

# OLP-57

## Selective Optical Power Meter

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Bedienungsanleitung  
Operating Manual



# OLP-57

## Selective Optical Power Meter

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Operating Manual	BN 2289/01
	BN 2289/21
	BN 2289/02
FTTx/PON	BN 2289/22
	BN 2289/03
	BN 2289/23
	BN 2289/04
	BN 2289/24

Please direct all enquiries to your local JDSU sales company.

The addresses can be found at:

<http://www.jdsu.com/tm-contacts>

The description of additional features of the device can be found at:

<http://www.jdsu.com/tm>

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# CONTENT

<b>1</b>	<b>INTRODUCTION</b> .....	<b>1</b>
	OLP-57 Power Meters .....	1
	Symbols used in this operating manual .....	4
<b>2</b>	<b>SAFETY INFORMATION</b> .....	<b>6</b>
	Warning symbols on the unit .....	6
	Proper usage .....	6
	Laser safety .....	7
	Visual Fault Locator (optional) .....	8
	Battery operation .....	9
	Ventilation .....	9
	SNT-121A Adapter/Charger .....	10
<b>3</b>	<b>GETTING STARTED</b> .....	<b>11</b>
	Unpacking the device .....	11
	Connecting optical cables .....	19
<b>4</b>	<b>BASIC OPERATION</b> .....	<b>22</b>
	Switching the device on/off .....	22
	Switching the backlight on/off .....	23
	Display elements .....	23
	Navigating in the menus .....	25
	Configuring the device .....	25
<b>5</b>	<b>OPERATION</b> .....	<b>34</b>
	Selecting a wavelength .....	34
	Selecting an instrument mode .....	35
	Displaying absolute power level .....	35
	PASS/FAIL measurement .....	37
	Displaying relative power level .....	41
	Displaying modulated signals .....	43
	VFL mode (optional) .....	43

<b>6</b>	<b>MEMORY MANAGEMENT</b> . . . . .	<b>44</b>
	General information . . . . .	44
	Saving results successively . . . . .	45
	Displaying stored results . . . . .	46
	Selecting the store location . . . . .	48
	Clearing the memory . . . . .	49
	Reading out the result memory . . . . .	50
<b>7</b>	<b>MAINTENANCE</b> . . . . .	<b>53</b>
	Cleaning the test port . . . . .	53
	Cleaning the instrument . . . . .	54
<b>8</b>	<b>REMOTE CONTROL</b> . . . . .	<b>55</b>
	Communication interface . . . . .	55
	Key . . . . .	55
	Commands . . . . .	56
<b>9</b>	<b>OFS-355 DOWNLOAD MANAGER</b> . . . . .	<b>72</b>
<b>10</b>	<b>MEASUREMENT EXAMPLE</b> . . . . .	<b>74</b>
	PON measurement . . . . .	74
	Example: Attenuation measurement . . . . .	75
<b>11</b>	<b>SPECIFICATIONS</b> . . . . .	<b>78</b>
	OLP-57 . . . . .	78
	SNT-121A Adapter/Charger . . . . .	82
	Visual Fault Locator (optional) . . . . .	82
<b>12</b>	<b>ORDERING INFORMATION</b> . . . . .	<b>83</b>
	OLP-57 . . . . .	83
	Accessories . . . . .	83
	<b>INDEX</b> . . . . .	<b>86</b>

# 1 INTRODUCTION

## OLP-57 Power Meters

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The OLP-57 Test Set family consists of following models:

- BN 2289/01
- BN 2289/21
- BN 2289/02
- BN 2289/22
- BN 2289/03
- BN 2289/23
- BN 2289/04
- BN 2289/24

The Test Sets are specially designed for high performance testing of all optical signals in FTTx-PONs. Battery operation from four AA batteries and the robust, shock-proof design provide long operating time in the field even under tough conditions. AC line operation via a separate AC adapter and the USB interface for remote control also ensure ease of use in the laboratory or production environment.

### Common features

All OLP-57 series power meters can connect to single mode fibers (9/125  $\mu\text{m}$ ).

Tests on systems from different manufacturers with different connector types are easy to handle due to the universal adapter system.

## Differences between the devices

	BN 2289/xy			
	01, 21	02, 22	03, 23	04, 24
Connector	PC/ APC	PC/ APC	PC/ APC	PC/ APC
Selective measurement				
1310 nm	–	–	✓	–
1490 nm	✓	✓	✓	–
1550 nm	✓	✓	✓	–
Through path	–	✓	✓	✓
1310 nm uplink burst power measurement	–	✓	✓	✓
Broadband mode	–	✓	–	✓

Please note that the descriptions which follow apply to OLP-57/xy as indicated in the table above.

### Connector type

The connection is made with a contact type connector. Make sure that the connectors used are designated .../PC or .../APC.

### 1490/1550 nm selective power measurements

All OLP-57 devices feature a port to which PON downstream links (from OLT, Optical Line Termination) can be connected. The signals at wavelengths 1490 nm and 1550 nm are filtered and measured separately

(does not apply to BN 2289/04, BN 2289/24). This power meter port is calibrated at the respective center wavelength.

### **Through path**

The models with through path feature a second port for PON upstream links (from ONT, Optical Network Termination) at 1310 nm to be connected. Signals from this port are passed through to the 1490/1550 nm port and vice versa. The OLP-57 can be inserted into the PON network transparently using this feature.

### **Burst power measurements at 1310 nm**

The OLP-57 can also be used to measure burst type signals as found in PON uplink paths at 1310 nm in FTTx mode. The average burst power is displayed separately from the burst duty cycle (active/idle). This power meter port is calibrated at the respective center wavelength.

### **Broadband mode**

Some OLP-57 models feature non-selective power measurements via the 1310 nm port. In this mode, the OLP-57 FTTx tester behaves like a standard broadband power meter, e.g. attenuation measurements can be made in the usual way using a suitable optical source. OLS-55 Optical Laser Sources are ideal for this application.

Both modulated and unmodulated light signals can be measured. The average power of modulated light signals is displayed. The broadband power meter is calibrated at 850 nm, 1310 nm, 1550 nm and 1625 nm. Modulated signal mode, which uses different fixed frequencies, can be used to identify fibers in a fiber bundle, for example.

The "Auto- $\lambda$ " function allows automatic wavelength detection. This application requires a wavelength encoding light source, e.g. one of the OLS-55 Optical Laser Sources.

# Symbols used in this operating manual

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The following symbols, warnings and character formats are used in this operating manual:

---

**CAUTION**

Follow the instructions carefully to avoid **damage** to the device.

**WARNING**

Follow the instructions carefully to avoid **damage** to the device or **injury** to the person.

**DANGER**

Follow the instructions carefully to avoid **damage** to the device or **severe injury** to the person.

---

**High Voltage**

Follow the instructions carefully to avoid **damage** to the device or **severe injury** to the person.

This safety instruction is given if the danger is due to **high voltage**.

---

**Laser**

Follow the instructions carefully to avoid **damage** to the device or **severe injury** to the person.

This safety instruction is given if the danger is due to **laser radiation**.

Information specifying the laser class is also given.

---

**Very important instruction**

Follow this instruction carefully; e.g.

**!** Make sure you protect yourself and others from exposure to laser light.

---

✓	<p><b>Requirement</b></p> <p>This requirement must be met first; e.g.</p> <p>✓ The system is switched on</p>
⇒ 1. 2.	<p><b>Instruction</b></p> <p>Follow the instructions given (the numbers indicate the order in which the instructions should be followed); e.g.</p> <p>⇒ Select mode.</p>
<i>Italics</i>	<p><b>Result</b></p> <p>Indicates the result of following an instruction; e.g.</p> <p><i>The page opens.</i></p>
<b>Bold type face</b>	<p><b>Pages, controls, and display elements</b></p> <p>Screen pages, controls, and display elements are indicated in <b>bold type</b>.</p>
Text in blue	<p><b>Cross references</b></p> <p>Cross references are indicated in blue type. When using the PDF version, just click on the blue text to skip to the cross reference.</p>
[Store]	<p><b>Instrument keys</b></p> <p>Instrument keys are indicated within square brackets.</p>

# 2 SAFETY INFORMATION

## Warning symbols on the unit

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### Warning symbols indicating a potential hazard

! In all cases where the unit is labeled with a warning symbol, the operating manual must be consulted to learn more about the nature of the potential hazard and any action that must be taken.

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## Proper usage

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This instrument is intended for measurements on optical fiber devices and systems.

- ⇒ Please make sure the device is not operated outside the permitted ambient conditions.
- ⇒ Observe the specified measurement range.
- ⇒ Always make sure that the device is in proper working order before switching it on.

## Laser safety

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### WARNING

#### Dangerous laser radiation

**Laser radiation can cause irreparable damage to the eye and skin.**

The maximum permitted power for the OLP-57 means that the optical input signals can reach Hazard Level 3B, depending on the device type.

Bear this in mind when using the OLP-57. In particular, models equipped with a through channel transmit all the optical radiation from the input to the output without attenuation, even when the OLP-57 is switched off.

- ! Always be aware of the hazard level of the device to be connected.
  - ! Connect all optical fibers before switching on the radiation source.
  - ! Switch off the laser source before disconnecting the optical fibers.
  - ! Never look directly into the output of a laser source or into an optical fiber connected to it.
  - ! Always cover unused ports.
  - ! Heed the normal precautions for working with laser radiation and consider local regulations.
-

## Visual Fault Locator (optional)

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**WARNING****Dangerous laser radiation**

**Laser radiation can cause irreparable damage to the eye and skin.**

SmartClass devices equipped with the optional Visual Fault Locator are Class 2 Laser Products. The following label or similar is used to mark such devices according to the options fitted.



Observe the following safety instructions in addition to the general laser safety information:

- !** SmartClass devices fitted with the Visual Fault Locator are Class 2 Laser Products.
  - !** Do not direct the visible laser radiation into the eyes of other persons.
  - !** Do not look directly at the laser beam under any circumstances.
  - !** If laser radiation nevertheless enters your eye, shut the eye immediately and look away.
-

## Battery operation

---

**WARNING****Explosion danger**

Short-circuiting the batteries can result in overheating, explosion or ignition of the batteries and their surroundings.

- ! Never short-circuit the battery contacts by touching both contacts simultaneously with an electrical conducting object.
  - ! Only use AA size dry batteries or rechargeable batteries.
  - ! Make sure the batteries are inserted with the correct polarity.
- 

**WARNING****Explosion danger**

Dry batteries must not be recharged. An incorrect setting will charge dry batteries which may then explode.

- ! Set the device to the correct battery type after you have changed the batteries and switched on the device.
- 

## Ventilation

---

**CAUTION****Insufficient ventilation**

Insufficient ventilation can damage the device or adversely affect its function and safety.

- ! Ensure adequate ventilation when operating the device.
-

# SNT-121A Adapter/Charger

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## Safety class

The SNT-121A AC Adapter/Charger Unit is protectively isolated to conform with IEC 60950.

## Environmental conditions

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**CAUTION**

### Ambient temperature too high/low

Temperatures outside the operating range of 0 to +40 °C can damage the SNT-121A Adapter/Charger or adversely affect its function and safety.

- ! Only operate the SNT-121A Adapter/Charger indoors.
  - ! The SNT-121A Adapter/Charger must only be operated at ambient temperatures between 0 and +40 °C.
- 

**CAUTION**

### Insufficient ventilation

Insufficient ventilation can damage the SNT-121A Adapter/Charger or adversely affect its function and safety.

- ! Ensure adequate ventilation when operating the SNT-121A Adapter/Charger.
- 

**CAUTION**

### Condensation

Operation in the presence of condensation can damage the SNT-121A Adapter/Charger or adversely affect its function and safety.

- ! Do not operate the SNT-121A Adapter/Charger if condensation has formed.
  - ! If condensation cannot be avoided, such as when the SNT-121A Adapter/Charger is cold and is moved to a warm room, wait until the SNT-121A Adapter/Charger Unit is dry before plugging it into the AC power line.
-

# 3 GETTING STARTED

## Unpacking the device

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### Packing material

We suggest that you keep the original packing material. It is designed for reuse (unless it is damaged during shipping). Using the original packing material ensures that the device is properly protected during shipping.

### Checking the package contents

Your level meter is shipped with the following accessories:

- 2 adapters (BN 2150/00.xx)
- 4 dry batteries AA size
- Belt bag MT-1S
- Operating manual

### Checking for shipping damage

After you unpack the device, check to see if it has been damaged during shipping. This is particularly likely if the packaging is visibly damaged. If there is damage, do not attempt to operate the device. Doing so can cause further damage. In case of damage, please contact your local JDSU Sales Company. Addresses can be found at [www.jdsu.com](http://www.jdsu.com).

### Recovery following storage/shipping

Condensation can occur if a device that is stored or shipped at a low temperature is brought into a warm room. To prevent damage, wait until no more condensation is visible on the surface of the device before powering it up. Do not operate the device until it has reached its specified temperature range and wait until it has cooled down if the device was stored at a high temperature (see „Ambient temperature”, page 81).

