Newport User Commands

Revision History

08	22-Dec-2024	• Added IL and WM commands
07	02-Jul-2024	• Mention Ethernet, including rewrite of Introduction, adding **Communication Types** table and **Communication Protocol** section • Added DS and RO commands
06	22-Aug-2022	• Updated for 845-PE-RS • Updated for x938-R • Added BD command • Added AAHR command
05	02-May-2021	• Fixed a mistake in $SP compatibility
04	02-May-2019	• Updated for 844-PE-USB • Updated for new features: Pulsed Power, Low Frequency Power • General formatting improvements
03	17-Aug-2017	• Updated section **Device Communication Details** for RS-232
02	24-Apr-2017	• Adding section **Device Communication Details**
01	08-May-2016	• Initial Revision

Introduction

This document contains a description of the various commands that are used for remote control of the new line of Newport meters (843-R-USB, 1919-R, 841-PE-USB, 844-PE-USB, 845-PE-RS, and x938-R). For each command, we list which devices support the command as well as providing examples when necessary and listing limitations, as applicable.

Note: All commands work in an ASCII-based command and response protocol. As such, data delivery rates will not be as high as when working with the standard data streaming methods provided by the COM object. Therefore, for top performance we recommend working with the COM object. However, for features not directly supported by the COM object, or when the COM object cannot be used, for example on non-Windows platforms, or for RS-232 or Ethernet communication, these commands may be used.

Communication Types Supported

The following table indicates which types of communication can be used with each instrument.

	USB	RS-232	Ethernet
843-R-USB	•		
1919-R	•	•	
841-PE-USB	•		
844-PE-USB	•		
845-PE-RS		•	
x938-R	•	•	•

Communication Protocol

Communication consists of a command sent to the instrument, followed by a response received from the instrument. Every read of a response must be preceded by sending a command, and every command sent must be followed by reading a response. Failure to follow these rules may lead to communication problems.

- All commands and responses are ASCII strings.
- All commands are two or more letters, followed by parameters (when applicable).
- All commands are prefixed by a “$” (0x24).
- Response to successful command starts with a “*” (0x2A).
- Response to an invalid command starts with a “?” (0x3F).

USB

For communication via USB use the COM object Write and Read methods. Do not prefix commands with a “$” – this is handled by the Write method. The “*” and “?” prefixes for responses are returned by the Read method to allow the user to know if the command was successful.

RS-232

All commands must be terminated by a <LF><CR> (0x0A 0x0D) sequence. Responses from the instrument will also be terminated by a <LF><CR> sequence.

Ethernet

Communication with the x938-R via Ethernet uses TCP/IP on port 12321.

All commands must be terminated by a <LF> (0x0A). Responses from the instrument will also be terminated by a <LF>.

User Commands

This section describes the commands available to control the Newport devices. It is divided into 3 sections.

1. Command Summary. Table listing all available commands.
2. Basic Commands. These commands query and set the measurement configuration of the sensor and the device.
3. Advanced Commands. Commands that change calibration factors of the sensors and instrument. These commands will change the results of measurements and should be used only after careful consideration.

Multichannel devices

The 2938 has two channels. The CL command is provided to indicate which channel to operate on, for those commands which are specific to a channel.

Command Summary

The following table contains a listing of commands available with Newport devices.

Command	Meaning
AAHR	High Resolution
AAPC	Pulse Cycle
AATL	TTL pass/fail Limits
AQ	Average Query
AR	All Ranges
AW	All Wavelengths
BD	BauD rate
BT	BeamTrack
CL	select ChanneL
CQ	Calibration Query
DS	analog output Scale
DQ	Diffuser Query
EE	Exposure Energy
EF	Energy Flag
EP	Energy Pulse length
ER	Energy Ready
ET	Energy Threshold
FB	Force BeamTrack
FE	Force Energy
FP	Force Power
FQ	Filter Query
FX	Force eXposure
GU	Get range in Use
HC	Head Configuration
HI	Head Information
HT	Head Type
IC	Instrument Configuration
II	Instrument Information
IL	Read Wavelength
MA	MAins
MF	Maximum Frequency
MM	Measurement Mode
PL	Pulse Length

Command	Meaning
RN	Read raNge
RO	analog output type
RQ	Response Query
SE	Send Energy
SF	Send Frequency
SI	Send unIts
SK	Simulate Key-press
SP	Send Power
SX	Send maX
TA	TTL output
TRGT	TRigger Gate Type
TRSE	TRigger StatE
TRSP	TRigger gate StoP
TRST	TRigger gate StarT
TRTI	TRigger stop TIme
TRTW	pulse TRigger Window
TRXE	eXternal TRigger Edge
TRXH	eXternal TRigger Holdoff time
TRXT	TRigger Type
UT	User Threshold
VE	VErsion
WD	Wavelength adD
WE	Wavelength Erase
WI	Wavelength Index
WL	WaveLength
WM	Manual Wavelength
WN	Write raNge
ZA	Zero Abort
ZE	Zero
ZQ	Zero Query
ZS	Zero Save

Basic Commands

Command: **High Resolution**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
	•	•	•	•	•

Syntax	AAHR <option>
Description	Queries or sets measurement resolution. Normally instruments send 4 significant digits of measurement, when set to high resolution some sensors and measurement modes support 7 significant digits. Values for <option> (if not set, default to 0) • 0: Query • 1: Normal resolution (4 digits) • 2: High resolution (7 digits)
Example	• User sent **"AAHR 0"**. Device returns **"*1 NormalResolution HighResolution"** • User sent **"AAHR 2"**. Device returns **"*2 NormalResolution HighResolution"**
Limitations	None
See Also	Command Summary

Command: **Pulse Cycle**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
	•	•	•	•	•

Syntax	AAPC <0 or 10000-200000>
Description	Queries or sets the pulse cycle period in microseconds for Low Frequency Power mode on Photodiode sensors.
Example	Returns: The current pulse cycle period.
Limitations	Applicable to Low Frequency Power mode only
See Also	MM; Command Summary

Command: **TTL pass/fail limits**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
					•

Syntax	AATL <lower limit> <upper limit>
Description	Queries or sets lower and upper limits for TTL when in Pass/Fail mode. <lower limit> and <upper limit> are measurement values in exponential notation. If <lower-limit> and <upper-limit> are both 0 or omitted, this queries the values; if both are non-zero this sets the values.
Example	• User sent **"AATL 0 0"**. Device returns **"*1.000000e+0 5.000000e+3"** • User sent **"AATL 1.0e+1 1.0e+2"**. Device returns **"*1.000000e+01 1.000000e+02"**
Limitations	None
See Also	TA; Command Summary

