



Halogen Light Source with RS232 Intensity Control HL-2000-HP-232

Installation and Operation Manual

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Important Safety Notices

1. Read all safety and operating instructions before using this equipment.
2. Use this equipment in a clean, dry environment. Place the unit away from heat sources and ensure that nothing interferes with its ventilation.
3. Do not allow objects to fall, or liquids to spill into the unit through the enclosure openings.
4. Do not use any power supply other than the type described in these instructions or as marked on the unit.
5. Do not use the unit if it is damaged in any way. Contact your dealer for repair or replacement information.

Warranty

Mikropack GmbH warrants to the original user of this instrument that it shall be free of any defects resulting from faulty manufacture of this instrument for a period of 12 months from the original date of shipment.

This instrument should not be used for any Clinical or Diagnostic purposes. Data generated in these areas is not warranted in any way by Mikropack GmbH. Any defects covered by this Warranty shall be corrected either by repair or by replacement, as determined by Mikropack GmbH.

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About This Manual

Document Purpose and Intended Audience

This document provides you with set-up and operation information to get your light source up and running.

What's New in this Document

This version of the *Halogen Light Source with RS232 Intensity Control HL-2000-HP-232 Installation and Operation Manual* updates the logo and the contact information.

Document Summary

Chapter	Description
Chapter 1: Setup	Contains a list of package contents and unpacking instructions.
Chapter 2: Operation	Provides instructions for optimizing the optical power output and a diagram of the shutter.
Chapter 3: Bulb Replacement	Provides instructions for replacing the bulb.
Appendix A: ASCII Commands	Contains a list of the ASCII command set used to control the light source's attenuator and shutter.
Appendix B: HL-2000-HP-232 Specifications	Contains operating environment specifications, as well as other physical details of the product.

Product-Related Documentation

You can access documentation for Ocean Optics products by visiting our website at <http://www.oceanoptics.com>. Select *Technical* → *Operating Instructions*, then choose the appropriate document from the available drop-down lists. Or, use the **Search by Model Number** field at the bottom of the web page.

You can also access operating instructions for Ocean Optics products on the *Software and Technical Resources* CD included with the system.

Engineering-level documentation is located on our website at *Technical* → *Engineering Docs*.

Upgrades

Occasionally, you may find that you need Ocean Optics to make a change or an upgrade to your system. To facilitate these changes, you must first contact Customer Support and obtain a Return Merchandise Authorization (RMA) number. Please contact Ocean Optics for specific instructions when returning a product.

Chapter 1

Setup

Overview

The high-power Halogen Light Source with attenuator and shutter uses a 20-watt bulb for applications requiring large-diameter optical fibers, or fiber and probe bundles. The attenuator and shutter can be controlled by a series of ASCII commands issued by a host computer via RS-232.

Setting Up the HL-2000-HP-232 Light Source



Unpacking the Light Source

► *Procedure*

1. Unpack your new equipment carefully. Dropping this instrument can cause permanent damage.

1: Setup

2. Inspect the outside of the instrument and make sure that there is no damage. Do not use the instrument if damage is present. Contact your dealer for repair or replacement information, if necessary.
3. Use this instrument in a clean laboratory environment.