## Device overview

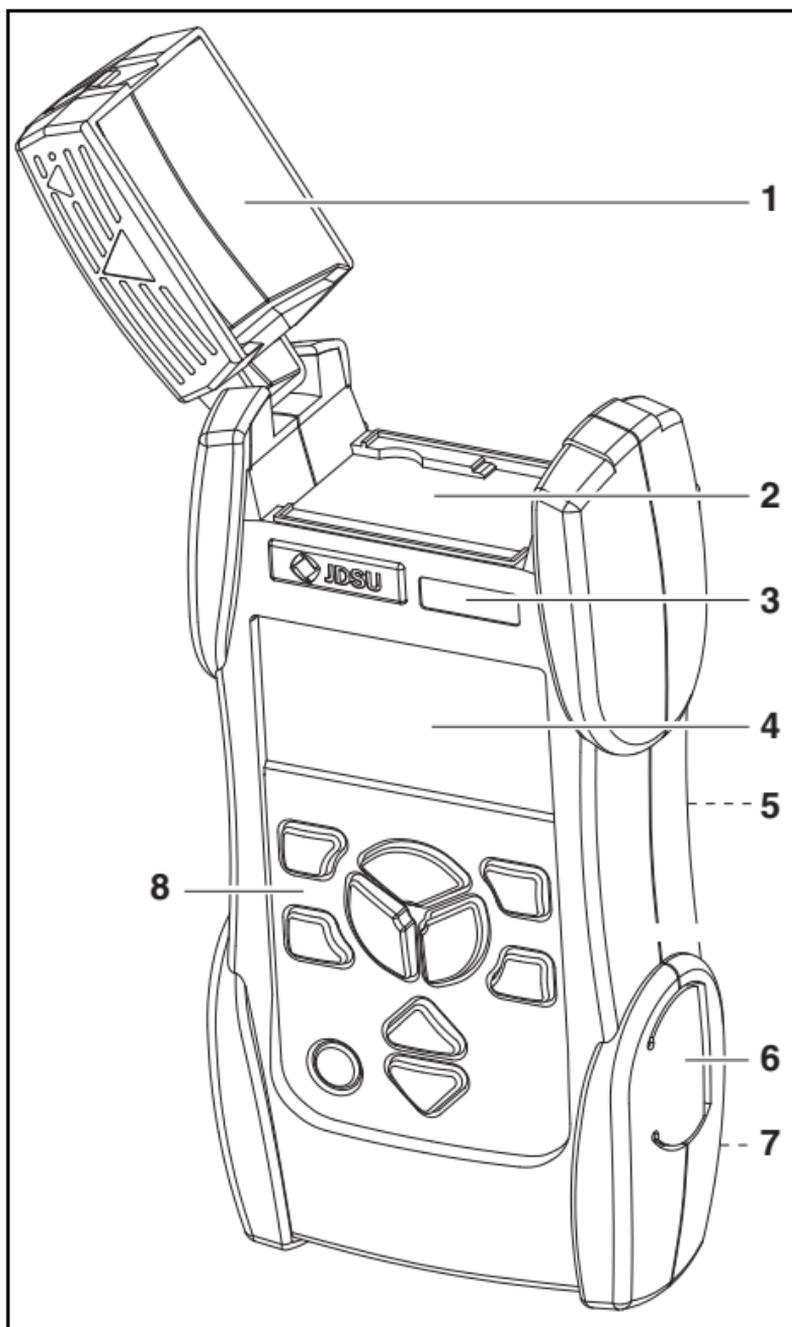


Fig. 1 Front and side view

- |   |   |
|---|---|
| 1 | Test head cover   |
| 2 | Connector panel (see <a href="#">page 14</a> for details) |
| 3 | Device label  |
| 4 | Display   |
| 5 | Stand (on rear of the device)                             |
| 6 | External power supply connector, USB control interface    |
| 7 | Battery compartment (on rear of the device)               |
| 8 | Key pad   |

	Press to select a wavelength.
	Press to switch the backlight on/off.
<b>PREV</b>	Press to go back one menu level (without making any changes).
<b>MENU ENTER</b>	Press to: <ul style="list-style-type: none"> <li>• open menu and select menu item</li> <li>• store settings</li> </ul>
<b>STORE</b>	Press to store displayed values.
<b>dBm/W</b>	Press to toggle level display between dBm and Watt.
<b>dB</b>	Press to select relative level power measurement.
	Press to switch the device on and off.
	Press to: <ul style="list-style-type: none"> <li>• scroll up/down in the menus</li> <li>• change values in the menus</li> </ul>

### 3 GETTING STARTED

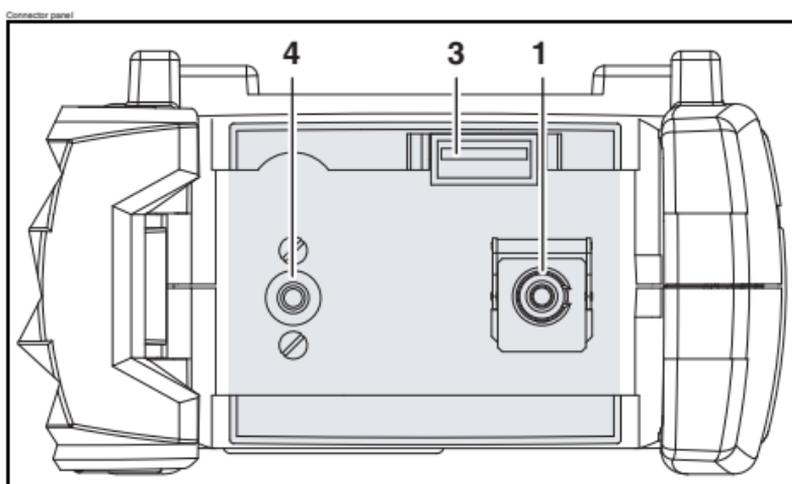


Fig. 2 OLP-57 connector panel (BN 2289/01, 21)

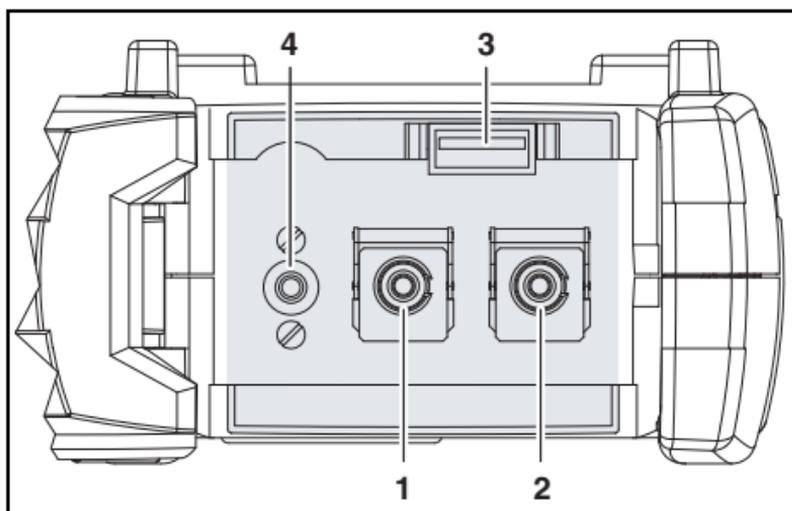


Fig. 3 OLP-57 connector panel (BN 2289/02, 03, 04, 22, 23, 24)

- 
- 1 Optical connector 1 (JAE adapter)  
Downstream at PON measurement

---

  - 2 Optical connector 2 (JAE adapter)  
Upstream at PON measurement

---

  - 3 USB stick interface

---

  - 4 VFL connector (optional)
-

## Power Supply

The following power sources can be used to operate the OLP-57:

- four 1.5 V dry batteries (Mignon AA size, alkaline type recommended)
- four 1.2 V NiMH rechargeable batteries (Mignon AA size)
- the SNT-121A Adapter/Charger
- via the USB control interface

## Battery operation



**CAUTION**

### Dangers when handling batteries

Handling batteries may be dangerous. Please note the following safety instructions.

- ! Please note the battery operation safety information in the chapter „[Battery operation](#)“, page 9.

### Replacing batteries

- ! Do not replace individual batteries. Always change all four batteries at the same time.
- ! Always use four batteries of the same type; i.e. do not mix rechargeable and non-rechargeable batteries.

## Replacing batteries

The battery compartment is on the back of the instrument.

1. Pull down the lid to open the battery compartment.
2. Fit new batteries or remove the used batteries and replace them with fresh ones.

**NOTICE:** Take care to insert the batteries correctly. The correct polarity is indicated by a diagram inside the battery compartment.

3. Close the battery compartment.
4. Press [**ⓘ**] to switch on.

### 3 GETTING STARTED

After you power up the device, the BATTERY CHANGED menu will prompt you to specify whether dry batteries or rechargeable batteries are being used.

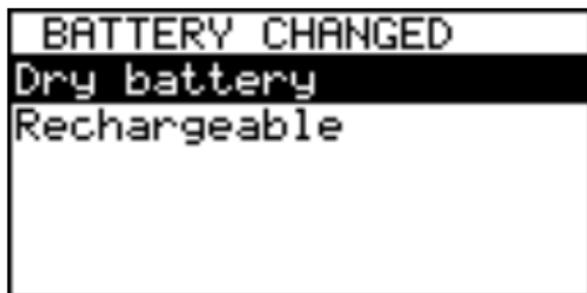


Fig. 4 Setup menu for battery type.

- Dry battery:** Operation using non rechargeable batteries
- Rechargeable:** Operation using rechargeable batteries

5. Select the battery setting that matches the battery type you have inserted and press **[MENU ENTER]**.
6. If **Rechargeable** was selected, the setting must be confirmed by pressing **[MENU ENTER]** again.

#### Recharging the batteries

If more than 90% of the battery capacity has been used, the batteries will be recharged when the SNT-121A Adapter/Charger and rechargeable batteries are being used to power the device. Complete recharging takes about 3 hours. The instrument switches to trickle charging automatically as soon as the batteries are fully charged.

If the charge cycle does not start although the SNT-121A Adapter/Charger is connected, check the battery type being used by looking in the battery compartment, and check the battery setting in the INFO menu is correct.

**Note:** The battery type cannot be selected using the instrument keys. To change the battery type, you must open the battery compartment and remove at least one battery for more than five seconds. After you replace the battery, the OLP-57 will query the battery type. The battery type you select will be stored until you change the batteries again.

**Note:** The batteries can not be recharged by using the USB interface.

### **General tips on using batteries**

- Always handle batteries with care.
- Do not drop or damage the batteries or expose them to excessively high temperatures.
- Do not store the batteries for more than one or two days at very high temperatures (e.g. in a vehicle), either separately or fitted in the instrument.
- Do not leave discharged batteries in the instrument for a long time if it is not being used.
- Do not store rechargeable batteries for more than 6 months without recharging them at intervals.
- Avoid deep discharging the batteries as this can cause the cell polarity to reverse and make the battery useless.

### **Protect the environment**

Please dispose of any unwanted dry batteries and rechargeable batteries carefully. They should also be removed from the instrument if it is to be scrapped. If facilities in your country exist for collecting such waste or for recycling, please make use of these rather than throwing the batteries in the normal trash. You will often be able to return used batteries to the place where you purchase new ones. Any dry or rechargeable batteries that you purchased from JDSU can be returned to one of our Service Centers for disposal.

## Operation from AC power

**NOTICE:** Only the SNT-121A Adapter/Charger must be used to operate the OLP-57 from AC power.

### To fit the AC line plug adapter:

1. Select the appropriate AC line plug adapter.
2. Slide the AC line plug adapter into the slot.  
*The SNT-121A Adapter/Charger is ready for use.*

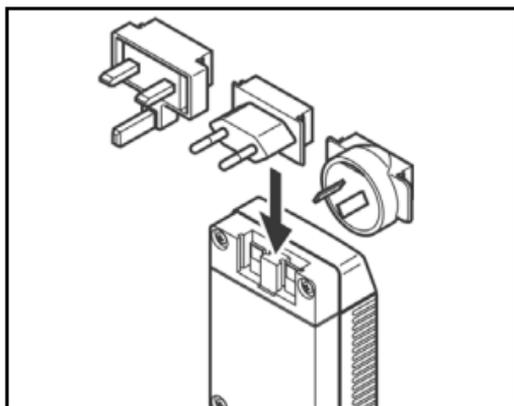


Fig. 5 SNT-121A Adapter/Charger.

### To change the AC line plug adapter:

1. Place the SNT-121A against the edge of a table or bench as shown (see Fig. 6).
2. Push the SNT-121A downwards.
3. Slide a different AC line plug adapter into the slot (see Fig. 5).

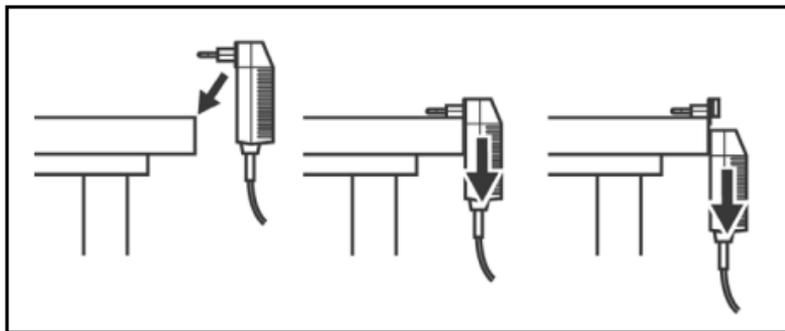


Fig. 6 SNT-121A: Changing the AC line plug adapter.

**To operate the OLP-57 from AC power:**

1. Connect the SNT-121A DC power cord to the OLP-57 DC power socket.  
(The socket is under the cover on the right side.)
2. Plug the SNT-121A into the AC line socket.  
*The OLP-57 switches on automatically when powered from the SNT-121A.*

**Note:** The SNT-121A provides power even if dry or rechargeable batteries are fitted in the instrument.

**Operation from USB interface power**

Although the USB interface is primarily intended for remote control, it can also be used to power the OLP-57.

**To power the OLP-57 via the USB interface:**

⇒ Just connect a standard USB cable to any USB socket of a PC or USB hub.

**Notes:**

- The device can be operated manually even if it is powered via the USB interface.
- It is not possible to charge the batteries via the USB interface.
- The device will be powered by the SNT-121A Adapter/Charger if the SNT-121A Adapter/Charger and the USB interface are both connected.

**Connecting optical cables**

---

**Mounting test adapters**

JDSU provides a number of test adapters for connecting the OLP-57 to the interface to be tested.

You can connect all standard optical connector types to the instrument using these adapters. The test adapters are suitable for connectors with planar (PC) and angled end surfaces (APC).

### 3 GETTING STARTED

Contact your local JDSU Sales Company for available adapter types.

The OLP-57 connector type must match the cable connector type:

- PC: BN 2289/01/02/03/04
- APC: BN 2289/21/22/23/24

The PC/APC version are easily identified by the colors of the name labels on the front:

- PC = blue
- APC = green

**Note:** Only single mode fibers (SMF) must be connect the OLP-57.

#### To mount the JAE test adapter:

1. Open the head cover and remove the protecting cap (if still mounted).
2. Place the test adapter vertically on the optical connector with the locking lever open.
3. Close the locking lever when the test adapter is firmly seated. You will hear the locking mechanism lock.
4. Repeat the procedure if the device is fitted with two ports.
5. Fit the fiber optic cable to the test adapter or close the head cover.

