



Scanning Monochromator (MonoScan2000)

Installation and Operation Manual

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Important Safety Notices

1. Read all safety notices and operating instructions before operating this unit.
2. Inspect the item for transport damage before using the 24VDC power supply for the first time.
3. Adhere to all warning stickers on the unit and all warnings contained in this manual.

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 data 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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Warranty Handling

► *Procedure*

Follow the procedure below to process a warranty claim:

1. Determine the problem or fault with your local distributor.
2. If a problem is evident, obtain an RMA number from your local distributor.

Important Safety Notices

3. Send the equipment to the local distributor for repair. If the item is under warranty, shipping will be free-of-charge both ways.
4. Contact your distributor for repair and delivery time. If the item is out of warranty, your distributor will provide a repair cost to you. In this situation, the distributor will not proceed with the repair until you order it.

Your system will be shipped back to you free of charge with insurance (if under warranty).

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About This Manual

Document Purpose and Intended Audience

This document provides you with an installation section to get your system up and running.

What's New in this Document

This version of the *Scanning Monochromater (MonoScan2000) Installation and Operation Manual* updates the photos and the interface information.

Document Summary

| Chapter | Description |
|--|--|
| Chapter 1: Setup | Contains a list of package contents and unpacking instructions. |
| Chapter 2: Programming Information | Provides programming information for the MonoScan-2000 software, as well as the EULA. |
| Appendix A: 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 an Ocean Optics Application Scientist for specific instructions when returning a product.

Chapter 1

Setup

Overview

The MonoScan-2000 is a small-bandwidth fiber optic scanning monochromator. This monochromator is specially made to achieve a high optical throughput in fluorescence and luminescence applications, resulting in an intensive spectral signal.

The unique system design makes it easily compatible with all Ocean Optics and Mikropack light sources, accessories and spectrometers. Its RS232 interface and 12VDC power make it convenient to use, and even possible for mobile applications.

Applications

- **Variable monochromatic lightsource:** If the MonoScan-2000 is combined to our fiber optic lightsources (e.g., HL-2000-HP, HPX-2000; DH-2000; DH-2000-BAL)
- **Single variable Wavelength detection:** If combined with a single Si-Detector
- **Programmable Fluorescence Scanner:** Two MonoScan-2000s combined can be used as a fully programmable fluorescence scanner if the unit is combined with a high-power lightsource (e.g., HPX-2000), going to the sample via fiber, detecting via fiber, then going through the second MonoScan-2000 combined with a single Si-Detector.

Set-up

The following sections provide instructions on unpacking and setting up your MonoScan-2000.

Unpacking the MonoScan-2000

► Procedure

1. Unpack the MonoScan-2000 carefully. Dropping this instrument can cause permanent damage.
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.
4. Submit the Registration Card to for warranty and support purposes.

Contents

Your MonoScan-2000 package should contain the following:

- MonoScan-2000 main system
- MonoScan-2000 12VDC power supply

Caution

Before using the power supply of the MonoScan-2000 for the first time, inspect the item for transport damage. Be sure to adhere to all warnings on the unit and in this operational manual.

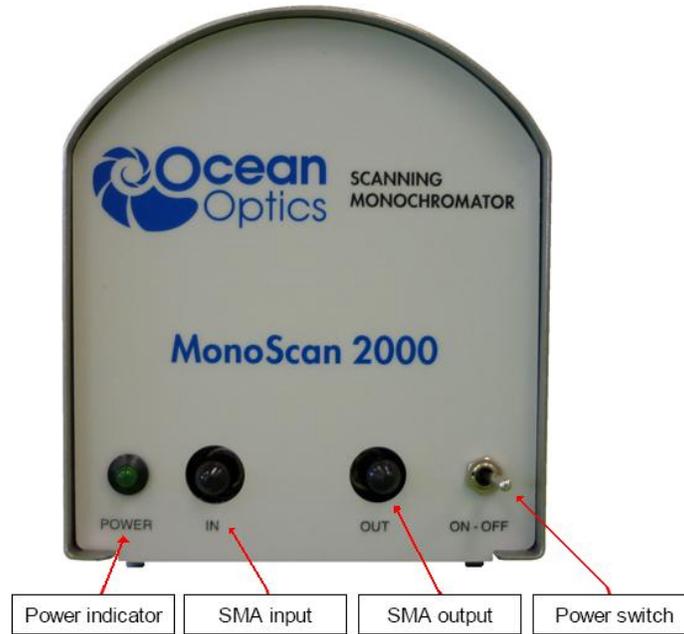
- Software CD (contains MonoScan-2000 software and calibration software)
- Ocean Optics Software & Technical Resources CD (contains manuals)
- RS232 connection cable