Package Contents

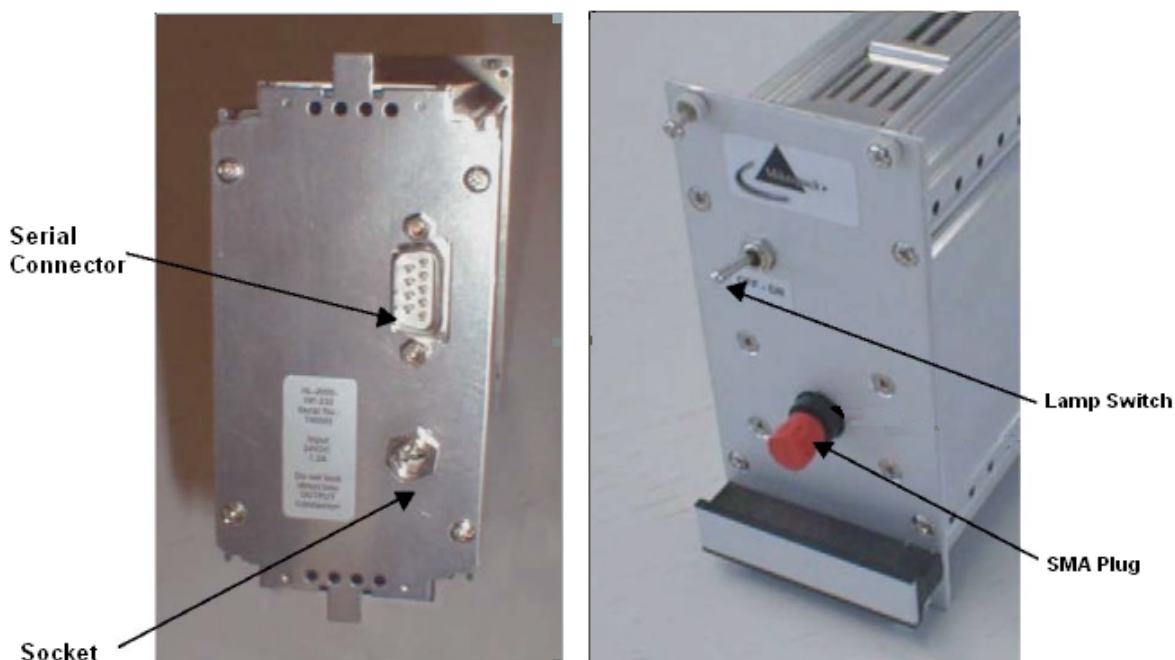
Your package should contain the following:

- ❑ One HL-2000-HP-232 Light Source
- ❑ One serial cable
- ❑ One 24 VDC 1,2A power supply
- ❑ HL-2000-HP-232 test software
- ❑ One Ocean Optics *Software and Technical Resources* CD

In addition, you need an optical fiber (1000 μ m diameter fiber is recommended).

Set-Up

Use the following procedure and diagrams to set up your light source.



► Procedure

1. Plug the power supply into a wall outlet.
2. Plug the other end of the power supply cable into the socket of the light source.
3. Plug the serial cable (included) into the light source connector, and the other end into the COM port on your PC.
4. Connect the SMA connector of your fiber optic cable to the SMA plugs.
5. Turn on the Halogen lamp using the power switch on the front of the light source. The shutter opens and the lamp flashes once.

Notes

The light can only be turned on via RS232 (see).

To test the light source, use the HL-2000-HP-232 test software included with your equipment.

6. Configure your computer's COM port to establish connection with your light source. The COM port settings are as follows:

Baud Rate: 9600 (if 9600 does not work, try 19200)

Data Bits: 8

Parity: None

Stop Bits: 1

Flow Control: None

Note

If you are working with a terminal, the **Local Echo** and **CR When Sending** options should be activated.

Operation

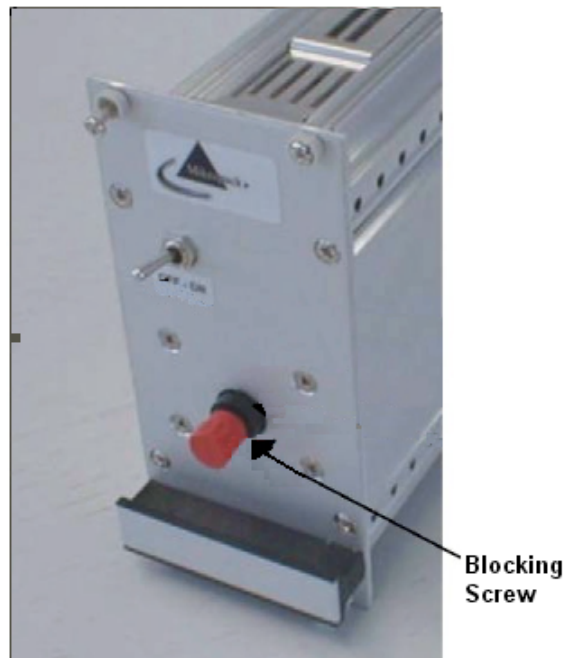
Optimizing the Optical Power Output

The HL-2000-HP-232 is adjusted at the factory to provide maximum power into a 200 μ m fiber. If a lower optical power is required or a different fiber (bundle) diameter is used, you can adjust the optical power of the unit.