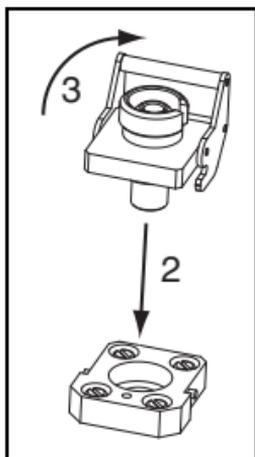


Fig. 7 Mounting the JAE test adapter

## Establishing the VFL connection (optional)

The Visual Fault Locator (VFL) is equipped with a universal push pull adapter (UPP) for all standard 2.5 mm connector systems.

### To establish a VFL connection:

⇒ Just plug the fiber equipped with a push pull connector into the VFL push pull adapter until you feel a resistance.

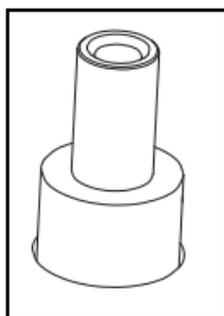


Fig. 8 VFL universal push pull adapter

# 4 BASIC OPERATION

## Switching the device on/off

---

**To switch the device on:**

⇒ Press [Ⓜ] to switch on the device.

**To switch the device off:**

⇒ Press and hold down [Ⓜ] **for more than 2 sec.** to switch off the device.

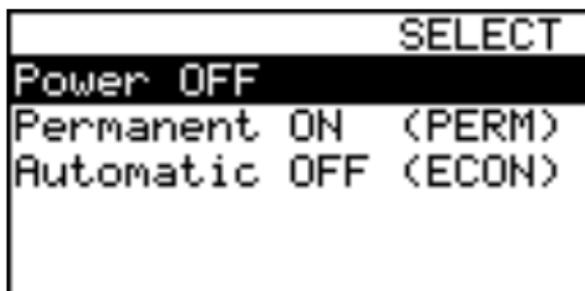
The OLP-57 has two power modes:

- **Permanent ON (PERM):**  
The device is switched on permanently.
- **Automatic OFF (ECON):**  
The device switches off 20 minutes after the last operation. This function is only available when the device is powered from batteries.

## Changing the power mode

✓ The device is switched on.

1. Press [Ⓜ] briefly (for less than 2 sec.).  
*The power mode EDIT menu opens:*



2. Select **Permanent ON** or **Automatic OFF**.
3. Press [MENU ENTER] to set the power mode.  
*The menu window closes.*

**Tip:** You can also use the **Power OFF** command in this menu to switch off the device. Simply press [①] twice (the first press opens the menu, the second selects the item).

## Switching the backlight on/off

⇒ Press [] to switch the backlight on.

⇒ Press [] again to switch the backlight off.

## Display elements

Broadband		USB 
<b>- 13.11 dBm</b>		
1310nm	CW	PERM
FTTx		USB
1550 nm	<b>12.33 dBm</b>	
1490 nm	<b>15.61 dBm</b>	
1310 nm	<b>05.21 dBm</b>	
		PERM

Fig. 9 Broadband and FTTx measurement display

## 4 BASIC OPERATION

	<b>External power supply</b> The OLP-57 is powered by the external AC adapter when this symbol is shown.
	<b>Battery status</b> Indicates the battery charge status. If it is not shown, only the AC adapter is active.
<b>USB</b>	<b>Power supply via USB</b> The device is powered via the USB interface for remote operation.
<b>1310nm</b>	<b>Wavelength (Broadband mode only)</b> Display of selected wavelength (displayed wavelength depends on settings and model).
<b>CW</b> <b>Auto-<math>\lambda</math></b>	<b>Signal modulation (Broadband mode only)</b> <ul style="list-style-type: none"><li>• <b>CW:</b> Continuous wave</li><li>• <b>Auto-<math>\lambda</math>:</b> Auto wavelength detection</li><li>• <b>270 Hz, 1 kHz, 2 kHz:</b> modulation frequency</li></ul>
<b>PERM</b> <b>ECON</b>	<b>Power mode</b> <ul style="list-style-type: none"><li>• <b>PERM:</b> Device remains switched on.</li><li>• <b>ECON:</b> Device switches off 20 minutes after the last operation.</li></ul>
<b>Center of display</b>	Shows the measurement results or setup values.
<b>Bottom of display</b>	<b>Name of threshold set (FTTx only)</b> The first 6 characters of the selected threshold set are displayed in the center pane in PASS/FAIL mode.

## Navigating in the menus

---

- ✓ The measurement display is shown.
- ⇒ Press **[MENU ENTER]** to open the MAIN menu.  
*The MAIN menu opens.*

### To select a menu item:

1. Press **[▲▼]** to highlight an item.
2. Press **[MENU ENTER]** to select the item.

### To leave a menu without making any changes:

- ⇒ Press **[PREV]**.

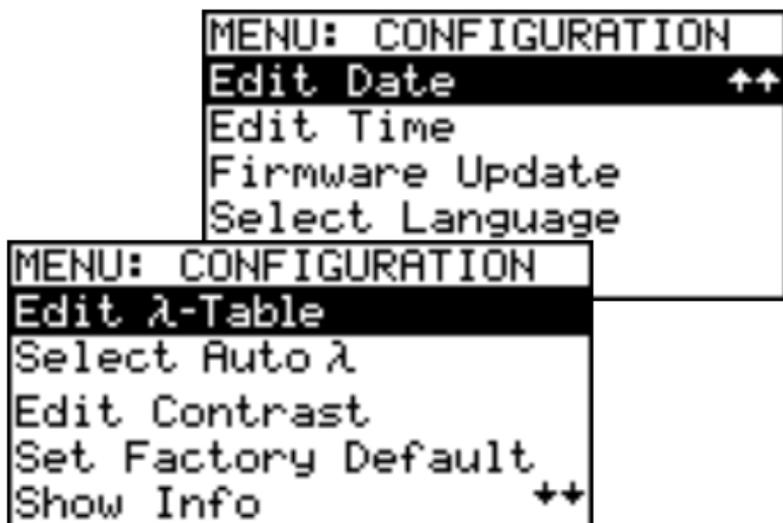
## Configuring the device

---

This chapter describes the basic settings in the Configuration menu.

### Configuration menu overview

- ✓ The measurement display is open.
- ⇒ Press **[MENU ENTER]** to open the MAIN menu and select **Configuration**.  
*The CONFIGURATION menu opens:*



The following table gives a short overview of the menu items. These are explained in the sections below.

<b>Edit <math>\lambda</math>-Table</b>	(Available only in devices that support broadband measurements) Edit the wavelengths in the table and the view status (show/hide) of each entry.
<b>Select Auto-<math>\lambda</math></b>	(Available only in devices that support broadband measurements) Activate/deactivate “Automatic Wavelength Detection”.
<b>Edit Contrast</b>	Adjust display contrast.
<b>Set Factory Default</b>	Set the device parameters and settings to their default values as defined by JDSU. This does not affect any stored measurement results.
<b>Show Info</b>	Display basic device information.
<b>Edit Date</b>	Adjust date.
<b>Edit Time</b>	Adjust time.
<b>Firmware Update</b>	Download the current device firmware version from the internet to the device.
<b>Select Language</b>	Select the language of the device texts.

## Editing the Lambda-Table

**Note:** Device models BN 2289/03 and BN 2289/23 do not have a  $\lambda$ -Table since it is used only in broadband mode.

The wavelength table ( $\lambda$ -Table) supports the definition of up to 30 wavelengths. The wavelengths with the attribute “shown” form a set of wavelengths which will be rotated through when the [ $\lambda$ ] key is pressed.

The remaining wavelengths are “hidden”.

E.g. if only two wavelengths have the attribute “shown”, you can toggle between them with a single keystroke.

### To edit the $\lambda$ -Table:

1. Press **Edit  $\lambda$ -Table** in the CONFIGURATION menu.  
*The EDIT  $\lambda$ -TABLE menu opens (displayed wavelengths may vary according to model and settings).*

MENU: EDIT $\lambda$ -TABLE		
1530nm	hidden	↕↕
1550nm	shown	
1570nm	hidden	
1590nm	shown	
1607nm	shown	↕↕

2. Highlight the entry to be edited and press **[MENU ENTER]**.  
*A window opens:*

MENU: EDIT $\lambda$ -TABLE	
Edit	
Show	
Hide	
	1550nm

3. Press **[MENU ENTER]** again to edit the selected wavelength (**Edit** is already selected).  
*The value to be edited is displayed:*

MENU: EDIT $\lambda$ -TABLE	
1550nm	

4. Press **[▲▼]** to change the value:
  - Press once to change one step at a time.
  - Hold down the key to increase the step change rate.

## 4 BASIC OPERATION

5. Press **[MENU ENTER]** to set the new wavelength.  
*The EDIT  $\lambda$ -TABLE window is displayed again.*
6. Press **[MENU ENTER]** again to change the view status.
7. Select **Show** to show the wavelength in the table  
– or –  
Select **Hide** to hide the wavelength in the table.
8. Press **[MENU ENTER]** to confirm the selection.

Repeat steps 2 through 7 as required.

### Enabling Auto-Lambda mode

**Note:** Device models BN 2289/03 and BN 2289/23 do not support Auto- $\lambda$ , since it works only in broadband mode.

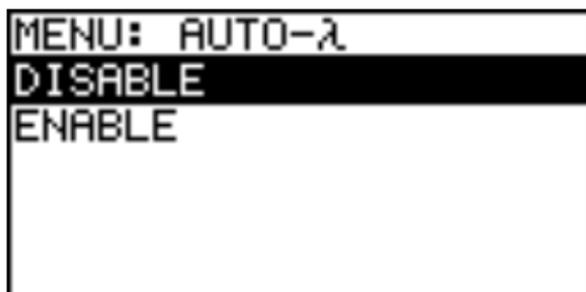
Auto- $\lambda$  is a special feature developed by JDSU that allows you to identify wavelengths automatically. To do this, the signal is modulated at a certain frequency (by a light source equipped with Auto- $\lambda$ , such as a JDSU OLS-55/-56), which can be detected by a JDSU OLP-57.

Wavelengths cannot be reliably detected if:

- the receive level is too low,
- wavelength encoding cannot be detected due to interference
- you are measuring the absolute level of a system that does not have wavelength encoding that matches JDSU power sources.

**To switch Auto- $\lambda$  mode on/off:**

1. Select **Select Auto- $\lambda$**  in the CONFIGURATION menu.  
*The AUTO- $\lambda$  menu is displayed.*



2. Select **ENABLE** to switch on Auto- $\lambda$ .  
– or –

Select **DISABLE** to switch off Auto- $\lambda$ .

- Press **[MENU ENTER]** to confirm the setting.  
*If Auto- $\lambda$  mode is activated and a laser source supporting Auto- $\lambda$  is connected, Auto- $\lambda$  will be displayed in the bottom center display pane.*

### Display in Auto- $\lambda$ mode

When **Auto- $\lambda$**  mode is activated and different wavelengths are detected, the power levels measured at these wavelengths are displayed simultaneously.

USB	
<b>1310nm</b>	-3.03dBm
<b>1550nm</b>	-3.00dBm
<b>1625nm</b>	-3.00dBm
Auto $\lambda$	PERM

Fig. 10 Display in **Auto- $\lambda$**  mode showing the detected wavelengths and their power levels.

Broadband	USB
<b>1310nm</b>	-3.03dBm
<b>1550nm</b>	-3.00dBm
<b>1625nm</b>	-3.00dBm
Auto $\lambda$	PERM

Fig. 11 Display in **Auto- $\lambda$**  mode (broadband) showing the detected wavelengths and their power levels.

## Setting the display contrast

1. Select **Edit Contrast** in the CONFIGURATION menu.  
*The CONTRAST menu opens:*

```
MENU: CONTRAST
Press arrow
UP  : to increase
DOWN: to decrease
```

2. Press [**▲▼**] to increase/decrease the contrast.
3. Press [**MENU ENTER**] to store the value and exit from the menu.

## Setting the factory default values

1. Select **Set Factory Default** in the CONFIGURATION menu.  
*The FACTORY DEFAULT menu opens:*

```
MENU: FACTORY DEFAULT
ENTER: to confirm
ANY KEY: to quit
```

2. Press [**MENU ENTER**] to set the factory defaults.  
– or –  
Press any key to exit from the menu without making any changes.

**Note:** Setting the factory default values does not affect your stored measurement results.

## Displaying device information

⇒ Select **Show Info** in the CONFIGURATION menu.

The *INFO* menu opens and basic device information is shown: device name, family, serial number, calibration date, software version, battery type and, if applicable, date and time.

## Setting the date and time

1. Select **Edit date** in the CONFIGURATION menu.  
The *EDIT DATE MENU* opens:



2. Press [▲▼] to set year and press [MENU ENTER].
3. Press [▲▼] to set month and press [MENU ENTER].
4. Press [▲▼] to set day and press [MENU ENTER].
5. Select **Edit time** in the CONFIGURATION menu.  
The *EDIT TIME menu* opens.
6. Press [▲▼] to set hours and press [MENU ENTER].
7. Press [▲▼] to set minutes and press [MENU ENTER].
8. Press [▲▼] to set seconds and press [MENU ENTER].

**Note:** The date and time will need to be set again if the device is without any power for more than 1 hour.

The device is without any power if

- neither the SNT-121A Adapter/Charger is connected,
- nor a USB connection is established and
- no batteries are fitted or the batteries are discharged.

## Updating the firmware

The latest version of the firmware can be downloaded from the internet at any time and stored in the EEPROM.

### To find the latest firmware version:

1. Visit the JDSU web site at [www.jdsu.com/test\\_and\\_measurement](http://www.jdsu.com/test_and_measurement).
2. Select your model from the product line.
3. Open the download area and download the latest firmware.

You will also find step-by-step instructions on how to update the firmware there.

After downloading the firmware to your PC follow the steps below to install the firmware into your device.

