

Testing Automatic Protection Switching

This section describes how to generate Automatic Protection Switching (APS) commands and view the network response.

APS commands are located in the K1 and K2 bytes of the section overhead. The K1 byte indicates a request for switch action. The K2 byte provides additional information about network architecture and alarm conditions.

Setting the APS Mode

The APS mode specifies whether the network is a ring network or a span network. The APS mode determines how the K1 and K2 bytes are interpreted and displayed by the CTS850.

To specify the APS mode:

| Press Menu Button | Select Menu Page | Highlight Parameter | Select Choice |
|-------------------|-----------------------------------|---------------------|---------------|
| TRANSMIT | APS COMMANDS (see Figure 3 83) | APS Mode | Span |
| | | | Ring |

CTS850 SDH/PDH Test Set

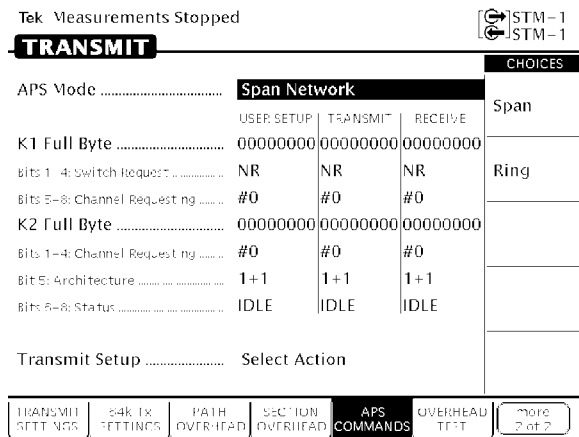


Figure 3 83: The APS COMMANDS Page

Setting the K1 Byte

There are two ways to edit the bits of the K1 byte. The first way is to set the value of each bit of the byte, one bit at a time. The second way is to assign values to the bits using preset choices, which use mnemonics to identify bit patterns.

To set the bit pattern of the K1 byte one bit at a time:

| Press Menu Button | Select Menu Page | Highlight Parameter | Select Choice |
|-------------------|------------------|---------------------|---------------------|
| TRANSMIT | APS COMMANDS | K1 FULL BYTE | Set to 00000000 |
| | | | Set to 11111111 |
| | | | Default 10101010 |
| | | | EDIT BYTE |

H Select **EDIT BYTE** to set the byte to a pattern different from the preset choices.

To set the bit pattern for the first four bits of the K1 byte:

| Press Menu Button | Select Menu Page | Highlight Parameter | Select Choice |
|-------------------|------------------|--|-----------------------|
| TRANSMIT | APS COMMANDS | Bits 1 4: Switch Request (under K1 FULL BYTE) | <i>as appropriate</i> |

The selections available for the first four bits of the K1 byte depend on whether the mode is set to Ring or Span. See Tables 3 30 and 3 31 for descriptions of the preset choices.

Table 3 30:
Choices for Bits 1 4 of K1 Byte When Mode Set to Ring

| Main Screen Mnemonic | Choice Text | Bit Pattern |
|----------------------|--------------------------|-------------|
| NR | NR No Request | 0000 |
| RR R | RR RReverse Request Ring | 0001 |
| RR S | RR SReverse Request Span | 0010 |
| EXER R | EXER RExerciser Ring | 0011 |
| EXER S | EXER SExerciser Span | 0100 |
| WTR | WTR Wait To Restore | 0101 |
| MS R | MS SManual Switch Ring | 0110 |
| MS S | MS SManual Switch Span | 0111 |
| SD R | SD RSignal Degrade Ring | 1000 |
| SD S | SD SSignal Degrade Span | 1001 |
| SD P | SD PSignal Degrade Prot | 1010 |
| SF R | SF RSignal Fail Ring | 1011 |

Table 3 30:
Choices for Bits 1 4 of K1 Byte When Mode Set to Ring (Cont.)

| Main Screen Mnemonic | Choice Text | Bit Pattern |
|----------------------|--------------------------------|-------------|
| SF S | SF SSignal Fail Span | 1100 |
| FS R | FS RForced Switch Ring | 1101 |
| FS S | FS SForced Switch Span | 1110 |
| LP S | LP SLockout of Protection Span | 1111 |