► *Procedure*

Follow the steps below to adjust the optical power of the HL-2000-HP-232 Light Source:

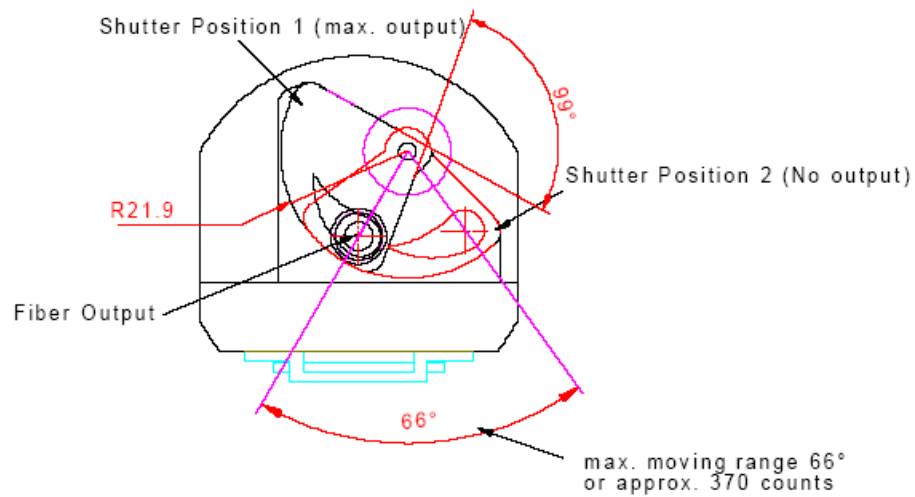
1. Connect a fiber optic spectrometer or an optical power meter to a fiber, and then connect the other end of the fiber to the HL-2000-HP-232's SMA plug.
2. Loosen the blocking screw with the provided 1.3mm Allen wrench.



2: Operation

3. Shift the SMA socket to optimize the optical power of the light source.
4. Tighten the blocking screw to secure the SMA socket position.

Shutter Diagram



Bulb Replacement

Overview

To order replacement bulbs for the HL-2000-HP-232, consult the [Parts List](#).

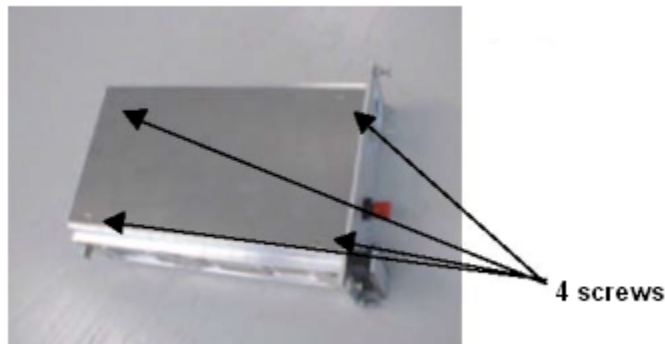
WARNING

Before replacing the bulb in the light source, disconnect the lamp from your power source and allow the unit to cool for at least twenty minutes, if necessary.

Bulb Replacement Procedure

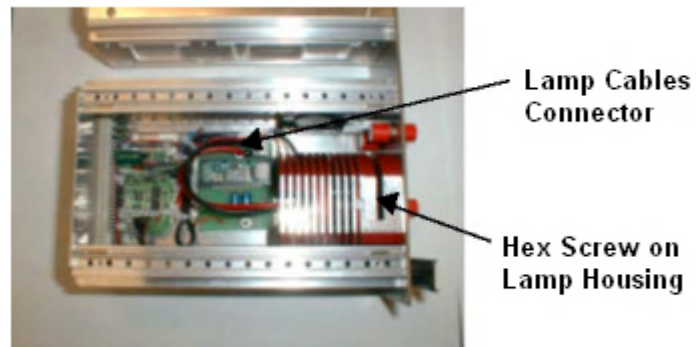
► Procedure

1. Remove the 19-inch cassette from the rack.
2. Remove the four slotted screws and remove the side cover of the lamp enclosure.



