

User Commands

Revision History

05	22-Aug-2022	<ul style="list-style-type: none">• Updated for Juno-RS• Updated for Ariel• Removed USBI• Added BD command• Added AAHR command
04	02-May-2019	<ul style="list-style-type: none">• Updated for Centauri and Juno+• Added information about multiple channels• Updated for new features: Pulsed Power, Fast Power, Low Frequency Power, External Trigger, TTL output• General formatting improvements
03	17-Aug-2017	<ul style="list-style-type: none">• Updated section Device Communication Details for RS-232
02	24-Apr-2017	<ul style="list-style-type: none">• Adding section Device Communication Details
01	08-May-2016	<ul style="list-style-type: none">• Initial Revision

Introduction

This document is based on one that was originally released with the ActiveX package that was provided for the USBI device. That package has since been replaced by the OphirLMMeasurement COM Object. We have also added many instruments to our line as well as having expanded the list of commands supported.

This document is an updated and detailed description of the various commands that are used for remote control of Ophir meters. 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 fully embracing working with the COM object. However, if there is a need to support legacy code, or RS-232 communication, this is here for you.

Nova-II, Vega, StarBright, Centauri

In addition to USB, the Nova-II, Vega, StarBright, and Centauri instruments are equipped with RS-232 communication capabilities.

Juno-RS

The Juno-RS communicates over RS-232 only.

Pulsar

The Pulsar is limited in its ability to allow remote control when measuring with Pyroelectric sensors. As such, for work with Pyro's on a Pulsar, the user must work with the standard COM object methods.

Ophir User Commands

This section describes the commands available to control the Ophir devices. It is divided into 4 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. [Logging Commands](#). These commands are specific to the Nova-II and Vega. They provide a means for uploading to the PC log files that were stored on board the meters.
4. [Advanced Commands](#). Commands that change calibration factors of the sensors and instrument. Use of these commands will change the results of measurements and should be used only after careful consideration.

When using the COM object, commands are sent to the device by calling the [Write](#) method and responses are received by calling the [Read](#) method. Alternatively, for instruments which support it, commands can be sent and responses received via RS-232 using any standard method.

Note: Devices expect a command before sending a response. 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.

Device Communication Details

In order to maintain code compatibility across the line of Ophir devices note the following syntax.

- 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 "\$" (Hex 0x24) and suffixed by a <LF> (Hex 0x0A).
- Response to successful command starts with a "*" (Hex 0x2A) and ends with a <LF>.
- Response to an invalid command starts with a "?" (Hex 0x3F) and ends with a <LF>. These codes are passed back to the user (as part of the string returned by the Read method) to allow the user to flag errors and perform application dependent error processing.
- When communicating in RS-232, the suffix of the command must also contain a <CR> (Hex 0x0D). The suffix of the response will contain a <CR> as well.

Note: The COM Object Write method for communication appends and removes the flags at the beginning and end of the ASCII strings.

Multichannel devices

The Pulsar and Centauri have more than one channel. 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 all commands available with Ophir devices.

Command	Meaning
AAHR	High Resolution
AAPC	Pulse Cycle
AATL	TTL pass/fail Limits
AF	Average Flag
AQ	Average Query
AR	All Ranges
AW	All Wavelengths
BD	BauD rate
BQ	BC20 Query
BT	BeamTrack
CL	select Channel
CQ	Calibration Query
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
FS	Force Screen
FX	Force eXposure
GU	Get range in Use
HC	Head Configuration
HI	Head Information
HT	Head Type
IC	Instrument Configuration
II	Instrument Information
KL	Key Legends
LC	Log Choose
LD	Log Delete
LF	Log File
LI	Log Info

Command	Meaning
LL	Log Last
LR	Log Reset
LS	Log Send
MA	MAins
MF	Maximum Frequency
MM	Measurement Mode
PL	Pulse Length
RE	REset
RN	Read raNge
RQ	Response Query
SE	Send Energy
SF	Send Frequency
SG	Send averaGe
SI	Send units
SK	Simulate Key-press
SP	Send Power
SX	Send maX
TA	TTL output
TW	Trigger Window
UT	User Threshold
VE	VErsion
WD	Wavelength adD
WE	Wavelength Erase
WI	Wavelength Index
WL	WaveLength
WN	Write raNge
WW	Wavelength Discrete
XO	eXternal trigger On/off
XT	eXternal Trigger mode
ZA	Zero Abort
ZE	Zero
ZQ	Zero Query
ZS	Zero Save