Table 3 31:
Choices for Bits 1 4 of the K1 Byte When Mode is Set to Span

| Main Screen Mnemonic | Choice Text | Bit Pattern |
|----------------------|------------------------|-------------|
| NR | NR No Request | 0000 |
| DNR | DNR Do Not Revert | 0001 |
| RR | RR Reverse Request | 0010 |
| Not Used | Not Used | 0011 |
| EXER | EXER Exerciser | 0100 |
| Not Used | Not Used | 0101 |
| WTR | WTR Wait to Restore | 0110 |
| Not Used | Not Used | 0111 |
| MS | MS Manual Switch | 1000 |
| Not Used | Not Used | 1001 |
| SD LP | SD Signal Degrade Low | 1010 |
| SD HP | SD Signal Degrade High | 1011 |
| SF LP | SF Signal Fail Low | 1100 |

Table 3 31:
Choices for Bits 1 4 of the K1 Byte When Mode is Set to Span (Cont.)

| Main Screen Mnemonic | Choice Text | Bit Pattern |
|----------------------|--------------------------|-------------|
| SF HP | SF Signal Fail High | 1101 |
| FS | FS Forced Switch | 1110 |
| LP | LP Lockout of Protection | 1111 |

The label for Bits 5 8, of the K1 byte, is Destination Node ID when the mode is set to Span. The label for Bits 5 8 is Channel Requesting when the mode is set to Ring.

To set the bit pattern for the last four bits of the K1 byte:

| Press Menu Button | Select Menu Page | Highlight Parameter | Select Choice |
|-------------------|------------------|-----------------------------------|-----------------------|
| TRANSMIT | APS COMMANDS | Bits 5 8: (under K1 FULL BYTE) | <i>as appropriate</i> |

See Table 3 32 for descriptions of the preset choices.

Table 3 32: Choices for Bits 5 8 of the K1 Byte

| Main Screen Mnemonic | Choice Text | Bit Pattern |
|-----------------------------|--------------------|--------------------|
| #0 | #0 (0000) | 0000 |
| #1 | #1 (0001) | 0001 |
| #2 | #2 (0010) | 0010 |
| #3 | #3 (0011) | 0011 |
| #4 | #4 (0100) | 0100 |
| #5 | #5 (0101) | 0101 |
| #6 | #6 (0110) | 0110 |
| #7 | #7 (0111) | 0111 |
| #8 | #8 (1000) | 1000 |
| #9 | #9 (1001) | 1001 |
| #10 | #10 (1010) | 1010 |
| #11 | #11 (1011) | 1011 |
| #12 | #12 (1100) | 1100 |
| #13 | #13 (1101) | 1101 |
| #14 | #14 (1110) | 1110 |
| #15 | #15 (1111) | 1111 |

Setting the K2 Byte

There are two ways to edit the bits of the K2 byte. The first way is to set the value of each bit of the byte, one bit at a time. The second way is to assign values to the bits using preset choices, which use mnemonics to identify bit patterns.

To set the bit pattern of the K2 byte one bit at a time:

| Press Menu Button | Select Menu Page | Highlight Parameter | Select Choice |
|-------------------|------------------|---------------------|---------------------|
| TRANSMIT | APS COMMANDS | K2 FULL BYTE | Set to 00000000 |
| | | | Set to 11111111 |
| | | | Default 10101010 |
| | | | EDIT BYTE |

H Select **EDIT BYTE** to set the byte to a pattern different than the preset choices.

The label for Bits 1 4, of the K2 byte, is Channel Requesting when the mode is set to Span. The label for Bits 5 8 is Source Node ID when the mode is set to Ring.

To set the bit pattern for the first four bits of the K2 byte:

| Press Menu Button | Select Menu Page | Highlight Parameter | Select Choice |
|-------------------|------------------|-----------------------------------|-----------------------|
| TRANSMIT | APS COMMANDS | Bits 1 4: (under K2 FULL BYTE) | <i>as appropriate</i> |

See Table 3 33 for descriptions of the preset choices.

Table 3 33: Choices for Bits 1 4 of the K2 Byte

| Main Screen Mnemonic | Choice Text | Bit Pattern |
|-----------------------------|--------------------|--------------------|
| #0 | #0 (0000) | 0000 |
| #1 | #1 (0001) | 0001 |
| #2 | #2 (0010) | 0010 |
| #3 | #3 (0011) | 0011 |
| #4 | #4 (0100) | 0100 |
| #5 | #5 (0101) | 0101 |
| #6 | #6 (0110) | 0110 |
| #7 | #7 (0111) | 0111 |
| #8 | #8 (1000) | 1000 |
| #9 | #9 (1001) | 1001 |
| #10 | #10 (1010) | 1010 |
| #11 | #11 (1011) | 1011 |
| #12 | #12 (1100) | 1100 |
| #13 | #13 (1101) | 1101 |
| #14 | #14 (1110) | 1110 |
| #15 | #15 (1111) | 1111 |

The label for Bit 5, of the K2 byte, is Architecture when the mode is set to Span. The label for Bit 5 is Path when the mode is set to Ring.