Command: **Average Query**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•				

Syntax	AQ <average-setting>
Description	Query and set the average setting of the sensor. Returns index of presently active Average setting as well as literal description of set of all available Average settings. If an unsupported index is specified, will prefix a '?' to the response. Values for <average-setting> (if not set, default to 0) • 0: Query device for present average setting. • 1: Configure sensor for first setting (“NONE”) • 2: Configure sensor for second setting. • Etc
Example	919E-10-35-250 set to average over one second • User sent **“AQ”**. Device returns **“* 3 NONE 0.5sec 1sec 3sec 10sec 30sec”** • User sent **“AQ 4”**. Device returns **“* 4 NONE 0.5sec 1sec 3sec 10sec 30sec”.** Sensor is now averaging over 3 seconds • User sent **“AQ 9”**. Device returns **“? 4 NONE 0.5sec 1sec 3sec 10sec 30sec”.** Sensor is still averaging over 3 seconds
Limitations	Thermopile sensors do not have an averaging option when measuring energy. If the command is sent when in energy mode, the instrument will return an error string
See Also	Command Summary

Command: **All Ranges**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	AR
Description	Returns all ranges available in sensor. This is prefixed by the index of the presently active range.
Example	For an 818-SL-DB sensor in the 30 microwatt range, this command will return **“* 3 AUTO 30.0mW 3.00mW 300uW 30.0uW 3.00uW 300nW 30.0nW”.** Note: The index of the highest numeric range is 0. The index of AUTO (when applicable) is -1
Limitations	None
See Also	GU, RN, SX, and WN; Command Summary

Command: **All Wavelengths**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	AW
Description	Returns string fully describing the wavelengths that the sensor is configured to work with.
Example	Example 1. 918D with Filter Out. Device returns **"*CONTINUOUS 350 1100 1 633 488 978 NONE NONE NONE"** The user would know that it is a continuous curve sensor (from the prefix CONTINUOUS), that the range of wavelengths is 350nm through 1100nm, that the present wavelength that the sensor is configured to measure for is 633 (from the index 1), and the 6 favorite settings as they would be displayed in PMManager (above 10000nm would be displayed as 10.0). The second and third parameters delimit the range of values that the $WL command would succeed with. Example 2. 919P-003-10 sensor. Device returns **"*DISCRETE 1 VIS NIR"** The user would know that this sensor is configured for a discrete set of wavelengths (from the prefix DISCRETE), that the sensor is presently configured to work at the VIS wavelength (from the index 1) and that the set of wavelengths that the sensor could be configured to work with (via the $WW command) is "VIS" and "NIR".
Limitations	None
See Also	WD, WE, WI, and WL; Command Summary

Command: **BauD rate**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
				•	

Syntax	BD <baud rate>
Description	Queries or sets the RS-232 baud rate. If <baud-rate> is omitted, this is a query, otherwise <baud-rate> must be one of the following values: 4800, 9600 , 14400, 19200, 38400, 57600, 115200. The change takes effect after the response is sent; the response is sent at the old baud rate.
Example	• User sent **"BD"**. Device returns **"*115200"** • User sent **"BD 9600"**. Device returns **"*9600"**
Limitations	None
See Also	Command Summary

Command: **BeamTrack**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	BT
Description	Query device for latest PEPS position and size measurements Response Format: "F" <Errors> "X" <X> "Y" <Y> "S" Size. Where F is followed by Hex map of error codes X is followed by the location of the laser spot on the X-axis in mm Y is followed by the location of the laser spot on the Y-axis in mm S is followed by the size of the laser beam in mm The following is the listing of possible error codes. Other codes may be returned by the sensor but can be ignored; they are either meant as diagnostic information for Newport personnel or are reserved for future use. 0x00001000: Position not measured (sensor can't measure position) 0x00002000: Signal too low (signal is just noise, not a meaningful measurement) 0x00004000: Position Measurement out of range (laser beam hit detector too far off center) 0x00008000: General Position Measurement Error
Example	**"* F 00000000 X -1.50 Y -0.9 S 6.50"** There were no errors, the spot size is 6.5mm and is found at the coordinates (-1.5, -0.9)
Limitations	For PEPS Sensors only.
See Also	Command Summary

Command: **select ChanneL**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
					•

Syntax	CL <channel >
Description	Queries or sets the channel which channel-specific commands will operate on. If <channel> is 0, returns the current channel, otherwise it sets the channel (by 1-based index)
Example	**"*1"** The current channel is channel 1 or A
Limitations	
See Also	Command Summary

Command: **analog output Scale**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
	•	•	•	•	•

Syntax	DS <voltage>
Description	Queries or sets the maximum analog output voltage. Values for <voltage> (if not present, default is 0) • 0: Query current maximum analog output voltage • 1, 2, 5, 10: Set the analog out voltage that indicates a reading at the maximum for the current range
Example	None
Limitations	For 1919-R, 841-PE-USB, 844-PE-USB and 845-PE-RS this setting has no effect when analog output type is set to raw
See Also	RO; Command Summary

Command: **Diffuser Query**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	DQ <diffuser-setting>
Description	Query and set the diffuser setting of the sensor. Values for <diffuser-setting> (if parameter isn't set, default to 0) • 0: Query meter for present Diffuser Mode • 1: Configure sensor for Diffuser Out mode • 2: Configure sensor for Diffuser In mode
Example	Example 1. A 919E-0.1-12-25K sensor. • User sent **"DQ"**. Device returns **"*1 N/A"**. There is only 1 setting (that the command is not applicable). Example 2. 919E-10-35-250. • User sent **"DQ"**. Device returns **"*1 OUT IN"**. Sensor is in Diffuser Out mode. • User sent **"DQ 2"**. Device returns **"* 2 OUT IN"**. Sensor is now in Diffuser In mode. • User sent **"DQ 3"**. Device returns **"? 2 OUT IN"**. Request is invalid and sensor remains in Diffuser In mode.
Limitations	For Pyroelectric sensor only
See Also	HC; Command Summary

Command: **Exposure Energy**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
	Pyro, Photo	Pyro	Pyro	Pyro	Pyro, Photo

Syntax	EE
Description	Instructs device to report up do date exposure measurement, number of pulses (for Pyroelectric sensors), and time elapsed (in tenths of a second).
Example	Example 1. Pyroelectric sensor in exposure mode. Device returns **"* 1.064E-1 2773 124"** Total exposure is 106.4mJ, 2773 pulses have been measured, and 12.4 seconds have elapsed since the start of exposure measurement. Example 2. Pyroelectric sensor in energy mode. Device returns **"?HEAD NOT MEASURING EXPOSURE"** Example 3. Pyroelectric sensor in power mode. Device returns **"HEAD NOT MEASURING ENERGY"**
Limitations	On some instruments for Pyroelectric sensors only, on some instruments also for Photodiodes (see table above).
See Also	FX; Command Summary

