NI-488.2M™ Software for Windows 95 Quick Reference Card

Status Word Conditions (`ibsta`)

Mnemonic	Bit Pos.	Hex Value	Type	Description
ERR	15	8000	dev, brd	GPIB error
TIMO	14	4000	dev, brd	Time limit exceeded
END	13	2000	dev, brd	END or EOS detected
SRQI	12	1000	brd	SRQ interrupt received
RQS	11	800	dev	Device requesting service
CMPL	8	100	dev, brd	I/O completed
LOK	7	80	brd	Lockout State
REM	6	40	brd	Remote State
CIC	5	20	brd	Controller-In-Charge
ATN	4	10	brd	Attention is asserted
TACS	3	8	brd	Talker
LACS	2	4	brd	Listener
DTAS	1	2	brd	Device Trigger State
DCAS	0	1	brd	Device Clear State

Error Codes (`iberr`)

Mnemonic	Decimal Value	Meaning
EDVR	0	System error
ECIC	1	Function requires GPIB board to be CIC
ENOL	2	No Listeners on the GPIB
EADR	3	GPIB board not addressed correctly
EARG	4	Invalid argument to function call
ESAC	5	GPIB board not System Controller as required
EABO	6	I/O operation aborted (timeout)
ENEB	7	Nonexistent GPIB board
EDMA	8	DMA error
EOIP	10	Asynchronous I/O in progress
ECAP	11	No capability for operation
EFSO	12	File system error
EBUS	14	GPIB bus error
ESTB	15	Serial poll status byte queue overflow
ESRQ	16	SRQ stuck in ON position
ETAB	20	Table problem

NI-488 Board-Level Functions

Function	Purpose
ibask	Return information about software configuration parameters
ibcac	Become Active Controller
ibcmd	Send GPIB commands
ibcmda	Send GPIB commands asynchronously
ibconfig	Change the software configuration parameters
ibdma	Enable or disable DMA
ibeos	Configure the end-of-string (EOS) termination mode or character
ibeot	Enable or disable the automatic assertion of the GPIB EOI line at the end of write I/O operations
ibfind	Open and initialize a GPIB board
ibgts	Go from Active Controller to Standby
ibist	Set or clear the board individual status bit for parallel polls
iblines	Return the status of the eight GPIB control lines
ibln	Check for the presence of a device on the bus
ibloc	Go to local
ibonl	Place the interface board online or offline
ibpad	Change the primary address
ibppc	Parallel poll configure
ibrd	Read data from a device into a user buffer
ibrda	Read data asynchronously from a device into a user buffer
ibrdf	Read data from a device into a file
ibrpp	Conduct a parallel poll
ibrsc	Request or release system control
ibrsv	Request service and change the serial poll status byte
ibsad	Change or disable the secondary address
ibsic	Assert interface clear
ibsre	Set or clear the Remote Enable (REN) line
ibstop	Abort asynchronous I/O operation
ibtmo	Change or disable the I/O timeout period
ibwait	Wait for GPIB events
ibwrt	Write data to a device from a user buffer
ibwrta	Write data asynchronously to a device from a user buffer
ibwrtf	Write data to a device from a file

Board Options (ibconfig)

Constant	Hex Value
IbcAUTOPOLL	07
IbcCICPROT	08
IbcDMA	12
IbcEndBitIsNormal	1A
IbcEOSchar	0F
IbcEOScmp	0E
IbcEOSrd	0C
IbcEOSwrt	0D
IbcEOT	04
IbcHSCableLength	1F
IbcIRQ	09
IbcPAD	01

Constant	Hex Value
IbcPP2	10
IbcPPC	05
IbcPPollTime	19
IbcReadAdjust	13
IbcSAD	02
IbcSC	0A
IbcSendLLO	17
IbcSRE	0B
IbcTIMING	11
IbcTMO	03
IbcWriteAdjust	14

