

GL400/350 Interface Commands

Outline

Interface commands are a group of commands that are used to connect the GL400/350 to a PC via LAN or USB, change internal settings, and perform control functions when measurement data, etc., is received.

Interface Command Types

There are two types of interface commands sent from the PC to control the GL400/350: Setting commands and Query (Response) commands.

- **Setting commands**

Setting commands are commands that are used to change settings and to perform processing. These commands are sent from the PC but do not need to be received by the GL400/350.

- **Query commands**

Depending on the type of command, a Query command sent from the PC may require a query (response) to be returned from the GL400/350. Whenever a query command is sent from the PC, it must be received by the GL400/350.

Interface Command Format

Interface commands are formatted using ASCII character strings, and there is no distinction made between upper-case and lower-case characters. Moreover, all the query commands from the GL400/350 are in a uniformly abbreviated upper-case character format. A New Line code is appended to each command, according to the New Line code format specified at the GL400/350. The format will be CR+LF, CR, or LF.



Command characters

The ASCII characters within this symbol represent a command for sending/receiving data. The character string comprises both upper-case and lower-case characters, and the upper-case characters are in an abbreviated format.



Query character

When the Query character is appended to a command, the command becomes a query command and is sent to the GL400/350.



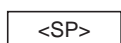
Connection character (colon)

Used to connect command characters.



Continuation character (semicolon)

Used for continuous transmission without any breaks between the commands (please limit the number of characters sent at one time to 512).



Blank space character

The blank space character indicates a space that is the size of one alphanumeric number.



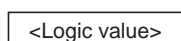
Integer value

The integer value is an ASCII text string. Used for GL400/350 settings.



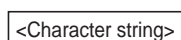
Decimal point, exponent, value with a unit attached

Represents a decimal value (such as 1.234), an exponent (such as 1E-6) or a value with a unit attached (such as IKHZ). As its use varies according to the command, please refer to the command flow chart for details.



Logic value

Represented by 1/0, ON/OFF, Enable/Disable, TRUE/FALSE, YES/NO, SET/RESET. Any of these can be used.



Character string

A character string must be enclosed in double quotation marks (" ").

Example: :ANN:TITL "DEMO RECORD"

Error Query

If an invalid command or a command that cannot be set is sent, an error occurs at the GL400/350 and an error query is generated. The :STAT:ERR? error query can be used to search for the error. Moreover, since up to 255 error queries are stored in the buffer, errors starting with the oldest error are sent in response whenever a :STAT:ERR? command is sent. Please refer to the Status Report section for further details on the errors.