Command: **Energy Flag**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	EF
Description	Polls device if a new energy reading has been processed and not yet communicated to the user.
Example	Device returns **"*1"** if there is a new reading or **"*0"** if there isn't.
Limitations	For Pyroelectric measuring power or energy; Thermopile sensors measuring energy.
See Also	ER (Thermopile only), SE, and SP (for Pyroelectric only); Command Summary

Command: **Energy Pulse length**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
	•	•	•	•	•

Syntax	EP <0 or 1-10000>
Description	Queries or sets the pulse length in milliseconds for Pulsed Power mode on Thermopile sensors.
Example	Returns: The current pulse length.
Limitations	Applicable to Pulsed Power mode only
See Also	MM; Command Summary

Command: **Energy Ready**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	ER
Description	Polls device if sensor is ready to take a new energy reading. This is useful for users that can control when their laser fires.
Example	Device returns “*1” if it’s ready for a new energy pulse or “*0” if it isn’t.
Limitations	For Thermopile sensors only, in energy or pulsed power measuring modes
See Also	EF and SE; Command Summary

Command: **Energy Threshold**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	ET <threshold>
Description	Query and set the threshold setting of the sensor. Values for <threshold> (if not set, default to 0) • 0: Query sensor for present threshold setting. • 1: Configure sensor to work with LOW threshold. • 2: Configure sensor to work with MEDIUM threshold. • 3: Configure sensor to work with HIGH threshold.
Example	919P-030-18 sensor. • User sent **“ET”**. Device returns **“*2 LOW MEDIUM HIGH”.** The sensor is in MEDIUM threshold mode. • User sent **“ET 4”**. Device returns **“?1 LOW MEDIUM HIGH”**. Trigger level is invalid and sensor remains in LOW threshold mode. • User sent **“ET 3”**. Device returns **“*3 LOW MEDIUM HIGH”**. Sensor has been configured to work in HIGH threshold mode.
Limitations	For Thermopile sensors only
See Also	HC, UT; Command Summary

Command: **Force BeamTrack**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	FB
Description	Puts instrument into Position Measurement mode. Device returns **“*”** if successful and **“?HEAD CANNOT MEASURE BEAMTRACK”** if not.
Example	User sent **“FB”**. Device returns **“*”**. Sensor is now measuring Position.
Limitations	For PEPS series of sensors only.
See Also	FE, FP, FX, HC, HI, MM, and SE; Command Summary

Command: **Force Energy**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	FE
Description	Puts instrument into Energy Measurement mode. Device returns **"*"** if successful and **"?HEAD CANNOT MEASURE ENERGY"** if not.
Example	User sent **"FE"**. Device returns **"*"**. Sensor is now measuring Energy.
Limitations	For Thermopile and Pyroelectric sensors.
See Also	FB, FP, FX, HC, HI, MM, and SE; Command Summary

Command: **Force Power**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	FP
Description	Puts instrument into Power Measurement mode. Device returns **"*"** if successful and **"?HEAD CANNOT MEASURE POWER"** if not.
Example	User sent **"FP"**. Device returns **"*"**. Sensor is now measuring Power.
Limitations	None
See Also	FB, FE, FX, HC, HI, MM, and SP; Command Summary

Command: **Filter Query**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	FQ <filter-setting>
Description	Query and set the filter setting of the sensor. Values for <filter-setting> (if not set, default to 0) • 0: Query device for present filter setting. • 1: Configure sensor for Filter Out mode. • 2: Configure sensor for Filter In mode. Note: On the 1919-R, for sensors that auto-detect the filter state, this is a query only and cannot be used to change the filter state
Example	Example 1. 918D sensor with Filter OUT. • User sent **"FQ"**. Device returns **"*1 OUT"**. Example 2. 918D sensor with Filter IN. • User sent **"FQ"**. Device returns **"*1 IN"**. Example 3. 818-SL-DB sensor. • User sent **"FQ"**. Device returns **"*1 OUT IN"**. Sensor is in Filter Out mode. • User sent **"FQ 2"**. Device returns **"* 2 OUT IN"**. Sensor has been reconfigured to Filter In mode. • User sent **"FQ 3"**. Device returns **"? 2 OUT IN"**. Invalid setting and sensor remains in Filter In mode.
Limitations	For Photodiode sensors only
See Also	HC; Command Summary

Command: **Force eXposure**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
	Pyro, Photo	Pyro	Pyro	Pyro	Pyro, Photo

Syntax	FX
Description	Puts instrument into exposure measurement mode. Device returns **"*"** upon success.
Example	User sent **"FX"**. Device returns **"*"**. Sensor is now measuring Exposure.
Limitations	On some instruments for Pyroelectric sensors only, on some instruments also for Photodiodes (see table above).
See Also	EE, FE, FP, MM, and SE; Command Summary

Command: **Get range in Use**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	GU
Description	When in autoranging, returns presently active numeric range.
Example	918D with Filter Out in autoranging. The latest readings have been about 2mW. Device returns **"*1"**.
Limitations	None
See Also	AR, RN, SX, and WN; Command Summary

Command: **Head Configuration**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	HC <configuration>
Description	Save selected Sensor Configuration Settings. Values for <configuration> • 'S': startup settings (Filter Setting, Energy Range, Diffuser setting, etc.). • 'C': Calibration settings. • 'R': Response settings. Device returns **"*SAVED"** on success, **"*UNCHANGED"** if nothing needed to be updated, or **"?FAILED"** if not successful.
Example	None
Limitations	R is for Thermopile sensors only
See Also	CQ, DQ, ET, FE, FM, FP, FQ, MM, PL, RQ, WD, WE, WI, WL, WM, WN; Command Summary

Command: **Head Information**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	HI
Description	Returns type, serial number, name, and measurement abilities of sensor. Measurement abilities are reported as an 8 byte hexadecimal code where Bit 0 is set if sensor can measure power. Bit 1 is set if sensor can measure energy. Bit 31 is set if sensor can measure frequency. All other bits are reserved and are not guaranteed to be 0 or 1.
Example	Example 1. 919P-003-10 sensor. Device returns **"* TH 12345 919P-003-10 00000183"**. The user knows that this is a Thermopile sensor (TH), its serial number (12345) and name (919P-003-10), and that it can be used to measure power or energy (bits 0 and 1 are set). Example 2. 919E-0.1-12-25K sensor. Device returns **"* PY 22323 919E-0.1-12 80000003"**. The user knows that this is a Pyroelectric sensor (PY), the serial number and name, and that it can measure power, energy, and frequency
Limitations	None
See Also	FE, FP, HT, and II; CommandSummary

