User Manual

KI6501 Optical CWDM Power Meter

Warranty:

Information in this manual is given in good faith for the benefit of the user. It cannot be used as the basis for claims against Kingfisher International or its representatives, if accidental damage or inconvenience results from use or attempted repair of the equipment.

This Kingfisher International product is guaranteed against defective components and workmanship for a period of 1 year from the date of delivery, unless specifically stated in the original purchase contract or agreement. This warranty excludes optical connectors or incorrect use.

The warranty will be voided if the following instance happens:-

1) Dismantling the instrument.
2) The instrument has been immersed in water or subjected to extreme environmental conditions.

Liability is limited solely to repair of the equipment.

CONTENTS

1. Summary

KI6501 is an easy and economical handheld CWDM Power Meter for testing multi-λ single mode fiber optic systems. It scans and stores the absolute or relative power levels of all 18 CWDM λ in 0.8 seconds. Test data can be viewed in graphical or numerical form, and reference values can be stored for easy loss testing. The instrument has good ergonomics which features a large, sunlight readable and backlit colour display, and a well laid out and easy to use front panel. Data Management Software enables stored test data to be downloaded to PC.

Applications of KI6501 CWDM Power Meter include the following:

- Wavelength selective Power Meter for systems with CWDM channel spacing.

- Quickly determine active channels.

- Diverse FTTx systems, RFoG etc.

For application support, please visit www.kingfisherfiber.com to see our comprehensive Application Notes written to support instrument users or an updated version of this manual. FAQ can be found in the "Support" section of our website.

Look at ww.kingfisherfiber.com to find distributor and service centre details from the Contact Us section.

Otherwise, if you are having difficulties, please feel free to contact sales@kingfisher.com.au for application support.

2. Main Instrument Features

- Compact, rugged & light weight

- Simple to use

- Fast measurement speed

- Scan range of 18 calibrated wavelengths

- Larger, sunlight readable, backlit colour display

- Simultaneous 9 wavelengths loss display

- Tabular and graphical display modes

- Internal memory for 1000 test records

- Test data transfer via USB port

- Programmable auto shut off

- External power / charger via mini USB port

- LED indicator for battery charging status

- 12 months warranty

- Low cost

3. Specifications

Parameters	Value
Technical	
Calibrated λ (nm)	1270,1290, 1310, 1330, 1350, 1370, 1390, 1410, 1430, 1450, 1470,1490, 1510, 1530, 1550, 1570, 1590, 1610
Number of channels	18
Channel spacing (nm)	20
Measurement speed (sec)	< 0.8
Measurement range (dBm)	-40 ~ 10
Measurement accuracy (dB)	±0.5[1]
Damage level (dBm)	27 (Composition of 18 λ)
Fiber type	Single Mode
General	
Optical connector/ interface	SC/PC
Display	2.8" Colour LCD with backlight
Display unit	dBm, dB
Display resolution	0.01 dB
Memory	1000 records of 18-λ tests in internal memory
PC interface	Data transfer via USB
Battery type	Built-in rechargeable Li-Polymer
Battery life	7 hours
Auto off function	Programmable (5~600 min after last key pressed)
Charging time	180 min
Flat battery performance	Unit works when charging a flat battery
External power /charging	Via USB port
Operate / Storage / Relative humidity	-20 ~ 55 °C / -10 ~ 50 °C / ~90% @0~40°C
Size / Weight	155 x 78 x 34 mm (6.10 x 3.07 x 1.34") / 0.35 kg (0.77 lb)

Note 1: At -20dBm, -10 ~ 50 °C, ±4nm from centre of pass-band, 9.5/125 fiber

4. Safety

	Take appropriate eye-safe precautions when handling live fibre.

Avoid condensation

The instrument is resistant to normal dust and moisture, however it is not waterproof. If moisture gets into the instrument, remove the batteries and dry it out carefully for at least one hour before using it again.

Storage

The equipment can be stored at the specified temperatures and relative humidity. Protect the unit from temperature extremes that may cause condensation within it.

Make sure to switch off the instrument whenever it is not in use. Keep the optical connector covered with the dustcover at all time.

5. Instrument Layout

Color LCD Display

Optical Connector

Mini-USB connector

Charging status LED

Instrument keys

6. Operation instructions

6.1 General functions of instrument keys

Key	Function
[Backlight]	ON/OFF Instrument, ON/OFF LCD display backlight
[PM]	AUTO/MANUAL Power Meter Mode
[CWDM]	Scan & present dBm in single-wavelength display mode
[SCAN]	Scan & present dBm in multiple-wavelength display mode
[dB/dBm]	Toggle between measurement units
[Graph]	Present scanned dBm/wavelength in graphical format
[Save]	Save scanned data to instrument's memory
[Recall]	Retrieve saved data from instrument's memory
[ENTER]	Enter
[ESC]	Cancel/quit
[Menu]	Instrument Setup
[▲]	Scroll up
[▼]	Scroll down

