:ENCRyption:BCH:MCC <val>
[:SOURce]:RADio:EDGE:SLOT0:NORMal:ENCRyption:BCH:MCC?
```

This command sets the mobile country code (MCC). The mobile country code is a 12 bit number used to represent the country where the basestation is located.

***RST** 0

Range 0–4095

:SLOT0:NORMal:ENCRyption:BCH:MNC

Supported E4438C with Option 416

```
[:SOURce]:RADio:EDGE:SLOT0:NORMal:ENCRyption:BCH:MNC <val>
[:SOURce]:RADio:EDGE:SLOT0:NORMal:ENCRyption:BCH:MNC?
```

This command sets the mobile network code (MNC). The mobile network code is the individual number a network will be assigned.

***RST** 0

Range 0–255

Remarks Federal regulation mandates that a 3-digit MNC will be used. For the ESG implementation the upper four bits are set to 1111.

:SLOT0:NORMal:ENCRyption:BCH:PLMN

Supported E4438C with Option 416

```
[:SOURce]:RADio:EDGE:SLOT0:NORMal:ENCRyption:BCH:PLMN <val>
[:SOURce]:RADio:EDGE:SLOT0:NORMal:ENCRyption:BCH:PLMN?
```

This command is used to set the Public Land Mobile Network (PLMN) which is used to indicate the country the phone is in. PLMN is also referred to as the National Country Code (NCC).

***RST** 0

Range 0–7

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:DLINk:MCS5:DATA

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:DLINk:MCS5:
DATA PN9|PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:DLINk:MCS5:
DATA?
```

This command sets the data type (pseudo-random number sequence) for the enhanced general packet radio service (EGPRS) modulation and coding scheme 5 (MCS-5) downlink channel.

***RST** PN9

Key Entry **PN9** **PN15**

Remarks To select downlink MCS-5 as the multiframe channel type, refer to “:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption” on page 646.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:DLINk:MCS9:DATA

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:DLINk:MCS9:
DATA PN9|PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:DLINk:MCS9:
DATA?
```

This command sets the data type (pseudo-random number sequence) for the enhanced general packet radio service (EGPRS) modulation and coding scheme 9 (MCS-9) downlink channel.

***RST** PN9

Key Entry **PN9** **PN15**

Remarks To select downlink MCS-9 as the multiframe channel type, refer to ":SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption" on page 646.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ETCH:F43:DATA

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ETCH:F43:
DATA PN9|PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ETCH:F43:
DATA?
```

This command sets the data type (pseudo-random number sequence) for the enhanced, circuit switched, full-rate traffic channel with 43.2k-bits per second of user data (E-TCH/F43.2).

***RST** PN9

Key Entry **PN9** **PN15**

Remarks To select E-TCH/F43.2 as the multiframe channel type, refer to ":SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption" on page 646.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:FIX4

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:FIX4 <val>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for framed transmission according to the modulation type, symbol rate, filter, and burst shape selected for the EDGE modulation format.

***RST** #B0000

Range #B0000–#B1111 or 0–15

Key Entry **FIX4**

Remarks FIX4 must already be selected as the data type.

To select FIX4 as the data type, refer to ":SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption" on page 646.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ULINk:MCS5:DATA

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ULINk:MCS5:
DATA PN9|PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ULINk:MCS5:
DATA?
```

This command sets the data type (pseudo-random number sequence) for the enhanced general packet radio service (EGPRS) modulation and coding scheme 5 (MCS-5) uplink channel.

***RST** PN9

Key Entry **PN9** **PN15**

Remarks To select uplink MCS-5 as the multiframe channel type, refer to ":SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption" on page 646.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ULINk:MCS9:DATA

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ULINk:MCS9:
DATA PN9|PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:ULINk:MCS9:
DATA?
```

This command sets the data type (pseudo-random number sequence) for the enhanced general packet radio service (EGPRS) modulation and coding scheme 9 (MCS-9) uplink channel.