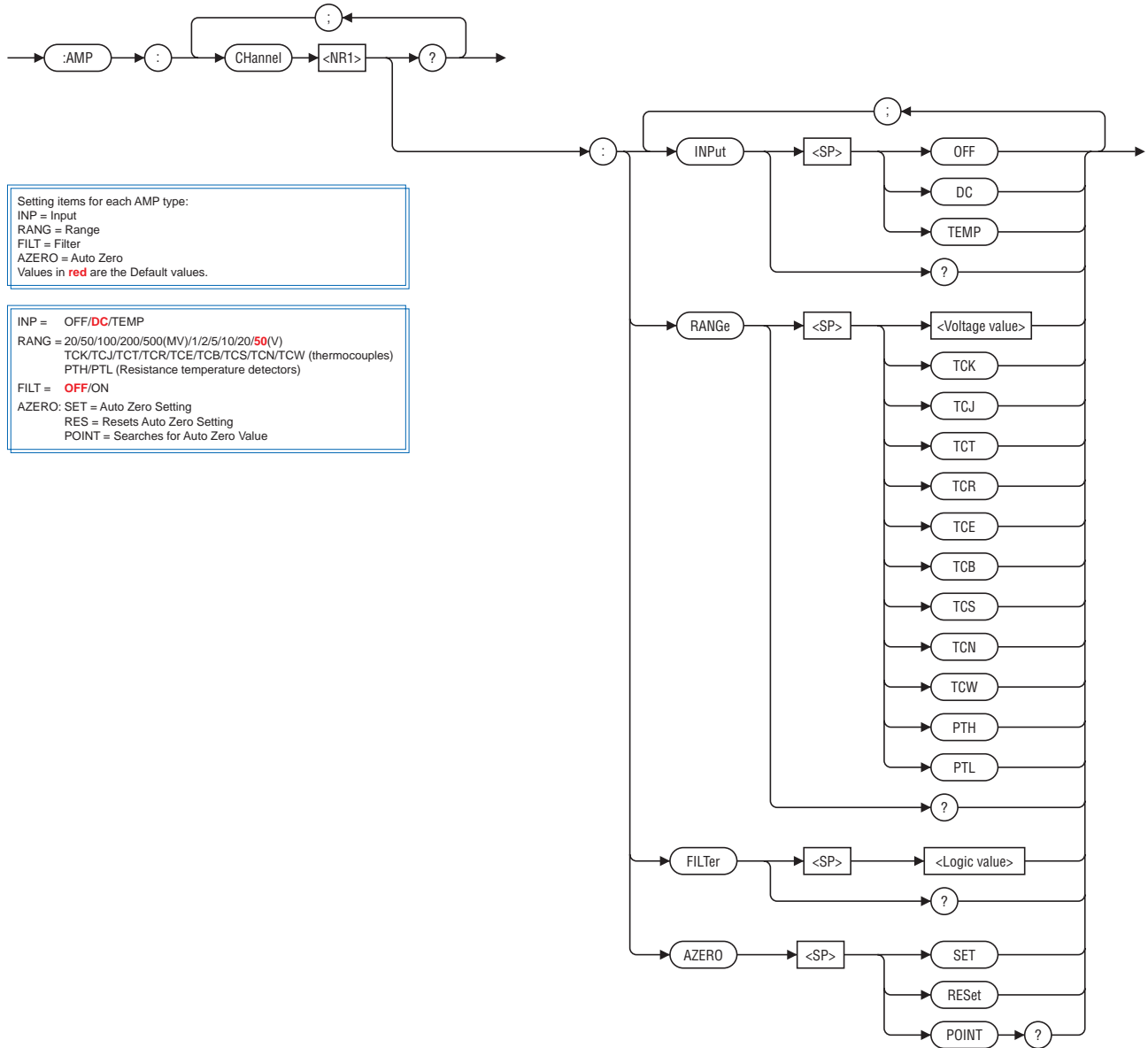
Status Command

The status command is used to check the status of the GL400/350. :STAT:COND? can be used to search for each status, but at high-speed operations, such as when the GL400/350 is capturing data to memory at a rate that doesn't even reach 1 second, the status condition changes too quickly from 0 → 1 → 0 to enable an accurate confirmation to be made of the 1 status. At this time, it is recommended that you use :STAT:FILT to enable the status changes to be saved.

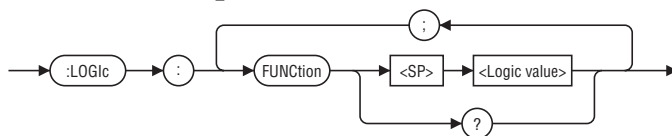
Command Examples

Command Sent from the PC	Commands Received from the GL400/350	Explanation
:AMP:CH?	:AMP:CH1:INP DC;RANG 50MV:FILT OFF:TYP V	Queries the Input, Range, Filter, and Amp Type for CH1.
:AMP:CH1:RANG 50MV	None	Sets the Range for CH1 to 50mV.