Quick Start

► Procedure

1. Install the software delivered with the MonoScan-2000 (double-click on Setup.exe)
2. Connect the power supply to main connection.
3. Connect the power supply to the MonoScan-2000.

4. Connect your PC to the MonoScan-2000
5. Power-on the MonoScan-2000.



Front Panel

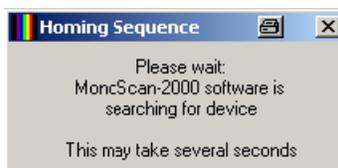


Rear Panel

6. Start the MonoScan-2000 software.



7. Go to the Connection settings menu and select the Comport to which the MonoScan-2000 is connected.
8. Go to Connection settings menu and select Connect to establish a connection between the PC and the MonoScan-2000 (the MonoScan-2000 will run to its internal reference and will be set to 250nm).
9. If the device is found on the chosen Comport, the following message appears:



All buttons then become enabled.

10. Set another wavelength by clicking on one of the buttons (<10nm, <1nm, 1nm >, 10nm >) or enter a wavelength and click **Goto**.
11. When the measurements are finished, close the connection between the PC and the MonoScan-2000 in the **Connection settings – Disconnect** menu.

Chapter 2

Programming Information

MonoScan-2000 Interface-DLL

The following functions are exported by MonoScandrv.dll:

MONO_OpenConnection

long __stdcall MONO_OpenConnection(char* PortName);

Returns the handle value for the specified Comport as long integer.

This value has to be stored locally for all other functions.

Returns a negative value in case of error.

Portname has to be e.g. "Com1", "Com2"

MONO_CloseConnection

short __stdcall MONO_CloseConnection(long Handle);

Close the connection opened before.

Returns 1 on success else -1

long Handle: Handle of the comport returned by MONO_OpenConnection

MONO_GetDeviceData

short __stdcall MONO_GetDeviceData(long Handle, unsigned short Node, long* CalibrationData, char* SerialNo);

Get the calibration data and the serialnumber of the device

long Handle: The handle to the comport returned by MONO_OpenConnection

unsigned short Node: has to be 0 (zero)

long* CalibrationData: Array of long integers, has to contain 92 elements

char* SerialNo: The serialnumber of the Device, at least 10 characters

MONO_SetWavelength

short __stdcall MONO_SetWavelength(long Handle, unsigned short Node, short WavelengthInNm, long* CalibrationData);

Set the MonoScan-2000 to a specified wavelength in nm.

Returns 1 on success else a negative number.

Long Handle: Handle of the comport returned by MONO_OpenConnection

unsigned short Node: must be 0 (zero)

short WavelengthInNm: desired wavelength in nm

long* CalibrationData: Array filled by MONO_GetDeviceData

MONO_GetWavelength

short __stdcall MONO_GetWavelength(long Handle, unsigned short Node, long* CalibrationData);

returns the actual position of the MonoScan-2000 in nm.

Long Handle: Handle of the comport returned by MONO_OpenConnection

unsigned short Node: must be 0 (zero)

long* CalibrationData: Array filled by MONO_GetDeviceData

MONO_RunReferenceSequence

short __stdcall MONO_RunReferenceSequence(long Handle, unsigned short Node);

MonoScan will run to its internal reference point and reset the internal position

Long Handle: Handle of the comport returned by MONO_OpenConnection

unsigned short Node: must be 0 (zero)

MONO_HomingRunActive

short __stdcall MONO_HomingRunActive(long Handle, unsigned Node);

call this function sequentially to see if reference sequence has completed

returns 1 if reference sequence is still active else 0.