6.2 Switching Instrument ON/OFF

To switch ON instrument, press and hold [Backlight] for 2 seconds. The instrument will be defaulted to PM Auto (Auto Power Meter) Mode upon initialization; see pictures below for instrument displays.
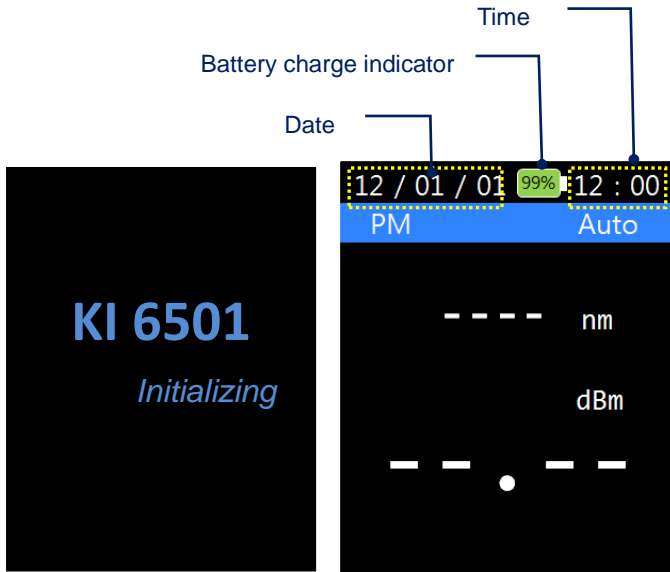
When the instrument is switched ON, its LCD backlight can be toggled ON or OFF by pressing [Backlight]. Backlight will turn off automatically approx 30 seconds after the last key-press.

To switch OFF instrument, press and hold [Backlight] for 2 seconds. The instrument will switch OFF a few second after the display shown below.

KI 6501

Powering down
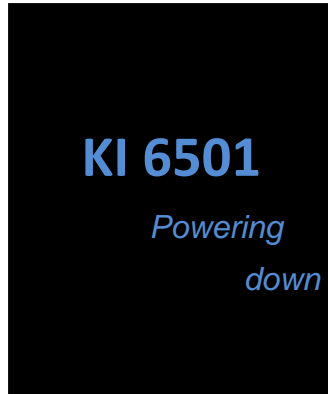
6.3 PM (Power Meter) Mode

Power Meter can be operated either in PM Auto Mode or PM Manual Mode. PM Manual mode displays real time power measurement values.

PM Auto Mode:

In this operation mode, the instrument automatically scans the optical input and displays the wavelength (along with its corresponding measured power value) which has been detected with the highest level of power.

The instrument is defaulted to PM Auto Mode upon power-ON; otherwise it can be switched from other operation modes to this by pressing [PM], see picture below for instruments user interface.
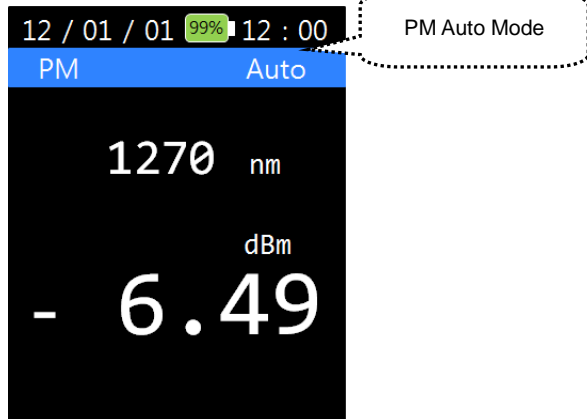
PM Auto Mode

PM Manual Mode:

Use this operation mode to manually select and display real time power values of the wavelengths available at the optical input. See picture below for user interface of this mode.
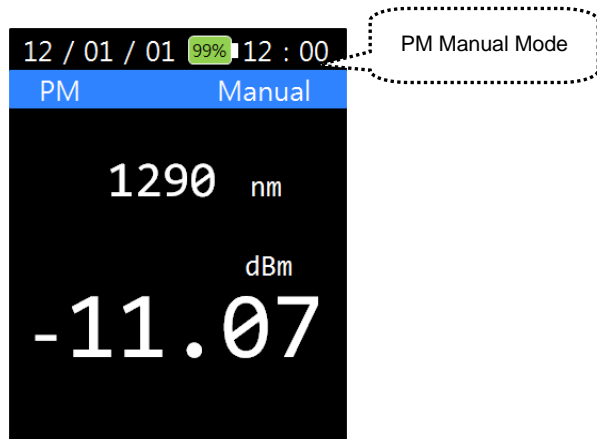
PM Manual Mode

In PM auto Mode, press [PM] once to switch to PM Manual Mode. Use [▲, ▼] to select the desired wavelengths for power values displays.
Press [PM] again to return the instrument to PM Auto Mode.

