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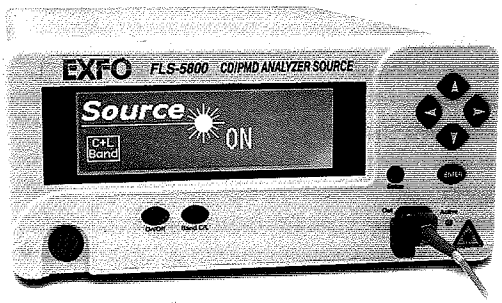
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Find the *Exfo FLS-5834-EI* at our website: ***Click HERE***

CD/PMD Analyzer Source

FLS-5800



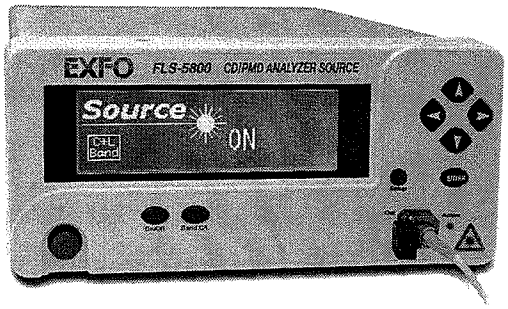
User Guide

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CD/PMD Analyzer Source

FLS-5800



If the equipment described herein bears the CE symbol, the said equipment complies with the applicable European Union Directive and Standards mentioned in the Declaration of Conformity.

User Guide

P/N: 1038416
September 2003

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Certification Information

F.C.C. Information

Electronic test equipment is exempt from Part 15 compliance (FCC) in the United States. However, compliance verification tests are performed on all EXFO equipment.

CE Information

Electronic test equipment is subject to the EMC Directive in the European Union. The EN61326 standard prescribes both emission and immunity requirements for laboratory, measurement, and control equipment. This unit has been tested and found to comply with the limits for a Class A digital device. Please refer to the Declaration of Conformity.

CSA Information

This unit is certified by the CSA (certificate number 162451) and was evaluated according to applicable CSA and UL standards (as confirmed by "C-US" mark) as well as applicable IEC standards for use in Canada, the United States, and other countries.

Independent Laboratory Testing

This unit has undergone extensive testing according to the European Union Directive and Standards. All pre-qualification tests were performed internally, at EXFO, while final tests were performed externally, at an independent, accredited laboratory. This guarantees the unerring objectivity and authoritative compliance of all test results.

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DECLARATION OF CONFORMITY

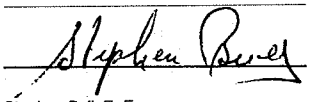
Application of Council Directive(s):	73/23/EEC - The Low Voltage Directive 89/336/EEC - The EMC Directive
Manufacturer's Name:	EXFO ELECTRO-OPTICAL ENG.
Manufacturer's Address:	400 Godin Avenue Vanier, Quebec Canada G1M 2K2 (418) 683-0211
Equipment Type/Environment:	Light Industrial Scientific Equipment
Trade Name/Model No.:	FLS-5800 Modulated Broadband Light Source

Standard(s) to which Conformity is Declared:

EN 61010-1:1993/ A2: 1995	**Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements**
EN 60825-1: 1994/ A2: 2001	**Safety of Laser Products-Part 1: Equipment Classification, Requirement, and User's guide**
EN 61326: 1997/ A2: 2001	**Electrical Equipment for Measurement, Control and Laboratory Use - EMC Requirements**
EN 55022: 1998/ A1: 2000	**Limits and methods of measurement of radio disturbance characteristics of information technology equipment**

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive and Standards.

Manufacturer

Signature: 

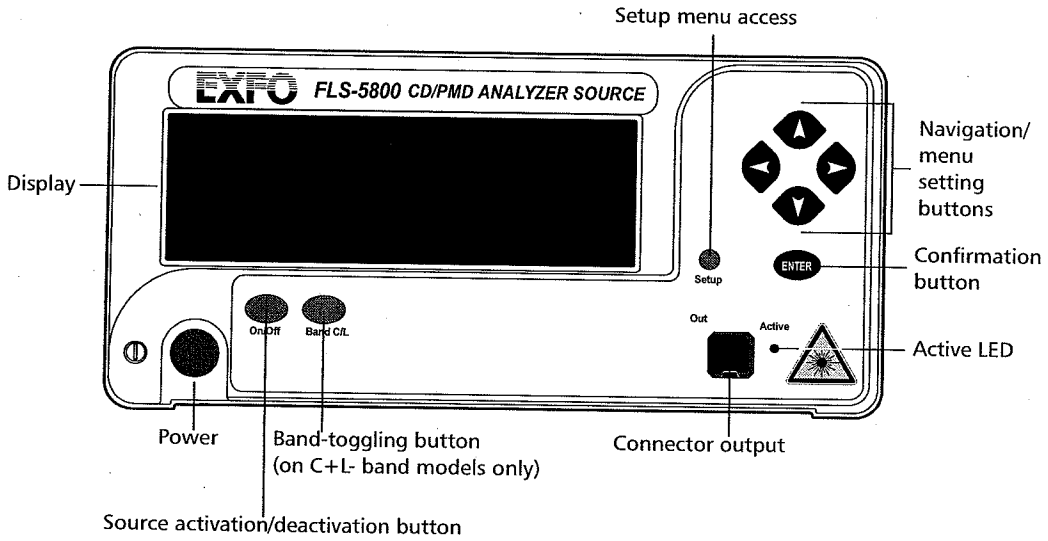
Full Name: Stephen Bull, E. Eng
Position: Vice-President Research and Development
Address: 400 Godin Avenue Vanier, Quebec, Canada
Date: February 25, 2002

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1 Introducing the FLS-5800 CD/PMD Analyzer Source

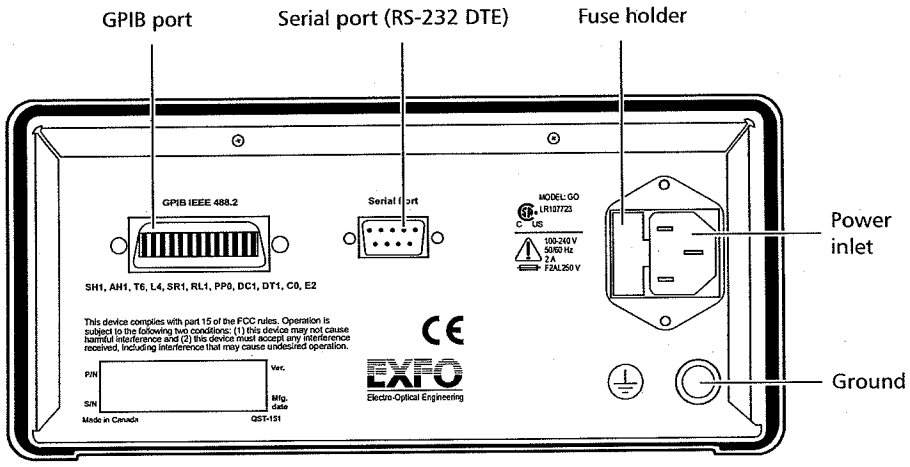
The FLS-5800 CD/PMD Analyzer Source is a modulated, polarized broadband fiber-optic source that has been especially designed to be used with EXFO FTB-5800 Chromatic Dispersion Analyzer.

Front Panel



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Back Panel



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2 Safety Information

Safety Conventions

Before using the product described in this manual, you should understand the following conventions:



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in *death or serious injury*. Do not proceed unless you understand and meet the required conditions.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *minor or moderate injury*. Do not proceed unless you understand and meet the required conditions.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *component damage*. Do not proceed unless you understand and meet the required conditions.



IMPORTANT

Refers to information about this product you should not overlook.

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Electrical Safety Information

This unit uses an international safety standard three-wire power cable. This cable serves as a ground when connected to an appropriate AC power receptacle.

Note: *If you need to ensure that the unit is completely powered off, disconnect the power cable.*



WARNING

- **Insert the power cable plug into a power outlet with a protective ground contact. Do not use an extension cord without a protective conductor.**
- **If the unit is to be powered via an auto transformer for voltage reduction, connect the common terminal to the grounded power source pole.**
- **Before powering on the unit, connect all grounding terminals, extension cords and devices to a protective ground via a ground socket. Any interruption of the protective grounding is a potential shock hazard and may cause personal injury. Whenever the ground protection is impaired, do not use the unit and secure it against any accidental operation.**
- **Do not tamper with the protective ground terminal.**

Only qualified electricians should connect a new plug if needed. The color coding used in the electric cable depends on the cable. New plugs should meet the local safety requirements and include:

- adequate load-carrying capacity
- ground connection
- cable clamp

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IMPORTANT

EXFO assumes no liability for your failure to comply with the indications in this documentation.



WARNING

- **Use this unit indoors only.**
- **Position the unit so as not to block the ventilation holes.**
- **Do not remove unit covers during operation.**
- **To avoid electrical shock, do not operate the unit if any part of the outer surface (covers, panels, etc.) is damaged.**
- **Use only fuses with the required rated current and specified type (IEC, 250 V, 2 A, fast blow, 0.197 in. x 0.787 in. / 5 mm x 20 mm). Do not use repaired fuses or short-circuited fuse holders.**
- **Only authorized personnel should carry out adjustments, maintenance or repair of opened units under voltage. A person qualified in first aid must also be present. Do not replace any components while power cable is connected.**
- **Operation of any electrical instrument around flammable gases or fumes constitutes a major safety hazard.**
- **Capacitors inside the unit may be charged even if the unit has been disconnected from its electrical supply.**

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Equipment Ratings	
Relative humidity[a]	0 % to 80 % non-condensing
Maximum operation altitude	2000 m (6562 ft)
Pollution degree	2
Installation category	II
Power supply rating[b]	100 V to 240 V (50 Hz/60 Hz)
	maximum 2 A

a. Measured in 0 °C to 31 °C (32 °F to 87.8 °F) range, decreasing linearly to 50 % at 40 °C (104 °F).
b. Not exceeding ± 10 % of the nominal voltage.

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LED Safety Information



WARNING

Do not install or terminate fibers while a light source is active. Never look directly into a live fiber and ensure that your eyes are protected at all times.



WARNING

Use of controls, adjustments and procedures for operation and maintenance other than those specified herein may result in hazardous radiation exposure.