Long Handle: Handle of the comport returned by MONO_OpenConnection

unsigned short Node: must be 0 (zero)

MONO_PositionReached

short __stdcall MONO_PositionReached(long Handle, unsigned short Node);

call this function to see if the desired position has been reached.

Returns 0 if still moving else 1

Long Handle: Handle of the comport returned by MONO_OpenConnection

unsigned short Node: must be 0 (zero)

MONO_SetPosition

short __stdcall MONO_SetPosition(long Handle,unsigned short Node,long Position);

call this function to set an absolute user defined position. Wavelength is not linear to position

Returns 0 in case of error else 1

long Handle: Handle of the comport returned by MONO_OpenConnection

unsigned short Node: must be 0 (zero)

long position: absolute position value

MONO_GetPosition

long __stdcall MONO_GetPosition(long Handle,unsigned short Node);

call this function to get the absolute position in steps (arbitrary unit)

long Handle: handle of the comport returned by MONO_OpenConnection

unsigned short Node: must be 0 (zero)

Direct Serial Communication (ASCII Commands)

If you do not want to use the DLL-functions you can directly communicate with the MonoScan2000 using ASCII commands.

► Procedure

The following steps are required:

1. Establish serial connection from PC to MonoScan-2000
2. Read device information such as calibration data and serial number (not necessarily needed)
3. Set an absolute position. Repeat this step as needed.
4. Close serial connection

ASCII Commands

| Command | Description | Example |
|---------|---|--------------------|
| GOHOSEQ | Reference run is executed. Runs to the lower endpoint (approx 200nm) and sets this position to 0 (zero) | GOHOSEQ [CR] |
| LA<Pos> | Sets absolute position in steps Command M starts positioning | LA-5000 [CR]M [CR] |
| LR<Pos> | Sets relative position in steps Command M starts positioning | LR100 [CR]M [CR] |
| POS | Returns actual position in steps | POS [CR] |

| Command | Description | Example |
|----------|---|---------------|
| HO | Sets current position to 0 (zero). A reference run executed before will be lost | HO [CR] |
| GPROGSEQ | Returns the data stored in the MonoScan-2000 | GPROGSEQ [CR] |

Note

All Commands have to be completed by Carriage return [CR]

Stored Data

| Stored Data | Comment |
|-------------|--|
| JMP1 | Internal |
| 11220001 | Serial Number |
| 0 | Absolute position for 200nm (not valid) |
| 0 | |
| -497 | |
| -1087 | |
| -1665 | |
| -2201 | Absolute position for 250nm |
| -2750 | |
| -3306 | |
| ... | Some data left out |
| -46911 | Absolute Position for 1100nm (not valid) |
| A1 | Internal |
| LR5000 | Internal |
| M | Internal |
| delay20 | Internal |
| gohoseq | Start reference run |

Every time the MonoScan-2000 is powered-on, a reference run is performed.

End User License Agreement for Software (EULA)

This End-User License Agreement ("EULA") is a legal agreement between you (either an individual or a single entity) and Mikropack GmbH ("Mikropack") for the Mikropack MonoScandrv software, which includes computer software and may include associated media, printed materials, and "online" or electronic documentation ("SOFTWARE"). By installing, copying, or otherwise using the SOFTWARE, you agree to be bound by the terms of this EULA. If you do not agree to the terms of this EULA, do not install, copy or use the SOFTWARE.

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3. Limited Warranty

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4. Disclaimer of Warranty

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Appendix A

Specifications

This section provides information on the operating environment and physical specifications of the MonoScan-2000.

Operating Environment

The following table provides information on optimizing the operating environment of your MonoScan-2000.