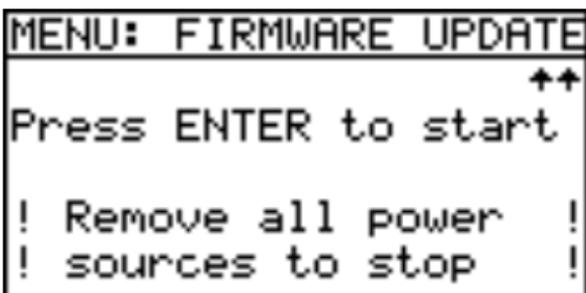
### To install the firmware into the device:

1. Select **Firmware Update** in the CONFIGURATION menu.

*The FIRMWARE UPDATE menu opens:*



2. Press [▼] to open the next window.  
– or –  
Press [PREV] to cancel.



3. Press [MENU ENTER] to start the update.  
– or –  
Press [PREV] to cancel.

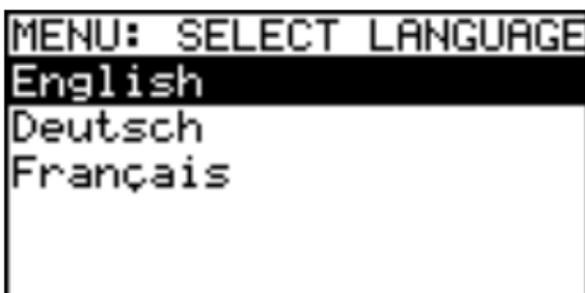
4. Connect the device to the PC via the USB interface.

**Note:** Once the update has been started it cannot be stopped by pressing any of the keys.  
To stop the update you must disconnect the device from all power sources (adapter/charger, batteries, USB connection).

## Selecting a language

1. Select **Select Language** in the CONFIGURATION menu.

*The SELECT LANGUAGE menu opens:*



2. Press [▲▼] to highlight the language you want and press [MENU ENTER] to select it.

# 5 OPERATION

## Selecting a wavelength

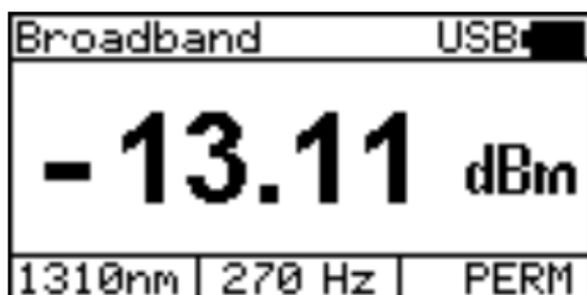
---

The sensitivity of the photo diode depends on the wavelength. The wavelength setting of the device must match the wavelength of the incoming signal to ensure a correct reading.

### To select a wavelength:

⇒ Press [ $\lambda$ ] to select a new wavelength.

*The value is shown in the lower left display pane:*



↑  
selected wavelength

The wavelengths that can be selected by pressing this key are an extract of those contained in the internal wavelength table ( $\lambda$ -Table).

See „[Editing the Lambda-Table](#)“, page 26 for details of how to edit this table.

**Note:** The [ $\lambda$ ] button is only needed in broadband mode. In FTTx mode (i.e. always with models BN 2289/03 und BN 2289/23) this button does not have any function.

## Selecting an instrument mode

1. Select **Select Instr. Mode** in the MAIN menu.  
*The MODE SELECTION menu opens.*
2. Press [**▲▼**] to select the instrument mode and press [**MENU ENTER**] to accept the setting.

## Displaying absolute power level

The power level is displayed in dBm or Watts (nW,  $\mu$ W, mW) in absolute power level mode.

⇒ Press [**dBm/W**] to display absolute power level and to toggle between the display modes.

## Broadband mode

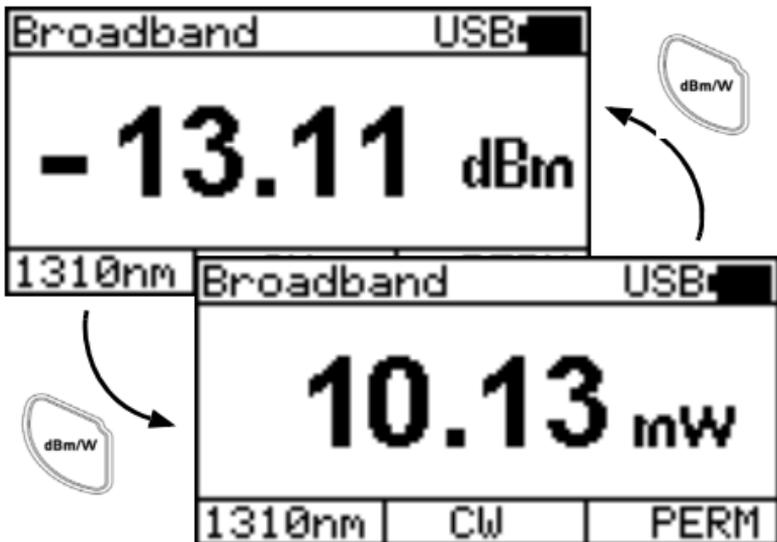


Fig. 12 Displays in Broadband mode.

## FTTx mode

A third display mode, PASS / FAIL, is provided in FTTx mode (see next section for PASS/FAIL measurement).

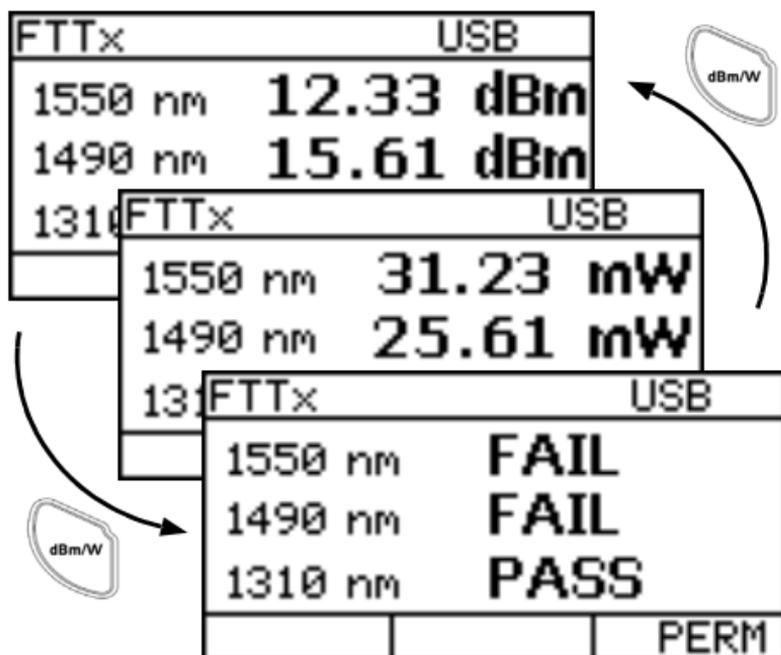


Fig. 13 Displays in FTTx mode.

## PASS/FAIL measurement

The PASS/FAIL function allows you to quantify measurement results very quickly. You must set the thresholds before you select the PASS/FAIL function.

### OLP-57 threshold levels

The “Over”, “Pass” and “Margin” threshold levels are used to sort measurement results into 4 categories:

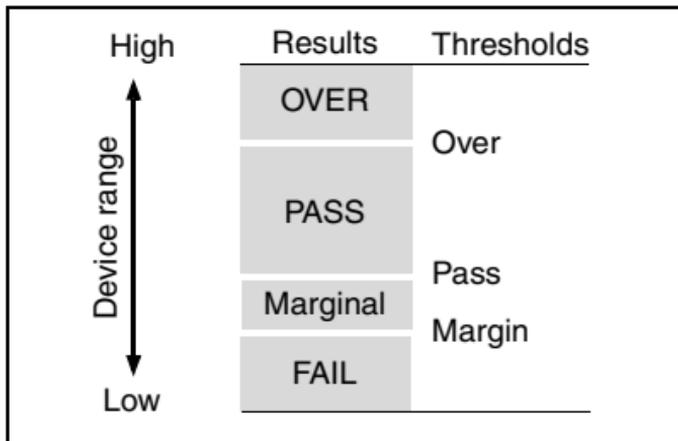


Fig. 14 Thresholds and result areas

These thresholds can be defined separately for each wavelength (1310, 1490 and 1550 nm) and stored together as a threshold set. You can store up to ten such sets in the OLP-57.

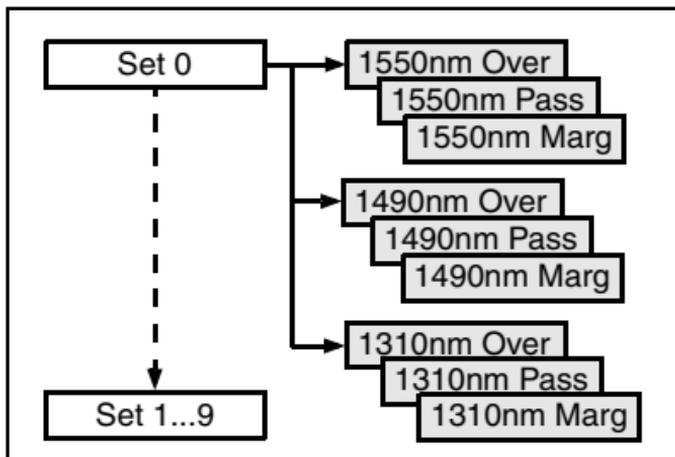


Fig. 15 Threshold set structure

## Editing a threshold set

1. Select **Edit Thresholds** in the MAIN menu.  
*The Select to Edit menu opens.*

SELECT TO EDIT		
0	[A	]
1	[B	]
2	[C	]
3	[	]
4	[	]++

2. Select a set (0...9).  
*The selected set is displayed.*

EDIT THRESHOLD SET	
Thresholds	1550nm
Thresholds	1490nm
Thresholds	1310nm
Name of Set	

## Editing threshold levels

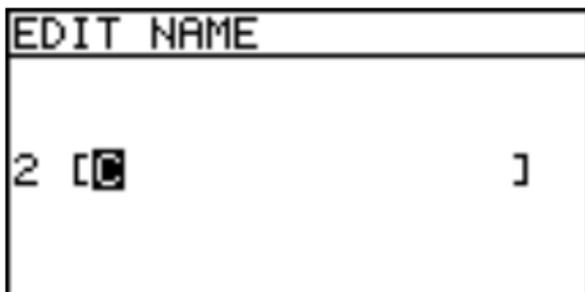
1. Select a wavelength and press **[MENU ENTER]**.  
*The THRESHOLD EDIT menu opens:*

SELECT THRESHOLD		
1550nm	Over	+2.0dBm
1550nm	Pass	+0.2dBm
1550nm	Marg	-0.8dBm

2. Press **[▲▼]** to select a threshold and press **[MENU ENTER]** to enable edit mode.
3. Press **[▲▼]** to change the level and press **[MENU ENTER]** to store the value.
4. Press **[PREV]** to exit from the menu.

## Editing the name of a threshold set

1. Select **Name of Set** and press **[MENU ENTER]**.  
The *EDIT NAME* menu opens.



2. Press **[▲▼]** to edit the highlighted character.  
Characters available in **▲** direction: space, A-Z, a-z, 0-9, special characters.
  3. Press **[MENU ENTER]** to move the cursor to the next character.
  4. Press **[PREV]** to move the cursor to the previous character.
  5. To save the changes and exit from the menu, move the cursor to the last character (by pressing **[MENU ENTER]** several times) and then press **[MENU ENTER]** once more.
  6. To exit from the menu without making any changes, move the cursor to the first character (by pressing **[PREV]** several times) and press **[PREV]** once more.
- ⇒ To return to the measurement display press **[PREV]** several times.

*The last threshold set that was edited will be selected for measurement when you exit from the setting menu.*

## Selecting a threshold set for measurement

1. Select **Select Thresholds** in the MAIN menu.  
*The THRESHOLD SELECT menu opens*

SELECT THRESHOLD SET		
0	[A	]
1	[B	]
2	[C	]
3	[	]
4	[	]++

2. Press [**▲▼**] to select a threshold set and press [**MENU ENTER**] to confirm the selection.

## Measuring in PASS/FAIL mode

**Note:** You must set the threshold levels before you can make measurements in **PASS/FAIL** mode.

1. Select a threshold set.
2. Press the [**dBm/W**] key several times until **PASS/FAIL** results are displayed.

## Displaying relative power level

The actual measured power level relative to a reference value is displayed in relative power display mode. The reference value can be set by defining the actual power level as the reference value. This setting can then be edited manually.

### Setting the reference level

- ✓ The device is in absolute power level display mode.
- 1. Press **[MENU ENTER]** to open the Main menu.

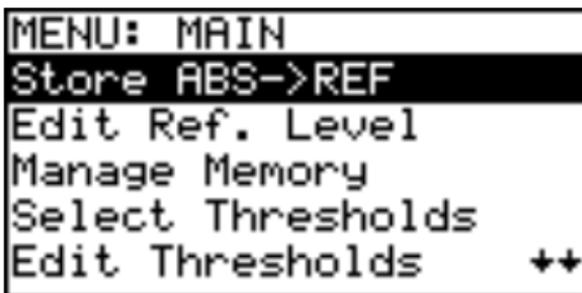


Fig. 16 MAIN menu in **Broadband** mode

- 2. Press **[MENU ENTER]** again to store the reference level.

*The actual power level is set as the new reference level. The reference level is displayed in the top display bar. Reference power level display mode is activated.*

**Note:** The reference level must be stored for each wavelength separately and is saved even when the power is off.

## Editing the reference level

The reference level can be also edited manually.

⇒ Select **Edit Ref. Level** in the MAIN menu.

*The measurement display opens in EDIT mode.*

### Broadband mode

REF: -17.78dBm		EDIT
-13.11 dB		
850 nm		PERM

Fig. 17 EDIT in **Broadband** mode

1. Press [**▲▼**] to change the value.
2. Press [**MENU ENTER**] to confirm the setting.

### FTTx mode

REF: -17.78dBm		EDIT
1550nm	12.33	dB
1490nm	15.61	dB
1310nm	05.21	dB
		PERM

Fig. 18 EDIT in **FTTx** mode

1. Press [**λ**] to select the wavelength.
2. Press [**▲▼**] to change the value.
3. Press [**MENU ENTER**] to confirm the setting.

## Displaying modulated signals

The OLP-57 automatically detects the modulation frequency of light signals modulated at the fixed frequencies of 270 Hz, 1 kHz and 2 kHz. The detected frequency is shown in the lower center display pane.