Basic Commands

Command: High Resolution

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
	•	•				•			

Syntax	AAHR <option>
Description	<p>Queries or sets measurement resolution. Normally instruments send 4 significant digits of measurement, when set to high resolution they can send 7 significant digits. Note that this option affects communication of measurements to the PC, the actual measurement is not affected.</p> <p>Values for <option> (if not set, default to 0)</p> <ul style="list-style-type: none">• 0: Query• 1: Normal resolution (4 digits)• 2: High resolution (7 digits)
Example	<ul style="list-style-type: none">• 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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•				•			•

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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
									•

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	<ul style="list-style-type: none">• 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 Flag**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
			•	•					

Syntax	AF
Description	Checks if a new averaged reading has been prepared since previous use of SG command.
Example	Returns: 0 (no new average) or 1 (new average prepared).
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	AQ and SG ; Command Summary

Command: **Average Query**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
			•	•	•	•			•

Syntax	AQ <average-setting>
Description	<p>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.</p> <p>Values for <average-setting> (if not set, default to 0)</p> <ul style="list-style-type: none">• 0: Query device for present average setting.• 1: Configure sensor for first setting ("NONE")• 2: Configure sensor for second setting.• Etc
Example	<p>PE50-BBDIF-C set to average over one second</p> <ul style="list-style-type: none">• 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	AF and SG ; Command Summary

Command: **All Ranges**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

Syntax	AR
Description	Returns all ranges available in sensor. This is prefixed by the index of the presently active range.
Example	For a PD300 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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

Syntax	AW
Description	Returns string fully describing the wavelengths that the sensor is configured to work with.
Example	Example 1. PD300 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 StarLab (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. 3AP 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 , WL , and WW ; Command Summary

Command: **BauD rate**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
		•							

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	<ul style="list-style-type: none">• User sent “BD”. Device returns “*115200”• User sent “BD 9600”. Device returns “*9600”
Limitations	None
See Also	Command Summary

Command: **BC20 Query**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•		•			

Syntax	BQ <BC20-setting>
Description	Query and set BC20 sensor mode (HOLD or CONTINUOUS). Returns string containing index of present BC20 Mode as well as a literal description of both modes If Remote User specified an unsupported index, will prefix a '?' to the response. Values for <average-setting> (if not set, default to 0) <ul style="list-style-type: none">• 0: Query device for present setting.• 1: for HOLD (if applicable)• 2: for CONTINUOUS
Example	<ul style="list-style-type: none">• User sent “BQ”. Meter returned “* 1 HOLD CONTINUOUS”. Sensor is in HOLD mode.• User sent “BQ 2”. Device returns “* 2 HOLD CONTINUOUS”. Sensor is now in CONTINUOUS mode.• User sent “BQ 3”. Device returns “? 2 HOLD CONTINUOUS”. Requested setting was an error. Sensor stayed in CONTINUOUS mode.
Limitations	For BC20 Sensors only. Error string will be returned for all other sensor types.
See Also	Command Summary

Command: **BeamTrack**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•			•

Syntax	BT
Description	<p>Query device for latest BeamTrack position and size measurements</p> <p>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</p> <p>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 Ophir personnel or are reserved for future use.</p> <p>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</p>
Example	<p>"* F 00000000 X -1.50 Y -0.9 S 6.50"</p> <p>There were no errors, the spot size is 6.5mm and is found at the coordinates (-1.5, -0.9)</p>
Limitations	For BeamTrack Sensors only.
See Also	Command Summary

Command: **select Channel**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
								•	•