WARNING

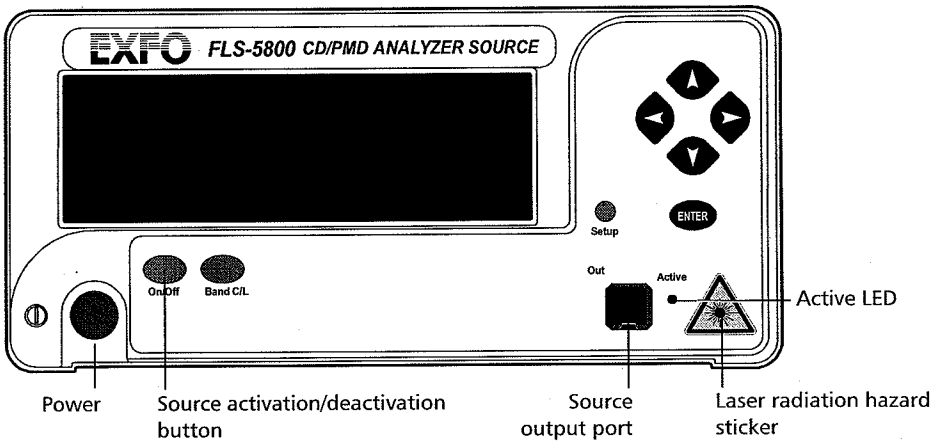
Use of optical instruments with this product increases eye hazard.

Your FLS-5800 CD/PMD Analyzer Source is a Class 1M LED product in compliance with standard IEC 60825-1 Amendment 2: 2001. LED radiation may be encountered at the output port.

The product is safe under reasonably forseeable conditions of operation but it may be hazardous if you use optics within a diverging or collimated beam. *Do not view directly with optical instruments.*

- Wavelength: 1520 to 1640 nm
- Maximum output power at the connector: 10 mW

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The unit has an active LED on its front panel. When lit, this LED indicates that an optical signal is being emitted from the source port.

The active LED will turn on three seconds before the source starts emitting.

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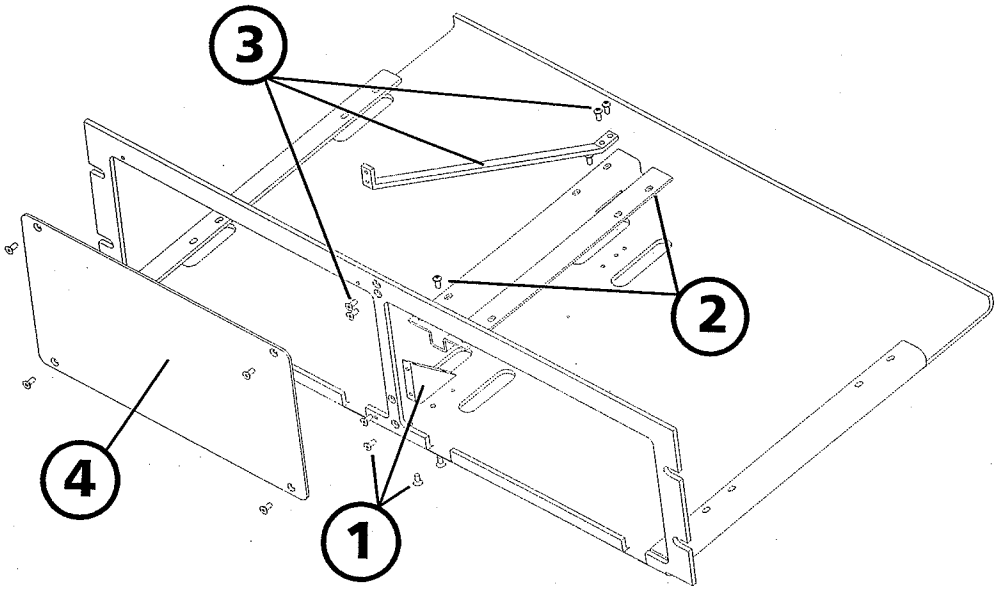
3 Getting Started with Your Light Source

Installing your FLS-5800 CD/PMD Analyzer Source in a Rackmount

You can place your FLS-5800 CD/PMD Analyzer Source in a rackmount in order to facilitate its usage.

To install the rackmount:

1. Fix the angle iron using four flat Phillips screws.



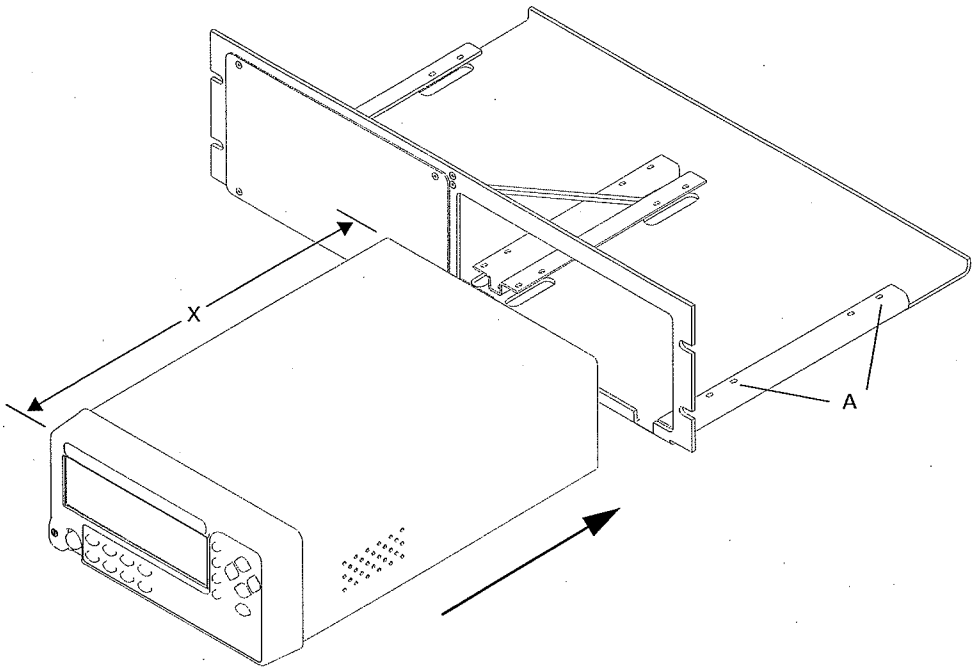
2. Fix the rackmount bracket to the frame using two round Phillips screws.
3. Fix the rackmount stiffener using two flat Phillips screws (for the front panel) and two round Phillips screws.
4. If your rackmount will contain only one unit, fix the rackmount cover plate to the empty part of the frame using four flat Phillips screws.

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To install your FLS-5800 CD/PMD Analyzer Source in a rackmount:

1. Slide the benchtop unit into the rackmount and tighten it from underneath using the four cover fixing screws.

   If measurement X on the illustration exceeds 11.125 in., fix the unit into the four holes identified as A. Otherwise, use the other four holes.



2. If a second benchtop is to be installed, remove the cover plate and repeat step 1.

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Turning the CD/PMD Analyzer Source On and Off



IMPORTANT

Before turning on the source, please read the *Electrical Safety Information* on page 4.

To turn the CD/PMD Analyzer Source on and off:

Press the red button located in the lower left-hand corner of the front panel.

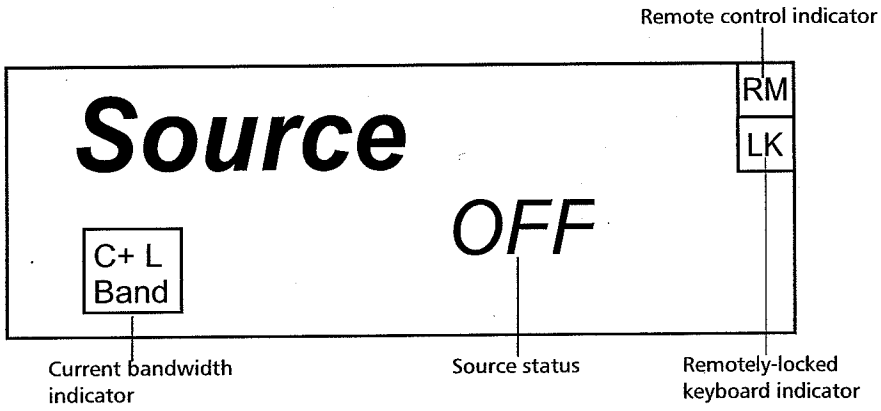
Upon startup, the unit beeps twice, performs a self-test and then displays the main window with the source deactivated.

When the unit is turned off, the current Setup menu settings remain in a storage device called non-volatile memory. These settings include display features and remote control.

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FLS-5800 CD/PMD Analyzer Source Display

The main window of your unit allows you to get important information on the source with just one glance.



- The *source status indicator* shows whether the source is active or not (ON/OFF). In the case of an active source, a graphical element representing a light beam is also displayed.
- The *remote control indicator* (**RM**) appears when the unit is currently controlled by remote commands (via GPIB or RS-232 communication mode).
- The *locked keyboard indicator* (**LK**) shows that a remote application prevents you from using the keyboard of the unit.
- The *bandwidth indicator* shows the current bandwidth (C, L or C + L).

Note: *The term "keyboard" refers to all front panel buttons –except the red button used to power the unit on or off.*

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4 Setting CD/PMD Analyzer Source Parameters

The blue button on the right side of the display provides access to the single-level *Setup* menu. You can access the Setup menu even while the source is active. The figure below shows Setup menu items.

Refresh Rate	8 Hz	RS232 / GPIB	GPIB
Backlight	ON	GPIB Addr.	12
Contrast	▼◐▲	Baud Rate	N.A.
Video Mode	STD	Flow Ctrl	N.A.
Exit			

To set a parameter:

1. Use arrows on the front panel of the unit to select the parameter you want to modify. The current selection is displayed in reverse video.
2. Press ENTER to edit the parameter. The cell containing the value will then be displayed in reverse video, indicating you can modify its contents.
3. Use the up/down arrows to select the appropriate value.
4. Confirm your selection by pressing ENTER. The display wiil return to normal.

To exit the Setup menu, press the blue button providing access to the menu. You can also select the **Exit** item from the Setup menu (last item at the bottom of the window) and press ENTER. The CD/PMD Analyzer Source will revert to its state prior to entering the menu.

Note: *The unit will beep whenever it does not allow an operation.*

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Setting Refresh Rate

This function allows you to define the refresh rate of the display.

To set the refresh rate:

1. Press the Setup button.
2. Use the up/down or left/right arrow keys to select **Refresh Rate** (the item will be displayed in reverse video).

Refresh Rate	8 Hz	RS232 / GPIB	GPIB
Backlight	ON	GPIB Addr.	12
Contrast	▼ ◐ ▲	Baud Rate	N.A.
Video Mode	STD	Flow Ctrl	N.A.
Exit			

3. Press ENTER to access the **Refresh Rate** edit box.
4. Use the up/down arrow keys to set the refresh rate between 1/2 Hz, 1 Hz, 2 Hz, 4 Hz, 8 Hz and 16 Hz.
5. Press ENTER to confirm the new refresh rate.