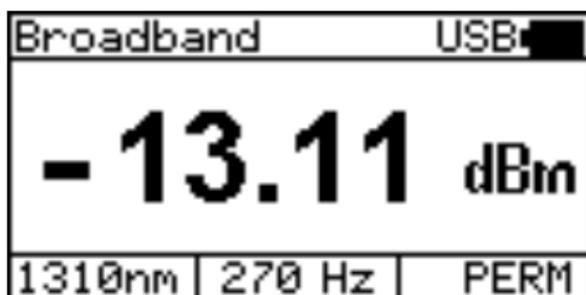


Fig. 19 Detection of modulated light, e.g. 270 Hz.

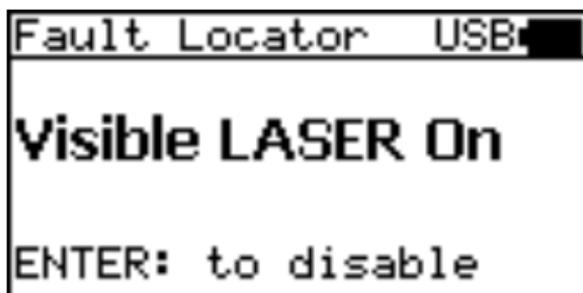
## VFL mode (optional)

If the Visual Fault Locator (VFL) option is available, the MAIN menu will additionally show the item **Switch To VFL Mode**.

### To enable the Visual Fault Locator:

⇒ Open the MAIN menu and select **Switch To VFL Mode**.

*The fault locator starts flashing, all other functions are deactivated and the following is displayed:*



### To disable the Visual Fault Locator:

⇒ Press [MENU ENTER].

*The instrument reverts to the measurement mode that was set previously.*

# 6 MEMORY MANAGEMENT

## General information

---

The OLP-57 allows you to save the measured power level values in a structured data memory and recall them as required. Up to 350 results can be stored. All data is saved to a non-volatile memory (E<sup>2</sup>PROM).

Data can also be downloaded via the USB interface to a PC for further evaluation.

Two methods of recording values are available to meet individual requirements:

- Measured values stored in successive memory locations.
- Measured values stored in pre-defined memory locations.

## Result memory structure

The OLP-57 is equipped with a data memory which is structured according to the typical device under test, i.e. a cable made up from several fibers. This hierarchical structure predetermines the memory locations which generally contain the following data:

- **Group** number: 001 to 350
- **Meas(urement)** number: 001 to 350
- **Wavelength**

A combination of these three values is assigned to each memory location, each value being accessible separately.

## Saving results successively

Results are stored simply by pressing [**Store**]. Each time the key is pressed, the next memory location will be used to store the current result. The results of all three wavelengths will always be stored in FTTx mode. If the memory is initially empty, the memory starts with Group 001 and Meas 001. The Meas # then increments each time [**Store**] is pressed (up to a maximum of 350).

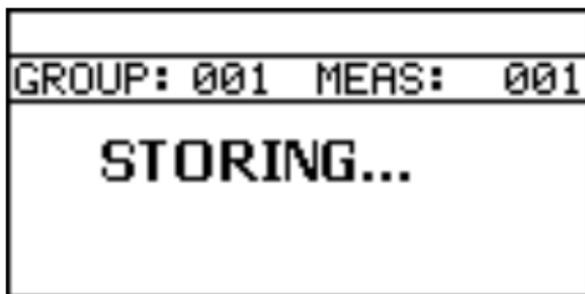
This method is ideal for simple measurement sequences, e.g. when a limited number of power level values for a **single** item under test are to be recorded.

### To save current results successively:

- ✓ The entire result memory is empty or the first and subsequent memory locations are empty.
- ✓ The device is in measure mode.

1. Press [**Store**] to save the first result.

*The display briefly indicates the first memory location, e.g. Group 033, Meas 001. "STORING ..." confirms the storing process is successful.*



2. Press [**Store**] again every time you want to save a further result value.

*The display briefly shows the memory location used. The Meas # increments each time.*

If the results are to be stored starting from a different memory location, such as Group 015, Meas 005, these values must be specified in advance (see „[Selecting the store location](#)“, page 48).

If you attempt to store data at memory locations that are already occupied by the results of previous measurements, a warning will be displayed:

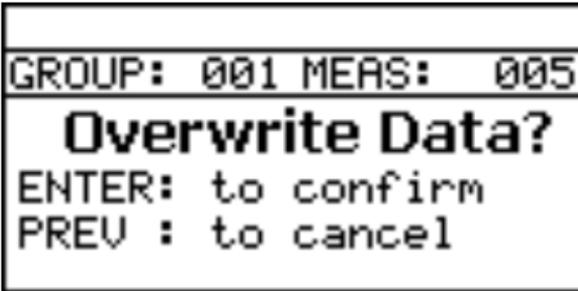


Fig. 20 Display if selected memory location is already occupied.

- ⇒ Press [**MENU ENTER**] to overwrite the old data with new data.
- ⇒ Press [**PREV**] if you do not want to overwrite the old data.

## Displaying stored results

---

Displaying the last measurement results stored is probably the function you will use the most often. For this reason, the last memory location used will be displayed when you enter the **MANAGE MEMORY** menu. The Meas # is highlighted by default so you have quick access to all the measurements of a certain Group.

### To display the last results stored:

- ⇒ Select **Manage Memory** in the **MAIN** menu.  
*The last results stored are displayed.*  
*Stored results example: Group 025, Meas 004:*  
*3 wavelengths detected, relative measurement mode with measured levels and reference values.*

2007/JUL/18 15:47:31		
GROUP: 001 MEAS: 004		
$\lambda$ /nm	Lev/dB	Ref/dBm
1550	LOW	-50.00
1490	LOW	-50.00
1310	LOW	+0.00

To select another Measurement in the current Group:

⇒ Press [▲▼] to increase/decrease the Meas #.

2007/JUL/18 15:47:34		
GROUP: 001 MEAS: 001		
λ/nm	Lev/dB	Ref/dBm
1550	LOW	-50.00
1490	LOW	-50.00
1310	LOW	+0.00

To select another Group and Measurement:

1. Press [MENU ENTER].

*The MANAGE MEMORY menu opens:*

MENU: MANAGE MEMORY		
Select Group		
Clear Actual Meas		
Clear Group		
Clear All		
GROUP: 001 MEAS: 001		

2. Press [MENU ENTER] again (Select Group is selected).

*The current Group and Meas 001 will be displayed:*

2007/JUL/18 15:47:34		
GROUP: 001 MEAS: 002		
λ/nm	Lev/dB	Ref/dBm
1550	LOW	-50.00
1490	LOW	-50.00
1310	LOW	+0.00

3. Press [▲▼] to increase/decrease the Group #.
  4. Press [MENU ENTER].  
*MEAS # will be highlighted.*
  5. Press [▲▼] to increase/decrease the Meas #.
- ⇒ Press [MENU ENTER] to exit from the menu.

## Selecting the store location

---

When you press [**Store**] in measurement mode, the results are stored at the active memory location. Each time you press the key, the Meas # is incremented but the Group # remains the same. You cannot select the memory location, Meas # or Group # in measurement mode.

If you do not want to overwrite existing data or if you want to set a specific Group and Meas number, you must open the MANAGE MEMORY menu and select the location.

The procedure is the same as for displaying a memory location (see „[Displaying stored results](#)“, page 46), as the last memory location displayed is always set as the current memory location when storing data.

### To save results at a selected location:

1. Set the wavelength and measurement mode as required.
  2. Select **Manage Memory** in the MAIN menu.
  3. Press [**▲▼**] to edit the Meas # only.  
Go to step 9 if you only want to edit the Meas #.
  4. Press [**MENU ENTER**].  
*The MANAGE MEMORY menu opens.*
  5. Press [**MENU ENTER**] again (**Select Group** is highlighted).  
*The current Group # and Meas 001 are displayed.*
  6. Press [**▲▼**] to edit the Group #.
  7. Press [**MENU ENTER**].  
*Meas # is highlighted.*
  8. Press [**▲▼**] to edit the Meas #.
  9. Press [**PREV**] to exit from the menu.
- ⇒ Press [**Store**] to store the results.

## Clearing the memory

You can store up to 350 data sets in the OLP-57. Each data set can contain up to 3 measurements in Auto  $\lambda$  mode (in conjunction with a JDSU OLS-55 light source). Each data set contains the wavelength, the relative power level and reference value or the absolute power level, and the date / time when it was stored.

You do not have to clear the entire memory to free up capacity. You can clear individual Meas or Group locations to provide access to specific Meas or Group numbers.

The OLP-57 has the following memory clear functions:

- **Clear Actual Meas**  
Clears the data of the selected measurement
- **Clear Group**  
Clears all the measurements of the selected Group
- **Clear All**  
Clears all the data in the memory.

### Clearing memory data

1. Select **Manage Memory** in the MAIN menu.  
*The last results stored are displayed.*
2. Press **[MENU ENTER]**.  
*The MANAGE MEMORY menu opens:*

```

MENU:  MANAGE MEMORY
Select Group
Clear Actual Meas
Clear Group
Clear All
GROUP: 001 MEAS: [000]
  
```

**To clear the data from a current measurement:**

1. Set the Group # and Meas # of the data you want to clear.
2. Press **[▲▼]** to select **Clear Actual Meas**.
3. Press **[MENU ENTER]** to clear the selected Measurement data.

4. Press **[PREV]** to exit from the menu.

**Note:** If you now store results, they will be stored at the memory location for the cleared Meas # of the last Group displayed.

### To clear all the data of a Group:

1. Set the Group # that you want to clear.
2. Press **[▲▼]** to select **Clear Group**.
3. Press **[MENU ENTER]** to clear all the Meas data for the selected Group #.
4. Press **[PREV]** to exit from the menu.

**Note:** If you now store results, they will be stored at memory location Meas 001 of the last Group displayed.

### To clear the entire memory:

1. Press **[▲▼]** to select **Clear All**.
2. Press **[MENU ENTER]** to clear all memory data.
3. Press **[PREV]** to exit the menu.

**Note:** If you now store results, they will be stored at memory location Group 001 and Meas 001.

## Reading out the result memory

---

The result memory can be read out in two ways:

- by reading the measurement results to a PC or
- by copying the result memory to a memory stick.

## Reading out the measurement results to a PC

The OFS-355 Download Manager can be used to transfer the result memory to a PC via the USB interface. For further details see „[OFS-355 Download Manager](#)“, page 72.

## Copying the result memory to a memory stick

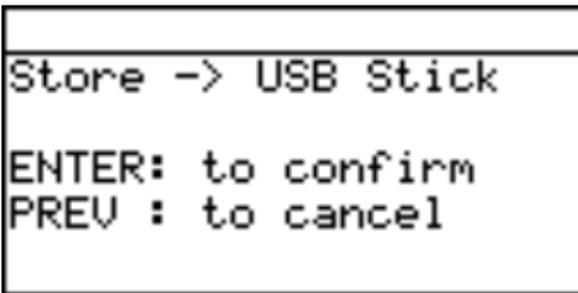
The result memory can be copied to a memory stick plugged into the USB port on the connector panel. This allows you to store a large amount of data in ASCII format. The OFS-355 Download Manager can then be used to transfer the result memory to a PC for further evaluation or print out. For further details see „OFS-355 Download Manager”, page 56.

### To copy the result memory to a memory stick:

1. Plug in the memory stick to the device USB port on the connector panel.

*The folder structure is read.*

**Note:** Depending on the number of folders and the USB speed this procedure may take up to 30 seconds. When completed the following message appears:



2. Press **[MENU ENTER]** to transfer the contents of the measurement memory to the memory stick.

*The contents are stored as a single file in a folder named after the unit in use.*

The measurement memory can now be deleted ready to store new results.

**Note:** Do not remove the memory stick during the data transfer.

A new data transfer can be started at any time as long as the memory stick is plugged in.

## 6 MEMORY MANAGEMENT

### To start a new data transfer:

1. Open the main menu and select the displayed item (menu items may vary depending on the model and operating mode).

```
MENU: MAIN
Store ABS->REF
Edit Ref. Level
Manage Memory
Store -> USB Stick
Select Thresholds ++
```

*The window opens to start the transfer.*

```
Store -> USB Stick

ENTER: to confirm
PREV : to cancel
```

2. Press **[MENU ENTER]** to transfer the contents of the measurement memory to the memory stick.  
*The contents are stored as a single file in a folder named after the unit in use.*

# 7 MAINTENANCE

---



**Dangerous voltage and invisible laser radiation**



**Maintenance or cleaning of the device when it is connected up or operating may damage the device or injure you.**

**WARNING**

**!** Make sure that the device is switched off and disconnected from all power sources and optical radiation sources before maintenance or cleaning.

---

## Cleaning the test port

---

It is a good idea to check that the optical connections are clean and to clean them if necessary before starting measurements. Even very small dust particles on the end surfaces of the plugs or in the test adapters can adversely affect the accuracy of the measurement.

1. Switch off the device.
2. Remove the test adapter from the optical connection.  
*The plug end surface is now accessible.*
3. Wipe off the plug end surface using a cotton bud soaked in isopropanol. This cleaning method is very effective and leaves no residues.
4. Blow out the test adapter with clean compressed air (available in spray cans, e.g. Anti Dust Spray).

**Note:** Cover the optical connections with the dust cap whenever they are not in use. This prevents them from getting dirty.

## **Cleaning the instrument**

---

If the instrument gets dirty through use, you can clean it using a soft cloth moistened with a mild solution of detergent.

---



**CAUTION**

### **Water and cleaning fluids**

**The device may be damaged or destroyed if water or cleaning fluids get inside it.**

- !** Make sure that water or cleaning fluids do not get inside the instrument.
-

# 8 REMOTE CONTROL

## Communication interface

---

The OLP-57 is equipped with a USB interface for remote control via a PC. The driver files needed on the PC for this can be download from [www.jdsu.com/test\\_and\\_measurement](http://www.jdsu.com/test_and_measurement).

The OFS-355 Download Manager is quickly and easily installed (see next chapter). This automatically installs the appropriate drivers.

## Key

---

The following table lists the parameter types used in remote control.