:AMP:CH5:RANG TCK:RANG?	:AMP:CH5:RANG TCK	Sets the Range for CH5 to TCK, and queries the range for the same channel.

1. AMP Group

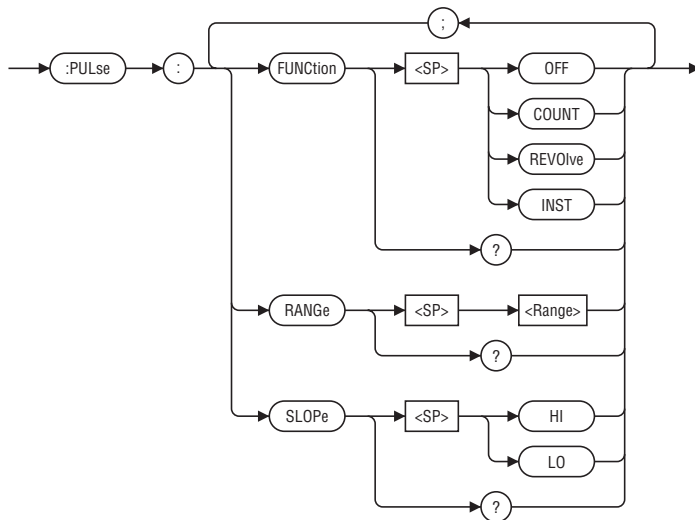


2. LOGic Group



FUNC =Logic **OFF**/ON

3. PULse Group



FUNC = **OFF**/COUNT (counts)/
REVolve (rpm)/INST (instants)

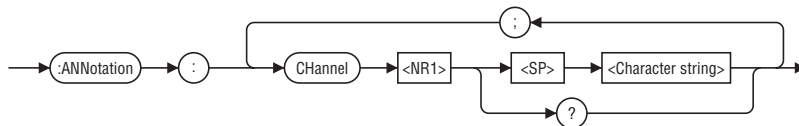
RANGe (Sets a different range value for COUNT, REVOlve, or INST.
Valid with respect to the item set for FUNC)

COUNT (counts) = 50/500(K)/5/50/500(MA)C
REVolve (rpm) = 500/5/50/500(K)RPM
INST (instants) = 50/500(K)/5/50(MA)C

Example: PUL:FUNC COUNT
PUL: RANG 500MAC

SLOPe (measurement method) = **HI** (Rising)/LO (Falling)

4. ANNotation Group

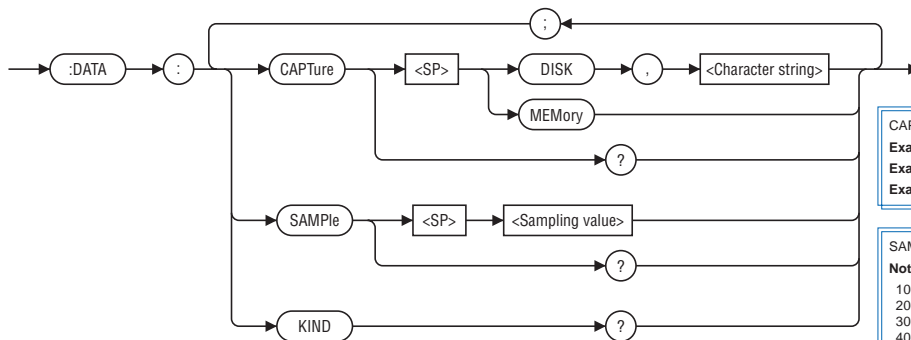


CH: Annotation character string for each channel (comment)

Note: The maximum number of alphanumeric characters that can be input is 11.