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Setting Backlight

In certain circumstances, you might want to deactivate the display backlight.

To deactivate the backlight:

1. Press the Setup button.
2. Use the up/down or left/right arrow keys to select **Backlight** (the item will be displayed in reverse video).
3. Press ENTER to access the **Backlight** edit box.
4. Use the up/down arrow keys until the backlight value changes to *OFF*.
5. Press ENTER to confirm the new backlight setting.

To reactivate the backlight:

➤ Standing very close to the screen to see the information displayed, repeat steps 1 to 4 above (but set the backlight value to *ON*).

OR

➤ Reset the unit to the default factory parameters (see *Resetting the CD/PMD Analyzer Source* on page 17).

Setting Contrast

To modify the contrast:

1. Press the Setup button.
2. Use the up/down or left/right arrow keys to select **Contrast** (item will appear in reverse video).
3. Press ENTER to access the **Contrast** edit box.
4. Use the up/down arrow keys to adjust the contrast as required.
5. Press ENTER to confirm the contrast adjustment.

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Setting Video Mode

To change the video mode:

1. Press the Setup button.
2. Use the up/down or left/right arrow keys to select **Video Mode** (item will appear in reverse video).
3. Press ENTER to access the **Video Mode** edit box.
4. Use the up/down arrow keys to set the required video mode.

Refresh Rate	8 Hz	RS232 / GPIB	GPIB
Backlight	ON	GPIB Addr.	12
Contrast	▼ ◐ ▲	Baud Rate	N.A.
Video Mode	STD	Flow Ctrl	N.A.
Exit			

Refresh Rate	8 Hz	RS232 / GPIB	GPIB
Backlight	ON	GPIB Addr.	12
Contrast	▼ ◐ ▲	Baud Rate	N.A.
Video Mode	INV	Flow Ctrl	N.A.
Exit			

5. Press ENTER to confirm the video mode.

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Resetting the CD/PMD Analyzer Source

You may want to reset the CD/PMD Analyzer Source parameters to their original values.

To reset parameters to values at time of purchase, while turning on the unit:

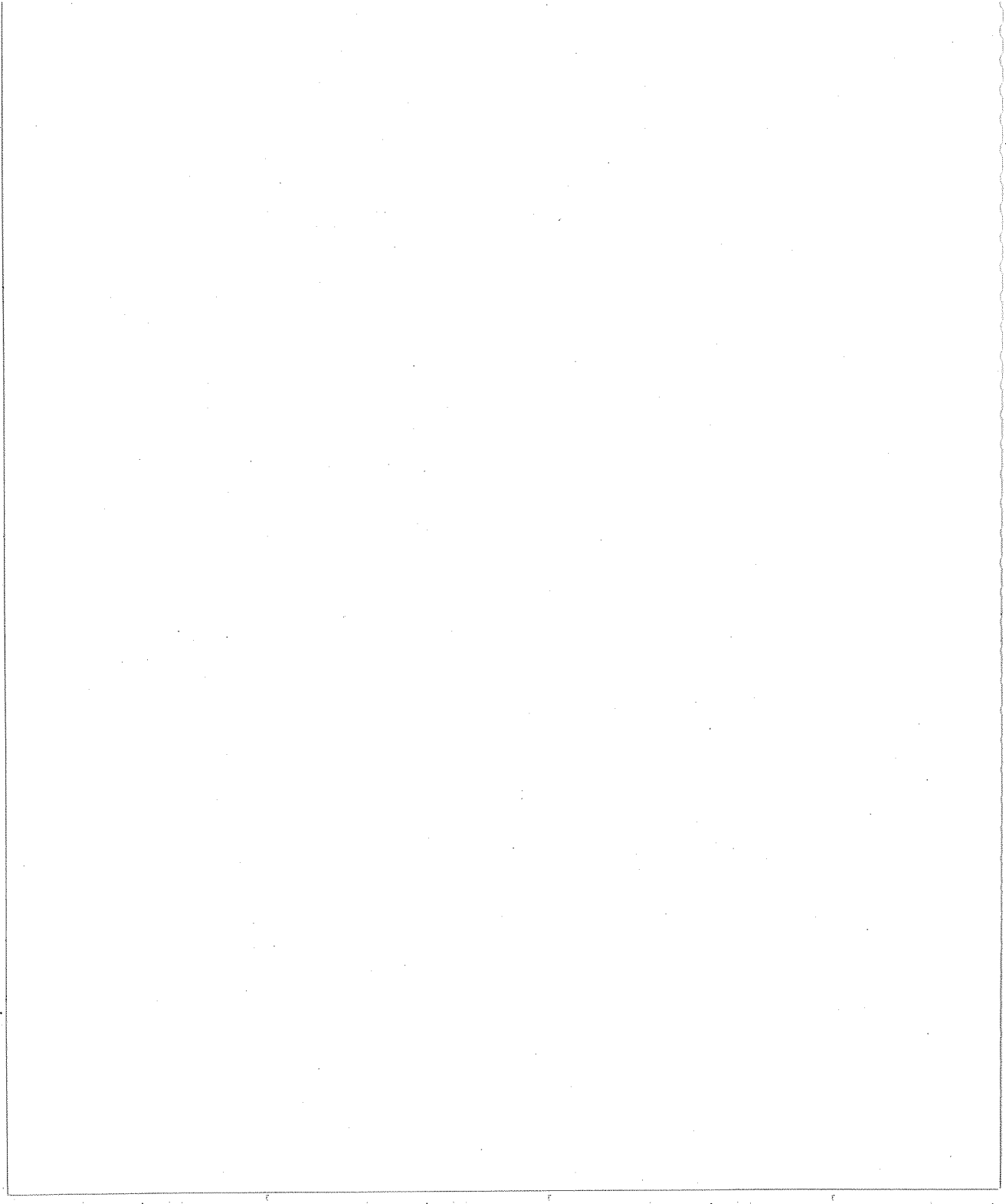
Press ENTER until the unit beeps three times.

All the user-defined parameters are automatically reset. The following table presents the parameters and their default values.

Parameters	Reset Value or State
Source	OFF
Source Bandwidth	C+L band (for sources equipped with both C and L bands)
Backlight	ON
Video Mode	STD (standard)
Refresh Rate	4 Hz
RS232/GPIB (Remote control)[a]	GPIB
GPIB Address[a]	12
Baud Rate[a]	N.A.
Flow Ctrl[a]	N.A.

a. Parameter cannot be reset by a remote control command.

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5 Operating the CD/PMD Analyzer Source

Changing the Source's Bandwidth

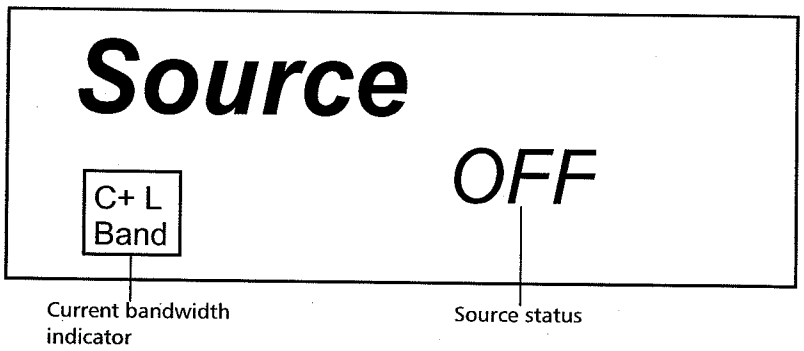
If your FLS-5800 CD/PMD Analyzer Source is equipped with both C and L bands, it can be set to

- C band
- L band
- C + L band

Note: *You cannot change the source's bandwidth while the source is emitting.*

To change the source's bandwidth:

Press on the Band C/L button, located on the front panel, until the desired bandwidth is displayed on the screen.



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Activating or Deactivating the Source

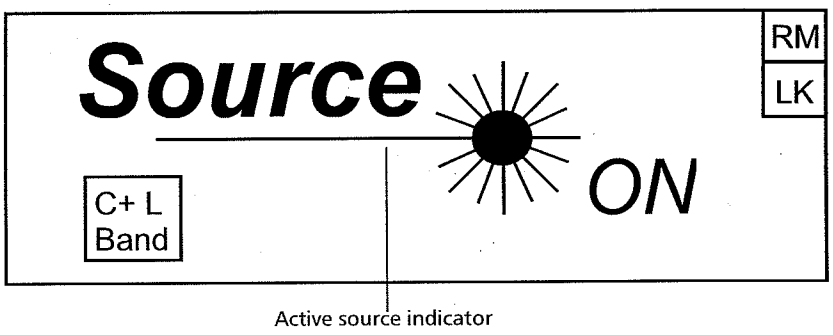
Note: *The CD/PMD Analyzer Source provides a three-second safety delay between the source activation and actual light emission.*

To activate the source:

1. Setup the source as explained in *Setting CD/PMD Analyzer Source Parameters* on page 13.

   To activate the source, press on the On/Off button. The active LED on the module front will light up, and the front display will read "*Source ON*", also showing a light beam icon.

   The word "*ON*" will flash during the three-second safety delay.



2. To deactivate the source, press the On/Off button again. The active LED on the module front will then turn off and the display will read "*Source OFF.*"

IMPORTANT

To obtain optimum stability, the led source should be allowed to warm up for 10 minutes. If this warmup time is not respected, the CD measurement will present an uncertainty of 0.15 ps/nm.

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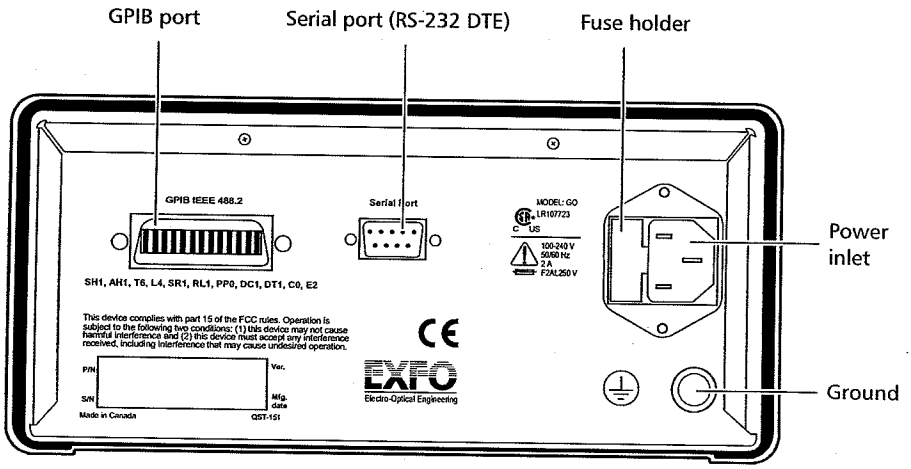
6 Controlling the Source Remotely

The CD/PMD Analyzer Source can be remotely controlled either by

- a GPIB interface (through a GPIB cable connected to the GPIB port)

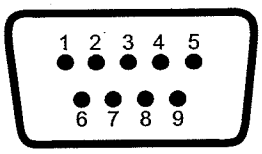
OR

- an RS-232 interface (through a serial cable connected to the serial port).