<NR1>	Integer value. Examples: 23, 90, 0
<NR2>	Real number. Examples: 23.45, 1.30
<NR3>	Exponential number. Examples: 4.3E-3, -8.9456E8, 123E-5
<NRf>	<NR1>   <NR2>   <NR3>
<BOOLEAN>	Boolean value. Examples: 0, 1, OFF, ON
<MNEMONIC>	Short form. The valid short forms are listed with the corresponding commands.
<STRING_RESPONSE_DATA>	IEEE4888.2, 8.7.1

# Commands

---

## Overview

### Utility commands

\*IDN?

\*OPC?

:SYST:PERM:POW

:DISP:CONT

:DISP:CONT?

:SYST:LANG

:SYST:LANG?

:SYST:DATE

:SYST:DATE?

:SYST:TIME

:SYST:TIME?

:DEV:MODE

:DEV:MODE?

### Broadband Wavelength commands

:POW:CAL:WAV:MAX?

:POW:CAL:WAV:MIN?

:POW:CAL:WAV:TAB

:POW:CAL:WAV:TAB?

:POW:CAL:WAV

:POW:CAL:WAV?

### FTTx Wavelength commands

:FTTX:CAL:WAV:TAB?

**Power Meter commands**

:DISP:UNIT  
 :DISP:UNIT?  
 :REF:STAT  
 :REF:STAT?  
 :REF:VAL  
 :REF:VAL?  
 :FTTX:REF:VAL  
 :FTTX:REF:VAL?  
 :WAV:AUTO  
 :WAV:AUTO?  
 :FETC:AM:AUTO:FREQ?  
 :FETC:AM:INT:FREQ?  
 :FETC:MEAS:VAL?

**FTTx Threshold Set commands**

:FTTX:THR:PASS:VAL  
 :FTTX:THR:PASS:VAL?  
 :FTTX:THR:OVER:VAL  
 :FTTX:THR:OVER:VAL?  
 :FTTX:THR:MARG:VAL  
 :FTTX:THR:MARG:VAL?  
 :FTTX:THR:NAME  
 :FTTX:THR:NAME?  
 :FTTX:FETC:MEAS:THR:STAT?

**Broadband/FTTx Memory Management commands**

:MEM:FREE?  
 :BB:MEM:USED?  
 :FTTx:MEM:USED?  
 :BB:MEM:GROU  
 :FTTx:MEM:GROU  
 :BB:MEM:GROU?  
 :FTTx:MEM:GROU?  
 :BB:MEM:GROU:MEAS  
 :FTTx:MEM:GROU:MEAS

:BB:MEM:GROU:MEAS?  
 :FTTx:MEM:GROU:MEAS?  
 :BB:MEM:ID:MEAS?  
 :FTTx:MEM:ID:MEAS?  
 :MEM:STOR:MEAS  
 :BB:MEM:REC:MEAS?  
 :FTTx:MEM:REC:MEAS?  
 :BB:MEM:REC:ALL?  
 :FTTx:MEM:REC:ALL?  
 :BB:MEM:DEL:MEAS  
 :FTTx:MEM:DEL:MEAS  
 :BB:MEM:DEL:GROU  
 :FTTx:MEM:DEL:GROU  
 :BB:MEM:DEL:ALL  
 :FTTx:MEM:DEL:ALL  
 :MEM:DEL:ALL

## Utility commands

Command string	Parameter type / Response type / Unit / Info
*IDN?	Returns the unique identification of the device. <b>Response type:</b> <STRING_RESPONSE_DATA> e.g. JDSU Germany GmbH, OLP-57/01,A-0106,V03.30
*OPC?	Returns "1" as soon as all operations in progress have been completed.
:SYST :PERM :POW	Ensures the device is switched on permanently i.e. that it does not switch off after 20 minutes.
:DISP :CONT	Sets the display contrast. <b>Parameter type:</b> <NR1> Range: 0...15 (0: min, 15: max.)

Command string	Parameter type / Response type / Unit / Info
:DISP :CONT?	Returns the display contrast. Range: 0...15 (0: min, 15: max.)
:SYST :ERR?	Returns the oldest error in the error queue. <b>Response type:</b> <NR1>, <STRING_RESPONSE_DATA> e.g. -100, "Command error"
:SYST :DEV :DEF	Sets the device parameters to their default values.
:SYST :LANG	Sets the language. <b>Parameter type:</b> <MNEMONIC> <ul style="list-style-type: none"> <li>• EN: English</li> <li>• DE: German</li> <li>• FR: French</li> </ul>
:SYST :LANG?	Returns the current language. EN or DE or FR
:SYST :DATE	Sets the date (yy,mm,dd). e.g. :SYST:DATE 07,11,30
:SYST :DATE?	Returns the date (yy,mm,dd). e.g. 07,11,30
:SYST :TIME	Sets the time (hh,mm,ss). e.g. :SYST:TIME 23,59,59

Command string	Parameter type / Response type / Unit / Info
<b>:SYST :TIME?</b>	Returns the time (hh,mm,ss). e.g. 23,59,59
<b>:DEV:MODE</b>	Sets the device operating mode. <b>Parameter type:</b> <MNEMONIC> <b>Modes:</b> <ul style="list-style-type: none"> <li>• BB: Broadband mode</li> <li>• FTTX: FTTX mode</li> </ul>
<b>:DEV:MODE?</b>	Returns the device operating mode: BB or FTTX

## Broadband Wavelength commands

Command string	Parameter type / Response type / Unit / Info
<b>:POW :CAL :WAV :MAX?</b>	Returns the maximum wavelength that can be set. e.g. 1650
<b>:POW :CAL :WAV :MIN?</b>	Returns the minimum wavelength that can be set. e.g.1260
<b>:POW :CAL :WAV :TAB</b>	Sets up to 30 wavelengths in the $\lambda$ -Table. Parameter type: <NR1,NR1,...> e.g. :POW:CAL:WAV:TAB 1280,1300,1310,1480,1510,1550

Command string	Parameter type / Response type / Unit / Info
:POW :CAL :WAV :TAB?	Returns the contents of the $\lambda$ -Table. Response type: <NR1,NR1,...>
:POW :CAL :WAV	Selects the calibration wavelength from the $\lambda$ -Table. See :POW:CAL:WAV:TAB? for more details. Parameter type: <NR1> e.g. :POW:CAL:WAV 1310
:POW :CAL :WAV?	Returns the calibration wavelength currently used in the instrument. e.g. 1310

## FTTX Wavelength commands

Command string	Parameter type / Response type / Unit / Info
:FTTX :CAL :WAV :TAB?	Returns the calibrated wavelengths in FTTX mode. e.g. 1550,1490,1310

## Power Meter commands

Command string	Parameter type / Response type / Unit / Info
:DISP :UNIT	<p>Selects how the power level is displayed.</p> <p><b>Parameter type:</b> &lt;MNEMONIC&gt;</p> <ul style="list-style-type: none"> <li>• LIN: linear display of power level (<math>\mu\text{W}</math>)</li> <li>• LOG: logarithmic display of power level (dBm or dB)</li> <li>• STATUS: pass/fail based on thresholds levels (in FTTX mode only)</li> </ul>
:DISP :UNIT?	<p>Returns the power level display type: LIN or LOG or STATUS</p>
:REF :STAT	<p>Determines whether the power level reading is displayed as an absolute or a relative value.</p> <p><b>Parameter type:</b> &lt;BOOLEAN&gt;</p> <ul style="list-style-type: none"> <li>• 0: absolute value (<math>\mu\text{W}</math> or dBm)</li> <li>• 1: relative value (dB)</li> </ul> <p>Default setting: 0</p>
:REF :STAT?	<p>Returns the type of power level display.</p> <p><b>Response type:</b> &lt;BOOLEAN&gt;</p> <ul style="list-style-type: none"> <li>• 0: absolute value</li> <li>• 1: relative value</li> </ul>
:REF :VAL	<p>Sets the value for the specified wavelength (to which the power level reading is referred) in relative mode.</p> <p><b>Parameter type:</b> &lt;NR1&gt;,&lt;NRf&gt;</p> <p>e.g. :REF:VAL 1310,-34.50 sets the reference value for 1310 nm to -34.50 dBm.</p>

Command string	Parameter type / Response type / Unit / Info
:REF :VAL?	<p>Returns the value for the specified wavelength (to which the power level reading is referred) in relative mode.</p> <p><b>Parameter type:</b> &lt;NR1&gt;  <b>Response type:</b> &lt;NRf&gt;  <b>Unit:</b> dBm</p> <p>e.g. :REF:VAL? 1490</p>
:FTTX :REF :VAL	<p>Sets the value for the specified wavelength (which the power level reading refers to) in relative mode.</p> <p><b>Parameter type:</b> &lt;NR1&gt;,&lt;NRf&gt;</p> <p>FTTX:CAL:WAV:TAB? returns the allowed wavelengths.</p> <p>e.g. :FTTX:REF:VAL 1310,-34.50 sets the reference value for 1310 nm to -34.50 dBm.</p>
:FTTX :REF :VAL?	<p>Returns the value for the specified wavelength (which the power level reading refers to) in relative mode.</p> <p><b>Parameter type:</b> &lt;NR1&gt;  <b>Response type:</b> &lt;NR2&gt;  <b>Unit:</b> dBm</p> <p>e.g. :FTTX:REF:VAL? 1490</p>
:WAV :AUTO	<p>Determines whether device recognizes Auto <math>\lambda</math> modulation frequencies which automatically sets the system calibration wavelengths.</p> <p><b>Parameter type:</b> &lt;BOOLEAN&gt;</p> <ul style="list-style-type: none"> <li>• 0: Auto-<math>\lambda</math> recognition off</li> <li>• 1: Auto-<math>\lambda</math> recognition on</li> </ul> <p>Default setting: 0</p>

Command string	Parameter type / Response type / Unit / Info
:WAV :AUTO?	Returns whether Auto- $\lambda$ recognition is on or off. <ul style="list-style-type: none"> <li>• 0: Auto-<math>\lambda</math> recognition off</li> <li>• 1: Auto-<math>\lambda</math> recognition on</li> </ul>
:FETC :AM :AUTO :FREQ?	Returns <ul style="list-style-type: none"> <li>• "1", if an Auto-<math>\lambda</math> modulation frequency was detected on the incoming signal.</li> <li>• "0" otherwise</li> </ul>
:FETC :AM :INT :FREQ?	Returns <ul style="list-style-type: none"> <li>• "0", if the incoming signal is not modulated or Auto-<math>\lambda</math> modulation frequency is detected.</li> <li>• the modulation frequency [Hz] otherwise</li> </ul> <b>Response type:</b> <NR1>
:FETC :MEAS :VAL?	Returns up to 3 power levels measured at the input port of the device (depends on the number of wavelengths displayed simultaneously). <b>Response type:</b> <NR3, NR3, NR3> <b>Response unit:</b> Absolute display (:REF:STAT 0) <ul style="list-style-type: none"> <li>• in dBm for DISP:UNIT LOG</li> <li>• in W for DISP:UNIT LIN</li> </ul> Relative display (REF:STAT 1) in dB <ul style="list-style-type: none"> <li>• +9.91E37 overflow</li> <li>• -9.91E37 underflow</li> </ul>

## FTTX Threshold Set commands

Command string	Parameter type / Response type / Unit / Info
:FTTX :THR :PASS :VAL	Sets value for PASS threshold. For details see FTTX:THR:OVER:VAL.
:FTTX :THR :PASS :VAL?	Returns value [dBm] for PASS threshold. For details see FTTX:THR:OVER:VAL?.
:FTTX :THR :OVER :VAL	Sets value for OVER threshold. <b>Parameter type:</b> <NR1>,<NR1>,<NRf> Parameter: <ul style="list-style-type: none"> <li>• threshold set number [0...9]</li> <li>• one of the calibrated FTTX wavelengths [nm] returned on :FTTX:CAL:WAV:TAB?</li> <li>• threshold value: [dBm]</li> </ul> Values must be set for all calibrated wavelengths separately, e.g. FTTX:THR:OVER:VAL 1,1310,-5.00 FTTX:THR:OVER:VAL 1,1490,-5.00 FTTX:THR:OVER:VAL 1,1550,-5.00
:FTTX :THR :OVER :VAL?	Returns value [dBm] of OVER threshold. <b>Parameter type:</b> <NR1>,<NR1> Parameter: <ul style="list-style-type: none"> <li>• threshold set number [0...9]</li> <li>• one of the calibrated FTTX wavelengths [nm] returned on :FTTX:CAL:WAV:TAB?</li> </ul> e.g. :FTTX:THR:OVER:VAL? 1,1310

Command string	Parameter type / Response type / Unit / Info
:FTTX :THR :MARG :VAL	Sets value for MARG threshold. For details see FTTX:THR:OVER:VAL.
:FTTX :THR :MARG :VAL?	Returns value [dBm] for MARG threshold. For details see FTTX:THR:OVER:VAL?.
:FTTX :THR :NAME	Defines name of threshold set. Parameter type: <NR1>,<STRING> <ul style="list-style-type: none"> <li>• threshold set no. [0...9]</li> <li>• name (max. 15 char.)</li> </ul> e.g. :FTTX:THR:NAME 2,SET_John
:FTTX :THR :NAME?	Returns name of threshold set. <b>Parameter type:</b> <NR1> <ul style="list-style-type: none"> <li>• threshold set no. [0...9]</li> </ul> <b>Response type:</b> <STRING> <ul style="list-style-type: none"> <li>• name</li> </ul>

Command string	Parameter type / Response type / Unit / Info
:FTTX :THR :SET	<p>Selects one of the predefined threshold sets applied in pass/fail mode (see ":DISP:UNIT")</p> <p><b>Parameter type:</b> &lt;NR1&gt;</p> <ul style="list-style-type: none"> <li>• threshold set no. [0...9]</li> </ul>
:FTTX :THR :SET?	Returns the number [0...9] of the currently selected threshold set.
:FTTX :FETC :MEAS :THR :STAT?	<p>Returns the result of PASS/FAIL measurement with the current thresholds.</p> <p>The value returned is one of the following parameters: HIGH,OVER,PASS,MRG,FAIL,LOW e.g. PASS,MRG,PASS</p>

## Broadband/FTTX Memory Management commands

Command string	Parameter type / Response type / Unit / Info
:MEM :FREE?	Returns the number of how many measurements can still be stored until memory is full.
:BB :MEM :USED?  :FTTX :MEM :USED?	Returns the number of Broadband/FTTX mode measurements stored in the memory.
:BB :MEM :GROU  :FTTX :MEM :GROU	Selects the group (1...350) where the measurement is stored, deleted or recalled.  <b>Parameter type:</b> <NR1> e.g. :BB:MEM:GROU 10 / :FTTX:MEM:GROU 10
:BB :MEM :GROU?  :FTTX :MEM :GROU?	Returns the group where the measurement is stored, deleted or recalled.  e.g. 10
:BB :MEM :GROU :MEAS  :FTTX :MEM :GROU :MEAS	Sets the measurement number (1...350) in the current group where the measurement is stored, deleted or recalled.  <b>Parameter type:</b> <NR1> e.g. :BB:MEM:GROU:MEAS 25 / :FTTX:MEM:GROU:MEAS 25

Command string	Parameter type / Response type / Unit / Info
:BB :MEM :GROU :MEAS?  :FTTX :MEM :GROU :MEAS?	Returns the measurement number in the current group where the measurement is stored, deleted or recalled.  e.g. 25
:BB :MEM :ID :MEAS?  :FTTX :MEM :ID :MEAS?	Returns the current group and measurement number where the measurement is stored, deleted or recalled.  e.g. 10,25
:MEM :STOR :MEAS	Stores the current measurement under the current group/ measurement number.  <b>Note:</b> If this command is repeated immediately (i.e. with no other commands, such as :BB:MEM:REC:MEAS? / :FTTX:MEM:REC:MEAS? in between), the identifier increments by 1 for the next store operation.