Command: **Head Type**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	HT
Description	Returns more specific sensor type than the HI command Return Codes: • BT: BeamTrack • CP: Pyroelectric • SI : Photodiode • TH : Thermopile • XX : No sensor connected
Example	919P-003-10 sensor. Device returns "***TH**" 919E-0.1-12-25K sensor. Device returns "***CP**"
Limitations	None
See Also	FE, FP, HI, and II; CommandSummary

Command: **Instrument Configuration**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	IC
Description	Save Instrument Configuration. The new settings will be saved in the device's memory. Device returns **"*SAVED"** on success, **"*UNCHANGED"** if nothing needed to be updated, or **"?FAILED"** if not successful.
Example	None
Limitations	None
See Also	MA; CommandSummary

Command: **Instrument Information**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	II
Description	Returns id, serial number, and name of instrument being queried
Example	Device returns **"* 843R 113217 843R"**. The user knows that this is an 843-R-USB and its serial number (113217)
Limitations	None
See Also	HI; CommandSummary

Command: **Read Wavelength**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
					•

Syntax	IL 0 IL 2
Description	Query device for wavelength measurements The parameter determines the amount of information returned: • 0: <Power> <Wavelength> <Temperature> <Errors> <--> • 2: <Wavelength> The following is the listing of possible hexadecimal error codes. Other codes may be returned by the sensor but can be ignored; they are either meant as diagnostic information for Newport personnel or are reserved for future use. 02: Hold: Either the measured wavelength is changing quickly and is therefore unreliable, in which case the values returned are the previously measured values, or the wavelength has been set manually (see WM) 04: Close to edge: The measured wavelength is near the sensor's limits 08: Out of range: The wavelength is out of range – measurements are invalid 20: Temperature: The sensor's temperature has not yet stabilized. Measurements may be inaccurate 40: Input low: The signal's power is too low – measurements are invalid
Example	**"*2.286E-6 1451.06 27.20 00 1.000E+00"** There were no errors, the power is 2.286µW, the wavelength is 1451.06nm and the sensor temperature is 27.2°C
Limitations	For 819-WL Sensors only.
See Also	WM; Command Summary

Command: **MAins**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	MA <line-frequency>
Description	Query and set the line-frequency setting of the instrument. Values for <line-frequency> (if not set, default is 0) • 0: Query meter for present setting. • 1: Configure meter to work with mains of 50Hz (European standard). • 2: Configure meter to work with mains of 60Hz (North American and Japanese standard). Response: String containing index of presently active mains setting as well as literal description of both mains settings. If Remote User specified an unsupported index, will prefix a '?' to the response. Note: Factory default for devices is 50Hz
Example	Example 1. User sent **"MA"**. Device returns **"* 2 50Hz 60Hz"**. The User knows that the device is configured to work with a line frequency of 60Hz. Example 2. European customer wants to set the device to correct line frequency and sends **"MA 1"**. Device returns **"* 1 50Hz 60Hz"**
Limitations	None
See Also	IC; CommandSummary

Command: **Maximum Frequency**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Command	**MF (Maximum Frequency)**
Syntax	MF
Description	Queries the device for maximum pulse frequency at which the sensor can sample the laser for energy measurements.
Example	Example 1. 919E-10-24-10K set to 1µS pulse width. Device returns **"*10000".** The sensor can sample pulses of a laser whose frequency is 10kHz. Example 2. 919E-10-24-10K set to 5mS pulse width. Device returns **"*100"**. The sensor can sample pulses of a laser whose frequency is 100 Hertz.
Limitations	For Pyroelectric and Photodiode energy sensors only
See Also	HI, PL, and SF; CommandSummary

Command: **Measurement Mode**

The following table indicates which modes are supported for which instruments. 4C means exposure is supported on Pyroelectric sensors only. 4CD means exposure is supported on Pyroelectric and Photodiode sensors.

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
1, 2, 3, 5	1, 2, 3, 4CD, 5, 14, 16	1, 2, 3, 4C, 5, 14, 16	1, 2, 3, 4C, 5, 14, 16	1, 2, 3, 4C, 5, 14, 16	2, 3, 4CD, 5, 14, 15, 16

Syntax	MM <measurement-mode>
Description	Set instrument to selected Measurement Mode Values for < measurement-mode > • 0: Query present measurement mode • 1: Passive, non-measurement mode • 2: Power • 3: Energy • 4: Exposure (Pyroelectric, Photodiode) • 5: Power with Position (and Size) (PEPS sensors) • 6: Reserved for Future Use • 7: Reserved for Future Use • 8: Reserved for Future Use • 9: Reserved for Future Use • 10: Reserved for Future Use • 11: Reserved for Future Use • 12: Reserved for Future Use • 13: Reserved for Future Use • 14: Pulsed Power (Thermopile) • 15: Fast Power (Photodiode) • 16: Low Frequency Power (Photodiode) Device returns **"*"** on success, **"?NOT SUPPORTED"** if the sensor doesn't support this measurement mode, or "**?PARAM ERROR**" if it doesn't recognize the <measurement-mode>. Note: MM is intended to supersede the FB, FE, FP, and FX commands.
Example	None
Limitations	As listed in the table above
See Also	FB, FE, FP, FX, HC; Command Summary

Command: **Pulse Length**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	PL <pulse-length>
Description	Query and set maximum pulse-length (in time) that sensor is configured to measure. Values for <pulse-length> (if not set, default is 0) • 0: Query device for present setting. • 1: Set sensor to first pulse width setting. • 2: Set sensor to second pulse width setting. • Etc.
Example	919E-10-24-10K • User sent **"PL"**. Device returns **"*3 2.0us 30us 500us 1.0ms 5.0ms"**. The full set of options is 2µS, 30µS, 500µS, 1mS and 5mS and the sensor is presently configured to option 3 500µS pulses. • User sent **"PL 6".** Device returns **"?3 2.0us 30us 500us 1.0ms 5.0ms"**. 6 is a setting that is out of range and therefore the setting is still 500µS • User sent **"PL 1".** Device returns **"*"**. Setting has been changed to 2.0µs.
Limitations	For Pyroelectric and Photodiode Energy sensors only.
See Also	HC and MF; Command Summary

Command: **Read raNge**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	RN
Description	Returns presently active measurement range.
Example	Example 1. 918D in autoranging. Device responds **"*-1"**. Example 2. 919E-10-24-10K in 2mJ range. Device responds **"*4"**.
Limitations	
See Also	AR, GU, SX, and WN; Command Summary