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: Diffuser Query

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•			•

Syntax	DQ <diffuser-setting>
Description	<p>Query and set the diffuser setting of the sensor.</p> <p>Values for <diffuser-setting> (if parameter isn't set, default to 0)</p> <ul style="list-style-type: none">• 0: Query meter for present Diffuser Mode• 1: Configure sensor for Diffuser Out mode• 2: Configure sensor for Diffuser In mode
Example	<p>Example 1. A PE10-C sensor.</p> <ul style="list-style-type: none">• User sent "DQ". Device returns "*1 N/A". There is only 1 setting (that the command is not applicable). <p>Example 2. PE50-BBDIF.</p> <ul style="list-style-type: none">• 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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
Pyro C	Pyro	Pyro	Pyro	Pyro		Pyro, Photo			Pyro, Photo

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

Command: **Energy Flag**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

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 in power or energy measurement modes; Thermopile sensors in energy or pulsed power measurement modes
See Also	ER (Thermopile only), SE , and SP (for Pyroelectric only), MM ; Command Summary

Command: **Energy Pulse length**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•				•	•		•

Syntax	EP <0 or 1-10000>
Description	Queries or sets the pulse length in milliseconds for pulsed power mode on Thermopile sensors. The Ariel measures the pulse length with each measurement, and therefore will return “*AUTO” for a query and “?AUTO” when attempting to set the value.
Example	Returns: The current pulse length.
Limitations	Applicable to pulsed power measurement mode only
See Also	MM ; Command Summary

Command: **Energy Ready**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

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 ready for a new energy pulse or “*0” if not.
Limitations	For Thermopile sensors only, in energy or pulsed power measurement modes
See Also	EF and SE ; Command Summary

Command: **Energy Threshold**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

Syntax	ET <threshold>
Description	Query and set the threshold setting of the sensor. Values for <threshold> (if not set, default to 0) <ul style="list-style-type: none">• 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	30A sensor. <ul style="list-style-type: none">• 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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•			•

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 BeamTrack series of sensors only.
See Also	FE , FP , FX , HC , HI , MM , and SE ; Command Summary

Command: **Force Energy**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

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: **Force Power (Illuminance Sensors)**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•		•			•

Syntax	FP <lux or footcandles>
Description	<p>Special case of FP command for PD300-CIE sensors. Causes the instrument to go to a specified illuminance measurement screen, irrespective of current status. If no parameter is sent, this command will force the instrument into the currently configured illuminance screen.</p> <p>Values for <lux or footcandles></p> <ul style="list-style-type: none">• L: Set measurement mode to lux• F: Set measurement mode to footcandles
Example	User sent “FP L”. Device returns “*”. Sensor is now measuring lux.
Limitations	None
See Also	FB , FE , FX , HC , HI , MM , and SP ; Command Summary

Command: **Filter Query**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•		•	•

Syntax	FQ <filter-setting>
Description	<p>Query and set the filter setting of the sensor.</p> <p>Values for <filter-setting> (if not set, default to 0)</p> <ul style="list-style-type: none">• 0: Query device for present filter setting.• 1: Configure sensor for Filter Out mode.• 2: Configure sensor for Filter In mode.
Example	<p>Example 1. 3A-IS sensor.</p> <ul style="list-style-type: none">• User sent “FQ”. Device returns “*1 N/A”. There is only 1 setting (that the command is not applicable). <p>Example 2. PD300 sensor.</p> <ul style="list-style-type: none">• 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 Screen**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•		•

Syntax	Force Screen <screen-setting>
Description	<p>Force the instrument into one of the screens</p> <p>Values for <screen-setting></p> <ul style="list-style-type: none">• 0: Force to power measurement.• 1: Force to energy measurement.• 2: Force to non-measurement screen• 3: Force to no sensor connected screen• 5: Force to Position screen (BeamTrack sensors only)
Example	<p>Example 1. 3A-IS sensor.</p> <ul style="list-style-type: none">• User sent “FS 1”. Now measuring power• User sent “FS 2”. Now measuring energy <p>Example 2. PD300 sensor.</p> <ul style="list-style-type: none">• User sent “FS 1”. Now measuring power• User sent “FS 2”. Device responds with error code because sensor cannot be used for measuring energy
Limitations	None
See Also	FB , FE , FP , HC , MM : Command Summary

Command: **Force eXposure**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
Pyro C	Pyro	Pyro	Pyro	Pyro		Pyro, Photo			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 most instruments for Pyroelectric sensors only, on some instruments also for Photodiodes (see table above). On Juno, supported only for Pyro C, not for old Pyros
See Also	EE , FE , FP , MM , and SE ; Command Summary

