
UC8722C/UC8724C/UC8728C Multi Channel Optical Power Meter Programming Guide

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CONTENTS

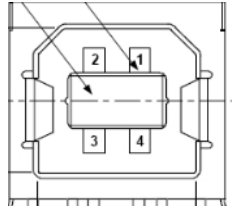
Communication Port	Error! Bookmark not defined.
USB Port	Error! Bookmark not defined.
RS-232 Port	Error! Bookmark not defined.
Communication Format	Error! Bookmark not defined.
Data Rate	Error! Bookmark not defined.
Command Format and Syntax.....	Error! Bookmark not defined.
Data Type	Error! Bookmark not defined.
Command List	Error! Bookmark not defined.
Common Command	Error! Bookmark not defined.
*IDN?.....	Error! Bookmark not defined.
*OPC?.....	8
Read Command	Error! Bookmark not defined.
Read[n]: Power?.....	Error! Bookmark not defined.
Sense Command	Error! Bookmark not defined.
Sense [n]:Correction : Collect : ZERO?.....	10
Sense[n] :Correction : Collect : ZERO.....	11
Sense[n] : Power : Wavelength ?.....	11
Sense [n]: Power : Wavelength.....	11
Sense[n] : Power : Atime?.....	11
Sense[n] : Power : Atime.....	11
Sense[n] : Power : Reference : State?.....	12
Sense[n] : Power : Reference : State.....	12
Sense[n] : Power : Reference : Display.....	12
Sense[n] : Power : Reference ?.....	12
Sense[n] : Power : Reference.....	12
Sense[n] : Power : Unit ?.....	13
Sense[n] : Power : Unit.....	13
Internal Function Setting	13
Sense : Function :Parameter:Logging?.....	14
Sense : Function :Parameter:Logging.....	14
Sense : Function :State:START.....	14

Sense : Function : State:STOP.....	14
Sense : Function : State: ?.....	14
Sense : Function : Result ?.....	15
External Synchronous Trig Setting Commands.....	16
Sense : Trigger : INPUT ?.....	17
Sense : Trigger : INPUT.....	17
System Setting Commands.....	17
INITSYS:PULSE?.....	18
INITSYS:PULSE.....	18
BAUD:?.....	18
BAUD:<VALUE>.....	18

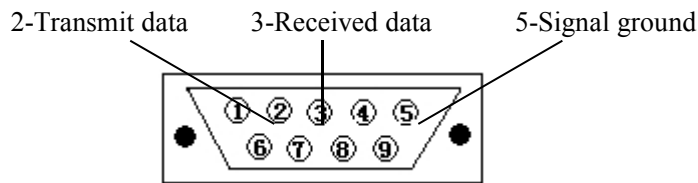
Communication Port

USB Port

Standard four-PIN B type USB port.



RS232 Serial Port



The DB9 connector and pin assignments for GM8012

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.

[n] The characters between square brackets show Channel number, No number select means Channel 1.

/ 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	s	ms, s
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.

Specifying the Channel

The UC8722C/UC8724C/UC8728C with 2/4/8 Channels for connecting with Optical Sensor. Each channel is identified by a channel number.

For commands that require you to specify a channel, the channel number is represented by [n] in a command.

The channel number represents the optical head's position connected into the UC8722C/UC8724C/UC8728C. These numbers are displays on the top of each channel of the front panel.

For example, query the wavelength of the power meter for channel 2. The command is SENS[n] : POW : WAVELENGTH ?, you should send:

- SENS2 : POW : WAVELENGTH ?

Commands Lists

Common Commands

Command	Function
*IDN?	Identification query

*IDN?

Syntax *IDN?

Response UC Instruments, UC8728C OPTICAL POWER METER,
SN:GG033616004, HR : 1.00, FR : 1.00

UC Instruments: Manufacturer
UC8728C OPTICAL POWER METER: Instrument model
*****SN:GG013601004: Serial number of this instrument
*****HW Revision 1.00: Hardware revision
**Firmware Revision 1.00: Firmware revision

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

*OPC?

Syntax *OPC?

Response 1 / 0
>

Description The *OPC? Query the instrument working status. When the instrument is working for internal order, response 0; When the instrument response 1, means it can accept next operation order.