Command: **Send Energy**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	SE
Description	Queries device for Energy Measurement
Example	This command returns the most recent energy measurement. To verify that the device has not previously reported it to the user, this command should be used in together with the EF command. Example. 1. User sends EF command. 2. Read device response. If response is **"*0"** repeat step 1. If response is **"*1"** continue with step 3. 3. User send SE command 4. Device responds **"*1.100E-4"** (110uJ)
Limitations	Not for Photodiode sensors. Sensor must be measuring Energy
See Also	EF, ER, FE, SF, and SP; Command Summary

Command: **Send Frequency**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	SF
Description	Queries device for frequency at which the laser is firing. Note: Although sensors can measure frequency up to 1000's of Hertz, to actually measure each of those pulses, you must work with the COM object
Example	Example. Device returns **"*1.000E3"**. The laser is firing at a frequency of 1000Hz.
Limitations	For Pyroelectric and Photodiode energy sensors only
See Also	MF, PL, SE, and SP; Command Summary

Command: **Send unIts**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	SI
Description	Queries meter for present measurement mode. Returns a single character that represents the present measurement mode. • d: dBm • J: Joules • W: Watts • X: Passive mode. Nothing being measured
Example	919P-003-10 measuring power. Device returns **"*W"**.
Limitations	None.
See Also	Command Summary

Command: **Simulate Key-press**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•				

Syntax	SK<0..3 for 843-R-USB, 0..8 for 1919-R>
Description	Simulates pressing a key on the meter's front panel • 0: Left-most softkey • 1: 2nd softkey. • 2: 3rd softkey • 3: Right-most softkey The following apply to the 1919-R only • 4: Right Arrow of the Navigation Panel • 5: Left Arrow of the Navigation Panel • 6: Up Arrow of the Navigation Panel • 7: Down Arrow of the Navigation Panel • 8: Enter Button of the Navigation Panel
Example	None.
Limitations	None.
See Also	Command Summary

Command: **Send Power**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	SP
Description	Queries device for Power Measurement
Example	For all sensors except Pyroelectric sensors: Return next power measurement • Example. User sent **"SP".** Device returns **"*1.300E-5"**. Power measured is 13 microwatts. For Pyroelectric sensors This command returns the most recent power measurement. To verify that the device has not previously reported it to the user, this command should be used in together with the EF command. Example. 1. User sends EF command. 2. Read device response. If response is **"*0"** repeat step 1. If response is **"*1"** continue with step 3. 3. User sends SP command 4. Device returns **"*1.100E-1"** (110mW)
Limitations	Sensor must be measuring Power
See Also	EF, FP, SE, and SF; Command Summary

Command: **Send maX**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	SX
Description	Queries device for the maximum allowable reading on present scale.
Example	Returns Max allowable reading for present range in scientific notation or AUTO if in autoranging. Examples: • **"*AUTO"** for sensor in autoranging. • **"*3.000E-2"** for sensor in the 30mW range.
Limitations	None
See Also	AR, GU, RN, WN; Command Summary

Command: **TTL output**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
					•

Syntax	TA <TTL-setting>
Description	Queries or sets the devices TTL output setting. When <TTL-setting> is 0, this is a query which returns the current setting and the available settings. When <TTL-setting> is greater than 0 it is the 1-based index of the desired setting. The following settings are available: • 1 Disable_(Low): The output will be set low • 2 On_(High): The output will be set high • 3 Signal_On_Error: The output will be high when there is a measurement error (out of range), and low when there is no measurement error • 4 Pass/Fail_Limits: The output will be high when there is a measurement error or when the measurement is out of the range set with the AATL command; at other times it will be high
Example	• User sent **"TA 0"**. Device returns **"*1 Disable_(Low) On_(High) Signal_On_Error Pass/Fail_Limits"**. TTL is set low • User sent **"TA 2"**. Device returns **"*2 Disable_(Low) On_(High) Signal_On_Error Pass/Fail_Limits"**. TTL is now set high
Limitations	None
See Also	AATL; Command Summary

Command: **TRigger Gate Type**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
					•

Syntax	TRGT <option>
Description	Queries or sets the type of gate trigger, when the trigger type (TRXT) is set to Gate. Values for <option> (if omitted, default to 0) • 0: Query • 1 StartStop: Use separate triggers to start and stop measuring (see TRST, TRSP) • 2 High: Measure only when the external trigger input is high • 3 Low: Measure only when the external trigger input is low • 4 Single: Start measuring when receiving a command (see TRSE) or when the on-screen softkey is pressed; stop measuring after receiving a single measurement
Example	• User sent **"TRGT 0"**. Device returns **"*1 StartStop High Low Single"** • User sent **"TRGT 2"**. Device returns **"*2 StartStop High Low Single"**
Limitations	None
See Also	TRXT, TRST, TRSP, TRSE; Command Summary

Command: **TRigger StatE**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
					•

Syntax	TRSE <option>
Description	Queries or sets whether the trigger is armed (not measuring) or triggered (measuring). This value can always be queried, but can only be set for trigger types that allow changing the state by command. Values for <option> (if omitted, default to 0) • 0: Query • 1 TriggerArmedState: The trigger is armed (not measuring) • 2 RunningState: The trigger is triggered (measuring)
Example	• User sent **"TRSE 0"**. Device returns **"*2 TriggerArmedState RunningState"** • User sent **"TRXE 1"**. Device returns **"*1 TriggerArmedState RunningState"**
Limitations	None
See Also	TRGT, TRST, TRSP; Command Summary

Command: **TRigger gate StoP**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
					•

Syntax	TRSP <option>
Description	Queries or sets the trigger gate stop, when the trigger type (TRXT) is set to Gate and the gate type (TRGT) is set to StartStop. Values for <option> (if omitted, default to 0) • 0: Query • 1 NeverStop: No stop trigger – once measuring has started there is no trigger to stop it • 2 ExternalTrigger: Stop measuring when an external trigger input is received • 3 SoftKey: Stop measuring when the on-screen softkey is pressed • 4 PCcommand: Stop measuring when receiving a command (see TRSE) • 5 OnTime: Stop measuring a fixed amount of time after starting measuring (see TRTI)
Example	• User sent **"TRSP 0"**. Device returns **"*1 NeverStop ExternalTrigger SoftKey PCcommand OnTime"** • User sent **"TRSP 2"**. Device returns **"*2 NeverStop ExternalTrigger SoftKey PCcommand OnTime"**
Limitations	None
See Also	TRXT, TRGT, TRXE, TRXH, TRSE, TRTI; Command Summary

Command: **TRigger gate StarT**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
					•