Command: **Get range in Use**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•			•

Syntax	GU
Description	When in autoranging, returns presently active numeric range.
Example	PD300 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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

Syntax	HC <configuration>
Description	Save selected Sensor Configuration Settings. Values for <configuration> <ul style="list-style-type: none">• ‘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 , PL , RQ , WD , WE , WI , WL , WN , WW ; Command Summary

Command: Head Information

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

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 lit if sensor can measure power. Bit 1 is lit if sensor can measure energy. Bit 31 is lit if sensor can measure frequency. All other bits are reserved and are not guaranteed to be 0 or 1.
Example	Example 1. 03AP sensor. Device returns “* TH 12345 03AP 00000183” . The user knows that this is a Thermopile sensor (TH), its serial number (12345) and name (03AP), and that it can be used to measure power or energy (bits 0 and 1 are lit). Example 2. PE10-C sensor. Device returns “* PY 22323 PE10-C 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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•		•

Syntax	HT
Description	Returns more specific sensor type than the HI command Return Codes: <ul style="list-style-type: none">• BC : BC20• BT: BeamTrack• CR : RM9 family of sensors• CP: Pyroelectric• FX : Axial Sensor• LX : PD300-CIE sensor• NJ : nanoJoule meter (obsolete sensor type)• PY : Pyroelectric (obsolete sensor type)• RM : PD300RM• SI : Photodiode• TH : Thermopile• TP : Temperature Probe (obsolete sensor type)• XX : No sensor connected
Example	3A-P sensor. Device returns “*TH” PE10-C sensor. Device returns “*CP”
Limitations	None
See Also	FE , FP , HI , and II ; CommandSummary

Command: **Instrument Configuration**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

Syntax	II
Description	Returns id, serial number, and name of instrument being queried
Example	Device returns ** JNPL 443002 JUNO_PLUS . The user knows that this is a Juno+ and its serial number (443002)
Limitations	None
See Also	HI ; CommandSummary

Command: **Key Legends**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
			•	•					

Syntax	KL
Description	Returns a string containing the legends for each soft key, delimited by the open quote character ". A tilde "~" character preceding a legend indicates an active, reverse highlighted key.
Example	None
Limitations	None
See Also	SK ; CommandSummary

Command: **MAins**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

Syntax	MA <line-frequency>
Description	<p>Query and set the line-frequency setting of the instrument.</p> <p>Values for <line-frequency> (if not set, default is 0)</p> <ul style="list-style-type: none">• 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). <p>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.</p> <p>Note: Factory default for devices is 50Hz</p>
Example	<p>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.</p> <p>Example 2. European customer wants to set the device to correct line frequency and sends "MA 1". Device returns "* 1 50Hz 60Hz"</p>
Limitations	Unsupported on Nova-II / Vega unless working with a BeamTrack sensor.
See Also	IC ; CommandSummary

Command: **Maximum Frequency**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•			•

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	<p>Example 1. PE25-C set to 1µS pulse width. Device returns "*10000". The sensor can sample pulses of a laser whose frequency is 10kHz.</p> <p>Example 2. PE25-C set to 5mS pulse width. Device returns "*100". The sensor can sample pulses of a laser whose frequency is 100 Hertz.</p>
Limitations	For Pyroelectric and Photodiode energy sensors only
See Also	HI , PL , and SE ; CommandSummary

Command: **Measurement Mode**

The following table indicates which modes are supported for which instruments. 4C means exposure is supported on Pyro C sensors only. 4E means exposure is supported on all Pyroelectric sensors. 4CD means exposure is supported on Pyro C and Photodiode sensors. Note that the MM command is not supported on Pulsar – use [FE](#), [FP](#) and [FX](#) instead. For BC-20 sensors on the Nova II and Vega use [BQ](#). For PD300-CIE on Nova II and Vega use [FP](#).