Multiline Interface Messages

Hex	Dec	ASCII	Msg		Hex	Dec	ASCII	Msg
00	0	NUL			20	32	SP	MLA0
01	1	SOH	GTL		21	33	!	MLA1
02	2	STX			22	34	"	MLA2
03	3	ETX			23	35	#	MLA3
04	4	EOT	SDC		24	36	$	MLA4
05	5	ENQ	PPC		25	37	%	MLA5
06	6	ACK			26	38	&	MLA6
07	7	BEL			27	39	'	MLA7
08	8	BS	GET		28	40	(	MLA8
09	9	HT	TCT		29	41	)	MLA9
0A	10	LF			2A	42	*	MLA10
0B	11	VT			2B	43	+	MLA11
0C	12	FF			2C	44	,	MLA12
0D	13	CR			2D	45	-	MLA13
0E	14	SO			2E	46	.	MLA14
0F	15	SI			2F	47	/	MLA15
10	16	DLE			30	48	0	MLA16
11	17	DC1	LLO		31	49	1	MLA17
12	18	DC2			32	50	2	MLA18
13	19	DC3			33	51	3	MLA19
14	20	DC4	DCL		34	52	4	MLA20
15	21	NAK	PPU		35	53	5	MLA21
16	22	SYN			36	54	6	MLA22
17	23	ETB			37	55	7	MLA23
18	24	CAN	SPE		38	56	8	MLA24
19	25	EM	SPD		39	57	9	MLA25
1A	26	SUB			3A	58	:	MLA26
1B	27	ESC			3B	59	;	MLA27
1C	28	FS			3C	60	<	MLA28
1D	29	GS			3D	61	=	MLA29
1E	30	RS			3E	62	>	MLA30
1F	31	US	CFE		3F	63	?	UNL

Message Definitions

CFE[†]	Configuration Enable	MLA	My Listen Address
CFG[†]	Configure	MSA	My Secondary Address
DCL	Device Clear	MTA	My Talk Address
GET	Group Execute Trigger	PPC	Parallel Poll Configure
GTL	Go To Local	PPD	Parallel Poll Disable
LLO	Local Lockout		

[†]This multiline interface message is a proposed extension to the IEEE 488.1 specification to support the HS488 high-speed protocol.

Multiline Interface Messages (Continued)

Hex	Dec	ASCII	Msg		Hex	Dec	ASCII	Msg
40	64	@	MTA0		60	96	`	MSA0, PPE
41	65	A	MTA1		61	97	a	MSA1, PPE, CFG1
42	66	B	MTA2		62	98	b	MSA2, PPE, CFG2
43	67	C	MTA3		63	99	c	MSA3, PPE, CFG3
44	68	D	MTA4		64	100	d	MSA4, PPE, CFG4
45	69	E	MTA5		65	101	e	MSA5, PPE, CFG5
46	70	F	MTA6		66	102	f	MSA6, PPE, CFG6
47	71	G	MTA7		67	103	g	MSA7, PPE, CFG7
48	72	H	MTA8		68	104	h	MSA8, PPE, CFG8
49	73	I	MTA9		69	105	i	MSA9, PPE, CFG9
4A	74	J	MTA10		6A	106	j	MSA10, PPE, CFG10
4B	75	K	MTA11		6B	107	k	MSA11, PPE, CFG11
4C	76	L	MTA12		6C	108	l	MSA12, PPE, CFG12
4D	77	M	MTA13		6D	109	m	MSA13, PPE, CFG13
4E	78	N	MTA14		6E	110	n	MSA14, PPE, CFG14
4F	79	O	MTA15		6F	111	o	MSA15, PPE, CFG15
50	80	P	MTA16		70	112	p	MSA16, PPD
51	81	Q	MTA17		71	113	q	MSA17, PPD
52	82	R	MTA18		72	114	r	MSA18, PPD
53	83	S	MTA19		73	115	s	MSA19, PPD
54	84	T	MTA20		74	116	t	MSA20, PPD
55	85	U	MTA21		75	117	u	MSA21, PPD
56	86	V	MTA22		76	118	v	MSA22, PPD
57	87	W	MTA23		77	119	w	MSA23, PPD
58	88	X	MTA24		78	120	x	MSA24, PPD
59	89	Y	MTA25		79	121	y	MSA25, PPD
5A	90	Z	MTA26		7A	122	z	MSA26, PPD
5B	91	[	MTA27		7B	123	{	MSA27, PPD
5C	92	\	MTA28		7C	124			MSA28, PPD
5D	93	]	MTA29		7D	125	}	MSA29, PPD
5E	94	^	MTA30		7E	126	~	MSA30, PPD
5F	95	_	UNT		7F	127	DEL	

Message Definitions (Continued)