Syntax	TRST <option>
Description	Queries or sets the trigger gate start, when the trigger type (TRXT) is set to Gate and the gate type (TRGT) is set to StartStop. Values for <option> (if omitted, default to 0) • 0: Query • 1 AlwaysRunning: No start trigger – defaults to measuring, if measurement is stopped there is no trigger to restart it • 2 ExternalTrigger: Start measuring when an external trigger input is received • 3 SoftKey: Start measuring when the on-screen softkey is pressed • 4 PCcommand: Start measuring when receiving a command (see TRSE)
Example	• User sent **"TRST 0"**. Device returns **"*1 AlwaysRunning ExternalTrigger SoftKey PCcommand"** • User sent **"TRST 2"**. Device returns **"*2 AlwaysRunning ExternalTrigger SoftKey PCcommand"**
Limitations	None
See Also	TRXT, TRGT, TRXE, TRXH, TRSE; Command Summary

Command: **TRigger stop TIme**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
					•

Syntax	TRTI <-1 or 0-86400000>
Description	Queries or sets the trigger gate stop time in milliseconds, when the trigger type (TRXT) is set to Gate, the gate type (TRGT) is set to StartStop, and the gate stop (TRSP) is set to OnTime.
Example	• User sent **"TRTI -1"**. Device returns **"*100"** indicating that the gate trigger will stop measuring 100ms after it starts. • User sent **"TRTI 200"**. Device returns **"*200"**. The trigger will now stop measuring 200ms after it starts.
Limitations	None
See Also	TRXT, TRGT, TRSP; Command Summary

Command: **pulse TRigger Window**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
					•

Syntax	TRTW <0 or 1-50000>
Description	Queries or sets the devices external trigger window size in microseconds, when the trigger type (TRXT) is set to Pulse.
Example	• User sent **"TRTW 0"**. Device returns **"*100"** • User sent **"TRTW 200"**. Device returns **"*200"**
Limitations	For Pyroelectric and Photodiode energy sensors only
See Also	TRXT TRXE; Command Summary

Command: **eXternal TRigger Edge**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
					•

Syntax	TRXE <option>
Description	Queries or sets the triggering edge for the external trigger input. Values for <option> (if omitted, default to 0) • 0: Query • 1 Falling: The external trigger is triggered on a falling edge input • 2 Rising: The external trigger is triggered on a rising edge input
Example	• User sent **"TRXE 0"**. Device returns **"*1 Falling Rising"** • User sent **"TRXE 2"**. Device returns **"*2 Falling Rising"**
Limitations	None
See Also	TRST, TRSP, TRXH, TRTW; Command Summary

Command: **eXternal TRigger Holdoff time**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
					•

Syntax	TRXH <-1 or 0.001-210000>
Description	After receiving an external trigger input, the device will wait before the trigger takes effect. This command queries or sets the delay, in milliseconds.
Example	• User sent **"TRXH -1"**. Device returns **"*0.00000"** indicating that the external trigger takes effect immediately. • User sent **"TRXH 1.5"**. Device returns **"*1.50000"**. The trigger will now take effect 1.5ms after the external input is received.
Limitations	Does not apply to Pulse trigger type
See Also	TRST, TRSP, TRXE; Command Summary

Command: **TRigger Type**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
					•

Syntax	TRXT <option>
Description	Queries or sets the devices trigger type. Values for <option> (if omitted, default to 0) • 0: Query • 1 Disable: Do not use triggers, measure continuously • 2 Gate: Use triggers to start/stop measuring • 3 Pulse: Use external trigger to indicate when to expect a pulse (for pyroelectric sensors only)
Example	• User sent **"TRXT 0"**. Device returns **"*1 Disable Gate Pulse"** • User sent **"TRXT 2"**. Device returns **"*2 Disable Gate Pulse"**
Limitations	The Pulse option is available for Pyroelectric and Photodiode energy sensors only
See Also	TRGT, TRTW, TRXE; Command Summary

Command: **User Threshold**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	UT <0..2500>
Description	Queries and sets threshold for Pyroelectric and Photodiode energy sensors. This aids in screening out false triggers due that may arise due to electronic noise.
Example	Examples: • "**$UT**". Device returns "***300 169 2500**". Present threshold setting is 3%, minimum is 1.69%, maximum is 25% • "**$UT 2000**" Device returns "***2000 169 2500**". Threshold now set to 20%, minimum is 1.69%, maximum is 25%
Limitations	For Pyroelectric and Photodiode energy sensors only.
See Also	ET; Command Summary

Command: **VErsion**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	VE
Description	Query device for version of embedded software
Example	Firmware version 1.33 is installed. The 843-R-USB returns **"*EF1.33"**
Limitations	None
See Also	Command Summary

Command: **Wavelength adD**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	WD <Index> <Wavelength>
Description	Add a wavelength to list of favorite wavelengths that the sensor is configured to work with. Index: Location in list of wavelengths in which to insert the wavelength selected (must between an unused value between 1 and 6 as returned by the AW command) Wavelength: New favorite wavelength (must be between the lower and upper wavelength limits as returned by the AW command)
Example	919E-0.1-12-25K these following settings as returned by the AW command **"*CONTINUOUS 193 12000 4 NONE 366 532 1064 2100 10.6"** • User sent **"WD 4 248"**. Device returns **"?WAVELENGTH ALREADY DEFINED. USE WL COMMAND"** • User sent **"WD 1 100"**. Device returns **"?WAVELENGTH OUT OF RANGE"** • User sent **"WD 7 248"**. Device returns **"?INDEX NOT IN RANGE"**. • User sent **"WD 1 248"**. Device returns **"*"**.
Limitations	For all sensors with a continuous spectrum
See Also	AW, HC, WE, WI, and WL; Command Summary

Command: **Wavelength Erase**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	WE <Index>
Description	Instructs device to delete from its list of favorite wavelengths the wavelength at location <Index>. Index must be between 1 and 6 and not the presently active index.
Example	919E-0.1-12-25K with these settings as returned by the AW command **"*CONTINUOUS 193 12000 4 248 366 532 1064 2100 10.6"** • User sent **"WE 4"**. Device returns **"?CANNOT ERASE PRESENTLY ACTIVE INDEX"**. • User sent **"WE 5"**. Device returns **"*"**.
Limitations	For all sensors with a continuous spectrum
See Also	AW, HC, WD, WI, and WL; Command Summary

Command: **Wavelength Index**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	WI <Index>
Description	Set the device to work with wavelength at location <Index> in list of favorite wavelengths.
Example	919E-0.1-12-25K with these settings as returned by the AW command **"*CONTINUOUS 193 12000 4 248 366 532 1064 NONE 10.6"** • User sent **"WI 5"**. Device returns **"?NO WAVELENGTH DEFINED AT SELECTED INDEX"**. • User sent **"WI 1"**. Device returns **"*"**.
Limitations	None
See Also	AW, HC, WD, WE, and WL; Command Summary