Example: ANN:CH 20 "ABCDEFGHJUK"

5. DATA Group



CAPT (Data capture destination) = **MEM**/DISK

Example: Disk: DATA:CAPT DISK, "A:\DEFAULT.GBD"

Example: Memory: DATA:CAPT MEM

Example: CSV file: DATA:CAPT DISK, "A:AAAA.CSV"

SAMP (Sampling interval)

Note: Maximum sampling values

10-ch model = 100ms

20-ch model = 200ms

30-ch model = 500ms

40-ch model = 500ms

50-ch model = 500ms

60-ch model = 1s

70-ch model = 1s

80-ch model = 1s

90-ch model = 1s

100-ch model = 1s

100/200/500(MS)/1/2/5/10/20/30/60/120/300/600/1200/1800/3600(S)

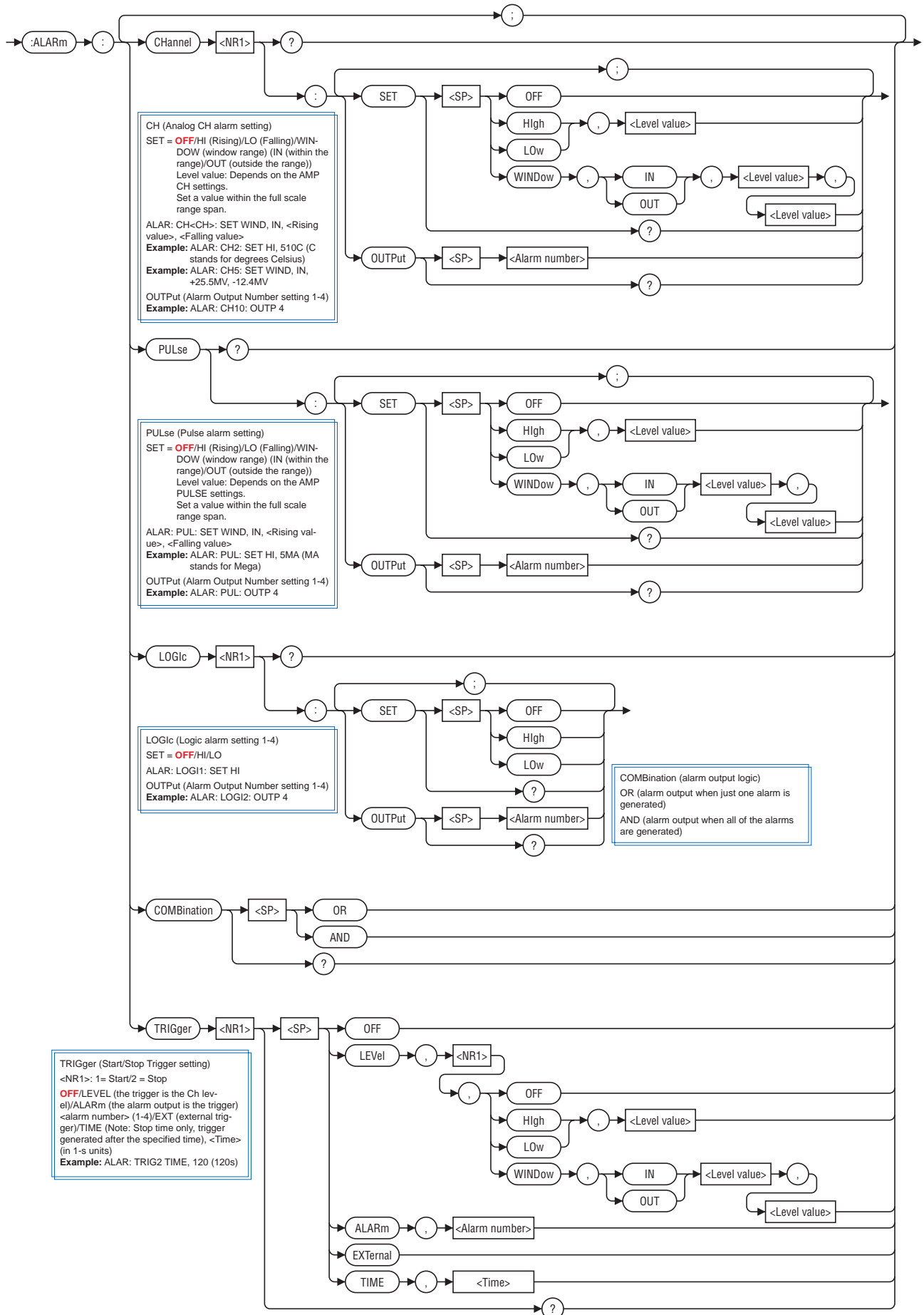
Example: DATA:SAMP 500MS

KIND = Memory data capture information

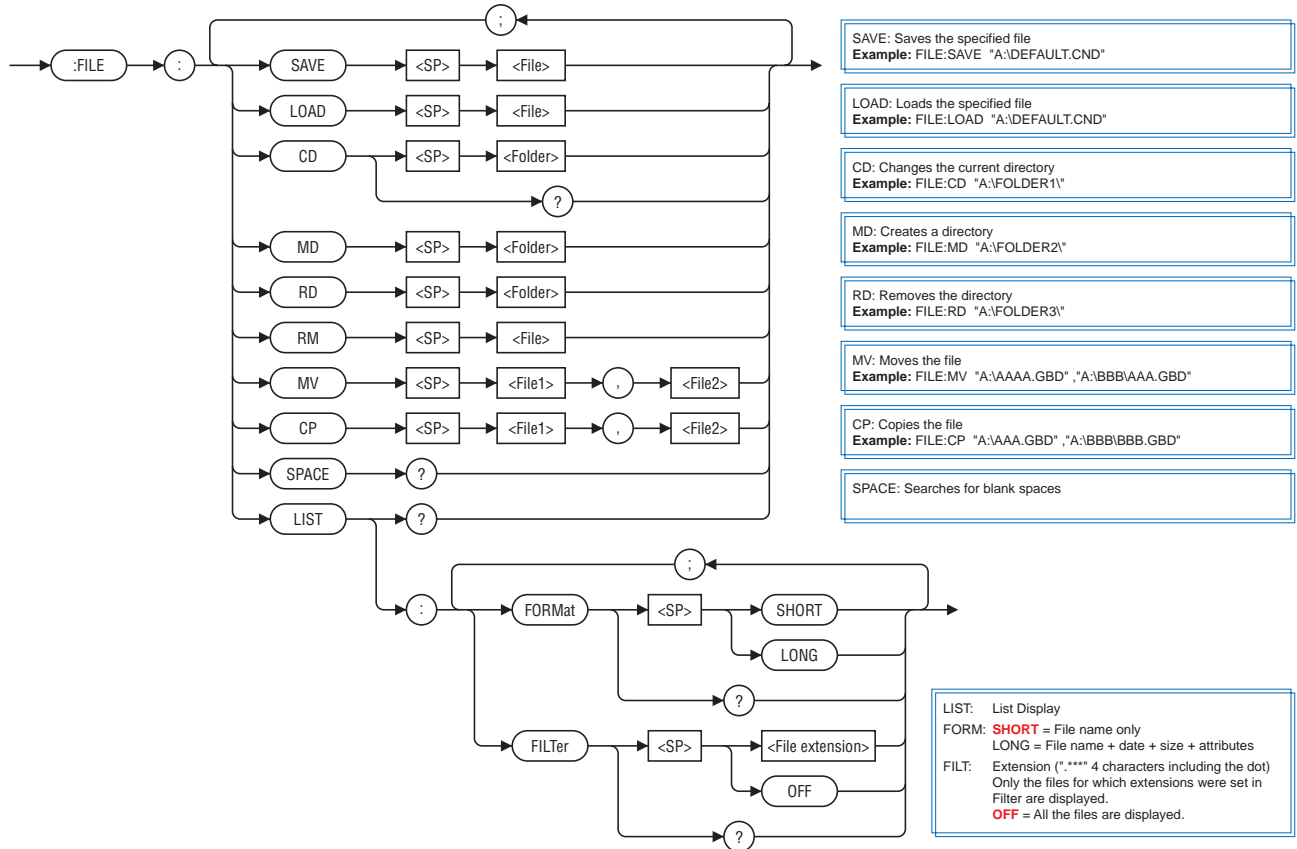
Confirms the validity/non-validity of the data captured in the GL400/350's internal memory.