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
1, 2, 3, 4C, 5, 7, 8, 11, 12, 14, 16	1, 2, 3, 4C, 5, 7, 8, 9, 10, 11, 12, 14, 16	1, 2, 3, 4C, 5, 7, 8, 9, 10, 11, 12, 14, 16	1, 2, 3, 4E, 5	1, 2, 3, 4E, 5	1, 2, 3, 5	1, 2, 3, 4CD, 5, 7, 8, 9, 10, 11, 12, 14, 16	1, 2, 3, 14		2, 3, 4CD, 5, 7, 8, 9, 10, 14, 15, 16

Syntax	MM <measurement-mode>
Description	<p>Set instrument to selected Measurement Mode</p> <p>Values for < measurement-mode ></p> <ul style="list-style-type: none"> • 0: Query present measurement mode • 1: Passive, non-measurement mode • 2: Power • 3: Energy • 4: Exposure (Pyroelectric, Photodiode) • 5: Power with Position (and Size) (BeamTrack sensors) • 6: Reserved for Future Use • 7: Lux (PD300-CIE sensors) • 8: Footcandles (PD300-CIE sensors) • 9: Irradiance (PD300-RM sensors) • 10: Dosage (PD300-RM sensors) • 11: Hold mode (BC20 sensors) • 12: Continuous (BC20 sensors) • 13: Reserved for Future Use • 14: Pulsed Power (Thermopile) • 15: Fast Power (Photodiode) • 16: Low Frequency Power (Photodiode) <p>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> (such as all modes above 5 for Nova-II and Vega)</p> <p>Note: MM is intended to supersede the BQ, FB, FE, FP, and FX commands.</p>
Example	None
Limitations	As listed in the table above
See Also	BQ , FB , FE , FP , FX , HC ; Command Summary

Command: **Pulse Length**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•			•

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) <ul style="list-style-type: none">• 0: Query device for present setting.• 1: Set sensor to first pulse width setting.• 2: Set sensor to second pulse width setting.• Etc.
Example	PE25-C <ul style="list-style-type: none">• 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: **REset**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

Syntax	RE
Description	Resets the instrument.
Example	None
Limitations	Note: May cause loss of USB communication that will need to be re-enumerated
See Also	Command Summary

Command: **Read raNge**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

Syntax	RN
Description	Returns presently active measurement range.
Example	Example 1. PD300 in autoranging. Device responds “ *-1 ”. Example 2. PE50-C in 2mJ range. Device responds “ *4 ”.
Limitations	
See Also	AR , GU , SX , and WN ; Command Summary

Command: **Send Energy**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

Syntax	SE
Description	Queries device for Energy Measurement
Example	<p>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.</p> <p>Example.</p> <ol style="list-style-type: none">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 command4. 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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•			•

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 averaGe**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
			•	•					

Syntax	SG
Description	Requests most recent average calculated by the instrument.
Example	<p>Returns power or energy average as an ASCII string in scientific notation.</p> <p>Returns most recent average reading calculated by the instrument. Will return the same average more than once if the request is repeated before a new average has been prepared. Use with \$AF to ensure reading each average only once.</p> <p>Errors reported “?HEAD NOT MEASURING POWER” if thermopile sensor is measuring energy</p>
Limitations	Nova-II and Vega only. Does not average energy for Thermopile sensors.
See Also	AF and AQ ; Command Summary

Command: **Send units**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

Syntax	SI
Description	<p>Queries meter for present measurement mode. Returns a single character that represents the present measurement mode.</p> <ul style="list-style-type: none">• c: Foot-Candles (PD300CIE sensor, not supported on all meters)• d: dBm• j: Energy Density (Joules/cm²) (Irradiance)• J: Joules• l: Lux (PD300CIE sensor, not supported on all meters)• u: Lumens (PD300CIE-IS sensor, not supported on all meters)• w: Power Density (Watts/cm²) (Dosage)• W: Watts• X: Passive mode. Nothing being measured
Example	3AP measuring power. Device returns “ W ”.
Limitations	None.
See Also	Command Summary

Command: **Simulate Key-press**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
			•	•	•	•	•		

Syntax	SK<1..3 for Ariel, 0..3 for StarLite, 0..8 for others>
Description	<p>Simulates pressing a key on the meter's front panel</p> <p>For Nova-II, Vega, StarBright and StarLite</p> <ul style="list-style-type: none">• 0: Left-most softkey• 1: 2nd softkey.• 2: 3rd softkey• 3: Right-most softkey <p>For Nova-II, Vega and StarBright</p> <ul style="list-style-type: none">• 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 <p>For Ariel</p> <ul style="list-style-type: none">• 1: Left-most softkey• 2: 2nd softkey.• 3: 3rd softkey
Example	None.
Limitations	None.
See Also	Command Summary