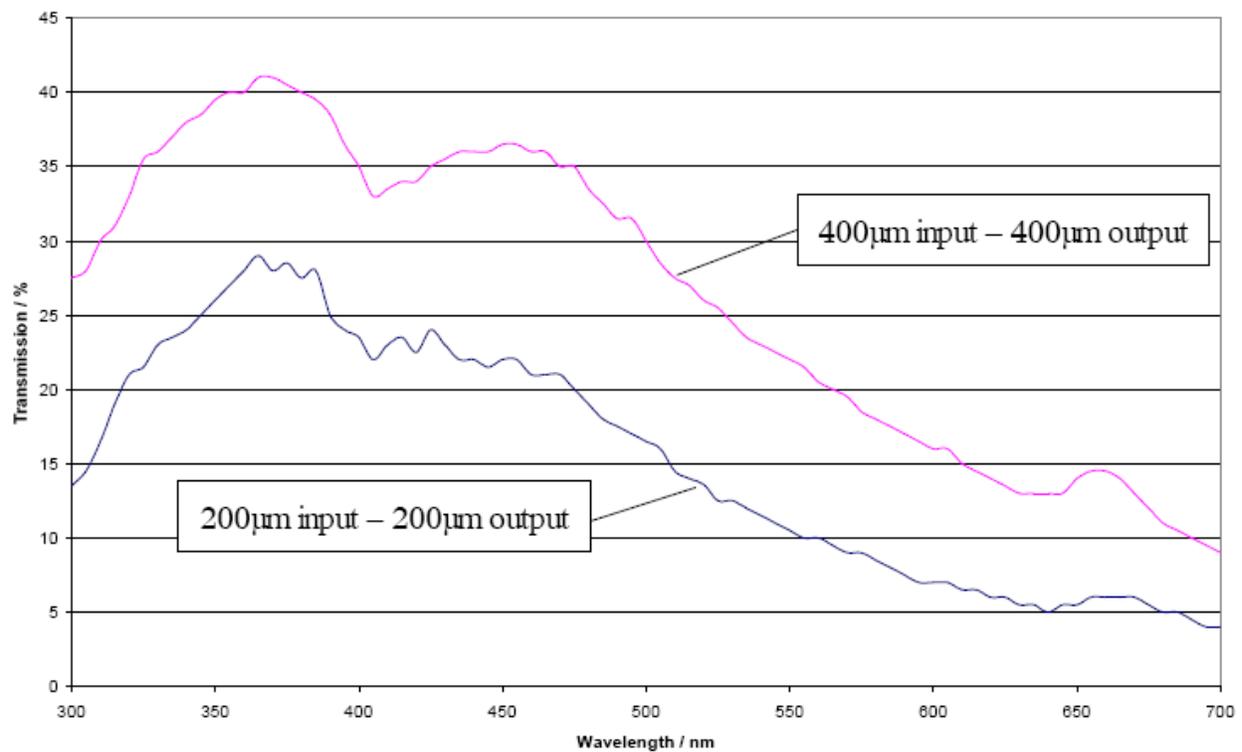
| Operating Environment | The MonoScan-2000 Unit . . . |
|-------------------------|--|
| Moisture | Is designed for operation in dry rooms only. |
| Ventilation | Should be situated so that its location or position does not interfere with proper ventilation. |
| Heat | Should be situated away from any device that emits excessive heat. |
| Object and Liquid Entry | Should be positioned so that objects do not fall on top of the unit. Additionally, ensure that no liquids are spilled into the enclosure through openings. |
| Power Sources | The unit should be connected to a power supply only of the type described in the operating instructions or as marked on the unit. |

Physical Specifications

| Specification | Value |
|---|--|
| Wavelength range | 300 – 700 nm |
| FWHM | 4 – 9 nm (400 –1000 fiber) |
| Holographic grating | 1250 l/mm, Blaze 350nm |
| Accuracy | <0.5nm |
| Repeatability | 0.2nm |
| Transition speed (wavelength-to-wavelength) | Approximately 3s 300-700nm 1nm step ~ 15ms |
| Dispersion | Approximately 10nm/mm |

A: Specifications

| Specification | Value |
|---|-------------------------------------|
| Optical throughput (1000 μ m fiber) | >50% @ 350nm, >30% @ 500nm |
| Interface | RS-232 |
| Connectors | SMA 905 |
| Power Requirements | 12 VDC max. 1,2A (WT-24V-E), 400 mA |
| Dimensions (LxWxH) | 148 x 112 x 132 mm |
| Weight | 1.2 kg |
| Temperature range | 5°C – 35°C |



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