Example: Memory data is valid: DATA:KIND OK
Memory data is invalid: DATA:KIND NG

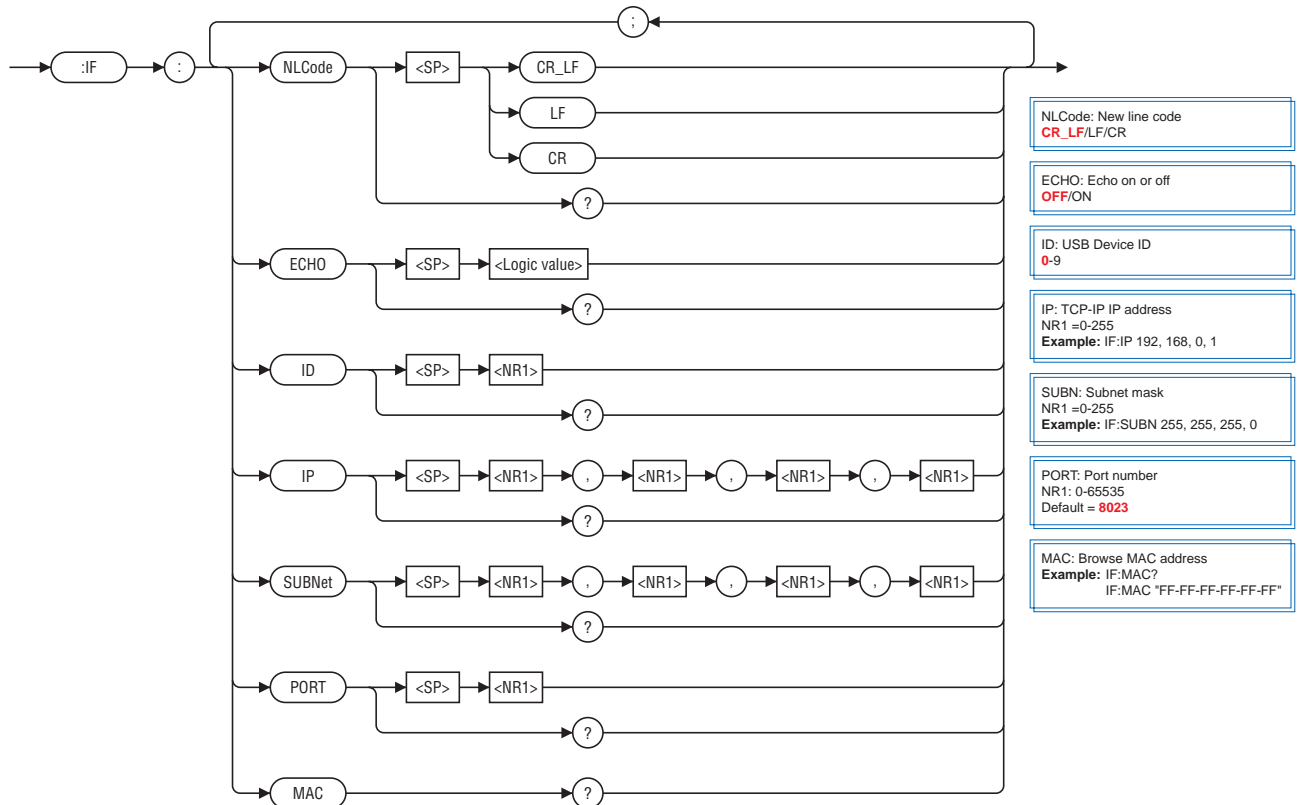
6. ALARm Group



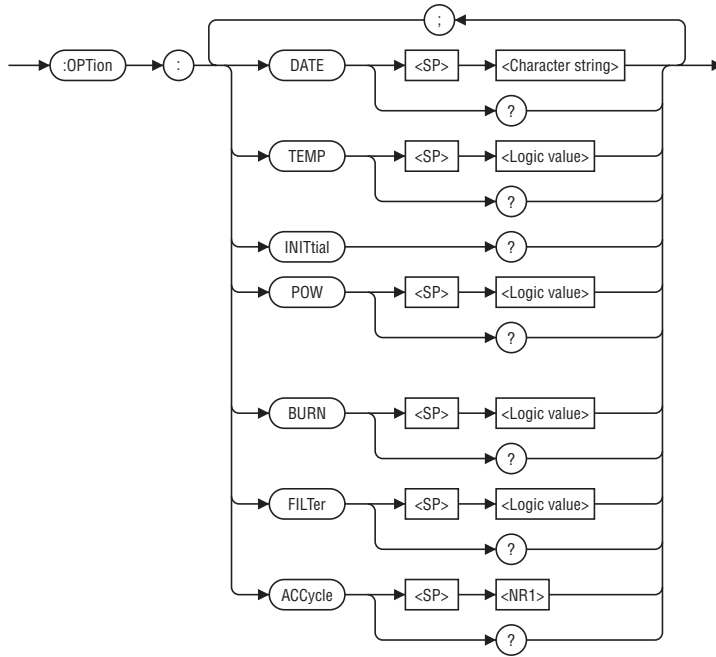
7. FILE Group



8. IF Group



9. OPTion Group



DATE: Date
Example: "2003-12-12 11:22:33"

TEMP: Room temperature compensation
ON = Internal/OFF = External

INITIAL: Factory default settings
Settings are returned to the factory default setting after this command has been executed and "OK" is returned.
Note: As the internal settings will be changed after the command has been executed, please reconnect the interface.

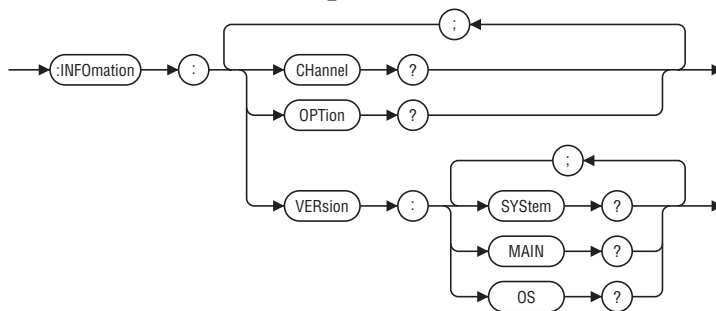
POW: Power on start
In this mode, data capture starts as soon as the power is turned on.

BURN: Burnout
OFF/ON

FILTER: External filter
OFF/ON (Not used)

ACCycle: Power line frequency
50/60

10. INFOrmation Group

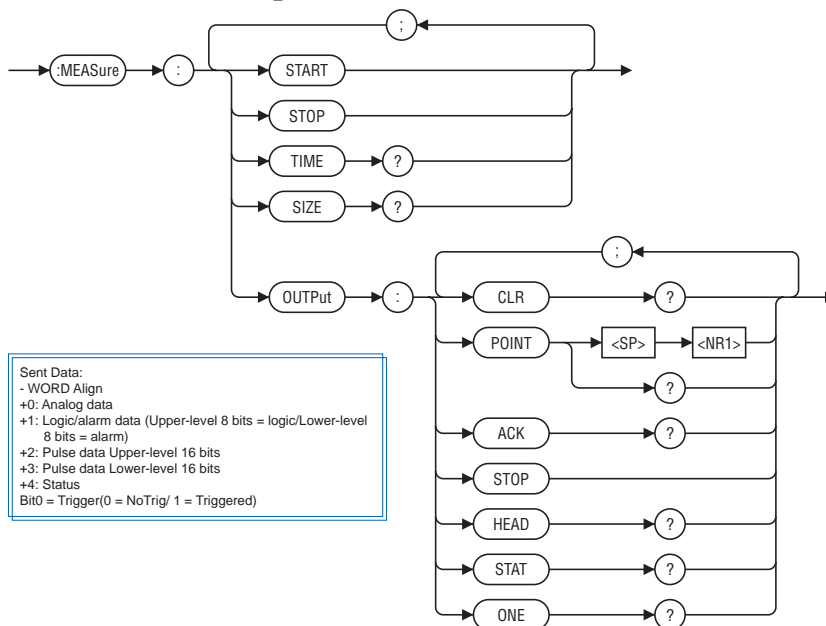


CH: Total number of channels

OPT: Not used

VER: Version information
SYS = System Control FPGA
MAIN = Main CPU Firmware
OS = Operating System Version