Read Commands

Command	Function
READ[n] : POW ?	n =1 ~ 8, specify channel number

```

: POW : MAX ?
: POW : MIN ?
    
```

Specifying the Channel

You specify the channel by attaching a numeric suffix to the READ number. You access channel 1 by using READ1, or channel 2 by using READ2.

READ[n] : POW ?

Syntax READ[n] : POW ?
 Response < VALUE >

Description This command gets a power reading from the module. 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 READ1 : POW ?
 -72.711dBm
 >

READ[n] : POW : MAX ?

Syntax READ[n] : POW : MAX ?
 Response < VALUE >

Description This command returns the power maximum for the power meter module.

Example READ1 : POW : MAX ?
 -72.711dBm
 >

READ[n] : POW : MIN ?

Syntax READ[n] : POW : MIN ?
 Response < VALUE >

Description This command returns the power minimum for the power meter module.

Example READ1 : POW : MIN ?
 -90.000dBm
 >

Another Example Read: Power ? (If you do not key in n number, the

machine will read all 8 channel optical power value,
unit: dBm)

```
-42.754 , -2.552 , -13.784 , -56.876 , -43.220 , -76.123 , -65.878 , -33.982
>
```

Sense Commands

Command	Function
Sense[n]	n(Channel Range: 1 ~ 8)
: Correction:Collect:ZERO?	
: Correction:Collect:ZERO	
:Power	
: Wavelength ?	
: Wavelength	<VALUE>
: Atime?	
: Atime	<VALUE>
: Reference:State?	
: Reference:State	< 0/1 >
: Reference:Display	
: Reference?	
: Reference	< VALUE >
: Unit?	
: Unit	< 0/1 >

Sense [n]:Correction : Collect : ZERO?

Syntax Sense[n] : Correction : Collect : ZERO?

Description Read Cannel n and see if current no light ZERO operation OK or not? If response “0” means ZERO operation successful, otherwise is failed and response error .

Example S2 : C : C : ZERO?
0
>

Sense[n] :Correction : Collect : ZERO

Syntax Sense[n] : Correction : Collect : ZERO

Description Set channel n not light input ZERO.

Example S2 : C : C : ZERO
>

Sense[n] : Power : Wavelength ?

Syntax Sense[n] : Power : Wavelength ?

Response < VALUE >

Description Read Channel n current wavelength.

Example S2 : P : W ?
1550
>

Sense [n]: Power : Wavelength

Syntax Sense[n] : Power : Wavelength < VALUE >

Description Set channel n optical power current wavelength

Example S2 : P : W 1528
>

Sense[n] : Power : Atime?

Syntax Sense [n]: Power : Atime ?

Response < VALUE> defaults unit ms

Description Read optical power meter current average time.

Example S2 : P : A ?
100ms
>

Sense[n] : Power : Atime

Syntax Sense[n] : Power : Atime < VALUE> defaults unit ms

Description Setting optical power meter current average time (Notice: all channel use same average time) .

Example S2 : P : A 20ms
>

Sense[n] : Power : Reference : State?

Syntax Sense [n]: Power : Reference : State?

Response < 0/1>

Description Read Channel optical power meter status. Response 0: Absolute optical power testing status. At this moment, Read:power? Read optical power, Unit is mW or dBm It was depend on Sense:Power:Unit? Setting.
Response 1: means relative optical power testing statu. At this status Read:power? Read optical power value. Unit dB.

Example S2 : P : R : S?
0
>

Sense[n] : Power : Reference : State

Syntax Sense[n] : Power : Reference : State < 0/1>

Response >

Description Set channel n optical power meter testing status.

Example S2 : P : R : S 1
>

Sense[n] : Power : Reference : Display

Syntax Sense[n] : Power : Reference : Display

Description Setting channel n current optical power value as optical power reference value.

Example S2 : P : R : D
>

Sense[n] : Power : Reference ?

Syntax Sense[n] : Power : Reference ?

Response < VALUE>, Float 类型

Description Read Channel n optical power reference value.

Example S2 : P : R ?
-20.00dBm
>

Sense[n] : Power : Reference

Syntax Sense[n] : Power : Reference < VALUE>

Description Setting channel n optical power reference value.