Command: **WaveLength**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	WL <Wavelength>
Description	Set wavelength at presently active index to new value. <Wavelength> must be between the lower and upper limits of the spectrum as returned in the AW command
Example	919E-0.1-12-25K with these settings as returned by the AW command **"*CONTINUOUS 193 12000 1 248 366 532 1064 NONE 10.6"** • User sent **"WL 19000"**. Device returns **"?WAVELENGTH OUT OF RANGE"**. • User sent **"WL 11000"**. Device returns "**"**.
Limitations	For all sensors with a continuous spectrum
See Also	AW, HC, WD, WE, and WI; Command Summary

Command: **Manual Wavelength**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
					•

Syntax	WM <manual-wavelength-setting>
Description	Query and set whether the sensor will use the measured wavelength or the manually set wavelength. Values for <manual-wavelength-setting> (if missing, default to 0) • 0: Query meter for present manual wavelength mode • 1: Use automatic (i.e. measured) wavelength • 2: Use manually set wavelength (set with WI or WL)
Example	Example 1. • User sent **"WM"**. Device returns **"*1 AutoWL_Mode ManualWL_Mode"**. Currently using automatic wavelength. Example 2. • User sent **"WM 2"**. Device returns **"*2 AutoWL_Mode ManualWL_Mode"**. Now using manual wavelength.
Limitations	For 819-WL sensors only
See Also	HC, WI, WL, and IL; Command Summary

Command: **Write raNge**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	WN <range-setting>
Description	Configure sensor to measure in a specific range Note: The index of the highest numeric range is 0. The index of AUTO (when applicable) is -1
Example	To force a 918D in Filter Out mode into the 3mW range enter **"WN 1"**. Device returns "*".
Limitations	None
See Also	AR, GU, RN, and SX; Command Summary

Advanced Commands

Commands described in this chapter will affect the measurement performance of the sensor. They should be used with caution.

Command: **Calibration Query**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
	•	•	•	•	•

General Overview

Syntax	CQ <factor-index> <new-factor>
Description	Query and set presently active calibration factors. Values for <factor-index> (if not set, default is 0) • 0: Query only. • 1: Request to change the active overall factor. • 2: Request to change the active laser's factor. For sensors that don't have per-wavelength factors, will return error code. New-factor is a floating-point number between 0.0002 and 2.0 scaled up by 10000 (2 to 20000)
Example	Examples for different sensor types are listed below
Limitations	None
See Also	HC; Photodiode, Pyroelectric – Continuous, Pyroelectric – Discrete, Thermopile; Command Summary;

Photodiode Sensors

Syntax	See CQ (Calibration Query – Overview)
Description	Will return overall factor presently in use (depends on the Filter setting). Photodiode sensors only have an overall factor. Therefore Factor-index should not be set to 2.
Example	• User sent **"CQ"**. Device responded **"*1.025"** (correction factor of 2.5%) • User sent **"CQ 2 10000"**. Device responded **"?1.025"** (factor not changed). • User sends **"CQ 1 22000"**. Device responds **"?PARAM ERROR"** (new-factor is greater than 20000). • User sends **"CQ 1 10100"**. Device responds **"*1.0100"** (factor set to 1%). Note. In order to adjust the calibration factors for both Filter Out and Filter In modes the User should perform the following steps 1. FQ 1 (Set the sensor to Filter Out mode) 2. Adjust Filter Out factor with the CQ command 3. FQ 2 (Set the sensor to Filter In mode) 4. Adjust Filter In factor with the CQ command 5. HC C (to save calibration factors permanently)
Limitations	None
See Also	FQ and HC; Calibration Query – Overview

Thermopile Sensors

Syntax	See CQ (Calibration Query – Overview)
Description	CQ returns 4 values • User Power or Energy factor (depending on measurement mode). This factor can be updated by "CQ 1 <value>". It affects measurements with any laser. • User Laser factor. This factor can be updated by "CQ 2 <value>". It affects measurement with the presently active laser only • Overall Laser factor. This is the factor that the Device uses for the present Laser in use. It is affected by the User Laser Factor and by a Newport calibration factor for this wavelength that cannot be adjusted by the User • Overall Sensitivity. This is a composite of the User Power factor, the Laser factors in use, and a Newport overall sensitivity factor that cannot be adjusted by the User. Note that changes in the Power Factor affect this field for all Lasers. Changes in the User Laser Factor affect this field only for the present laser in use.
Example	• User sent **"AW"**. Device responded **"*DISCRETE 1 CO2 YAG VIS"**. Presently active laser is CO2 • User sent **"SI"**. Device responded **"*W"**. Sensor is in power mode. • User sent **"CQ"**. Device responded **"*1.0000 1.0000 1.0000 2.5926E-8"**. These are the factors for CO2 laser in Power Mode. • User sent **"CQ 1 11000"**. Device responded **"*1.1000 1.0000 1.0000 2.3569E-8"**. Note the change in fields 1 and 4. • User sent **"CQ 2 11000"**. Device responded **"*1.1000 1.1000 1.1000 2.1426E-8"**. Note the change in fields 2, 3, and 4 • User sent **"WI 2"**. Device responded **"*"**. Presently active laser is now YAG. • User sent **"CQ"**. Device responded **"*1.1000 1.0000 1.0950 2.1524E-8"**. Fields 2, 3, and 4 were replaced by values for YAG laser • User sent **"CQ 2 9000"**. Device responded **"*1.1000 0.8999 0.9853 2.3919E-8"**. Note change in fields 2, 3, and 4 • User sent **"WI 1"**. Device responded **"*"**. Presently active laser is now CO2. • User sent **"CQ"**. Device responded **"*1.1000 1.1000 1.1000 2.1426E-8"**. Notice that the values are the same as in step 5. The laser specific changes of step 8 have no effect on a different laser. • User sent **"FE"**. Device responded **"*"**. Sensor is in energy mode • User sent **"CQ"**. Device responded **"*1.0000 1.1000 1.1000 2.1426E-8"**. Field 1 is the energy factor. It has no effect on field 4.
Limitations	None
See Also	AW, FE, FP, HC, and WI; Calibration Query – Overview

Pyroelectric Sensors – Continuous

Syntax	See CQ (Calibration Query – Overview)
Description	Will return overall factor presently in use (depends on the Pulse Width setting). These Pyroelectric sensors only have an overall factor. Therefore Factor-index should not be set to 2.
Example	• User sends **"CQ"**. Device responds **"*1.025"** (correction factor of 2.5%) • User sends **"CQ 2 10000"**. Device responds **"?1.025"** (factor not changed) • User sends **"CQ 1 22000"**. Device responds **"?PARAM ERROR"** (new-factor is greater than 20000) • User sends **"CQ 1 10100"**. Device responds **"*1.0100"** (factor set to 1%) Note. In order to adjust the calibration factors for all pulse widths, use CQ in conjunction with the PL command.
Limitations	None
See Also	PL and HC; Calibration Query – Overview