11. MEASure Group



Sent Data:
- WORD Align
+0: Analog data
+1: Logic/alarm data (Upper-level 8 bits = logic/Lower-level 8 bits = alarm)
+2: Pulse data Upper-level 16 bits
+3: Pulse data Lower-level 16 bits
+4: Status
Bit0 = Trigger(0 = NoTrig/ 1 = Triggered)

START: Starts data capture

STOP: Stops data capture

TIME: Measurement start time, measurement stop time

SIZE: Number of sent data records

CLR: Clears the data transmission buffer
Perform this function before starting measurement

POINT: Data buffer number
1-1000/0 = ring buffer

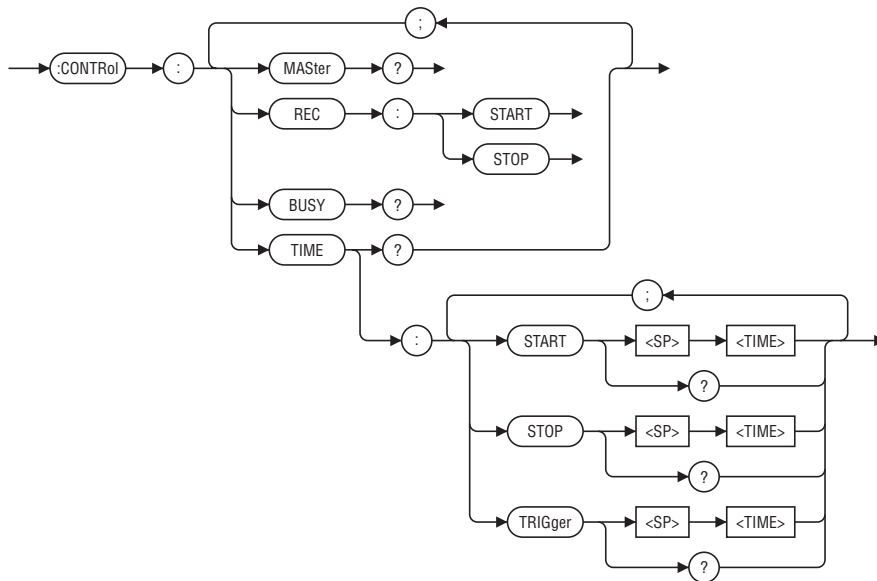
ACK: Requests data transmission

STOP: Stops data transmission

STAT: Transmission status
STAT <BufferSize>, <DataNo>, <Break>
<BufferSize> = Number of data in the buffer
<DataNo> = Data number
<Break> = Number of data interrupts

ONE: 1 record output

12. CONTRol Group



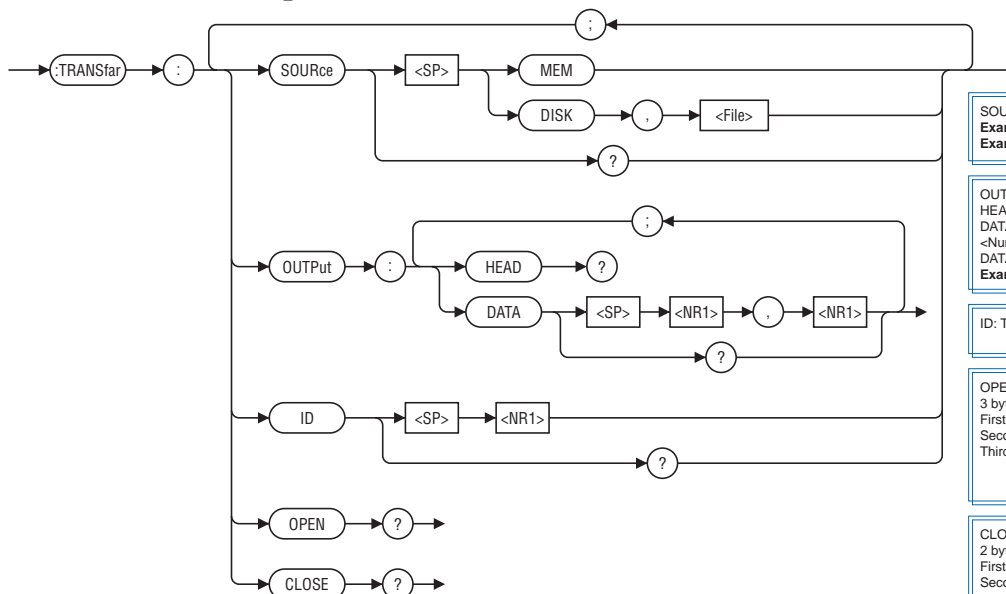
MAS: Master/slave enquiry

REC: Synchronized control
START = Synchronized start
STOP = Synchronized stop

BUSY: Checks preparations for synchronized start
OK/NG

TIME: Time
START = Start time
STOP = Stop time
TRIG = Trigger time
Example: CONTR:TIME:START "2003-04-01 12:22:33"

13. TRANSfer Group



SOUR: Data transfer source
Example: TRANS: SOUR MEM
Example: TRANS: SOUR DISK, "A:\AA.GBD"

OUTP: Transfer data
HEAD: Transfer data header
DATA NR1, NR1
<Number of start points> <Number of end points>
DATA? = Transfer data
Example: TRANS: OUTP: DATA 1, 100

ID: Transfer ID

OPEN: Opens the file
3 bytes of binary data are transferred as a query
First byte: ID number
Second byte: Not used
Third byte: 76543210
||||| If 1, failed to open
+++++++ Not used

CLOSE: Closes the file
2 bytes of binary data are transferred as a query
First byte: Not used
Second byte: 76543210
||||| If 1, failed to close
+++++++ Not used

OUTP:DATA? Contents (when the model is a 10-channel model)
#6***** (8 bits, ***** represents the number of bytes)
+0: Binary status (16 bits, not used)
Size part repeated (up to here)
+1 to 10: Analog data (excluding channels for which MeasOff has been specified)
+11 Pulse data (Upper-level 16 bits) (None if pulse has been specified as off)
+12 Pulse data (Lower-level 16 bits) (None if pulse has been specified as off)
+13 Logic data (None if logic has been specified as off)
+14 Alarm data (always sent)
Size part repeated (up to here)
+nn Checksum (16 bits)

TRANSfer commands

SOUR:

Selects the file to be transferred from the GL400/350 to the PC. Either data captured to Memory or to Disk can be selected. For Memory, select a memory bank from 1 to 128. For Disk, specify a file name that includes the full path.