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The RS-232 connector (serial port) at the back of the CD/PMD Analyzer Source uses a DTE pinout configuration.



Pin Number	Description	Direction
2	Receive (Rx)	Input
3	Transmit (Tx)	Output
5	Signal ground (Gnd)	—

The commands used in both protocols are the same and are summarized in two reference tables. Common GPIB commands are listed in *General Commands—Quick Reference* table on page 34. Specific commands for the CD/PMD Analyzer Source are shown in the *Specific Commands—Quick Reference* table on page 35. Detailed information about these commands can be found in the *Remote Control Commands* appendix.

When the CD/PMD Analyzer Source is remotely controlled, **RM** appears in the upper right-hand corner of the display.

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Setting Remote Command Mode

To remotely control the CD/PMD Analyzer Source, you must set a GPIB address or activate the RS-232 port.

To set a remote command mode:

1. Press the Setup button.
2. Use the up/down or left/right arrow keys to select **RS232 / GPIB**. The current setting is displayed.

Note: *If* GPIB *is currently selected and you want to specify a GPIB address, see* *Setting GPIB Address on page 24.*

Refresh Rate	8 Hz	RS232 / GPIB	GPIB
Backlight	ON	GPIB Addr.	12
Contrast	▼ ◐ ▲	Baud Rate	N.A.
Video Mode	STD	Flow Ctrl	N.A.
Exit			

3. Press ENTER to access the **RS232 / GPIB** edit box.
4. Use the up/down arrow keys to toggle between *GPIB* and *RS232*.
5. Press ENTER to confirm.

If you selected *RS232*, the **GPIB Addr.** menu option is deactivated ("*N.A.*" is displayed).

If you selected *GPIB*, the **Baud Rate** and **Flow Ctrl** menu options are disabled ("*N.A.*" is displayed). If the currently selected GPIB address doesn't suit your needs, you can change it.

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Setting GPIB Address

If GPIB is selected as the remote command mode, you can select the GPIB address you want to use from 1 to 30 (default value is 12).

To set a GPIB address:

1. Press the Setup button.
2. Use the up/down or left/right arrow keys to select **GPIB Addr.** The current GPIB address is displayed.

Note: *If you are in RS-232 mode, the GPIB address cell will display* "N.A." *You must change the communication mode to* GPIB *before setting an address.*

Refresh Rate	8 Hz	RS232 / GPIB	GPIB
Backlight	ON	GPIB Addr.	12
Contrast	▼ ◐ ▲	Baud Rate	N.A.
Video Mode	STD	Flow Ctrl	N.A.
Exit			

3. Press ENTER, then use the up/down arrow keys to select a GPIB address between 1 and 30.
4. Press ENTER to confirm your choice.

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Setting Baud Rate

The baud rate is a parameter related to RS-232 communication. It determines the speed at which data is sent between the unit and a computer, in bits per second (bps).

To change the baud rate for your remote communications:

1. Press the Setup button.
2. Use the up/down or left/right arrow keys to select **Baud Rate**. The current setting is displayed.

Refresh Rate	8 Hz	RS232 / GPIB	RS232
Backlight	ON	GPIB Addr.	N.A.
Contrast	▼ ◐ ▲	Baud Rate	19200
Video Mode	STD	Flow Ctrl	Soft
Exit			

3. Press ENTER, then use the up/down arrow keys to select the baud rate. You can select 1200, 2400, 4800, 9600 or 19200 bps.
4. Press ENTER to confirm.

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Setting Flow Control

The flow control parameter applies only to RS-232 communication. This parameter allows you to select the type of serial communication used.

Choose *Soft* if you want the rate of data transmission to match the rate at which it can be processed by the device. This enables the computer and the CD/PMD Analyzer Source to stop each other from transmitting by sending a control character (Xoff). They will also be able to restart the transmission by sending another control character (Xon). This is known as a "*software handshake*", a procedure requiring a special cable.

To set a flow control:

1. Press the Setup button.
2. Use the up/down or left/right arrow keys to select **Flow Ctrl**. The current setting is displayed.

Refresh Rate	8 Hz	RS232 / GPIB	RS232
Backlight	ON	GPIB Addr.	N.A.
Contrast	▼ ◐ ▲	Baud Rate	19200
Video Mode	STD	Flow Ctrl	Soft
Exit			

3. Press ENTER, then use the up/down arrow keys to select the type of flow you want. "*None*" means no flow control. "*Soft*" allows the unit or computer controlling it, to turn the data transmission on or off.
4. Press ENTER to confirm.

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Communication Parameters

Note: *EOS means "End of String." EOI means "End or Identify."*

For GPIB Communication	
Terminate Read on EOS	Yes
Set EOI with EOS on Writes	Yes
Type of compare on EOS	8 bits
EOS byte	0Ah
Send EOI at end of Writes	Yes
GPIB primary address	See *Setting GPIB Address* on page 24
GPIB secondary address	None

For RS-232 Communication	
EOS bytes	0Ah
Baud rate	1200/2400/4800/9600/ 19200 bps
Parity	None
Data bits	8 bits
Stop bits	1 bit
Flow control	Software (Xon/Xoff) or None
Activation	See *Setting Remote Command Mode* on page 23

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Standard Status Data Structure

The four tables below give information on the common Status and Enable registers as defined by IEEE 488.2.

The diagram displayed on page 31 is a useful aid in understanding the general commands and how a service request (SRQ) is generated.

➤ Standard Event Status Register (ESR)

Bits	Mnemonics	Bit Value
7	Power On	128
6	Not used	0
5	Command Error	32
4	Execution Error	16
3	Device Dependent Error	8
2	Query Error	4
1	Not used	0
0	Operation Complete	1

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➤ Standard Event Status Enable Register (ESE)

Bits	Mnemonics	Bit Value
7	Power on	128
6	Not used	0
5	Command error	32
4	Execution error	16
3	Device dependent error	8
2	Query error	4
1	Not used	0
0	Operation complete	1

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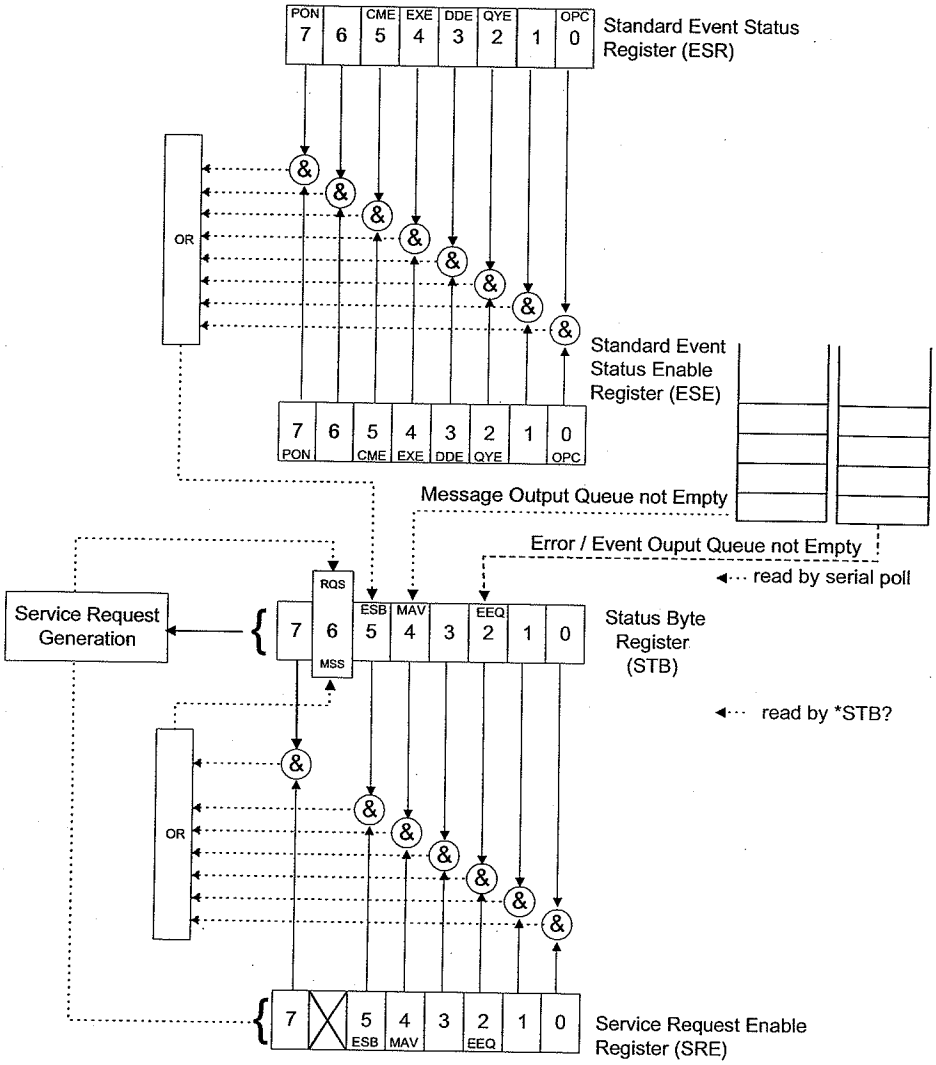
➤ Status Byte Register (STB)

Bits	Mnemonics	Bit Value
7	Not used	0
6	Request service / Master summary status	64
5	Event summary bit	32
4	Message available	16
3	Not used	0
2	Error / Event queue	4
1	Not used	0
0	Not used	0

➤ Service Request Enable Register (SRE)

Bits	Mnemonics	Bit Value
7	Not used	0
6	Reserved	0
5	Event status byte	32
4	Message available	16
3	Not used	0
2	Error / Event queue	4
1	Not used	0
0	Not used	0

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An SRQ is forced when a bit in the Status Byte register goes from 0 to 1 and the corresponding SRE mask bit is set. If an SRQ is forced, the RQS bit is set to 1 and will remain there until read by a serial poll –even if the reason or condition causing the service request no longer exists. Similarly, if a serial poll reads the RQS, it is reset to 0, whether or not the condition causing the service request still exists.