Command string	Parameter type / Response type / Unit / Info
:BB :MEM :REC :MEAS?  :FTTX :MEM :REC :MEAS?	Returns the measurement stored in the memory at the current group/meas value.  <b>Format for measurement:</b> group,meas;date,time; measdata[;measdata]  <b>Format of measdata:</b> wavelength, level, reference e.g. 1,6;2007/AUG/31,23:59:59; 1490nm,-45.69dB,-5.12dBm; 1550nm,-12.34dB,-10.00dBm
:BB :MEM :REC :ALL?  :FTTX :MEM :REC :ALL?	Returns all the broadband/FTTX measurements stored in the memory. Format for each measurement: see :BB:MEM:REC:MEAS? / :FTTX:MEM:REC:MEAS?
:BB :MEM :DEL :MEAS  :FTTX :MEM :DEL :MEAS	Deletes the current measurement.
:BB :MEM :DEL :GROU  :FTTX :MEM :DEL :GROU	Deletes all measurements in the specified group (1...350). e.g. :BB:MEM:DEL:GROU 20 / :FTTX:MEM:DEL:GROU 20

Command string	Parameter type / Response type / Unit / Info
<b>:BB</b> <b>:MEM</b> <b>:DEL</b> <b>:ALL</b>  <b>:FTTX</b> <b>:MEM</b> <b>:DEL</b> <b>:ALL</b>	Deletes all Broadband measurement results from the memory.  Deletes all FTTX measurement results from the memory.
<b>:MEM</b> <b>:DEL</b> <b>:ALL</b>	Deletes all Broadband and FTTX measurement results from the memory.

# 9 OFS-355 DOWNLOAD MANAGER

The OFS-355 Download Manager is a free download offered by JDSU which allows you to easily transfer stored measurement data to a PC, to enhance the performance of your SMART optical handheld devices, and to speed up production of your test reports.

## To download the OFS-355 Download Manager:

1. Go to the JDSU web site: [www.jdsu.com](http://www.jdsu.com)
2. Type OFS-355 in the search box.
3. Select OFS-355 from the search results list.  
*The OFS-355 information page opens.*
4. Select the download tab.
5. Click on the download link to download the software and follow the instructions given.

## OFS-355 Download Manager function overview

- Stored measurement data can be transferred to a PC and displayed as an Excel table for later evaluation.



Fig. 21 Main menu of the OFS-355 Download Manager.

- A complete acceptance report can be created quickly and easily.

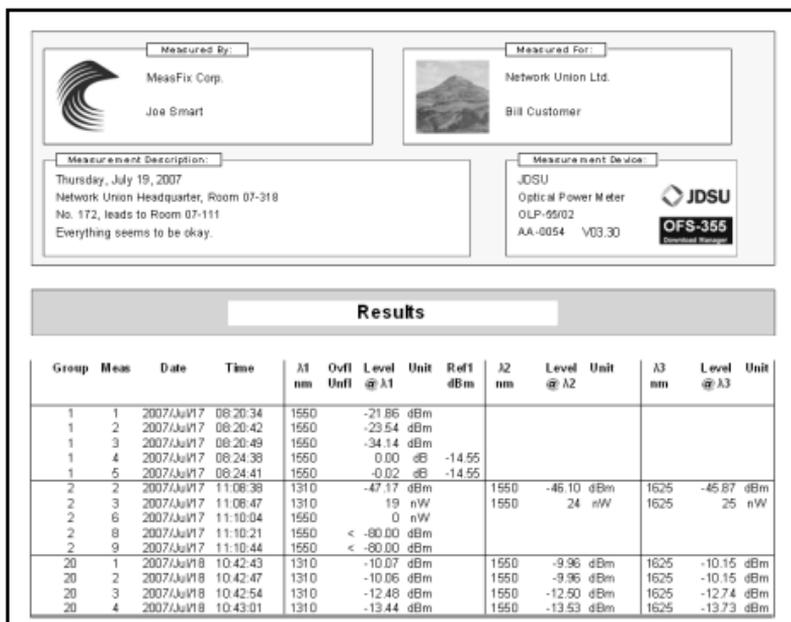


Fig. 22 Acceptance report

- The OFS-355 Download Manager allows remote control of a device connected to the PC. You can use this to measure the signal power level at intervals (and at several wavelengths) and transfer the data to the PC immediately. The data can be displayed as an incremental table or as a live graph.

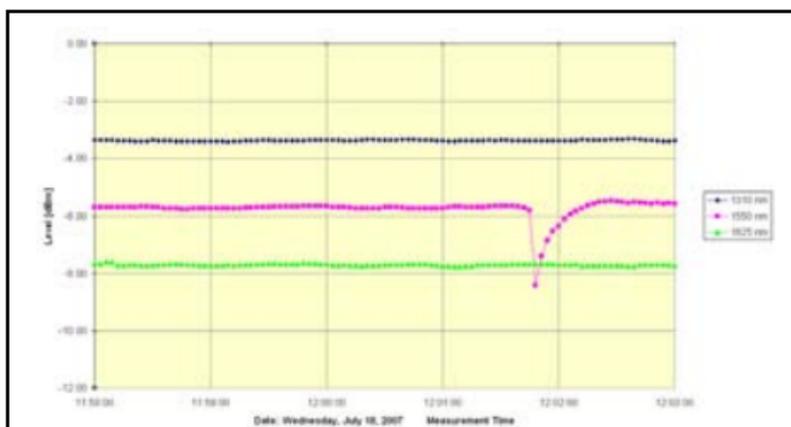


Fig. 23 Data displayed as a graph

- When certain pre-defined actions occur, e-mails can be sent to report the measurement results.

# 10 MEASUREMENT EXAMPLE

## PON measurement

The OLP-57 must be inserted in the signal path to measure signal power in passive optical networks (PON). Take care to connect the device correctly:

- Left socket: central office side (1490/1550 nm)
- Right socket: household side (1310 nm)

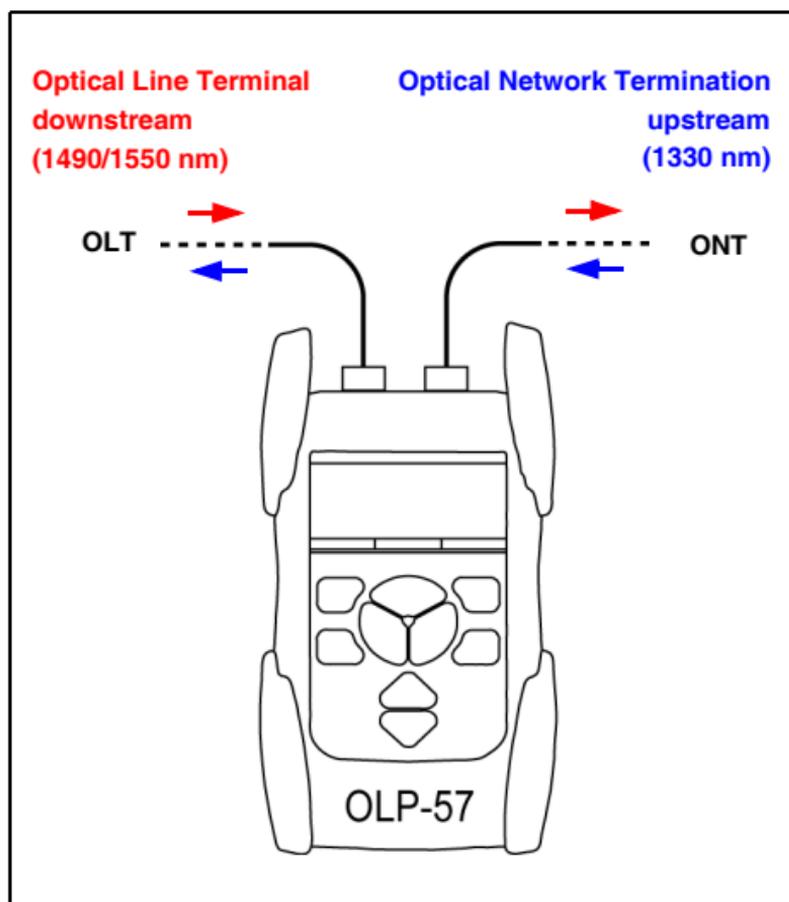


Fig. 24 OLP-57 connection for PON measurement.

## Example: Attenuation measurement

The optical attenuation of cable # 3 containing a total of 6 fibers (1310 nm) is to be measured as per IEC 874-1, Method 6.

The first step is to make a reference measurement at point A. The second step measures the loss due to the fiber path at point B.

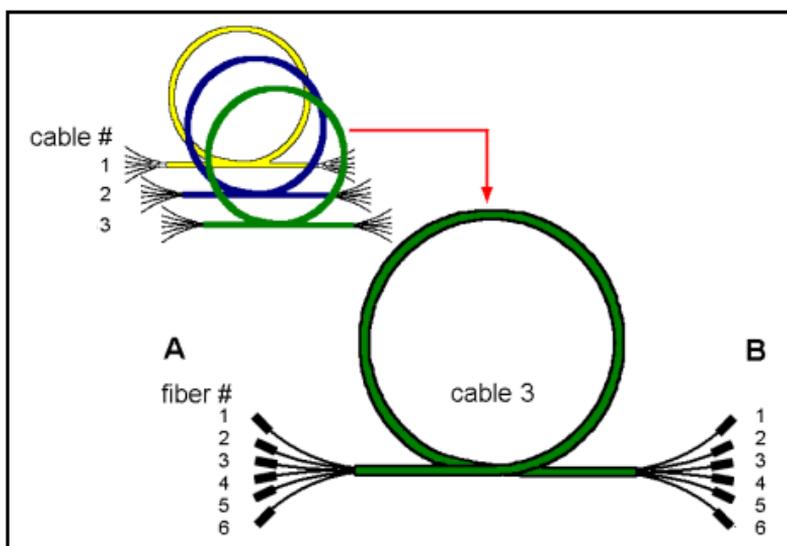


Fig. 25 Item under test: Cable 3, fibers 1 to 6.

### Test equipment

- OLP-57 Optical Power Meter
- OLS-55 Optical Laser Source
- 1 test adapter, BN 2014/00.xx
- 2 adapter cables, K 31xx (9/125  $\mu\text{m}$ )
- 2 adapters, S 31xx
- 1 test adapter, BN 2150/00.xx

## Step 1: Reference measurement

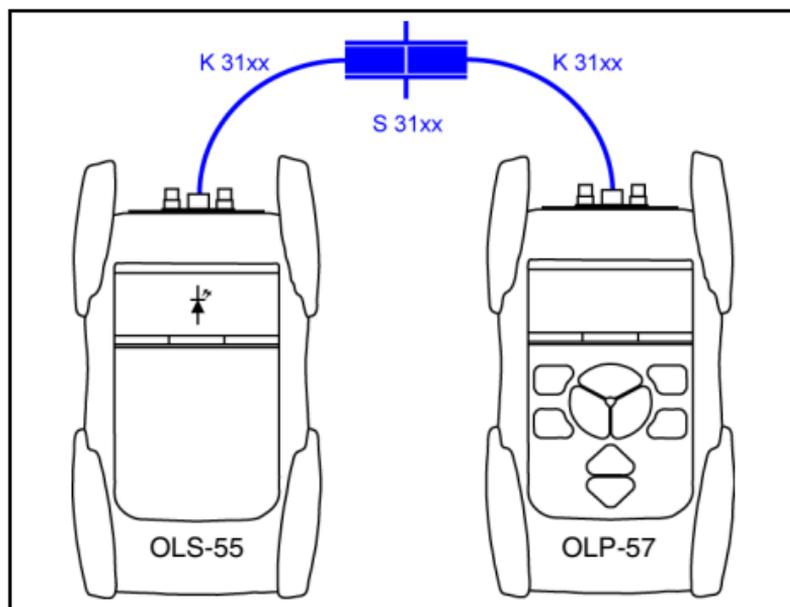


Fig. 26 Test setup for reference measurement at point A.

### Test procedure at point A

1. Fit the OLP and OLS with test adapters.
2. Fit the OLP and OLS with one adapter cable each and link them together using the S 31xx adapter.
3. Set the OLS and OLP to 1310 nm
4. Set the OLS to CW mode.
5. Set the OLP to absolute level display mode.
6. Save the measured level as reference level (ABS -> REF).
7. Set the OLP to relative level display mode.
8. Leave cable K 31xx connected to the OLS and OLP during the entire attenuation measurement.
9. Connect the OLS to the item under test (cable 3, fiber 2) at point A using cable K 31xx.
10. Move the OLP to point B.