***RST** PN9

Key Entry **PN9** **PN15**

Remarks To select uplink MCS-9 as the multiframe channel type, refer to ":SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption" on page 646.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:UNCoded

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:
UNCoded PN9|PN15
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption:
UNCoded?
```

This command sets the data type (pseudo-random number sequence) for an uncoded channel.

***RST** PN9

Key Entry **PN9** **PN15**

Remarks To select uncoded as the multiframe channel type, refer to ":SLOT0|[1]|2|3|4|5|6|7:NORMal:ENCRyption" on page 646.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:GUARd

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:
GUARd <24 or 27 bit_pattern>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:GUARd?
```

This command sets the hexadecimal value for the guard time field in the selected normal timeslot.

***RST**	Timeslots 0 & 4: #H7FFFFFF
	Timeslots: 1, 2, 3, 5, 6, &7: #H0FFFFFF
Range	Timeslots 0 & 4: #H0–#H7FFFFFF
	Timeslots: 1, 2, 3, 5, 6, &7: #H0–#H0FFFFFF
Key Entry	**G**
Remarks	The guard time field is always modulated (but not bursted), even when the timeslot is off.

If the guard time and `T2` symbols of the current timeslot and the `T1` symbols of the next timeslot do not match, the burst shape may not be smooth (even if the current timeslot is turned off).

To change the current timeslot type, refer to ":SLOT0|[1]|2|3|4|5|6|7[:TYPE]" on page 656.

:SLOT0|[1]|2|3|4|5|6|7:NORMal:T1

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:T1 <9 bit_pattern>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:T1?
```

This command sets the hexadecimal value for the leading 9-bit tail field in the selected normal timeslot.

***RST**	#H1FF
Range	#H0–#H1FF
Key Entry	**T1**

:SLOT0|[1]|2|3|4|5|6|7:NORMal:T2

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:T2 <9 bit_pattern>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:T2?
```

This command sets the hexadecimal value for the trailing 9-bit tail field in the selected normal timeslot.

***RST** #H1FF

Range #H0–#H1FF

Key Entry **T2**

:SLOT0|[1]|2|3|4|5|6|7:NORMal:TSEQuence

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:TSEQuence TSC0|TSC1|
TSC2|TSC3|TSC4|TSC5|TSC6|TSC7|<78 bit_pattern>
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:NORMal:TSEQuence?
```

This command sets the 78-bit training sequence code for a normal timeslot to one of eight values or to create a custom value.

***RST** #H3F3F9E49FFF3FF3F9E49

Range <78 bit_pattern>: #H0–#H3FFFFFFFFFFFFFFFFFFF

Key Entry **TSC0** **TSC1** **TSC2** **TSC3** **TSC4** **TSC5** **TSC6** **TSC7**
Custom TS

:SLOT0|[1]|2|3|4|5|6|7:LCAPacity:POWer

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:POWer MAIN|DELTa
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:POWer?
```

This command toggles the RF output power level function for the selected timeslot.

MAIN This choice specifies RF output as the main power level.

DELTa This choice specifies RF output as the alternative power level.

***RST** MAIN

Key Entry **Timeslot Ampl Main Delta**

:SLOT0|[1]|2|3|4|5|6|7:STATe

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:STATe ON|OFF|1|0
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7:STATe?
```

This command enables or disables the operating state of the selected timeslot.

***RST** Timeslot 0: 1 Timeslots 1–7: 0

Key Entry **Timeslot Off On**

:SLOT0|[1]|2|3|4|5|6|7[:TYPE]

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7[:TYPE] CUSTom|NORMal|GMSK|
NORMAL_ALL
[:SOURce]:RADio:EDGE:SLOT0|[1]|2|3|4|5|6|7[:TYPE]?
```

This command sets the timeslot type for the selected timeslot.

CUSTom This choice selects a generic, non-standard timeslot configuration that consists of a data field and a guard field.

NORMal This choice selects a normal timeslot configuration for an EDGE signal.