Command: **Send Power**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

Syntax	SP
Description	Queries device for Power Measurement
Example	<p>For all sensors except Pyroelectric sensors: Return next power measurement</p> <ul style="list-style-type: none">Example. User sent "SP". Device returns "*1.300E-5". Power measured is 13 microwatts. <p>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.</p> <p>Example.</p> <ol style="list-style-type: none">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 command4. 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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•		•

Syntax	SX
Description	Queries device for the maximum allowable reading on present scale.
Example	<p>Returns Max allowable reading for present range in scientific notation or AUTO if in autoranging.</p> <p>Examples:</p> <ul style="list-style-type: none">• "*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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
									•

Syntax	TA <TTL-setting>
Description	<p>Queries or sets the devices TTL output setting.</p> <p>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:</p> <ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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 Window**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
									•

Syntax	TW <0 or 1-50000>
Description	<p>Queries or sets the devices external trigger window size, in microseconds.</p> <p>When the value is 0, this is a query which returns the current window size. Otherwise it sets the window size</p>
Example	<ul style="list-style-type: none">• User sent “TW 0”. Device returns “*100”• User sent “TW 200”. Device returns “*200”
Limitations	None
See Also	XO , XT ; Command Summary

Command: **User Threshold**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•			•

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: <ul style="list-style-type: none">• "\$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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

Syntax	VE
Description	Query device for version of embedded software
Example	Firmware version 2.13 is installed. The Juno+ returns " *JP2.13 "
Limitations	None
See Also	Command Summary

Command: **Wavelength add**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•		•	•

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 be 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	PE10-C with the following settings as returned by the AW command " *CONTINUOUS 193 12000 4 NONE 366 532 1064 2100 10.6 " <ul style="list-style-type: none">• 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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•		•	•

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	PE10-C with the following settings as returned by the AW command “* CONTINUOUS 193 12000 4 248 366 532 1064 2100 10.6 ” <ul style="list-style-type: none">• 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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

Syntax	WI <Index>
Description	Set the device to work with wavelength at location <Index> in list of wavelengths.
Example	PE10-C with the following settings as returned by the AW command “* CONTINUOUS 193 12000 4 248 366 532 1064 NONE 10.6 ” <ul style="list-style-type: none">• 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 , WL , and WW ; Command Summary

Command: **WaveLength**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•		•	•

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	PE10-C with the following settings as returned by the AW command “* CONTINUOUS 193 12000 1 248 366 532 1064 NONE 10.6 ” <ul style="list-style-type: none">• 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: **Write raNge**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

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 PD300 in Filter Out mode into the 3mW range enter “WN 1” . Device returns “*” .
Limitations	None
See Also	AR , GU , RN , and SX ; Command Summary

Command: **Write discrete Wavelength**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
			•	•					

Syntax	WW <wavelength-string>
Description	Configure sensor to work with laser as defined in <wavelength-string> (must be a string as returned by the AW command).
Example	3AP sensor with the following settings as returned by the AW command. “*DISCRETE 1 VIS NIR” <ul style="list-style-type: none">• User sent “WW CO2”. Device returns “?LASER NOT FOUND”.• User sent “WW NIR”. Device returns “*”.
Limitations	For all sensors with a discrete spectrum. Note: WI works with Discrete Spectrum sensors and as such is preferred over WW
See Also	AW , HC , and WI ; Command Summary

Command: **eXternal trigger On/off**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
									•

Syntax	XO <option>
Description	Query and set the external trigger setting of the sensor. Values for <option> (if not set, default to 0) <ul style="list-style-type: none">• 0: Query device for present external trigger setting.• 1: Set external trigger off for this sensor• 2: Set external trigger on for this sensor
Example	<ul style="list-style-type: none">• User sent “XO 0”. Device returns “*1 Off On”.• User sent “XO 2”. Device returns “*2 Off On”.
Limitations	See XT
See Also	XT , TW ; Command Summary

