

Quick Reference Card

NI-488.2™ API

Status Word Conditions (`ibsta` or `Ibsta()`)*

Mnemonic	Bit	Hex	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 line is asserted
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	ATN line 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` or `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
EFSSO	12	File system error
EBUS	14	GPIB bus error
ESRQ	16	SRQ stuck in ON position
ETAB	20	Table problem
ELCK	21	Interface is locked
EARM	22	Ibnotify callback failed to rearm
EHDL	23	Input handle is invalid
EWIP	26	Wait in progress on specified input handle
ERST	27	Event notification was cancelled due to a reset of the interface
EPWR	28	The interface lost power

*The global functions `Ibsta()` and `Iberr()` are preferred. For more information, search for “ni4882 and gpib32” in the *NI-488.2 Help*.



Refer to ni.com for more product information.

Board-Level Traditional NI-488.2

Function	Purpose
ibask	Return information about software configuration parameters
ibcac	Become Active Controller
ibcmd (ibcmda)	Send GPIB commands (asynchronously)
ibconfig	Change the software configuration parameters
ibfind	Open and initialize an interface or a user-configured instrument descriptor
ibgts	Go from Active Controller to Standby
iblock	Acquire or release an exclusive interface lock for the current process
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
ibnotify	Notify user of one or more GPIB events by invoking the user callback
ibonl	Place the interface online or offline
ibppc	Parallel poll configure
ibrd (ibrda)	Read data (asynchronously) from an instrument into a user buffer
ibrdf	Read data from an instrument into a file
ibrpp	Conduct a parallel poll
ibsic	Assert interface clear
ibstop	Abort asynchronous I/O operation
ibwait	Wait for GPIB events
ibwrt (ibwrta)	Write data (asynchronously) to an instrument from a user buffer
ibwrtf	Write data to an instrument from a file

Board Options (**ibconfig**)

Constant	Hex Value
IbcAUTOPOLL	07
IbcDMA	12
IbcEndBitIsNormal	1A
IbcEOS	25
IbcEOSchar	0F
IbcEOScmp	0E
IbcEOSrd	0C
IbcEOSwrt	0D
IbcEOT	04
IbcHSCableLength	1F
IbcIRQ	09
IbcIST	20

Constant	Hex Value
IbcLON	22
IbcPAD	01
IbcPP2	10
IbcPPC	05
IbcPPollTime	19
IbcRSV	21
IbcSAD	02
IbcSC	0A
IbcSendLLO	17
IbcSRE	0B
IbcTIMING	11
IbcTMO	03

Device-Level Traditional NI-488.2

Function	Purpose
<code>ibask</code>	Return information about software configuration parameters
<code>ibclr</code>	Clear a specific instrument
<code>ibconfig</code>	Change the software configuration parameters
<code>ibdev</code>	Open and initialize an instrument
<code>iblock</code> [†]	Acquire or release an exclusive device lock for the current process
<code>ibloc</code>	Go to Local
<code>ibnotify</code>	Notify user of one or more GPIB events by invoking the user callback
<code>ibonl</code>	Place the instrument online or offline
<code>ibpct</code>	Pass control to another GPIB instrument with Controller capability
<code>ibppc</code>	Parallel poll configure
<code>ibrd (ibrda)</code>	Read data (asynchronously) from an instrument into a user buffer
<code>ibrdf</code>	Read data from an instrument into a file
<code>ibrpp</code>	Conduct a parallel poll
<code>ibrsp</code>	Conduct a serial poll
<code>ibstop</code>	Abort asynchronous I/O operation
<code>ibtrg</code>	Trigger selected instrument
<code>ibwait</code>	Wait for GPIB events
<code>ibwrt (ibwrta)</code>	Write data (asynchronously) to an instrument from a user buffer
<code>ibwrtf</code>	Write data to an instrument from a file

[†] The GPIB-ENET/100 interface does not support device-level `iblock`.

Device Options (`ibconfig`)

Constant	Hex Value
<code>IbcEOS</code>	25
<code>IbcEOSchar</code>	0F
<code>IbcEOScmp</code>	0E
<code>IbcEOSrd</code>	0C
<code>IbcEOSwrt</code>	0D
<code>IbcEOT</code>	04

Constant	Hex Value
<code>IbcPAD</code>	01
<code>IbcREADDR</code>	06
<code>IbcSAD</code>	02
<code>IbcSPollTime</code>	18
<code>IbcTMO</code>	03
<code>IbcUnAddr</code>	1B