GMSK This choice selects a normal GSM timeslot (GMSK modulation). Selecting a different EDGE modulation type does not change the GMSK modulation for a GMSK configured timeslot.

NORMAL_ALL This choice sets all timeslots to a normal timeslot configuration for an EDGE signal, regardless of the timeslot number selected.

***RST** NORM

Key Entry **Custom** **Normal** **GMSK** **Normal All**

:SOUT:

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SOUT FRAME|SLOT|ALL
[:SOURce]:RADio:EDGE:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

FRAME This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

SLOT This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

ALL This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

***RST** FRAME

Key Entry **Begin Frame** **Begin Timeslot #** **All Timeslots**

Remarks To change the synchronization output offset value, refer to ":SOUT:OFFSet" on page 657.

:SOUT:OFFSet

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SOUT:OFFSet <val>
[:SOURce]:RADio:EDGE:SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed in bits.

***RST** +0

Range –155 to 155

Key Entry **Sync Out Offset**

Remarks Negative values move the synchronization output signal earlier; positive values move it later.

To change the output of the EVENT1 rear panel connector to SLOT, refer to ":SOUT:" on page 657.

:SOUT:SLOT

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SOUT:SLOT <val>
[:SOURce]:RADio:EDGE:SOUT:SLOT?
```

This command selects the timeslot that will trigger a 1-bit output signal at the EVENT 1 rear panel connector.

***RST** +0

Range 0–7

Key Entry **Begin Timeslot #**

Remarks To change the output of the EVENT1 rear panel connector to SLOT, refer to “:SOUT:” on page 657.

:SRATe

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:SRATe <val>
[:SOURce]:RADio:EDGE:SRATe?
```

This command sets the transmission symbol rate.

The variable <val> is expressed in units of symbols per second (sps–Msps) and the maximum range value depends on the modulation type, and filter.

NOTE When using EDGE and GMSK, or multiframe EDGE, limit the symbol rate to no more than 271 ksps. Although higher rates may work, they are not supported.

***RST** +2.70833333E+005

Range

Modulation Type	Bits per Symbol	Internal Data
BPSK	1	1sps–50 Msps
FSK2		
MSK		
C4FM	2	1sps–50 Msps
FSK4		
OQPSK		
OQPSK195		
P4QPPSK		
QAM4		
QPSK		
QPSKIS95		
GRAYQPSK		
D8PSK	3	1sps–33.33 Msps
EDGE		
FSK8		
PSK8		
FSK16	4	1sps–25 Msps
PSK16		
QAM16		
QAM32	5	1sps–20 Msps
QAM64	6	1sps–16.67 Msps
QAM256	8	1sps–12.50 Msps

Key Entry **Symbol Rate**

Remarks When user-defined filters are selected using the command in section ":FILTer" on page 634, the upper bit rate will be restricted in line with the following symbol rate restriction:

- FIR filter length > 32 symbols: upper limit is 12.5 Msps
- FIR filter length > 16 symbols: upper limit is 25 Msps

When internal FIR filters are used, the limits of the above table always apply. For higher symbol rates, the FIR filter length will be truncated as follows:

- Above 12.5 Msps, the FIR length will be truncated to 32 symbols
- Above 25 Msps, the FIR length will be truncated to 16 symbols

  This will impact the relative timing of the modulated data, as well as the actual filter response.

When the symbol rate is changed, the ESG will reconfigure the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the symbol rate: lower symbol rates require more time.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 637.

NOTE In the EDGE format with a GMSK modulated timeslot, the maximum symbol rate is 25 Msps for up to 16 symbol wide filters. For 32 symbol wide filters, the limit is 12.5 Msps.

