GM8036 Laser Sweep
Optical Spectrum Analyzer

Programming Guide

UC INSTRUMENTS CORP.

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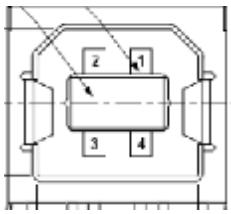
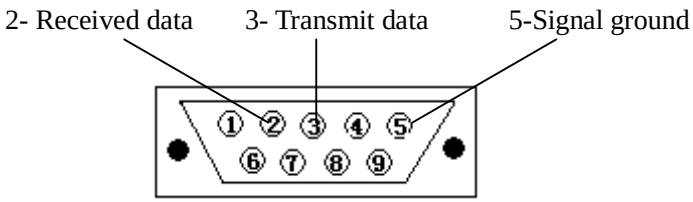
Communication Ports

USB Port

Standard four-core B type USB port.



RS232 Serial Port



The DB9 connector and pin assignments for GM8036

Communication setting:

1 Start bit, 8 Data bit, 1 Stop bit, No parity checking. Baud rate: 115200 bps.

Syntax

Commands Format

The following symbols describe the syntax of commands in the following chapters. The command is case-insensitive and can be written in upper case or in lower case or in both upper and lower case.

Example The command
READ1 : POW ?
can also be written in lower case as
read1 : pow ?
or it can be written as
Read1 : Pow ?

Put a colon (**:**) before a component to indicate a move to the next level of the combination.

Example SENS1 : POW : WAVELENGTH ?

A command message is ended by a carriage return and a line feed character (\CR\LF).

The response format specifies what the instrument returns in response to a query. All responses are terminated with '\CR\LF >'.

For the query command, if normal, the instrument returns response value with a '>', if an error occurs, then returns '>'.

For the written command, if normal, the instrument returns 'Ok! >'. If an error occurs, then returns '>'.

<…> The characters between angled brackets show the kind of data that you require, or that you get in a response. You don't type the angled brackets in the actual message.

[…] The characters between square brackets show optional information that you can include with the message.

/ The oblique line shows an either-or choice of data, for example, a/b means either a or b, but not both simultaneously.

All characters not between angled brackets are terminal symbols and must be sent exactly as shown. Items between angled brackets are not-terminal symbols, descriptions of these items follow the syntax description.

Spaces are ignored, they can be inserted to improve readability.

Units

The following table lists the base units in use.

Units	Default	Extended
Meter	nm	nm
Decibel	dB	dB
Second	ms	ms
Decibel/1mW	dBm	dBm

Data Type

Boolean	this can be data (ON or OFF), or a number. In a response you get 0, for OFF, or 1, for ON.
Value	is numeric data in one of the forms described below.
String	is Ascii data.
Unit	is one of DB, DBM, W (Watts), or S (seconds), or NM. It is the unit in a value.

Commands Lists

Common Commands

Command	Function
*IDN?	Identification query

***IDN?**

Syntax *IDN?

Response UC Instruments GM83001E: Manufacturer & Instrument model
Serial number: GG042914001 : Serial number of this instrument
HW Revision 1.10 : Hardware revision
Firmware Revision 3.03: Firmware revision

Description The *IDN? query gets the instrument identification over the interface.

After GM83001E is powered up, you should continuously send the *IDN? command to the optical head for ten times with 1 second interval. This makes GM83001 match the current baudrate. If not, waiting for 20 seconds without any operation to GM83001E, the optical head automatically matches 115200 bps baudrate.

Laser Source Commands

Command	Function
SOURCE	
: STATE ?	
: STATE	<BOOLEAN>
: FREQUENCY ?	
: FREQUENCY	<VALUE>
: FREQUENCY ? MAX /MIN	
: FREQUENCY MAX /MIN	
: WAVELENGTH ?	
: WAVELENGTH	<VALUE>
: WAVELENGTH? MAX /MIN	
: WAVELENGTH MAX /MIN	
: POWER?	
: POWER	
: UNIT ?	
: UNIT	< W/DBM >

SOURCE: STATE?

Syntax SOURCE : STATE?
Response < Boolean >

Description This command returns the current setting for the state of the laser source. ON means the source is enabled. OFF means the source is disabled.