Command: **eXternal Trigger mode**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
									•

Syntax	XT <option>
Description	<p>Query and set the external trigger mode of the instrument.</p> <p>Values for <option> (if not set, default to 0)</p> <ul style="list-style-type: none">• 0: Query device for present external trigger mode.• 1 Disable: Trigger is off• 2 Rising: Triggers on a rising edge (Pyro sensors only)• 3 Falling: Triggers on a falling edge (Pyro sensors only)• 4 High: Measures when trigger is high• 5 Low: Measures when trigger is low
Example	<ul style="list-style-type: none">• User sent “XT 0”. Device returns “*1 Disable Rising Falling High Low”• User sent “XT 2”. Device returns “*2 Disable Rising Falling High Low”
Limitations	
See Also	XO , TW ; Command Summary

Logging Commands

These commands enable the user to upload log files that were stored on the Nova-II and Vega devices. The Juno, Juno+, Juno-RS, Pulsar, and StarLite do not provide on-board storage. The StarBright and Centauri log data to a USB Flash Drive that can afterwards be attached to the PC for direct transfer.

Command: **Log Choose**

Syntax	LC <1-54000> for Nova-II <1-250000> for Vega
Description	<p>Set the Log pointer to the next datum to upload.</p> <p>Returns</p> <ul style="list-style-type: none">• *<index>: for success• ?POINT NOT IN RANGE: parameter greater than number of readings stored in this log file
Example	<p>Log File with 100 readings</p> <ul style="list-style-type: none">• LC 5: Instrument will return “*5”• LC 103: Instrument will return “?POINT NOT IN RANGE”
Limitations	None
See Also	Command Summary

Command: **Log Delete**

Syntax	LD <file-size>
Description	<p>Delete Log File that was previously selected with the LF command.</p> <p><file-size> must equal actual file size. This is a security measure to prevent unintentionally deleting the wrong log file.</p> <p>Returns</p> <ul style="list-style-type: none">• *<index>: for success• ?PARAM ERROR: if <file-size > doesn't equal size of selected file• ?NO FILE CHOSEN: if no log file had been previously selected with the LF command
Example	<p>Log File with 100 readings</p> <ul style="list-style-type: none">• LD 5: Instrument will return “?PARAM ERROR”• LD 100: Instrument will return “*”
Limitations	None
See Also	Command Summary

Command: **Log File**

Syntax	LF <0-10>
Description	Select a Log File for processing, where 0 represents the present logging session and 1-10 represent the log files that were stored Returns * <param>:<file size> for success
Example	Vega contains one Log File with 100 readings <ul style="list-style-type: none">• LF 1: Instrument will return "*1: 100"• LF 3: Instrument will return "*3: 0"• LF 11: Instrument will return "?NO SUCH FILE"
Limitations	None
See Also	Command Summary

Command: **Log Info**

Syntax	LI
Description	Get information about logged data. Returns " " <exp> <min> <max> <points> <sample rate> <units> <corrupt> <checksum> <name> <max_in_range> <serial _number> NONE 0 0 0 0 <exp>: Exponent used for all stored data in this log file <min>: Lowest mantissa in this file <max>: Highest mantissa in this file <points>: Number of data points stored in this file <sample rate>: Elapsed time between samples in seconds multiplied by 30 for logs of power and 0 for logs of energy <units>: Units logged (J, W etc.) <corrupt>: 1 if data may have been corrupted, else 0. <checksum>: Hexadecimal checksum word of the logged samples <Name>: NULL terminated string containing the name of the sensor <max_in_range>: Maximum value that is still within range for this log file <serial_no>: Serial number of the sensor "NONE 0 0 0 0": Have no meaning and are here for historical reasons To convert the mantissa data <mant> returned by \$LI and this <exp> to a real power or energy in watts or joules, use the formula $\text{RealPower} = \text{mant} * \text{Antilog}(\text{Exp} - 3)$ where antilog (x) means 10 raised to the power of x.
Example	Vega contains one Log File with 100 readings <ul style="list-style-type: none">• LF 1: Instrument returns "*1: 100"• LI: Instrument returned "*-6 17 782 100 2 W 0 8812 PD300-UV 3000 711578 NONE 0 0 0 0" This is a log file made with a PD300-UV serial number 711578. The readings were measured 15 times per second. The max possible reading was 3uW. The actual readings are between 0.017uW and 0.782 uW and the file wasn't corrupted.
Limitations	None
See Also	Command Summary