:TRIGger:TYPE

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger:TYPE CONTinuous|SINGle|GATE
[:SOURce]:RADio:EDGE:TRIGger:TYPE?
```

This command sets the trigger type.

CONTinuous The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to ":TRIGger:TYPE:CONTinuous[:TYPE]" on page 660.

SINGle The framed data sequence plays once for every trigger received.

GATE An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

***RST** CONT

Key Entry **Continuous** **Single** **Gated**

:TRIGger:TYPE:CONTinuous[:TYPE]

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger:TYPE:CONTinuous[:TYPE] FREE|TRIGger|RESet
[:SOURce]:RADio:EDGE:TRIGger:TYPE:CONTinuous[:TYPE]?
```

This commands selects the waveform's response to a trigger signal while using the continuous trigger mode.

For more information on triggering and to select the continuous trigger mode, see ":TRIGger:TYPE" on page 660.

The following list describes the waveform's response to each of the command choices:

FREE	Turning the ARB format on immediately triggers the waveform. The waveform repeats until you turn the format off, select another trigger, or choose another waveform file.
TRIGger	The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously until you turn the format off, select another trigger, or choose another waveform file.
RESet	The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously. Subsequent triggers reset the waveform to the beginning. For a waveform sequence, this means to the beginning of the first segment in the sequence.

***RST** FREE

Key Entry **Free Run** **Trigger & Run** **Reset & Run**

:TRIGger:TYPE:GATE:ACTive

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger:TYPE:GATE:ACTive LOW|HIGH
[:SOURce]:RADio:EDGE:TRIGger:TYPE:GATE:ACTive?
```

This command selects the active state (gate polarity) of the gate while using the gating trigger mode.

The LOW and HIGH selections correspond to the low and high states of an external trigger signal. For example, when you select HIGH, the active state occurs during the high of the trigger signal. When the active state occurs, the ESG stops the waveform playback at the last played sample point, then restarts the playback at the next sample point when the inactive state occurs. For more information on triggering and to select gating as the trigger mode, see ":TRIGger:TYPE" on page 660.

The following list describes the ESG's gating behavior for the polarity selections:

LOW	The waveform playback stops when the trigger signal goes low (active state) and restarts when the trigger signal goes high (inactive state).
HIGH	The waveform playback stops when the trigger signal goes high (active state) and restarts when the trigger signal goes low (inactive state).

***RST** HIGH

Key Entry **Gate Active Low High**

:TRIGger[:SOURce]

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger[:SOURce] KEY|EXT|BUS
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]?
```

This command sets the trigger source.

For more information on triggering, see ":TRIGger:TYPE" on page 660. The following list describes the command choices:

KEY This choice enables manual triggering by pressing the front-panel **Trigger** hardkey.

EXT An externally applied signal triggers the waveform. This is the only choice that works with gating. The following conditions affect an external trigger:

- The input connector selected for the trigger signal. You have a choice between the rear-panel PATTERN TRIG IN connector or the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector. To make the connector selection, see ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 665.

  For more information on the connectors and on connecting the cables, see the *E4428C/38C ESG Signal Generators User's Guide*.

- The trigger signal polarity:

  — gating mode, see ":TRIGger:TYPE:GATE:ACTive" on page 661
  — continuous and single modes, see ":TRIGger[:SOURce]:EXTernal:SLOPe" on page 664

- The time delay between when the ESG receives a trigger and when the waveform responds to the trigger. There are two parts to setting the delay:

  — setting the amount of delay, see ":TRIGger[:SOURce]:EXTernal:DELay" on page 663
  — turning the delay on, see ":TRIGger[:SOURce]:EXTernal:DELay:STATe" on page 664

BUS This choice enables triggering over the GPIB or LAN using the `*TRG` or `GET` commands or the AUXILIARY INTERFACE (RS-232) using the `*TRG` command.