Example
```
SOURCE : STATE ?
ON
>
```

SOURCE: STATE

Syntax SOURCE : STATE <Boolean>

Description This command sets the state of the source output signal. You specify the state as a Boolean. OFF, or 0, disables the source. ON, or 1, enables the source.

Example
```
SOURCE : STATE 0
>
```

SOURCE: FREQUENCY ?

Syntax SOURCE : FREQUENCY ?
Response < VALUE >

Description This command returns the setting for the frequency of modulation of the output of the source module. The unit of returned value is default to GHz.

Example SOURCE : FREQUENCY ?
191200.0
>

SOURCE: FREQUENCY

Syntax SOURCE : FREQUENCY < VALUE >

Description This command sets the frequency of the amplitude modulation of the source output signal. The unit is default to GHz, you do not specify the unit in this command message.

Example SOURCE : FREQUENCY 191200
>

SOURCE: FREQUENCY? MAX /MIN

Syntax SOURCE : FREQUENCY ? MAX / MIN
Response <VALUE>

Description This command returns the range setting of frequency for source module. *MAX* represents the maximum of frequency. *MIN* represents the minimum of frequency. The unit of returned value is default to GHz.

Example SOURCE : FREQUENCY? MAX
196585.2
>

SOURCE : FREQUENCY? MIN
191194.0
>

SOURCE: FREQUENCY MAX /MIN

Syntax SOURCE : FREQUENCY MAX / MIN

Description This command sets the current frequency to maximum or minimum for the source module. The maximum and minimum of frequency depend on the source module you use. *MAX* represents the maximum. *MIN* represents the minimum.

Example SOURCE : FREQUENCY MAX
>

SOURCE: WAVELENGTH?

Syntax SOURCE : WAVELENGTH?
Response < VALUE >

Description This command returns the setting for the wavelength of the output of the source module. The unit of returned value is default to nm.

Example SOURCE : WAVELENGTH?
1525.0000
>

SOURCE: WAVELENGTH

Syntax SOURCE : WAVELENGTH < VALUE >

Description This command sets the wavelength of the output signal. The unit is default to nm, so you do not specify the unit in this command message.

Example SOURCE : WAVELENGTH 1550
>

SOURCE: WAVELENGTH? MAX /MIN

Syntax SOURCE : WAVELENGTH? MAX / MIN
Response <VALUE>

Description This command returns the range setting of wavelength for source module. *MAX* represents the maximum of wavelength. *MIN* represents the minimum of wavelength. The unit of returned value is default to nm.

Example SOURCE : WAVELENGTH? MAX
1568.0000
>

SOURCE : WAVELENGTH? MIN
1525.0000
>

SOURCE: WAVELENGTH MAX /MIN

Syntax SOURCE : WAVELENGTH MAX / MIN

Description This command sets the current wavelength to maximum or minimum for the source module. The maximum and minimum of wavelength depend on the source module you use. *MAX* represents the maximum. *MIN* represents the minimum.

Example SOURCE : WAVELENGTH MAX
>

SOURCE : POWER : UNIT?

Syntax	SOURCE : POWER : UNIT ?
Response	< dBm /W>
Description	This command returns the units of power of laser source.
Example	SOURCE : POWER : UNIT ? dBm >

SOURCE : POWER: UNIT

Syntax	SOURCE : POWER: UNIT < dBm /W >
Description	This command sets the displayed units of power of laser source.
Example	SOURCE : POWER : UNIT W >

SOURCE : POWER?

Syntax	SOURCE : POWER?
Description	This command returns the setting for the power of the source module. The units of returned value is either dBm or W, which is determined by the command " SOURCE : POWER: UNIT ".
Example	SOURCE : POWER ? 13.01 >

Sweep Commands

Command	Function

SWEEP
:AUTO < START >, < STOP >, < STEP >
: ABORT

SWEEP :AUTO <START>, <STOP>, <STEP>

Syntax SWEEP :AUTO <START>, <STOP>, <STEP>

Parameter **START** is the setting value of the wavelength at which the sweep begins for the source module. **STOP** is the setting value of wavelength at which the sweep ends. **STEP** is the size of the change in the wavelength for each step of a stepped sweep.