Example S2 : P : R -13dBm
>

Sense[n] : Power : Unit ?

Syntax Sense[n] : Power : Unit ?

Response <0 / 1 >

Description Read Channel n optical power unit.

0 : is dBm

1 : is mW

2 : is dB at this status, optical power meter was set at relative optical power testing status.

Example S2: P : U ?
dBm
>

Sense[n] : Power : Unit

Syntax Sense[n] : Power : Unit < 0 / 1 / 2 / dBm/mW/dB >

Description setting channel optical power meter power unit.

Example S2: P : U mW
>

Internal Function Setting Command

Command	Function
Sense:Function	
:Parameter	
:Logging?	
:Logging	<1~10000>,<0.01~1000mS>
:State	
:START	
:STOP	
:Result?	

Sense : Function :Parameter:Logging?

Syntax Sense : Function : Parameter : Logging?

Description Read internal function parameters.

Example Sens : F : P : L?
100,5mS
>

Note: Response data format as“ , ” before “ , ” is sampling data quantity. Available Sampling range is 1~10000.
After “ , ” is average sampling time, unit: mS. Available range: 0.01~1000mS。

Sense : Function :Parameter:Logging

Syntax Sense : Function : Parameter : Logging < VALUE1>,< VALUE2>

Description Setting internal function parameter.

Example Sens : F : P : L 2000,3
>

Note: Above setting is sampling 2000 times, each sampling data average sampling timeis 3 mS.

Sense : Function :State:START

Syntax Sense : Function : State : Start

Description Setting the last time setting internal function.

Example Sens : F : S : START
>

Sense : Function :State:STOP

Syntax Sense : Function : State : STOPt

Description Stop internal function.

Example Sens : F : S : STOP
>

Sense : Function :State: ?

Syntax Sense : Function : State : ?

Description Inquiry internal function status.

Example Sens : F : S : ?
1
>

Note: Response value as 0: stop status; Response value as 1: in process status.

Sense : Function : Result ?

Syntax Sense : Function: Result ?

Response < data1,data2 ... dataN>

Description Read the last time used internal function record data.

Example Sense : F : R?

.....
>

Note: Optical power meter on time or save into saving buffer storage memory dat format as below:

- 1、 each optical power data transfer as 2 byte format transfer.
- 2、 The first receiving byte is low 8 bit data; the second byte data is high8 bit data.
- 3、 each byte the highest bit bit7 is sequence representative bit, others bit bit6 ~bit0 is available data, show as below table:

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0 representative low 8 bit data	Available Data						

第一个字节

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
1 representative high 8 bit data	Available Data						

第二个字节

- 4、 Combine the second byte bit6 ~bit0 data with the first byte bit6 ~bit0 data become a 14 bit data: That is:

Hbit6、Hbit5、Hbit4、Hbit3、Hbit2、Hbit1、Hbit0、Lbit6、Lbit5、Lbit4、Lbit3、Lbit2、Lbit1、Lbit0

Data range: 0 ~ 16383. Calculate optical power value formula is:

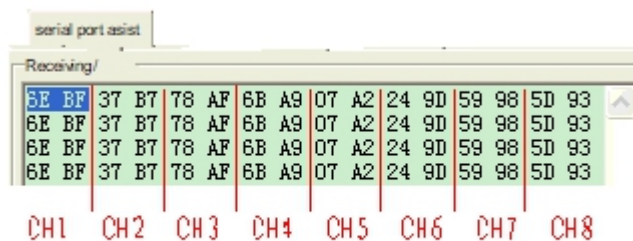
$$dBm = (x - 10000) / 100$$

For example: 5706 equal power: $dBm = (5706-10000) / 100 = -42.94$

- 5、 All received data's bit7 should start from the first data. It can be the receiving available verification. That is:

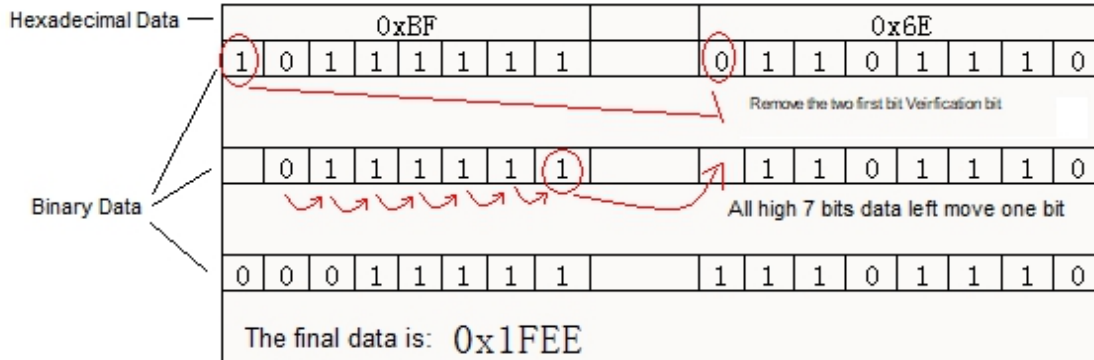
Start from bit7 following with 0、1、0、1、0、1、 ... as data complete verification

For example: receiving buffer storage received following data:



1、 2 Byte data representatives one channel optical power value, 1 ~ 8 channel recycle. Above table show each channel data was divided, that is: CH 1 data is : 6E BF ; CH 2 data is: 37 B7 ; ...

2、 Since the first Byte received bit bit7 0 is low bit, so CH1 correct data is 0xBF6E. It was changed in to binary data as below:



3、 The final data is 0x1FEE = 8174 It was calculated CH 1 power value as = (8174-10000) / 100 = -18.26 dBm

EXCEL calculation formula:

C1	fx		=(((HEX2DEC (B1)-128)*128+HEX2DEC (A1)) -10000) /100												
	A	B	C	D	E	F	G	H							
1	6E	BF	-18.26												

External Synchronous Trigger Input Setting Command

Command

Parameters

Sense:Trigger

:INPUT?

:INPUT <Ignore / Smeasure / NEXTstep / Cmeasure>

Sense : Trigger : INPUT ?

Syntax Sense : Trigger : INPUT ?

Response <Ignore / Smeasure / Nextstep / Cmeasure>

Description Read external sync trig signal setting type. Response value define as below:

Ignore : Ignore external Sync trig signal, That is internal function was setat: Start, Sense:Function:State:Star and immediatly start.

Smeasure : Single time sampling function. When the internal function status was set as : Start , each input sync trig signal will trig a sampling function and transfer the sampling data to computer.

Nextstep : Process a single sampling function. When internal Function was set a Start status, each input sync signal will process a data sampling and save the sampling data into buffer storage memory.

Cmeasure : restart a whole complete internal function, and save the data recordinto buffer storage memory.

Example Sense : Trigger : INPUT ?
Ignore
>

Sense : Trigger : INPUT

Syntax Sense : Trigger : INPUT <Ignore / Smeasure / Nextstep / Cmeasure> or <0/1/2/3>

Response >

Description Setting external sync trig signal setting type.

Example Sense : Trigger : INPUT Smeasure
>

System Setting Commands

Command	Parameter
INITSYS	
:PULSE?	
:PULSE	<0/ 1/ HIGH/ LOW>
BAUD:?	

BAUD:< VALUE>

INITSYS:PULSE?

Syntax INITSYS:PULSE ?

Response <HIGH/ LOW>

Description Read receiving sync trig signal type. Response: HIGH is high pulse;
Response: LOW is low pulse.

Example INITSYS:PULSE?
HIGH
>

INITSYS:PULSE

Syntax INITSYS:PULSE <0/ 1/ HIGH/ LOW>

Response >

Description Setting receiving sync trig signal type

Example INITSYS:PULSE 0
>

BAUD:?

Syntax BAUD: ?

Response RS232 Baud:115200; USB_VCP Baud:115200

Description Read current RS-232 and USB port baud rate.

BAUD:<VALUE>

Syntax BAUD: <VALUE>

Response >

Description Setting RS232 port baud rate, Range: (9600 ~ 2000000),

Note: Can not change USB port baud rate

All setting baud rate will be recovered as 115200 baud rate when user
re-power on the machine,

Example BAUD: 230400
>

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