***RST** KEY

Key Entry **Trigger Key** **Ext** **Bus**

:TRIGger[:SOURce]:EXTernal:DELay

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal:DELay <val>
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal:DELay?
```

This command sets the number of bits to delay the ESG's response to an external trigger.

The bit delay is a delay between when the ESG receives the trigger and when it responds to the trigger. The delay uses the clocks of the bit-clock to time the delay. After the ESG receives the trigger and the set number of delay bits (clocks) occurs, the ESG transmits the data pattern.

The delay occurs after you enable the state. See ":TRIGger[:SOURce]:EXTernal:DELay:STATe" on page 664. You can set the number of bits either before or after enabling the state.

For more information on configuring an external trigger source and to select external as the trigger source, see ":TRIGger[:SOURce]" on page 662.

Example

:RAD:CUST:TRIG:EXT:DELay 200000

The preceding example sets the delay for an external trigger for 200K bits.

***RST** +0

Range 0–1048575

Key Entry **Ext Delay Bits**

Remarks For most TDMA formats, there is one bit per symbol. However, there are 3 bits per symbol for the EDGE format. If the selected number of delay bits is not a multiple of the number of bits per symbol, the entered value is rounded down to the next whole symbol value.

:TRIGger[:SOURce]:EXTernal:DELay:FINe

Supported E4438C with Option 416

```
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal:DELay:FINe <val>
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal:DELay:FINe?
```

This command sets the fine trigger delay for synchronizing the ESG.

The fine delay value is added to the coarse delay setting (see ":TRIGger[:SOURce]:EXTernal:DELay" on page 663).

The variable `<val>` is expressed as a fraction of one symbol. For the EDGE format, there are 3 bits per symbol.

***RST** +0.00000000E+000

Range 0–1

:TRIGger[:SOURce]:EXTernal:DELay:STATe

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal:DELay:STATe ON|OFF|1|0
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal:DELay:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

For setting the delay time, see ":TRIGger[:SOURce]:EXTernal:DELay" on page 663, and for more information on configuring an external source, see":TRIGger[:SOURce]" on page 662.

***RST** 0

Key Entry **Ext Delay Off On**

:TRIGger[:SOURce]:EXTernal:SLOPe

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal:SLOPe POSitive|NEGative
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal:SLOPe?
```

This command sets the polarity for an external trigger signal while using the continuous, single triggering mode. To set the polarity for gating, see ":TRIGger:TYPE:GATE:ACTive" on page 661.

The POSitive and NEGative selections correspond to the high (positive) and low (negative) states of the external trigger signal. For example, when you select POSitive, the waveform responds (plays) during the high state of the trigger signal. When the ESG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest.

For more information on configuring an external trigger source and to select external as the trigger source, see ":TRIGger[:SOURce]" on page 662.

***RST** NEG

Key Entry **Ext Polarity Neg Pos**

:TRIGger[:SOURce]:EXTernal[:SOURce]

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal[:SOURce] EPT1|EPT2|
EPTRIGGER1|EPTRIGGER2
[:SOURce]:RADio:EDGE:TRIGger[:SOURce]:EXTernal[:SOURce]?
```

This command selects which PATTERN TRIG IN connection the ESG uses to accept an externally applied trigger signal when external is the trigger source selection.

For more information on configuring an external trigger source and to select external as the trigger source, see ":TRIGger[:SOURce]" on page 662. For more information on the rear-panel connectors, see the *E4428C/38C ESG Signal Generators User's Guide*.

The following list describes the command choices:

EPT1 This choice is synonymous with EPTRIGGER1 and selects the PATTERN TRIG IN rear-panel connector.

EPT2 This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.

EPTRIGGER1 This choice is synonymous with EPT1 and selects the PATTERN TRIG IN rear-panel connector.

EPTRIGGER2 This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.

***RST** EPT1

Key Entry **Patt Trig In 1** **Patt Trig In 2**

[:STATe]

Supported E4438C with Option 402

```
[:SOURce]:RADio:EDGE[:STATe] ON|OFF|1|0
[:SOURce]:RADio:EDGE[:STATe]?
```

This command enables or disables the EDGE modulation format.

***RST** 0

Key Entry **EDGE Off On**

Remarks Although the EDGE modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

Symbols

Numerics

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