Multiline Interface Messages

Hex	Dec	ASCII	Msg
00	0	NUL	
01	1	SOH	GTL
02	2	STX	
03	3	ETX	
04	4	EOT	SDC
05	5	ENQ	PPC
06	6	ACK	
07	7	BEL	
08	8	BS	GET
09	9	HT	TCT
0A	10	LF	
0B	11	VT	
0C	12	FF	
0D	13	CR	
0E	14	SO	
0F	15	SI	
10	16	DLE	
11	17	DC1	LLO
12	18	DC2	
13	19	DC3	
14	20	DC4	DCL
15	21	NAK	PPU
16	22	SYN	
17	23	ETB	
18	24	CAN	SPE
19	25	EM	SPD
1A	26	SUB	
1B	27	ESC	
1C	28	FS	
1D	29	GS	
1E	30	RS	
1F	31	US	CFE
20	32	SP	MLA0
21	33	!	MLA1
22	34	"	MLA2
23	35	#	MLA3
24	36	\$	MLA4
25	37	%	MLA5
26	38	&	MLA6
27	39	'	MLA7
28	40	(MLA8
29	41)	MLA9
2A	42	*	MLA10
2B	43	+	MLA11
2C	44	,	MLA12
2D	45	-	MLA13
2E	46	.	MLA14
2F	47	/	MLA15

Hex	Dec	ASCII	Msg
30	48	0	MLA16
31	49	1	MLA17
32	50	2	MLA18
33	51	3	MLA19
34	52	4	MLA20
35	53	5	MLA21
36	54	6	MLA22
37	55	7	MLA23
38	56	8	MLA24
39	57	9	MLA25
3A	58	:	MLA26
3B	59	;	MLA27
3C	60	<	MLA28
3D	61	=	MLA29
3E	62	>	MLA30
3F	63	?	UNL
40	64	@	MTA0
41	65	A	MTA1
42	66	B	MTA2
43	67	C	MTA3
44	68	D	MTA4
45	69	E	MTA5
46	70	F	MTA6
47	71	G	MTA7
48	72	H	MTA8
49	73	I	MTA9
4A	74	J	MTA10
4B	75	K	MTA11
4C	76	L	MTA12
4D	77	M	MTA13
4E	78	N	MTA14
4F	79	O	MTA15
50	80	P	MTA16
51	81	Q	MTA17
52	82	R	MTA18
53	83	S	MTA19
54	84	T	MTA20
55	85	U	MTA21
56	86	V	MTA22
57	87	W	MTA23
58	88	X	MTA24
59	89	Y	MTA25
5A	90	Z	MTA26
5B	91	[MTA27
5C	92	\	MTA28
5D	93]	MTA29
5E	94	^	MTA30
5F	95	_	UNT

Multiline Interface Messages (Continued)

Hex	Dec	ASCII	Msg
60	96	`	MSA0, PPE
61	97	a	MSA1, PPE, CFG1
62	98	b	MSA2, PPE, CFG2
63	99	c	MSA3, PPE, CFG3
64	100	d	MSA4, PPE, CFG4
65	101	e	MSA5, PPE, CFG5
66	102	f	MSA6, PPE, CFG6
67	103	g	MSA7, PPE, CFG7
68	104	h	MSA8, PPE, CFG8
69	105	i	MSA9, PPE, CFG9
6A	106	j	MSA10, PPE, CFG10
6B	107	k	MSA11, PPE, CFG11
6C	108	l	MSA12, PPE, CFG12
6D	109	m	MSA13, PPE, CFG13
6E	110	n	MSA14, PPE, CFG14
6F	111	o	MSA15, PPE, CFG15

Hex	Dec	ASCII	Msg
70	112	p	MSA16, PPD
71	113	q	MSA17, PPD
72	114	r	MSA18, PPD
73	115	s	MSA19, PPD
74	116	t	MSA20, PPD
75	117	u	MSA21, PPD
76	118	v	MSA22, PPD
77	119	w	MSA23, PPD
78	120	x	MSA24, PPD
79	121	y	MSA25, PPD
7A	122	z	MSA26, PPD
7B	123	{	MSA27, PPD
7C	124		MSA28, PPD
7D	125	}	MSA29, PPD
7E	126	~	MSA30, PPD
7F	127	DEL	

Message Definitions

CFE [‡]	Configuration Enable	PPD	Parallel Poll Disable
CFG [‡]	Configure	PPE	Parallel Poll Enable
DCL	Device Clear	PPU	Parallel Poll Unconfigure
GET	Group Execute Trigger	SDC	Selected Device Clear
GTL	Go To Local	SPD	Serial Poll Disable
LLO	Local Lockout	SPE	Serial Poll Enable
MLA	My Listen Address	TCT	Take Control
MSA	My Secondary Address	UNL	Unlisten
MTA	My Talk Address	UNT	Untalk
PPC	Parallel Poll Configure		

[‡] This multiline interface message is part of the IEEE 488.1-2003 specification and supports the HS488 high-speed protocol.

Multi-Device NI-488.2

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

Timeout Values (**ibconfig IbctMO**)

Constant	Decimal Value	Minimum Timeout	Constant	Decimal Value	Minimum Timeout
TNONE	0	disabled (no timeout)	T100ms	9	100 ms
T10us	1	10 μ s	T300ms	10	300 ms
T30us	2	30 μ s	T1s	11	1 s
T100us	3	100 μ s	T3s	12	3 s
T300us	4	300 μ s	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

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