To set the value of the fifth bit of the K2 byte:

| Press Menu Button | Select Menu Page | Highlight Parameter | Select Choice |
|-------------------|------------------|--------------------------------|-----------------------|
| TRANSMIT | APS COMMANDS | Bit 5: (under K2 FULL BYTE) | <i>as appropriate</i> |

See Tables 3 34 and 3 35 for descriptions of the preset choices for Bit 5.

Table 3 34: Choices for Bit 5 of the K2 Byte When Mode is Set to Span

| Main Screen Mnemonic | Choice Text | Bit Value |
|----------------------|-------------|-----------|
| 1+1 | 1+1 | 0 |
| 1:N | 1:N | 1 |

Table 3 35: Choices for Bit 5 of the K2 Byte When Mode is Set to Ring

| Main Screen Mnemonic | Choice Text | Bit Value |
|----------------------|-------------|-----------|
| SHORT | SHORT | 0 |
| LONG | LONG | 1 |

The label for Bits 6-8, of the K2 byte, is Status whether the mode is set to Ring or Span.

To set the bit pattern for the last three bits of the K2 byte:

| Press Menu Button | Select Menu Page | Highlight Parameter | Select Choice |
|-------------------|------------------|-----------------------------------|-----------------------|
| TRANSMIT | APS COMMANDS | Bits 6-8: (under K2 FULL BYTE) | <i>as appropriate</i> |

See Table 3-36 for descriptions of the preset choices.

Table 3-36: Choices for Bits 6-8 of the K2 Byte

| Main Screen Mnemonic | Choice Text | Bit Pattern |
|----------------------|----------------------------|-------------|
| IDLE | IDLE | 000 |
| BR | BR Bridged | 001 |
| BR&SW | BR & SW Bridged & Switched | 010 |
| | Extra Traffic | 011 |
| Reserved | Reserved | 100 |
| Reserved | Reserved | 101 |
| RDI | RDI | 110 |
| AIS | AIS | 111 |

NOTE. You can edit the transmitted K1 and K2 bytes directly from the SECTION OVERHEAD page.

Transmitting the K1 and K2 Bytes

Changing the values of the K1 and K2 bytes, shown in the USER SETUP column, does not automatically change the values of the transmitted K1 and K2 bytes. The TRANSMIT column shows the K1 and K2 bytes that are being transmitted.

To transmit new K1 and K2 bytes:

| Press Menu Button | Select Menu Page | Highlight Parameter | Select Choice |
|-------------------|------------------|---------------------|---------------------|
| TRANSMIT | APS COMMANDS | Transmit Setup | Transmit User Setup |
| | | | Transmit Default |
| | | | Transmit Illegal |

NOTE. You cannot transmit new values for the K1 or K2 bytes when the CTS850 is transmitting an MS AIS or MS FERF.

- H Select **Transmit User Setup** to change the value of the K1 and K2 bytes to that shown under USER SETUP.
- H Select **Transmit Default** to change all the bits in the K1 and K2 bytes to zeros.
- H Select **Transmit Illegal** to change all the bits in the K1 and K2 bytes to ones.

When you select an action from the Transmit Setup line, the TRANSMIT column is updated.

Viewing the Network Response to APS Commands

To view the network response to APS commands:

| Press Menu Button | Select Menu Page | Highlight Parameter | Select Choice |
|-------------------|------------------|---------------------|---------------|
| TRANSMIT | APS COMMANDS | none | none |

The network response to APS commands appears under the column labeled RECEIVE on the APS COMMANDS page (see Figure 3-84).

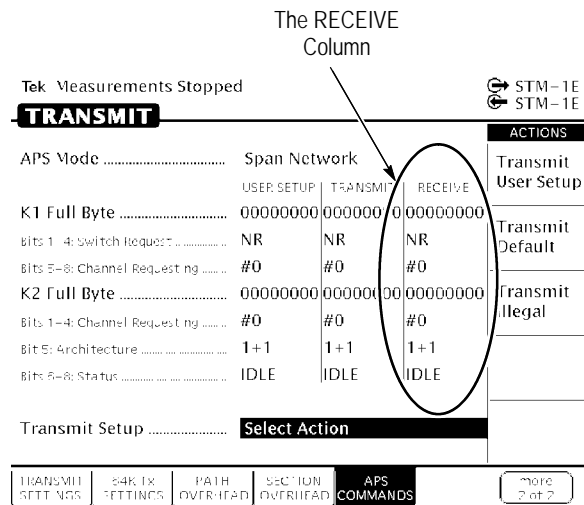


Figure 3-84: The RECEIVE Column on the APS COMMANDS Page