OUTPut:

HEAD transfers the header file, DATA sets the start and end points, and DATA? starts data transfer.

ID:

IDs are used when transferring multiple files. This command is used to perform ID setting and searching.

OPEN:

Opens the Memory or Disk file that was selected for SOUR. A Query is used to indicate the ID of the opened file, by issuing an ID number (from 1 to 16) for that file when the file is opened. Moreover, when the file is opened, an ID is set for that file in the same way as the ID (ID number) was issued by the ID setting command.

CLOSE:

Closes the open memory or disk after the data has been transferred.

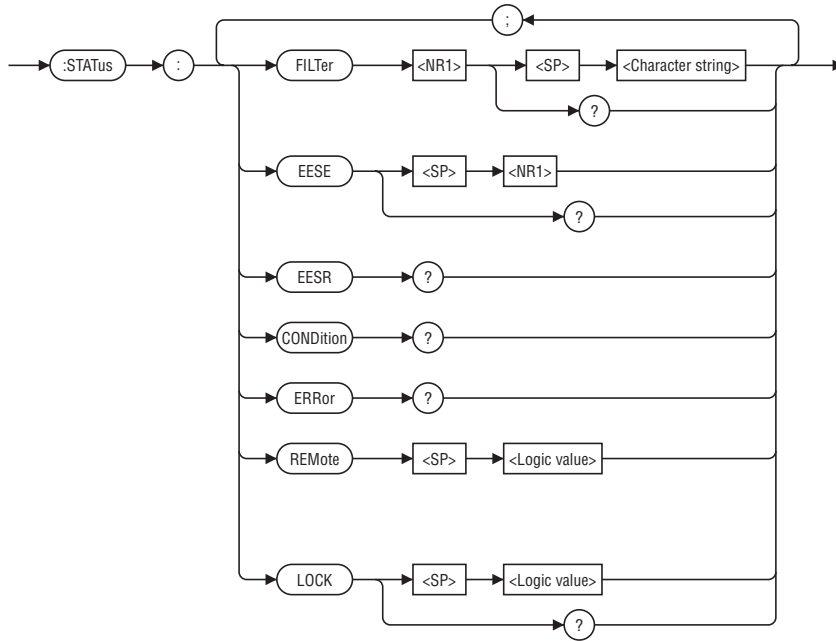
[Normal procedure]:

Specify Memory or Disk as the source of the data you want to transfer. → Use OPEN to open the file. → Use Query to return an ID. → Use OUTP: HEAD? to get the header. → Use OUTP: DATA<NR1><NR1> to set the file points to get. → Use OUTP: DATA? to get the data. → Use CLOSE to close the file after data transfer.

[ID Usage Example]:

Use SOUR to select file A, then OPEN to open file A (ID1). → Use SOUR to select file B, then OPEN to open file B (ID2). → Use ID1 to set the ID to 1. → Use OUTP: HEAD? to get the file A header. → Use ID2 to set the ID to 2. → Use OUTP: HEAD? to get the file B header. → Set the ID to ID1. → Use OUTP: DATA<NR1><NR1> to set the file A points. → Set the ID to ID2. → Use OUTP: DATA<NR1><NR1> to set the file B points. → Set the ID to ID1. → Use OUTP: DATA? to get the file A data. → Set the ID to ID2. → Use OUTP: DATA? to get the file B data. → Set the ID to ID1. → Use CLOSE to close file A. → Set the ID to ID2. → Use CLOSE to close file B.

14. STATus Group



FILT: Status filter
 FILT<Bit><NEV/RISE/FALL/BOTH>
 <BIT> = 0-15
 <NEV> = No detection
 <RISE> = Detection of rise
 <FALL> = Detection of fall
 <BOTH> = Detection of both rise and fall