3. Disconnect the two spare bulb cables from the connector.

3: Bulb Replacement



4. Loosen the hex screw on the lamp housing.
5. Remove the bulb by pulling it back away from the connector.
6. Replace the spare bulb with a new one.
7. Replace the hex screw on the lamp housing.
8. Replace the cover.

Appendix A

ASCII Commands

In serial communications mode, the motion controller is controlled via a series of ASCII instructions issued by a host computer.

Motion-Related Commands

Command	Function	Description	Example
M	Initiate Motion	Receipt of the "M" Move command initiates motion using the values presently loaded to determine the profile characteristics.	M
LA	Load Absolute Position	Allows programming of the desired target position relative to the present zero or "home" position.	LA 10000
LR	Load Relative Position	Allows programming of the desired target position relative to the present position.	LR 10000
SP	Load Command Velocity	This parameter should be loaded with the desired maximum profile velocity in position mode. This value should be selected to not exceed the capabilities of the mechanical system. Additionally, this command sets the maximum velocity value in "velocity mode".	SP 3000
AC	Load Command Acceleration	This parameter determines the acceleration and deceleration rate to be calculated by the profiler during execution. Argument in rpm/s ² (Allowed value: 0 to 20000)	AC 100
V	Select Velocity Mode	Execution of this command causes the controller to switch into the Velocity control mode. The motor will ramp the selected velocity at the rate defined by the AC parameter.	V 2200
HO	Define Home-Position	Define present position as zero	HO

A: ASCII Commands

Command	Function	Description	Example
DI	Disable Drive	Execution of this command disables the drive electronics and removes all current from the motor	DI
EN	Enable Drive	This instruction enables the drive electronics and allows the servo controller to become active, providing motor current as required.	EN
LL	Load Position Range Limits	The range limit mechanism provides an additional layer of protection. Both positive and negative range limits are determined independently using the sign of the limit parameter. If the controller receives an instruction from the host to move to a position that is not within the range limit window, it will stop at the set limit position.	LL 2000000 or LL -5000000

Configuration-Related Commands

Command	Function	Description	Example
POR	Set Proportional Loop Gain	The proportional gain determines the system's proportional response to a given amount of positional error. Increasing this parameter provides a tighter and more dynamically responsive system. (Allowed value 0 – 255)	POR 20
I	Set Integral Loop Gain	Unlike the proportional gain, where the response remains constant if there is no change in error, the integral term continues to increase the effects of its response until it becomes effective. This parameter determines the rate of change of this response. (Allowed value 0 – 255)	I 10
LPC	Load Peak Current Limit	This command sets the Peak current limit. The LPC argument is in milliamperes.	LPC 1000
LCC	Load Continuous Current Limit	This command sets the continuous current limit. The LCC argument is in milliamperes.	LCC 500
RN	Reset Node	This command resets the gains and current limits to the values stored in the controller ROM (the defaults).	RN

Command	Function	Description	Example
DCE	Delayed Current Error	This command sets the delay between current limit condition and setting the Fault-Status (Fault-Pin and Fault-Bit for the GFS-Command). The DCE argument is in milliseconds.	DCE 200
SOR	Source For Velocity	This command defines the source for the velocity of the motor. SOR 0 defines that commanded velocity will come from a serial command message using RS232. SOR 1 defines that the velocity value will be an analog input voltage of +/-10 VDC at the analog input. SOR 2 defines that the velocity value will be a PWM signal at the analog input. Note that the SP value dictates the Maximum Velocity reached for the Maximum PWM signal (SOR2) and the Maximum Velocity for 10 V at the analog input (SOR1).	SOR 1
EEPSAV	Save To EEPROM	This command saves the current parameters and configurations to EEPROM. The saved parameters are recalled during power up so that the motor is configured for use immediately. After saving all configuration parameters, a serial message "EEPROM writing done" will be sent from the controller.	EEPSAV
NP	Notify Position	This command tells the motion controller to send a "p" message when a particular position is reached. In the example above, when 10,000 is reached a "p" message will be sent from the controller.	NP 10000