Command: **Log Last**

Syntax	LL
Description	Resend the last 10 logged readings without incrementing the log pointer
Example	<ul style="list-style-type: none">• LR “*”• LS “*+0228 +0239 +0243 +0210 +0136 +0107 +0120 +0168 +0296 +0473”• LL “*+0228 +0239 +0243 +0210 +0136 +0107 +0120 +0168 +0296 +0473” <p>Log pointer was set to start of log. First 10 measurement were sent twice to the PC</p>
Limitations	None
See Also	Command Summary

Command: **Log Reset**

Syntax	LR
Description	Reset the Log File pointer to the first reading in the log. Next time LS is received, instrument will report readings 1 through 10
Example	None
Limitations	None
See Also	Command Summary

Command: **Log Send**

Syntax	LS
Description	<p>Send the next 10 logged measurements to the PC, incrementing the log pointer to the next batch of 10.</p> <p>Since all data stored in data logging mode are collected in the same measurement range, there is no need transmit the exponent associated with each data point for each point. This is read once using \$LI. When blocks of data are read from the memory using this \$LS command, only the mantissa is sent across the interface. The string returned contains ten mantissas in ASCII (text, not binary) form separated by spaces. If a block contains more points than were recorded, those points will have a mantissa of -9999.</p> <p>Each datum takes on the form "+8888 ". That is 1 character for sign, 4 characters exactly for mantissa, and 1 space. This will allow the PC software to do format checking to verify that no characters have been lost in transmission.</p>
Example	<ul style="list-style-type: none">• LR “*”• LS “*+0228 +0239 +0243 +0210 +0136 +0107 +0120 +0168 +0296 +0473”• LS “*+0616 +0682 +0736 +0767 +0782 +0779 +0763 +0742 +0710 +0648” <p>Log pointer was set to start of the log. First 20 measurements were sent to PC</p>
Limitations	None
See Also	Command Summary

The basic method of uploading log data to the PC is as follows:

LF <file-number> Select the file to upload
LI Get all applicable information
LR Set log pointer to start of file
Repeat
 LS Upload next 10 readings
Until receiving a string that contains -9999 in it.

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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•		•	•	•	•

General Overview

Syntax	CQ <factor-index> <new-factor>
Description	<p>Query and set presently active calibration factors.</p> <p>Values for <factor-index> (if not set, default is 0)</p> <ul style="list-style-type: none"> 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. <p>New-factor is a floating-point number between 0.0002 and 2.0 scaled up by 10000 (2 to 20000)</p>
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	<ul style="list-style-type: none"> 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%). <p>Note. In order to adjust the calibration factors for both Filter Out and Filter In modes the User should perform the following steps</p> <ol style="list-style-type: none"> 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	<p>CQ returns 4 values</p> <ul style="list-style-type: none"> 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 an Ophir 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 an Ophir 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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%) <p>Note. In order to adjust the calibration factors for all pulse widths, use CQ in conjunction with the PL command.</p>
Limitations	None
See Also	PL and HC ; Calibration Query – Overview

Pyroelectric Sensors – Discrete

Syntax	See CQ (Calibration Query – Overview)
Description	<p>CQ returns 3 values</p> <ul style="list-style-type: none"> 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 an Ophir calibration factor for this wavelength that cannot be adjusted by the User
Example	<ul style="list-style-type: none"> 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. <p>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.</p>
Limitations	None
See Also	AW , DQ , HC , PL , and WI ; Calibration Query – Overview

Command: Response Query

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•		•	•	•	•

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

Command: **Zero Abort**

Supported on the following meters:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

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. <ul style="list-style-type: none">• 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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

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	<ul style="list-style-type: none">• 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:

Juno	Juno+	Juno-RS	Nova-II	Vega	StarLite	StarBright	Ariel	Pulsar	Centauri
•	•	•	•	•	•	•	•	•	•

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	<ul style="list-style-type: none">• 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