Command Structure

The GPIB and RS-232 commands follow the guidelines determined by the Standard Commands for Programmable Instruments (SCPI) consortium. For example, the following command syntax is used to activate or deactivate the source.

SOUR:POW[:STAT]<wsp><Boolean>

- SOUR, POW and STAT are keywords that define the function of the command.
- [ ] indicates that a keyword or parameter is optional.
- <wsp> indicates that a space is required ("wsp" stands for "white space").
- <Boolean> indicates the command parameter.
- Keywords must be separated by a colon.

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To enter commands or queries you must use either the full word for the command, or the three- or four-letter shortcut. Commands are not case-sensitive, however spelling errors will cancel the command or query.

The command or query can be written using only shortcuts, only full words, or a combination of both.

Other command syntax elements are

- the comma, which is used to separate values in a command or query.
- the semi-colon, which is used to separate commands or queries, when you send more than one at a time.

Note: *It is recommended that you retrieve the response immediately after each query.*

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General Commands—Quick Reference

The FLS-5800 CD/PMD Analyzer Source recognizes the main commands identified in IEEE 488.2. The table below summarizes these commands. For more information about general commands, see *Remote Control Commands* on page 63.

Command	Function
*CLS	Clear status command
*ESE	Standard event status enable command
*ESE?	Standard event status enable query
*ESR?	Standard event status register query
*IDN?	Identification query
*OPC	Operation complete command
*OPC?	Operation complete query
*RST	Reset command
*SRE	Service request enable command
*SRE?	Service request enable query
*STB?	Read status byte query
*TST?	Self-test query
*WAI	Wait for pending operations to be completed

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The FLS-5800 CD/PMD Analyzer Source also recognizes commands that can only be used with RS-232 communication. These commands are summarized below.

Command	Function
*LOK	Set Remote Lockout programming state
*LOK?	Remote Lockout programming state query
*REM	Set Remote programming state

Specific Commands—Quick Reference

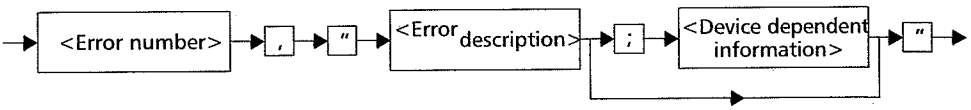
The table below contains a summary of the FLS-5800 CD/PMD Analyzer Source specific commands. If you need more information about these specific commands, see *Specific Commands* on page 72.

Command			Parameter/ Response	Description
DISP	BRIG		<numeric_value> |MINimum| MAXimum	Turn backlight on or off
	BRIG?		(0|1)	Backlight on or off?
SOUR	POW	STAT	0|1 |ON|OFF	Turn source on or off
		STAT?	(0|1)	Source active?
SOUR	WAV	BAND	C|L|CL	Bandwidth selection
SOUR	WAV	BAND?	(C|L|CL)	Current bandwidth?
SYST	ERR?		Error code	Next error from error queue?
	VERS?		Current version	Identification string?

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Error Messages Format

System and device specific errors are managed by the FLS-5800 CD/PMD Analyzer Source. The generic format for error messages is illustrated in the following figure.



As shown in the above figure, the message contains three parts:

- error number
- error description
- device dependent information

All error messages are stacked in a FIFO buffer. When there is at least one message in the buffer, bit 2 of the Status Byte Register is set to 1. Use the SYST:ERR? command to read the most recent message. The error message buffer is initialized when starting the CD/PMD Analyzer Source, when executing the *CLS command, or by reading the last message stored in the buffer.

- Error messages ending in a negative number are SCPI-based errors.

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SCPI Management Errors (System Errors)

Error Number	Description	Probable Cause
-100	"Command error"	A Command error has occurred. This is the generic syntax error for devices that cannot detect more specific errors.
-104	"Data type error"	The parser recognized a data element different than the one allowed.
-108	"Parameter not allowed"	More parameters were received than expected for the header.
-109	"Missing parameter"	Fewer parameters were received than expected for the header.
-113	"Undefined header"	The header is syntactically correct, but it is undefined for this specific device.
-130	"Suffix error"	An error occured while parsing a suffix.
-131	"Invalid suffix"	The suffix does not follow the appropriate syntax or it is inappropriate for this device.
-138	"Suffix not allowed"	A suffix was encountered after a numeric element which does not allow suffixes.
-200	"Execution error"	An execution error occurred. This is the generic syntax error for devices that cannot detect more specific errors.

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Error Number	Description	Probable Cause
-222	"Data out of range"	A legal program data element was parsed but could not be executed because the interpreted value was outside the legal range as defined by the device.
-224	"Illegal parameter value"	An exact value from a list of possibles was expected.
-300	"Device-specific error"	A device-dependent error occurred. This is the generic syntax error for devices that cannot detect more specific errors.
-321	"Out of memory"	An internal operation needed more memory than was available.
-350	"Queue overflow"	A specific code entered into the queue in lieu of the code that caused the error. This code indicates that there is no room in the queue and an error occurred but was not recorded.
-365	"Time out error"	This is a generic device-dependent error.
-400	"Query error"	A query error occurred. This is the generic syntax error for devices that cannot detect more specific errors.

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7 Maintenance

To help ensure long, trouble-free operation:

- Keep the unit free of dust.
- Clean the unit casing with a cloth slightly dampened with water.
- Store unit at room temperature in a clean and dry area. Keep the unit out of direct sunlight.
- Avoid high humidity or significant temperature fluctuations.
- Avoid unnecessary shocks and vibrations.
- If any liquids are spilled on or into the unit, turn off the power immediately and let the unit dry completely.



WARNING

Use of controls, adjustments and procedures for operation and maintenance other than those specified herein may result in hazardous radiation exposure.

Cleaning the Front Panel

Clean the front panel of the CD/PMD Analyzer Source regularly to avoid buildup of dust, dirt, and other foreign substances.

To clean the front panel:

1. Gently wipe the front panel with a cloth dampened with soapy water.
2. Rinse the front panel with a cloth dampened with water.
3. Dry with a clean wiping cloth.



IMPORTANT

To help keep the connectors and adapters clean, EXFO recommends that you install protective caps when the unit is not in use. You should also clean the fiber ends before every connection.

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Cleaning Connectors Equipped with EUI/EUA Adapters

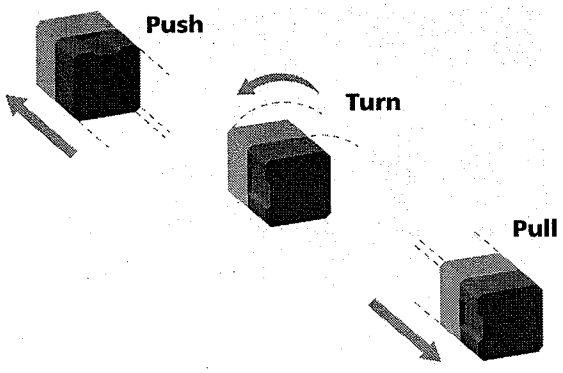
Regular cleaning of connectors equipped with EUI/EUA adapters will help maintain optimum performance. There is no need to disassemble the unit.

IMPORTANT

If any damage occurs to internal connectors, the module casing will have to be opened and a new calibration will be required.

To clean connectors:

1. Remove the EUI/EUA adapter from the module to expose the optical connector baseplate and ferrule.



2. Use a lint-free wiping cloth and deposit *only one drop* of isopropyl alcohol on it.

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IMPORTANT

Since isopropyl alcohol is not absolutely pure, it may leave residues if used abundantly or left to evaporate (about 10 seconds).

Avoid contact between the tip of the bottle and the wiping cloth, dry the surface quickly, and use a bottle that distributes only a drop of alcohol at a time.

3. Gently wipe the connector and ferrule.
4. With a dry lint-free wiping cloth, gently wipe the same surfaces to ensure that the connector and ferrule are perfectly dry.
5. Throw out the wiping cloths after one use.
6. Verify connector surface with a portable fiber-optic microscope (e.g., EXFO's FOMS) or fiber inspection probe (e.g., EXFO's FIP).



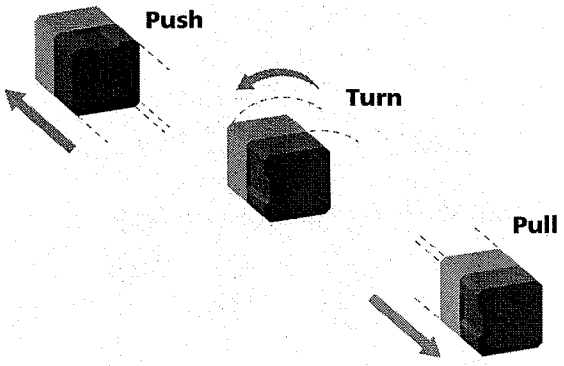
WARNING

Verifying the surface of the connector WHILE THE UNIT IS ACTIVE WILL result in permanent eye damage.

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To clean EUI/EUA adapters:

1. Remove the EUI/EUA adapter from the module connector.

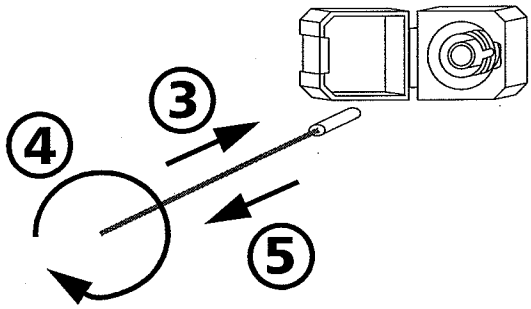


2. Moisten a cleaning tip (2.5 mm tip) provided by EXFO with *only one drop* of isopropyl alcohol.

IMPORTANT

Alcohol may leave traces if used abundantly. Avoid contact between the tip of the bottle and the cleaning tip, and do not use bottles that distribute too much alcohol at a time.

3. Slowly insert the cleaning tip into the adapter until it comes out on the other side (a slow clockwise rotating movement may help).



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4. Gently turn the cleaning tip one full turn.
5. Continue to turn as you withdraw the cleaning tip.
6. Repeat steps 3 to 5, but this time with a dry cleaning tip (2.5 mm tip provided by EXFO).