## Step 2: Attenuation measurement

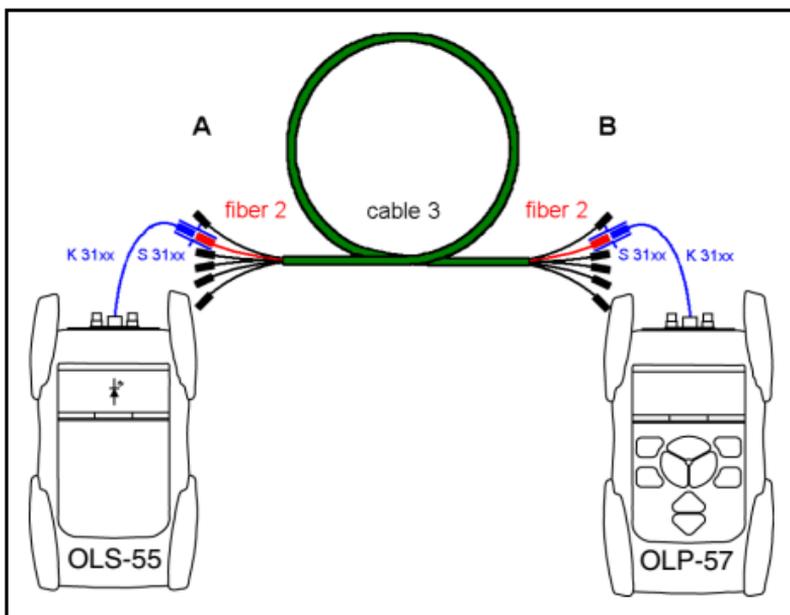


Fig. 27 Test setup for measuring attenuation

### Test procedure at point B

- ⇒ Connect the OLP with the item under test (cable 3, fiber 2) at point B.  
*The insertion loss for fiber 2 will be displayed.*

### Step 3: Saving the results

- ⇒ Press [Store]  
*The measured value will be stored at the memory location defined in the MANAGE MEMORY menu:*
- Memory location is not yet occupied: **STORING...** shows the successful process.
  - Memory location is already occupied:  
You will be asked to overwrite data.

For further information on how to store measurement results at a specific memory location please refer to „[Selecting the store location](#)“, page 48.

# 11 SPECIFICATIONS

## OLP-57

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### Model differences

	BN 2289/xy			
	01, 21	02, 22	03, 23	04, 24
Connector	PC/ APC	PC/ APC	PC/ APC	PC/ APC
Selective measurement				
1310 nm	–	–	✓	–
1490 nm	✓	✓	✓	–
1550 nm	✓	✓	✓	–
Through path	–	✓	✓	✓
1310 nm uplink burst power measurement	–	✓	✓	✓
Broadband mode	–	✓	–	✓

## FTTx wavelength selective characteristics

### 1310 nm (upstream)

Pass band	1260 to 1360 nm
Isolation <sup>1)</sup> of 1490/1550 nm band	> 50 dB
Max. permitted input level <sup>2)</sup>	+17 dBm
Measurement range	-35 to +10 dBm

- 1) Isolation is defined as rejection of neighboring signals in relation to the measurement signal.
- 2) In order to maintain Hazard Level 1M at the downstream port, the 1310 nm upstream input level is limited to the specified value.

### 1490 nm (downstream)

Pass band	1480 to 1500 nm
Isolation of 1550 nm band	> 50 dB
Isolation of 1310 nm band	> 50 dB
Max. permitted input level <sup>1)</sup>	+15 dBm
Measurement range	-50 to +10 dBm

- 1) In order to maintain Hazard Level 1M at the upstream port, the 1490 nm downstream input level is limited to the specified value.

### 1550 nm (downstream)

Pass band	1530 to 1570 nm
Isolation of 1490 nm band	> 50 dB
Isolation of 1310 nm band	> 50 dB
Max. permitted input level <sup>1)</sup>	+22 dBm
Measurement range	-50 to +26 dBm

- 1) In order to maintain Hazard Level 1M at the upstream port, the 1550 nm downstream input level is limited to the specified value.

## Measurement accuracy

Intrinsic uncertainty <sup>1) 2) 3)</sup>	±0.5 dB
PDL	< ±0.25 dB
Linearity <sup>3) 4)</sup>	±0.06 dB
Through path insertion loss <sup>1) 3)</sup>	< 1.5 dB

- 1) Under reference conditions at 23°C ±3K, wavelengths 1310/1490/1550 nm ±2 nm, CW signal.
- 2) At -7 dBm, incl. uncertainty of input connector.
- 3) With DIN connector.
- 4) 1490/1550 nm: -30 to +15 dBm,  
1310 nm upstream: -20 to +10 dBm  
Broadband mode: -40 to +10 dBm

## Memory

Data memory	1000 measurement results
Data readout/ remote control	via USB interface

## Optical interface

Fiber type	9/125 μm
Connectors	Interchangeable adapter from BN 2150/00.xx series. 2.5 mm plugs: FC, ST, SC, DIN 1.25 mm plugs: LC, MU adapter

## Power supply

Batteries	
• dry batteries	4 x Mignon (AA), 1.5 V
• rechargeable	4 x NiMH Mignon (AA), 1.2 V

Operating time (from dry batteries)	Broadband: > 60 h Burst: > 35 h
Power saving	Instrument switches off automatically after appr. 20 min (function can be disabled)
AC line operation	Via SNT-121A AC Adapter/Charger, integrated fast battery charging function (appr. 2 h.)

## EMC, calibration

EMC Standard	IEC 61326:2002
Emission	Class B Equipment
Immunity	IEC 61326, Table 1
Recommended calibration interval	3 years

## General specifications

Display	Graphical display, illuminated, Resolution: 128 x 64 pixels
Results displayed in	dBm, dB, mW, $\mu$ W, pass/fail
Measurement resolution <sup>1)</sup>	0.01 dB/0.001 $\mu$ W
Ambient temperature	
• Operation	-10°C to +55°C
• Storage and transport	-40°C to +70°C
Dimensions (w x h x d)	95 x 60 x 195 mm (3.74 x 2.36 x 7.68 in)
Weight	approx. 500 g (1.1 lb)

1) For power > -40 dBm

## SNT-121A Adapter/Charger

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Power supply type	FW 75550/12
Nominal line voltage range	100 to 240 VAC
Nominal line frequency range	47 to 63 Hz
Power consumption	max. 8.5 W
Output	12 V $\overline{\text{---}}$ / 1.25 A
Temperature range	0 to +40°C

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Condensation – even occasional – is not tolerable.

## Visual Fault Locator (optional)

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For devices with Visual Fault Locator only.

Laser safety	IEC 60825-1:2001
Laser classification	CLASS 2 LASER PRODUCT
Wavelength	635 nm
Output power	< 1 mW
Blink frequency	approx. 5 Hz
Optical connector	Universal push pull adapter (UPP) for all standard 2.5 mm connector systems

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# 12 ORDERING INFORMATION

## OLP-57

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1490/1550 nm, Through path, 1310 nm Burst, PC	BN 2289/03
1490/1550 nm, Through path, 1310 nm Burst, APC	BN 2289/23
1490 nm, Through path, 1310 nm Burst, Broadband mode, PC	BN 2289/04
1490 nm, Through path, 1310 nm Burst, Broadband mode, APC	BN 2289/24

### Included with the OLP-57:

- 2 interchangeable BN 2150/00.xx series adapters
  - 4 dry batteries Mignon (AA), 1.5 V
  - Operating manual
  - MT-1S belt bag
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Calibration report	BN 2289/90.01
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## Accessories

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### Universal optical adapter

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JAE type	
- ST	BN 2150/00.32
- DIN 47256	BN 2150/00.50
- FC-PC, FC-APC	BN 2150/00.51
- SC-PC, SC-APC	BN 2150/00.58
- LC	BN 2150/00.59

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**Cleaning materials, power supplies**

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OCK-10	
Optical connector cleaning kit	BN 2229/90.21
Cleaning tape for optical connectors	BN 2229/90.07
Spare optical cleaning tape	BN 2229/90.08
NiMH rechargeable batteries, Mignon AA, 1.2 V (4 batteries required)	BN 2237/90.02
SNT-121A Adapter/Charger (worldwide compatibility)	BN 2277/90.01
USB connection cable	K804

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**Bags**

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MT-1S carry pouch and strap for 1 instrument	BN 2277/90.02
MT-2S soft case for 2 instruments	BN 2126/03
MT-3S soft case for 3 instruments	BN 2126/04
MK-3S hard case for 4 instruments	BN 2093/31

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# INDEX

- A**
  - AC line plug adapter 18
  - Attenuation measurement 77
  - Auto lambda mode 28
- B**
  - Backlight 23
  - Batteries
    - Danger 15
    - Recharging 16
    - Replacing 15
    - Tips 17
  - Battery Operation 7
  - Broadband mode 3
  - Burst power measurements 3
- C**
  - Cables, connecting 19
  - Cleaning
    - Instrument 54
    - optical connections 53
    - Test port 53
  - Clearing the memory 49
  - Common features 1
  - Condensation 11
  - Connecting optical cables 19
  - Connector panel 14
  - Contrast 30
- D**
  - Damages during shipping 11
  - Data memory 44
  - Date and time 31
  - Default 30
  - Default values 30
  - Device information 30
  - Device overview 12
  - Differences between the devices 2
  - Display contrast 30
  - Display elements 23
  - Displaying
    - absolute power level 35
    - modulated signals 43
    - relative power level 41
  - Download manager 72
- E**
  - E2PROM 44
- Environmental protection 17**
- F**
  - Factory default 30
  - Firmware update 32
- I**
  - IEC 874-1 75
  - Information about device 30
  - Insertion loss 77
- L**
  - Lambda-Table
    - edit 26
  - Laser safety 7
- M**
  - Memory position 48
  - Memory structure 44
  - Menu
    - Configuration 25
  - Menu navigation 25
  - Modulated signal, displaying 43
- N**
  - NAN 55
  - Navigating in the menus 25
  - Not A Number 55
- O**
  - On/Off 22
  - Operation from AC power 18
  - Overview 12
- P**
  - Package contents 11
  - Packing material 11
  - PASS/FAIL measurement 37
  - Passive optical networks 74
  - PON 74
  - Power level
    - absolute 35
    - relative 41
  - Power level ranges 41
  - Power mode 22
  - Proper usage 6
- R**
  - Recovery 11
  - Recycling 17
  - Reference measurement 76

- Remote commands
  - Broadband Memory Management 57, 68
  - Broadband Wavelength 56, 60
  - FTTx Memory Management 57, 68
  - FTTx Wavelength 56, 61
  - Power meter 57, 62
  - Utility 58
- Results 45
- S**
- Saving results 45
- Shipping damage 11
- T**
- Test adapter, mounting 19
- Test equipment 75
- Test procedure 76
- Threshold set
  - edit a 38
  - selecting a 40
- Through path 3
- Time 31
- U**
- Updating the firmware 32
- V**
- VFL mode 43

## **JDSU Environmental Management Program**

Superb performance and high quality have always characterized JDSU datacom and telecom measurement technology products. In this same world-class tradition, JDSU has an established, proactive program of environmental management.

Environmental management is an integral part of JDSU's business philosophy and strategy requiring the development of long-term, productive solutions to problems in the key areas of economics, technology, and ecology.

A systematic environmental management program at JDSU is essential in regard to environmental policy and enhances cooperation between ourselves and our business partners.

### **The JDSU Environmental Management Program considers:**

#### **Product design and manufacture**

Environmental restrictions and requirements are taken into account during planning and manufacture of JDSU products. This attention ranges from the raw materials and finished components selected for use and the manufacturing processes employed, through to the use of energy in the factory, and right on up to the final stages in the life of a product, including dismantling.

#### **Hazardous materials**

JDSU avoids or uses with care any hazardous or dangerous material in the manufacturing process or the end product. If the use of a dangerous material cannot be avoided, it is identified in product documentation and clearly labeled on the product itself.

#### **Packaging materials**

Preference is given to reusable or biodegradable single-substance packaging materials whenever possible.

### **Environmental management partnerships**

JDSU encourages our customers and suppliers who take this responsibility seriously to join JDSU in establishing their own environmental management programs.

### **Recycling used products**

This product complies with the European Union Waste Electrical and Electronic Equipment directive (WEEE), 2002/96/EC. This product should not be disposed of as unsorted municipal waste and should be collected separately and disposed according to your national regulations.

In the European Union, all equipment purchased from JDSU after 2005-08-13 can be returned for disposal at the end of its useful life. Measuring systems affected by this can be recognized by the symbol on the right of a crossed-out trash can and a black bar. This symbol can be found either on the device or in the accompanying documents.



Contact your local Technical Assistance Center (TAC) for return and collection services available to you. If you would like specific information about the JDSU Environmental Management Program, please contact us at:

If you would like specific information about the JDSU Environmental Management Program, please contact us at [www.jdsu.com](http://www.jdsu.com)

The following pages provide with respect to Chinese Requirements information with regard to the location of restricted hazardous substances within this equipment.

As measuring equipment this equipment is excluded from the European regulations for the restriction of hazardous substances (RoHS).

# "中国RoHS"

## 《电子信息产品污染控制管理办法》（信息产业部，第39号）

### 附录 (Additional Information required for the Chinese Market only)

本附录按照"中国RoHS"的要求说明了有关电子信息产品环保使用期限的情况，并列出了产品中含有的有毒、有害物质的种类和所在部件。本附录适用于产品主体和所有配件。

环保使用期限：



本标识标注于产品主体之上，表明该产品或其配件含有有毒、有害物质（详情见下表）。

其中的数字代表在正常操作条件下至少在产品生产日期之后数年内该产品或其配件内含有的有毒、有害物质不会变异或泄漏。该期限不适用于诸如电池等易耗品。

有关正常操作条件，请参见产品用户手册。

产品生产日期请参见产品的原始校准证书。

**有毒、有害物质的类型和所在部件**

元器件 (Component)	有毒、有害物质和元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR <sup>6+</sup> )	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
产品主体 (Main Product)						
印刷电路板组件 (PCB Assemblies)	X	○	○	○	○	○
内部配线 (Internal wiring)	○	○	○	○	○	○
显示器 (Display)	○	○	○	○	○	○
键盘 (Keyboard)	○	○	○	○	○	○
塑料外壳零件 (Plastic case parts)	○	○	○	○	○	○
配件 (Accessories)	○	○	○	○	○	○

○：代表该部分中所有均质材料含有的该有毒、有害物质含量低于SJ/T11363-2006标准的限值。

X：代表该部分中所有均质材料含有的该有毒、有害物质含量高于SJ/T11363-2006标准的限值。