EESE: Extended Event Enable Register

EESR: Extended Event Status Register

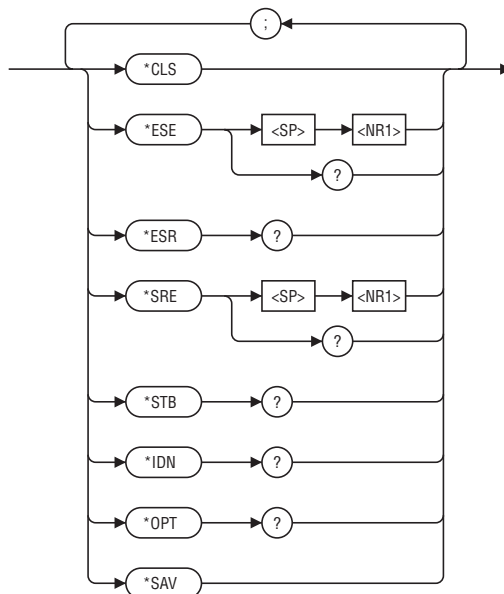
COND: Device Status Register

ERR: Error Code

REM: Remote
 OFF/ON

LOCK: Local Lockout
 OFF/ON

15. COMMON Commands



*CLS: Error Query Initialization

*ESE: Standard Event Enable Register

*ESR: Standard Event Status Register

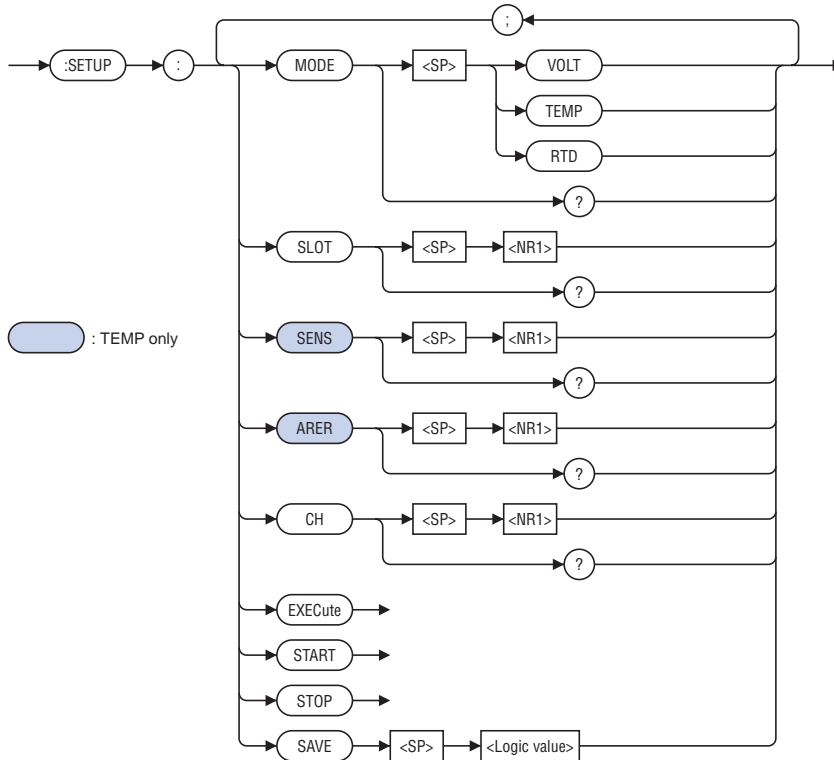
*SRE: Service Request Register

*STB: Read Status Byte

*OPT: Read Option Information

*SAV: Save Settings

16. SETUP Group



MODE: VOLT (voltage)/TEMP (temperature)/RTD (resistance temperature detector)

SLOT: AMP Slot 1= Slot1/2= Slot 2

SENS: Sensor (only when MODE is TEMP)

10CH: 1
20CH: 1/2
50CH: 1/2

AREA (only when MODE is TEMP)

10CH: 1/2
20CH: 1/2
50CH: 1/2/3/4/5

CH: Channel setup

VOL, RTD = 1 to number of SLOT CH
TEMP = 1 to 5

EXEC: Executes the setup

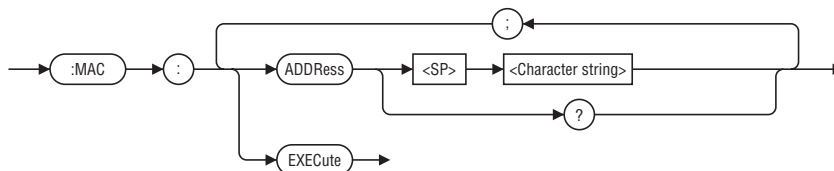
START: Starts the setup operation

STOP: Stops the setup operation

SAVE: Writes data to the EEPROM

<SETUP:MODE VOLT>	<SETUP:MODE TEMP>	
1. :SETUP:MODE VOLT 2. :SETUP:SLOT * 3. :SETUP:CH ** 4. :SETUP:EXEC :SETUP :GND (waiting to receive data) 5. :SETUP:START :GAIN20MV (waiting to receive data) (5 repeated) Commands received :GAIN50MV :GAIN100MV :GAIN200MV :GAIN500MV :GAIN1V :GAIN2V :GAIN5V :GAIN10V :GAIN20V :GAIN50V (after repeats) :EEPROM (waiting to receive data) 6. :SETUP:SAVE ON :COMPLETE (waiting to receive data) ==end==	1. :SETUP:MODE TEMP 2. :SETUP:SLOT * 3. :SETUP:SENS * 4. :SETUP:AREA * 5. :SETUP:CH ** 6. :SETUP:EXEC :SETUP :RTD (waiting to receive data) 7. :SETUP:START :EEPROM (waiting to receive data) 8. :SETUP:SAVE ON :COMPLETE (waiting to receive data) ==end==	1. :SETUP:MODE RTD 2. :SETUP:SLOT * 3. :SETUP:CH ** 4. :SETUP:EXEC :SETUP :RTD :0OHM (waiting to receive data) 5. :SETUP:START :350OHM (waiting to receive data) 6. :SETUP:START :EEPROM (waiting to receive data) 7. :SETUP:SAVE ON :COMPLETE (waiting to receive data) ==end==

17. MAC Group



ADDRess: Sets the MAC address (ADDRess).
Character string = "FF-FF-FF-FF-FF-FF" hexadecimals

EXEC: Writes data to the EPROM.
Writes the MAC address set for ADDR to the EPROM.

18. UP Group



UP: Begins preparations for the transfer of update data.

19. Status Report

Displays a table showing the Status Group and Common Command operations.
Before using each register, perform *CLS to clear any buffered information in the error queue, etc.