Note: *Make sure you don't touch the soft end of the cleaning tip and verify the cleanliness of the cotton tip.*

7. Throw out the cleaning tips after one use.

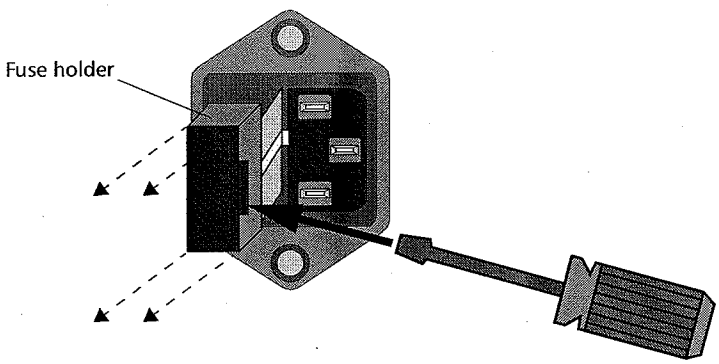
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Replacing Fuses

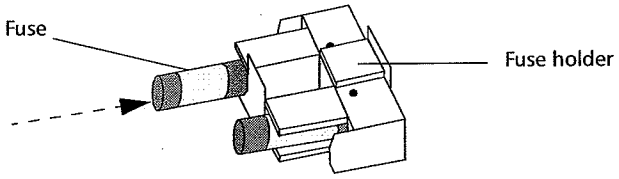
The FLS-5800 CD/PMD Analyzer Source contains two F2.0L250V-type fuses (IEC, 5 mm x 20 mm (0.197 in x 0.787 in), fast-acting, low breaking capacity, 250 V). The fuse holder is located at the back of the CD/PMD Analyzer Source, just beside the power inlet.

To replace a fuse:

1. Turn off the unit and unplug the power cord.
2. Using a flat-head screwdriver as a lever, pull the fuse holder out of the CD/PMD Analyzer Source.



3. Check and replace the fuses, if necessary.
4. Insert the new fuse into the fuse holder.



5. Make sure the fuses are placed firmly in the holder prior to reinsertion.
6. Firmly push the fuse holder into place.

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Recalibrating the Unit

If a calibration due date was not indicated by EXFO on the calibration label, this means that the calibration certificate for your FLS-5800 CD/PMD Analyzer Source has been modified in conformity with the ISO/IEC 17025 Standard.

EXFO recommends that an annual calibration be performed on your FLS-5800 CD/PMD Analyzer Source to ensure that it remains within the published specifications. However, as prescribed by the ISO/IEC 17025 Standard, this date can only be set by you.

You should indicate the calibration due date in the space provided on the calibration label.

Upgrading the Embedded Software

To upgrade the CD/PMD Analyzer Source embedded software, you will need to obtain the upgrade files from EXFO's Technical Support Group. You will also need a null-modem cable.

IMPORTANT

You may upgrade software in DOS, Windows 3.1, Windows 9x, or Windows 2000. With some notebook computers, you may need to be in a DOS environment. If problems occur, contact EXFO.

To upgrade the embedded software:

1. Turn off the CD/PMD Analyzer Source.
2. Connect a null-modem cable to the CD/PMD Analyzer Source RS-232 port and to an unused serial communication port on your PC.
3. On your PC's hard disk, create a folder named "*Test*" (*C:\Test*).
4. Unzip or copy the upgrade files into the newly created folder.

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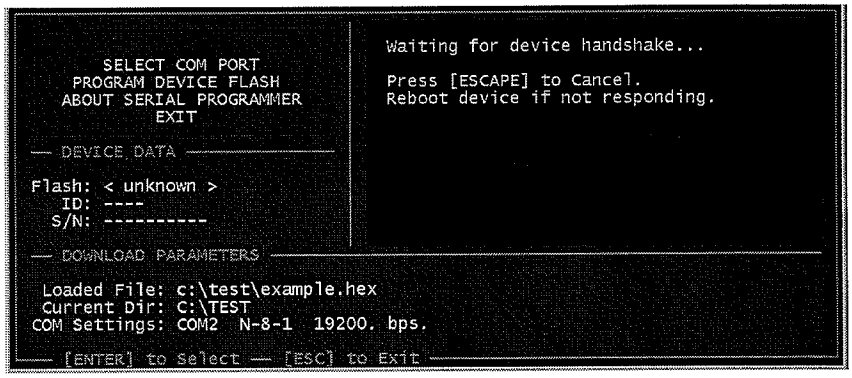
5. If the software upgrade is performed in Windows 98, you must restart your PC in DOS mode before launching the upgrade program. In other cases, simply exit to DOS.

6. Go to the "C:\Test" folder and launch the upgrade program by typing the following line (spaces are required between parameters):

   Lo0006.exe /C:2 /F:c:\test\filename.hex /S:19200

   Parameters can be decoded as follows:

   - /C: serial port number (COM2 in the above example)
   - /F: file to copy on your unit (replace "filename" with the actual name of the .hex file on your hard disk)
   - /S: PC-to-unit transfer speed (if "19200" does not work, try "56700")



7. When the **Waiting for device handshake** message appears, turn on the CD/PMD Analyzer Source.

   The unit display remains off, the unit beeps once and the upgrade program starts automatically. A progress bar on the PC screen indicates the upgrade status. Once the software upgrade is complete, the **Reboot device for self-test** message appears.

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8. If the software upgrade was performed in Windows 2000, an error message is displayed: "*LO0006 NTVDM has encountered a System Error. The parameter is incorrect. Choose 'Close' to terminate the application.*". Click on **Close** to hide the dialog box.

9. Turn the CD/PMD Analyzer Source off, and then on again.

   Some units will display the new version number at start-up, otherwise press the up and right arrow keys together while the unit is turned on.

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8 Troubleshooting

CD/PMD Analyzer Source Error Messages

Warning/Error Number	Description	Recommended Action
-11	Module reset error: The nulling was not performed correctly.	Restart your unit to solve the problem.
-12	Wrong module ID: The module returns the wrong ID.	Call EXFO for assistance.
-20	Module communication error: Communication error with the module.	Restart your unit to solve the problem.
-25	Checksum error: Checksum error while reading the module's FIFO.	Restart your unit to solve the problem.
-30	Command not accepted: The command that caused the warning will be lost. The unit may continue with the program even if the command was not performed.	If problem persists, call EXFO for assistance.
-31	Module setting error: One of the settings sent to the unit is wrong.	Review your command before sending it again.
-32	Action currently in progress: You cannot send a command while the unit is already active.	Wait until the unit is done before sending the command.
-34	Command overflow: Too many commands were sent to the unit at a time.	Wait until the unit is done before sending more commands.

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Warning/Error Number	Description	Recommended Action
-40	FIFO not ready for reading: The unit's FIFO is not ready for reading. Commands sent will be ignored.	If problem persists, call EXFO for assistance.
-60	Laser over-current: A problem occured with the current going to the laser.	Call EXFO for assistance.
-64	EEPROM error: The EEPROM was not detected.	Call EXFO for assistance.
-65	EEPROM checksum error: A Checksum error was detected by the unit.	Call EXFO for assistance.
-68	Temperature error: The operating temperature of the unit is from 10 °C to 40 °C (50 °F to 104 °F).	Make sure the ambient temperature is comprised in the specified temperature range.
-69	FPGA problem: A FPGA problem was detected.	Call EXFO for assistance.
-73	Supply voltage error: Internal voltage values are out of the operation range.	Call EXFO for assistance.
-74	Laser pump failure: A problem occured in the output (optical) power of the laser pump.	Call EXFO for assistance.
-75	Laser temperature problem: Laser temperature is out of the operation range.	Make sure the ambient temperature is comprised in the specified temperature range.

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Warning/Error Number	Description	Recommended Action
-76	Thermo-electric cooler over-current: A problem occured with the current going to the thermo-electric cooler.	Call EXFO for assistance.
-79	EEPROM access error: A problem occured when accessing the EEPROM memory (read or write).	Call EXFO for assistance.
100	No more room in the command pipe: A command could not be added to the command pipe.	If problem persists, call EXFO for assistance.
101	Timeout error: The command request was not performed in the set time amount.	Call EXFO for assistance.
102	Runtime error: The command was not performed by the unit due to a runtime error.	Call EXFO for assistance.
103	Invalid response: A command has triggered an invalid response from the unit.	Call EXFO for assistance.
200	Decompression error: An error occurred while decompressing the software.	Call EXFO for assistance.
32244	Floating exception: There is an overflow while running a command.	Restart your unit to solve the problem.
32245	Stack overflow: Not enough RAM to run the command.	Restart your unit to solve the problem.

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Warning/Error Number	Description	Recommended Action
32246	Abort called in firmware: The unit used a command which it is not intended to.	Restart your unit to solve the problem.
32300	Heap overflow: Not enough space in the heap.	Restart your unit to solve the problem.
32301 32302	Malloc overflow: Not enough RAM to run the command.	Restart your unit to solve the problem.
32303	Divide by zero: The unit attempted to perform a division by zero, which gives an infinite answer.	Restart your unit to solve the problem.
32304	Array boundary error: A table index is outside the bounaries set by the array.	Restart your unit to solve the problem.
32305	Invalid Opcode: The unit did not recognized the binary code.	Restart your unit to solve the problem.

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GPIB Troubleshooting

Problem	Probable Cause	Solution
Unable to communicate with CD/PMD Analyzer Source (no response from *IDN? command).	Incorrect communication type selected.	Select the correct communication type: RS-232 or GPIB.
	Incorrect communication parameters.	Check the communication parameters: bus address, baud rate, flow control, etc., as required.
	Incorrect termination characters.	Synchronize termination characters between the GPIB controller and the SCPI Manager.
	Poor bus connection.	Ensure the functionning of the controller card and make sure that the bus cable is properly connected.
	Improper configuration.	Verify that the GPIB interface is properly configured.
Receive "Undefined header" error.	Incorrect command syntax.	Verify and correct syntax.
Unstable communication.	Incorrect termination character.	Synchronize termination characters between the GPIB controller and the SCPI Manager.

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Finding Information on the EXFO Web Site

The EXFO Web site provides answers to frequently asked questions (FAQs) regarding the use of your FLS-5800 CD/PMD Analyzer Source.

To access FAQs:

1. Type http://www.exfo.com in your Internet browser.
2. Click on the **Support** tab.
3. Click on **FAQs** and follow the on-screen instructions. You will be given a list of questions pertaining to your subject.

The EXFO Web site also provides the product's most recent technical specifications.