External Limit Switch Configuration Commands

Command	Function	Description	Example
HA	Arm the "HOME" input	This command is used to arm the Home Arming mode. It is used with the external limit or reference switch to define the home position (the Analog input serves as this digital input as well).	HA 1

A: ASCII Commands

Command	Function	Description	Example
HL	Home Limit Action	This command is used to set the action that occurs when the limit switch is activated. If HL is set to 0, the motor will continue to run after switch activation but will send an "h" message signifying home switch was triggered. If HL is set to 1, the motor will stop immediately after switch activation.	HL 1
HN	Hard Notify	If HN is set to 1, it configures the motion controller to send a serial message "h" once the external limit switch is triggered.	HN 1
HP	Define External Switch Polarity	This command defines the activation edge of the external switch. If HP is 0 a falling edge at the external limit switch is valid. If HP is 1 a rising edge occurs actions due to HL, HN and HA-commands.	HP 0
HS	External Switch Status	This command returns the state of the limit switch. If the limit switch was active and an HS request is sent, the controller will return a 1. If the limit switch was not active since a HL, HN or HA-command was sent an HS request will return a 0 to the host.	HS

Commands That Return Data

Command	Function	Description	Example
GV	Get Velocity Commanded	This command returns the command velocity sent.	GV
GN	Get Actual Velocity	This command returns the actual velocity.	GN
GI	Get Integral Term	This command returns the Integral gain setting.	GI
GCL	Get Current Limit	This command returns the present current limit.	GCL
POS	Get Present Position	This command returns the present motor position.	POS
TEM	Get Temperature	This command returns the present coil temperature (in °C)	TEM
GAC	Get Acceleration	This command returns acceleration	GAC
GSP	Get Maximum Speed	This command returns Maximum speed setting.	GSP

Command	Function	Description	Example
GRC	Get Real Current	This command returns the current being used in milliamperes	GRC
GST	Get Status	<p>This command returns motion controller status.</p> <p><u>Bit</u> <u>Description</u></p> <p>Bit 0: 1... Position mode 0... Velocity mode</p> <p>Bit 1: 1... Speed command is analog input 0... Speed command comes via RS232</p> <p>Bit 2: 1... Speed command is PWM (SOR 2) 0... Speed command is analog voltage(SOR1)</p> <p>Bit 3: 1... Amplifier Enabled 0... Amplifier Disabled</p> <p>Bit 4: 1... In Position 0... Not in Position</p> <p>Bit 5: 1... Rising edge on external switch is valid 0... Falling edge on external switch is valid</p> <p>Bit 6: 1... External switch now high level 0... External switch now low level</p>	GST
GFS	Get Fault Status	<p>This command returns fault status.</p> <p><u>Bit</u> <u>Description</u></p> <p>(0 is normal, 1 is Fault present)</p> <p>0 Over-temperature condition</p> <p>1 Over-current condition</p> <p>2 Under-voltage (< 15VDC)</p> <p>3 Over-voltage (> 28VDC)</p>	GFS

A: ASCII Commands

Command	<i>Function</i>	<i>Description</i>	<i>Example</i>
VER	Get Version	This command returns firmware version.	VER
GPOR	Get Proportional Term	This command returns Proportional gain setting	GPOR

Appendix B

HL-2000-HP-232 Specifications

This section provides information on the operating environment, physical controls, and dimensions of the HL-2000-HP-232. It also provides a parts list.

Specifications

Specification	Criteria
Dimensions	70 mm x 100 mm x 160 mm
Weight	600 g
Pin description	Pin 2: RX Pin 3: TX Pin 5: Ground
Output	20 watts
Output to bulb	1.6 A @ 24 VDC
Wavelength range	360–2000 nm
Spectral Range	VIS - NIR
Stability	0.5%
Drift	<0.3% per hour
Time to stabilize	Approximately 5 minutes
Bulb lifetime	2,000 hours
Bulb color temperature	3,000 K
Temperature	5° C
Humidity	5–95% at 40° C

Parts List

Spare Parts / Order Information	Item Number
Halogen high-power 20 W light source with RS232 control	HL-2000-HP-232
Halogen spare bulb High-Power	HL-2000-HP-B

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