PPE	Parallel Poll Enable	SPE	Serial Poll Enable
PPU	Parallel Poll Unconfigure	TCT	Take Control
SDC	Selected Device Clear	UNL	Unlisten
SPD	Serial Poll Disable	UNT	Untalk

NI-488 Device-Level Functions

Function	Purpose
ibask	Return information about software configuration parameters
ibbna	Change the access board of a device
ibclr	Clear a specific device
ibconfig	Change the software configuration parameters
ibdev	Open and initialize a device
ibeos	Configure the end-of-string (EOS) termination mode or character
ibeot	Enable or disable the automatic assertion of the GPIB EOI line at the end of write I/O operations
ibln	Check for the presence of a device on the bus
ibloc	Go to local
ibonl	Place the device online or offline
ibpad	Change the primary address
ibpct	Pass control to another GPIB device with Controller capability
ibppc	Parallel poll configure
ibrd	Read data from a device into a user buffer
ibrda	Read data asynchronously from a device into a user buffer
ibrdf	Read data from a device into a file
ibrpp	Conduct a parallel poll
ibrsp	Conduct a serial poll
ibsad	Change or disable the secondary address
ibstop	Abort asynchronous I/O operation
ibtmo	Change or disable the I/O timeout period
ibtrg	Trigger selected device
ibwait	Wait for GPIB events
ibwrt	Write data to a device from a user buffer
ibwrta	Write data asynchronously to a device from a user buffer
ibwrtf	Write data to a device from a file

Device Options (`ibconfig`)

Constant	Hex Value	Constant	Hex Value
IbcEndBitIsNormal	1A	IbcREADDR	06
IbcEOSchar	0F	IbcReadAdjust	13
IbcEOScmp	0E	IbcSAD	02
IbcEOSrd	0C	IbcSPollTime	18
IbcEOSwrt	0D	IbcTMO	03
IbcEOT	04	IbcWriteAdjust	14
IbcPAD	01	IbcUnAddr	1B

NI-488.2 Routines

Routine	Purpose
AllSpoll	Serial poll all devices
DevClear	Clear a single device
DevClearList	Clear multiple devices
EnableLocal	Enable operations from the front panel of devices (leave remote programming mode)
EnableRemote	Enable remote GPIB programming for devices
FindLstn	Find listening devices on GPIB
FindRQS	Determines which device is requesting service
PassControl	Pass control to another device with Controller capability
PPoll	Perform a parallel poll on the GPIB
PPollConfig	Configure a device for parallel polls
PPollUnconfig	Unconfigure devices for parallel polls
RcvRespMsg	Read data bytes from a device that is already addressed to talk
ReadStatusByte	Serial poll a single device
Receive	Read data bytes from a device
ReceiveSetup	Address a device to be a Talker and the interface board to be a Listener in preparation for RcvRespMsg
ResetSys	Reset and initialize IEEE 488.2-compliant devices
Send	Send data bytes to a device
SendCmds	Send GPIB command bytes
SendDataBytes	Send data bytes to devices that are already addressed to listen
SendIFC	Reset the GPIB by sending interface clear
SendList	Send data bytes to multiple GPIB devices
SendLLO	Send the Local Lockout (LLO) message to all devices
SendSetup	Setup devices to receive data in preparation for SendDataBytes
SetRWLS	Place devices in remote with lockout state
TestSRQ	Determine the current state of the GPIB Service Request (SRQ) line
TestSys	Cause the IEEE 488.2-compliant devices to conduct self tests
Trigger	Trigger a device
TriggerList	Trigger multiple devices
WaitSRQ	Wait until a device asserts the GPIB Service Request (SRQ) line

Timeout Values (ibtmo)

Constant	Decimal Value	Minimum Timeout	Constant	Decimal Value	Minimum Timeout
TNONE	0	disabled - no timeout	T100ms	9	100 ms
T10us	1	10 μs	T300ms	10	300 ms
T30us	2	30 μs	T1s	11	1 s
T100us	3	100 μs	T3s	12	3 s
T300us	4	300 μs	T10s	13	10 s
T1ms	5	1 ms	T30s	14	30 s
T3ms	6	3 ms	T100s	15	100 s
T10ms	7	10 ms	T300s	16	300 s
T30ms	8	30 ms	T1000s	17	1000 s