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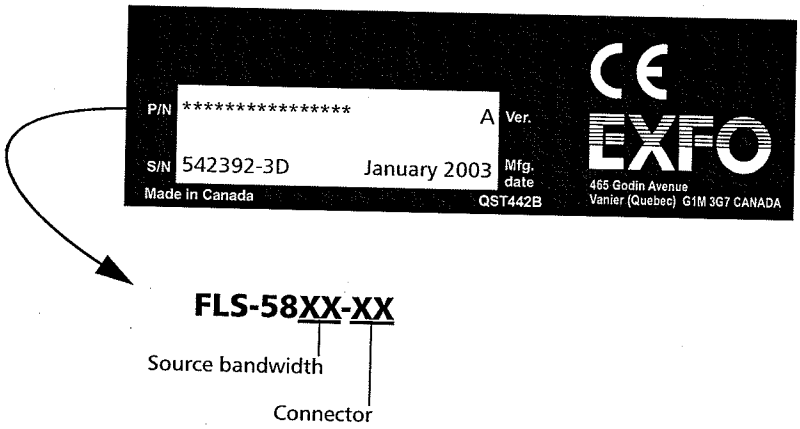
Contacting the Technical Support Group

To obtain after-sales service or technical support for this product, contact EXFO at one of the following numbers. The Technical Support Group is available to take your calls from Monday to Friday, 7:30 a.m. to 8:00 p.m. (Eastern Time in North America).

Technical Support Group
400 Godin Avenue
Vanier (Quebec) G1M 2K2
CANADA

1 866 683-0155 (USA and Canada)
Tel.: 1 418 683-5498
Fax: 1 418 683-9224
support@exfo.com

To accelerate the process, please have information such as the name and the serial number (see the product identification label—an example is shown below), as well as a description of your problem, close at hand.



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Transportation

Maintain a temperature range within specifications when transporting the unit. Transportation damage can occur from improper handling. The following steps are recommended to minimize the possibility of damage:

- Pack the unit in its original packing material when shipping.
- Avoid high humidity or large temperature fluctuations.
- Keep the unit out of direct sunlight.
- Avoid unnecessary shock and vibration.

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9 Warranty

General Information

EXFO Electro-Optical Engineering Inc. (EXFO) warrants this equipment against defects in material and workmanship for a period of one year from the date of original shipment. EXFO also warrants that this equipment will meet applicable specifications under normal use.

During the warranty period, EXFO will, at its discretion, repair, replace, or issue credit for any defective product, as well as recalibrate the product free of charge should the equipment need to be repaired or if the original calibration is erroneous.

IMPORTANT

The warranty can become null and void if:

- **the equipment has been tampered with, repaired, or worked upon by unauthorized individuals or non-EXFO personnel.**
- **the warranty sticker has been removed.**
- **case screws, other than those specified in this manual, have been removed.**
- **the case has been opened, other than as explained in this manual.**
- **the equipment serial number has been altered, erased, or removed.**
- **the equipment has been misused, neglected, or damaged by accident.**

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL EXFO BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

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Liability

EXFO shall not be liable for damages resulting from the use of the purchased product, nor shall be responsible for any failure in the performance of other items to which the purchased product is connected or the operation of any system of which the purchased product may be a part.

EXFO shall not be liable for damages resulting from improper usage or unauthorized modification of the product, its accompanying accessories and software.

Exclusions

EXFO reserves the right to make changes in the design or construction of any of its products at any time without incurring obligation to make any changes whatsoever on units purchased. Accessories, including but not limited to fuses, pilot lamps, and batteries used with EXFO products are not covered by this warranty.

Certification

EXFO certifies that this equipment met its published specifications at the time of shipment from the factory.

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Service and Repairs

EXFO commits to providing product service and repair for five years following the date of purchase.

To send any equipment for service or repair:

1. Call one of EXFO's authorized service centers (see *EXFO Service Centers Worldwide* on page 60). Support personnel will determine if the equipment requires service, repair, or calibration.
2. If equipment must be returned to EXFO or an authorized service center, support personnel will issue a Return Merchandise Authorization (RMA) number and provide an address for return.
3. If the unit has an internal storage device, perform a data backup before sending the unit for repairs.
4. Pack the equipment in its original shipping material. Be sure to include a statement or report fully detailing the defect and the conditions under which it was observed.
5. Return the equipment, prepaid, to the address given to you by support personnel. Be sure to write the RMA number on the shipping slip. *EXFO will refuse and return any package that does not bear an RMA number.*

Note: *A test setup fee will apply to any returned unit that, after test, is found to meet the applicable specifications.*

After repair, the equipment will be returned with a repair report. If the equipment is not under warranty, the customer will be invoiced for the cost appearing on this report. Return-to-customer shipping costs will be paid by EXFO for equipment under warranty. Shipping insurance is at the customer's expense.

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EXFO Service Centers Worldwide

If your product requires servicing, contact your nearest authorized service center.

EXFO Headquarters Service Center
400 Godin Avenue
Vanier (Quebec) G1M 2K2
CANADA

1 866 683-0155 (USA and Canada)
Tel.: 1 418 683-5498
Fax: 1 418 683-9224
quebec.service@exfo.com

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europe.service@exfo.com

EXFO China Service Center/ Beijing OSIC
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SINGAPORE 169876

Tel.: +65 6333 8241
Fax: +65 6333 8242
asiapacific.service@exfo.com

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A Technical Specifications

IMPORTANT

The following technical specifications can change without notice. The information presented in this section is provided as a reference only. To obtain this product's most recent technical specifications, visit the EXFO Web site at *www.exfo.com*.

Specifications[1]

	C-band	L-band
Center wavelength (nm)	1550 ± 10	1607.5 ± 17.5
Output power (dBm)	4	4
Peak spectral density (dBm/nm)	> -12.5	> -12.5
Power stability (15 minutes) (dB)	< 0.075	< 0.075
Modulation frequency (MHz)	100	101

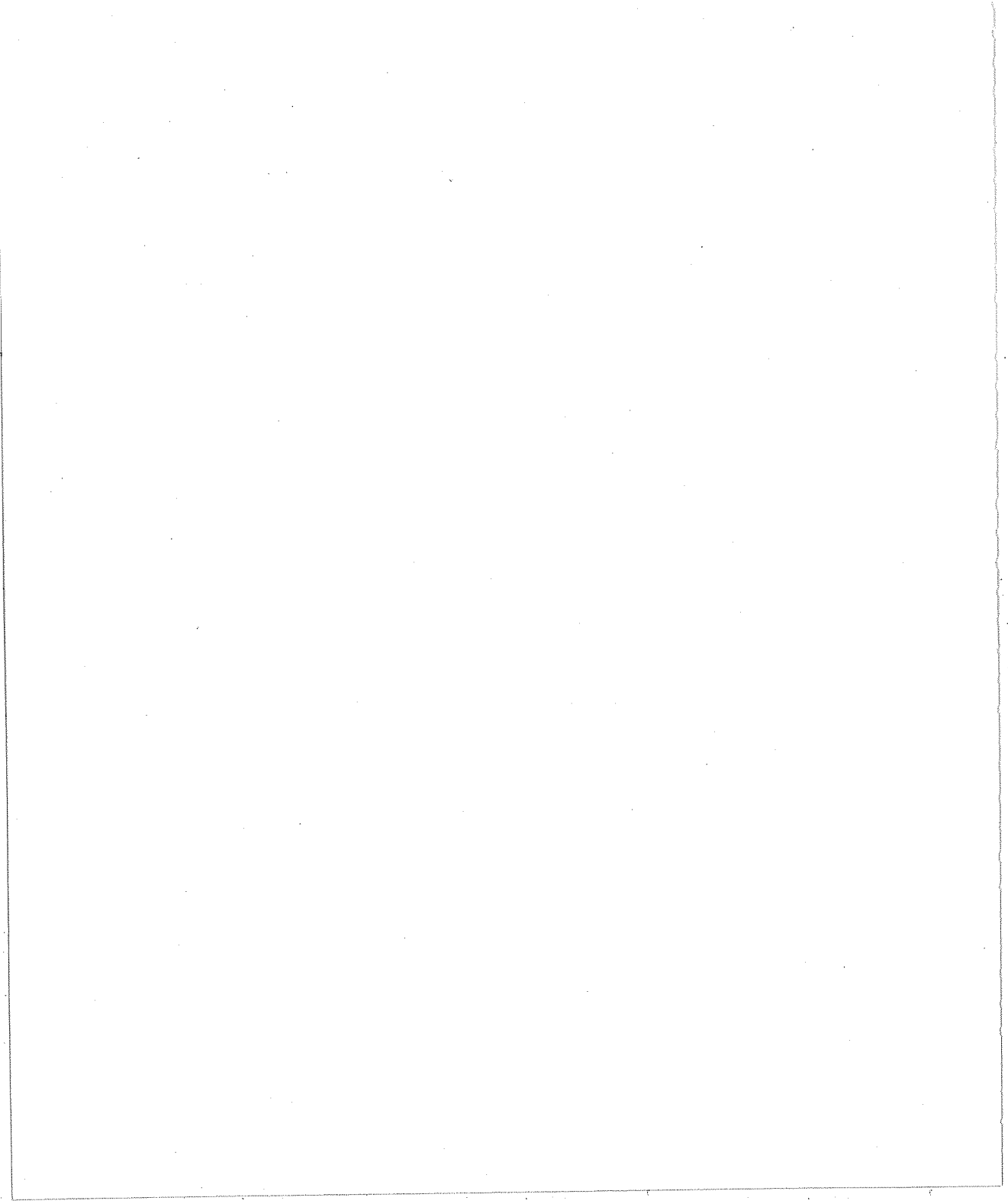
Note

1. Typical

General Specifications

Temperature	Operating	0 °C to 40 °C	(32 °F to 104 °F)
	Storage	-20 °C to 50 °C	(-4 °F to 122 °F)
Size (H x W x D)		11.7 cm x 22.2 cm x 33.3 cm	4 5/8 in x 8 3/4 in x 13 1/8 in
Weight		3.2 kg	7.1 lb

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B Remote Control Commands

Common Commands

The SCPI Manager recognizes all of the common commands identified as mandatory by IEEE-488.2. These commands are fully explained on the following pages.

Note: *The expression* <wsp> *stands for white space in certain GPIB commands syntax.*

*CLS

Description This command sets the contents of the Standard Event Status Register(ESR), the Status Byte Register (STB), as well as the Error and Input queues to zero. This command is commonly used to clear the status registers before enabling SRQ. Note that the following settings are not affected: Instrument interface address, Output queue, Service Request Enable Register (SRE), Standard Event Status Enable Register (ESE).

Syntax *CLS

*ESE

Description This command is used to set bits in the Standard Event Status Enable Register (ESE) to a new value (initial value is 189). The contents of the ESE register are logically ANDed with the ESR register. A non-zero result will set the Event Summary Bit (ESB) of the Status Byte Register (STB). This command is useful for selecting which events may generate an SRQ.

Syntax *ESE<wsp><value>

Parameter The <value> parameter must be between 0 and 255.

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*ESE?

Description This query reads the contents of the Standard Event Status Enable Register (ESE).

Syntax *ESE?

Response A binary integer between 0 and 255

*ESR?