Response OK!>

Description This command starts a wavelength sweep from START to STOP with a STEP. The unit of setting value is default to **pm**. Don't attach the unit in the command message.

Example SWEEP : :AUTO 1526000,1566000,10
……..
……..
OK!>

SWEEP : ABORT

Syntax SWEEP : ABORT

Response OK!>

Description This command aborts the sweep performing for source module.

Example SWEEP : ABORT
OK!>

Power Meter Commands

Command	Function
METER: POW1?	
METER: POW1 : ZERO : REF : REF? : REF <VALUE> : WAVE? : WAVE<VALUE> : UNIT? : UNIT	
METER : AVE? METER : AVE <VALUE>	
METER : SCANMODE? METER : AVE <VALUE>	

METER: POW1?

Syntax METER : POW1?
Response < VALUE>

Description This command gets a power reading from the optical head. The units of the number read back depend on whether the absolute or relative measurement mode is being used, and which units have been selected. The possible units are watts, dBm, or dB.

Example METER : POW1?
-72.711dBm
>

METER: POW1: ZERO

Syntax METER : POW1:ZERO
Response Zero OK!> or Zero Failed!>

Description This command zeros the electrical offsets for the power module.

Example METER : POW1:ZERO
Zero OK!>

METER: POW1: REF

Syntax METER : POW1: REF

Description This command sets the current power value as temporary reference value.

Example METER : POW1:REF
>

METER: POW1: REF?

Syntax METER : POW1:REF?
Response < VALUE>

Description This command returns the current reference value of the optical head. The returned value is default to dBm and No unit is attached.

Example METER : POW1:REF?
-72.711
>

METER: POW1: REF

Syntax METER : POW1: REF <VALUE>

Description This command sets the reference value for the power module. The unit for reference value is default to dBm, so you do not specify the unit in this command message.

Example METER : POW1:REF -50.12
>

METER: POW1: WAVE?

Syntax METER : POW1:WAVE?
Response < VALUE>

Description This command returns the wavelength setting for the power module. The returned value is in nanometer.

Example METER : POW1:WAVE?
1550 nm
>

METER: POW1: WAVE

Syntax METER : POW1: WAVE <VALUE>

Description This command sets the wavelength for the power module. The unit is default to nanometer, so you do not specify the unit in this command message.

Example METER : POW1:WAVE 1550
>

METER: POW1: UNIT?

Syntax METER : POW1: UNIT?
Response < dBm / W / dB >

Description This command returns the unit of power reading from the optical head.

Example METER : POW1: UNIT?
dBm
>

METER: POW1: UNIT

Syntax METER : POW1: UNIT <dBm / W / dB>

Description This command sets the unit of power in use. This can be watts, dBm or dB.

Example METER : POW1: UNIT dBm
>

METER: AVE?

Syntax METER : AVE?
Response <Value>, integer, ranges from 1 to 900000.

Description This command returns the setting for the averaging time for the optical head. The unit, milliseconds, is returned in the response message.

Example METER : AVE?
200ms
>

METER: AVE

Syntax METER : AVE <Value>

Description This command sets the averaging time for the optical head. The input power signal is read and averaged over this period. The range of setting value is from 1 900000, integer. The unit is default to milliseconds, so you do not specify the unit in this command message.

Example METER : AVE 100
>

METER: SCANMODE?

Syntax METER : SCANMODE?
Response <0/1>

Description This command queries if the module is in trigger mode. Under trigger mode, only when the module receives an external trigger signal, it returns a power value. 0 indicates the module is not in trigger mode. 1 indicates the module is in trigger mode.
Note that in trigger mode the return data is double float and the transmitted sequence of data is seen in the following example.

For example, the module returns a power value, -20.342 dBm, then the Hex format is 0XC1A2BC6A, the transmitted sequence of data is 6A BC A2 C1 3E. 3E is separated character.

Example METER : SCANMODE?
0
>

METER: SACNMODE

Syntax METER : SCANMODE <0/1>

Description This command decides if the module is in trigger mode. Under trigger mode, only when the module receives an external trigger signal, it returns a power value. 0 indicates the module is not in trigger mode. 1 indicates the module is in trigger mode.

Example METER : SCANMODE 1
>

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