Pyroelectric Sensors – Discrete

Syntax	See CQ (Calibration Query – Overview)
Description	CQ returns 3 values • Overall Energy Factor. This factor can be updated by "CQ 1 <value>". It affects measurements with any laser. • User Laser factor. This factor can be updated by "CQ 2 <value>". It affects measurement with the presently active laser only • Overall Laser factor. This is the factor that the Device uses for the present Laser in use. It is affected by the User Laser Factor and by a Newport calibration factor for this wavelength that cannot be adjusted by the User
Example	• User sent **"AW"**. Device responds **"* DISCRETE 2 248 1064 193"**. Presently active wavelength is 1064 • User sent **"CQ"**. Device responds **"*1.0000 1.0000 1.2500"** • User sent **"CQ 1 11000"**. Device responds **"*1.1000 1.0000 1.2500"**. Only first factor changed. • User sent **"CQ 2 12000"**. Device responds **"*1.1000 1.2000 1.5000"**. Note change in fields 2 and 3. • User sent **"WI 1"**. Device responds "*". Presently active laser is now 248 • User sent **"CQ"**. Device responds **"*1.1000 1.0000 1.0000"**. Overall Energy factor is unchanged. Factors 2 and 3 have been replaced by values for 248 • User sent **"CQ 2 9000"**. Device responds **"*1.1000 0.8999 0.8999"**. Note change in fields 2 and 3. • User sent **"WI 2"**. Device responds "*". Presently active laser is now 1064. • User sent **"CQ 2 12000"**. Device responds **"*1.1000 1.2000 1.5000"**. Note values of factors 2 and 3 are same as in step 4. The laser specific changes of step 8 have no effect on a different laser. Note. In order to adjust the calibration factors for all pulse widths, use CQ in conjunction with the PL command. For sensors with an adjustable diffuser, use CQ together with the DQ command.
Limitations	None
See Also	AW, DQ, HC, PL, and WI; Calibration Query – Overview

Command: **analog output type**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
	•	•	•	•	•

Syntax	RO <analog-output-type>
Description	Queries or sets the analog output type. **For the x938-R** Values for <analog-output-type> (if not present, default is 0) • 0: Query current analog output type • 1: Set the analog output type to digital • 2: Set the analog output type to raw **For the 1919-R, 841-PE-USB, 844-PE-USB, 845-PE-RS** Values for <analog-output-type> • Not present: Query current analog output type • 0: Set the analog output type to digital • 1: Set the analog output type to raw
Example	
Limitations	
See Also	DS; Command Summary

Command: **Response Query**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
	•	•	•	•	•

Syntax	RQ <response-factor>
Description	Query and set the User adjustable response time factor. Response-factor is a floating-point number between 0.0002 and 2.0 scaled up by 10000 (2 to 20000)
Example	User sent **"RQ"**. Device responds **"*1.000"** User sends **"RQ 22000"**. Device responds **"?PARAM ERROR"** (Response-factor is greater than 20000). User sends **"RQ 10100"**. Device responds **"*1.0100"**
Limitations	For Thermopile sensors only
See Also	CQ and HC; Calibration Query – Overview; Command Summary;

Command: **Zero Abort**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	ZA
Description	Aborts request to zero the device's measurement circuitry. Device returns status of the zeroing process. **"*ZEROING NOT STARTED"**. If ZA was sent before the ZE command. **"*ZEROING ABORTED"**. If ZA was sent before zeroing was completed. **"*ZEROING COMPLETED"**. If ZA was sent after zeroing was completed.
Example	User sent **"ZE"** followed by the **"ZA"** command. Device returned **"*ZEROING ABORTED"**.
Limitations	None
See Also	ZE, ZQ, and ZS; Command Summary

Command: **ZEro**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
	•	•	•	•	•

Syntax	ZE
Description	Analog components occasionally “drift” thereby introducing small errors in the meter’s measurement circuitry. This command measures that drift and subtracts it from measurements. We suggest zeroing the device once in two months.
Example	Example 1. User sent **“ZE”**. Device responded **“*”**. Example 2. User sent **“ZE”** before previous zeroing request terminated. Device responded **“?ZEROING IN PROGRESS”**. Note. There are three different types of zeroings. • High Impedance: With no sensor attached or with a Photodiode sensor attached. • Low Impedance: With a Thermopile sensor attached. For these sensors, the User should first perform a Low Impedance zero, save the result, and then perform a High Impedance zero. • Fast Zero: With a Pyroelectric sensor attached
Limitations	None
See Also	ZA, ZQ, and ZS; Command Summary

Command: **Zero Query**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	ZQ
Description	User request to determine status of zeroing process. Device will return **“*ZEROING NOT STARTED”**. If ZE command has not been sent. **“*ZEROING IN PROGRESS”**. If ZE command was sent but the zeroing process has not yet terminated. **“*ZEROING COMPLETED”**. If the zeroing process terminated successfully. **“*ZEROING FAILED”**. If the zeroing process terminated unsuccessfully. **“*ZEROING ABORTED”**. If the zeroing process was terminated by the ZA command.
Example	• User sent **“ZQ”**. Device responded **“*ZEROING NOT STARTED”**. • User sent **“ZE”**. Device responded **“*”**. • User sent **“ZQ”**. Device responded **“*ZEROING IN PROGRESS”**. • Delay about 30 seconds. • User sent **“ZQ”**. Device responded **“*ZEROING COMPLETED”**.
Limitations	None
See Also	ZA, ZE, and ZS; Command Summary

Command: **Zero Save**

Supported on the following meters:

843-R-USB	1919-R	841-PE-USB	844-PE-USB	845-PE-RS	x938-R
•	•	•	•	•	•

Syntax	ZS
Description	Save results of the zeroing process to the device's memory. Device returns "?ZEROING ABORTED". If ZS is issued after zero was aborted. "?ZEROING IN PROGRESS". If ZS is issued during zeroing process. "?ZEROING FAILED". If ZS is issued after zeroing process failed. "*SAVED". Upon success
Example	• User sent **"ZS"**. Device responded **"?ZEROING NOT STARTED"**. • User sent **"ZE"**. Device responded **"*"**. • User sent **"ZS"**. Device responded **"?ZEROING IN PROGRESS"**. • Delay about 30 seconds. • User sent **"ZS"**. Device responded **"*SAVED"**.
Limitations	None
See Also	ZA, ZE, and ZQ; Command Summary