Description This query reads the contents of the Standard Event Status Register (ESR) and clears it.

Syntax *ESR?

Response A binary integer between 0 and 255

*IDN?

Description This query reads the CD/PMD Analyzer Source system identification string.

Syntax *IDN?

Response "EXFO E.-O. Engineering,FLS-5800,xxxxxxxxxx,2.0r0", where

– xxxxxxxx is the serial number

– 2.0r0 is the Firmware level.

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*OPC

Description This command will cause the CD/PMD Analyzer Source to generate the operation complete message in the Standard Event Status Register (ESR) when all pending selected CD/PMD Analyzer Source operations have been completed.

Syntax *OPC

Example *IDN?;*OPC

Note The following actions cancel the *OPC command (and put the instrument into Operation Complete Command Idle state):

Power On

Device clear active state is asserted on the interface

*CLS

*RST

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*OPC?

Description This query puts an ASCII 1 in the Output queue and generates the operation complete message in the Standard Event Status Register (ESR) when all pending selected CD/PMD Analyzer Source operations have been completed. This query is useful to prevent another command from processing until the current command is complete.

Syntax *OPC?

Response "1"

Note The following actions cancel the *OPC command (and put the instrument into Operation Complete Command Idle state):

- Power On
- Device clear active state is asserted on the interface
- *CLS
- *RST

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*RST

Description The *RST command sets the instrument to reset settings (factory settings stored in ROM). Pending *OPC and *OPC? actions are cancelled. The instrument is placed in idle state. The *RST command clears the Input and Error queues. The following settings are not changed:

- Instrument interface address
- Output queue
- Service Request Enable Register (SRE)
- Standard Event Status Enable Register (ESE)

Syntax *RST

Note For a complete list of default parameters, see *Resetting the CD/PMD Analyzer Source*, on page 17.

This command uses electronic parts with a limited life span (non-volatile memory). Use this command in moderation.

*SRE

Description This command sets bits in the Service Request Enable Register (SRE; initial value is 52), and enables the corresponding bit in the Status Byte Register (STB). The command can be used to select which events can initiate a service request.

Syntax *SRE<wsp><value>

Parameter The <value> parameter must be between 0 and 255.

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*SRE?

Description This query returns the contents of the Service Request Enable Register (SRE).

Syntax *SRE?

Response A binary integer between 0 and 255

*STB?

Description This query returns the contents of the Status Byte Register (STB).

Syntax *STB?

Response A binary integer between 0 and 255

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*TST?

Description This query initiates an internal self-test and returns a binary value indicating the test results.

Syntax *TST?

Response A decimal value indicating the sum of all corresponding errors:

"0"–No errors

"1"–N/A

"2"–Supply voltage error:

"4"–N/A

"8"–N/A

"16"–Laser temperature problem:

"32"–Thermo-electric cooler over-current:

"64"–N/A

"128"–EEPROM access error:

"256"–EEPROM checksum error:

"512"–EEPROM error:

"1024"–FPGA problem:

"2048"–Temperature error:

"4096"–SPI communication problem

"8192"–PLL unlock

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*WAI

Description	This command prevents the CD/PMD Analyzer Source from processing any further command until the No-Operation-Pending-Flag is set. All pending operations must be completed before processing another command.
Syntax	*WAI
Parameters	None

The supported RS-232 commands are fully explained hereafter.

*LOK

Description	This command is used to set the Remote Lockout programming state.
Syntax	*LOK<wsp><value>
Parameters	The <value> parameter is a boolean value indicating if the CD/PMD Analyzer Source is "0" or "unlocking" "1" or "locking"
Note	This command can only be used when working with RS-232 communication.

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*LOK?

Description This query returns the Remote Lockout programming state.

Syntax *LOK?

Response A boolean value indicating if the CD/PMD Analyzer Source is
"0" unlocked
"1" locked

Note This command can only be used when working with RS-232 communication.

*REM

Description This command is used to set the Remote programming state.

Syntax *REM<space><data>

Parameters The <data> parameter can be "1" to set the Remote programming state to Remote or "0" to set the Remote progamming state to Local.

Note This command can only be used with RS-232 communication.

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Specific Commands

There are some commands specific to the CD/PMD Analyzer Source. These commands are fully explained on the following pages.

DISPlay:BRIGhtness

Description	This command turns the backlight of the unit on or off.
Syntax	DISP:BRIG<wsp><numeric_value>|MINimum|MAXimum
Parameters	A numeric parameter: "1"–turns the backlight on "0"–turns the backlight off
Example	DISP:BRIG 1 DISPLAY:BRIGHTNESS 0

DISPlay:BRIGhtness?

Description	This command returns the state of the backlight.
Syntax	DISP:BRIG?
Response	A numeric value: "1"-the backlight is on "0"-the backlight is off
Example	DISP:BRIG? 1

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SOURce:POWer[:STATe]

Description This command turns on or off the source. When the source is on, the red LED on the front of the module illuminates.

Syntax SOUR:POW[:STAT]<wsp><boolean>|ON|OFF

Parameters A boolean parameter:

"1"–turns the source on

"0"–turns the source off

Example SOUR:POW:STAT 1 (turns the source on.)

SOURCE:POWER 0 (turns the source off.)

SOURce:POWer:STATe?

Description This query returns a value indicating the state of the optical source (on or off).

Syntax SOUR:POW:STAT?

Response A boolean value:

"1"–the source is on

"0"–the source is off

Example SOUR:POW:STAT? 1

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SOURce[:WAVelength]:BANDwidth

Description On models equipped with both L and C bands, this command allows you to change the source's bandwidth.

Syntax SOUR[:WAV]:BAND<wsp>C|L|CL

Parameters A <CHARACTER PROGRAM DATA>:
C|L|CL

Example SOUR:BAND CL
SOURce:BANDwidth CL
SOUR:WAV:BAND C
SOURce:WAVelength:BANDwidth C

SOURce[:WAVelength]:BANDwidth?

Description This query returns a value indicating the current source bandwidth.

Syntax SOUR[:WAV]:BAND?

Response A <CHARACTER RESPONSE DATA>:
"C"–C bandwidth is selected
"L"–L bandwidth is selected
"CL"–C+L bandwidth is selected

Example SOUR[:WAV]:BAND? C
SOURce:WAVelength:BANDwidth? C

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SYSTem:ERRor?

Description This command returns the next error in the error queue. When an error is generated, an error number is sent to the error queue. The error queue is accessed with the SYST:ERR? query.

Syntax SYST:ERR?

Response See error list and description in *SCPI Management Errors (System Errors)* on page 37.

SYSTem:VERSion?

Description This query reads the CD/PMD Analyzer Source identification string.

Syntax SYST:VERS?

Response "EXFO E.-O. Eng. FLS-5800 vx.xx"xxxxxxxx xxxxxxx, where xxxxxxxx xxxxxxx is the serial number and vx.xx is the current product version.

Note This query returns the same response as the *IDN? query.

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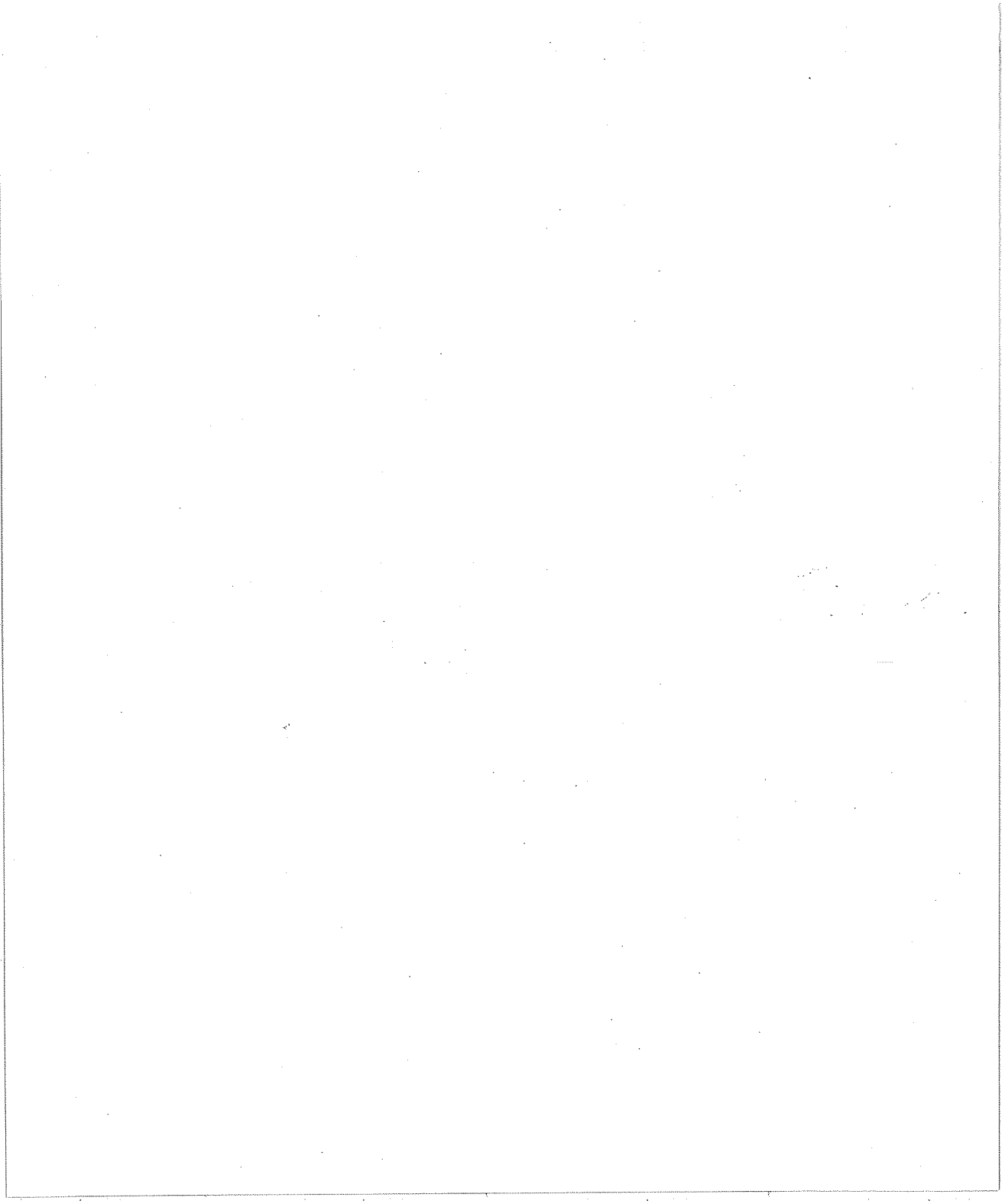
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