6.4 CWDM Mode

Press [CWDM] to scan optical input once and display power values in single-wavelength display mode. See picture below for CWDM user interface.
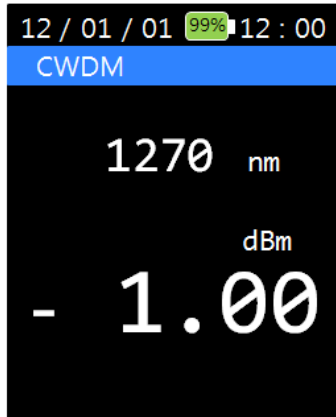
Use [▲, ▼] to display the power values of other wavelengths scanned at the optical input.

6.5 SCAN Mode

When [SCAN] is pressed, the wavelengths and their corresponding power values scanned at the optical input will be displayed in multiple-wavelength format. A max of 9 wavelengths can be displayed simultaneously. Use [▲, ▼] to scroll between available display pages. See picture below for SCAN Mode User Interface.
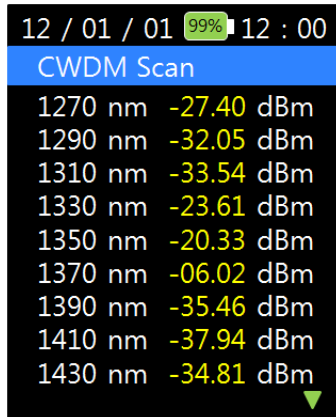
6.6 Measurement unit (dB/dBm) selection

Press [dB/dBm] to toggle between the measurements units of dB and dBm in PM (Power Meter) Modes.

The displayed power will be become "0.00 dB" when [dB/dBm] is pressed; see figure below.

6.7 Graphical Display Mode

Press [Graph] to display the wavelengths/power values scanned at the optical input in graphical format, see picture below for an example.
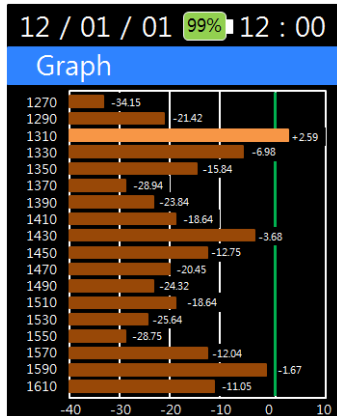

Press [Graph] again will switch the display to the multiple-wavelength format shown in example of section 6.5.

6.8 Saving Scanned Data in Instrument's Memory

In SCAN Mode, press [Save] to save the scanned optical input data into memory, see below user interface. Press [ENTER] to continue with the data saving process or press [ESC] to quit without saving.

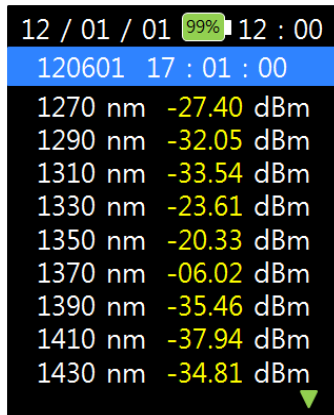A maximum of 1000 test data record file can be saved.
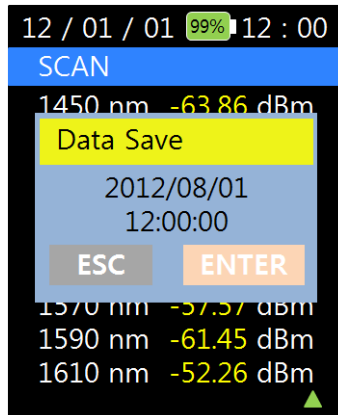
6.9 Retrieving Data Save in Instrument

Press [Recall] and the user interface below will be displayed.
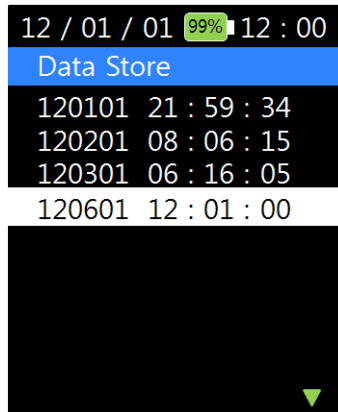
Use [▲, ▼] to highlight the desired file (in which data was saved) followed by pressing [ENTER]. The data will be retrieved and displayed on LCD as shown in picture below.

Use [▲, ▼] to scroll between the available displays pages to read all data in the retrieved file.

Toggle [Graph] to display the retrieved data in graphical or tabular (multiple-wavelength) format.

6.10 Instrument Setup options

Press [Menu] to display the available instrument setup options in the Menu Option List. Pictures below show the Menu Option list (in 2 display pages).

Use [▲, ▼] to scroll between available pages and to highlight the desired option. Press [ENTER] to select the highlighted option.

Menu Option list, page 1/2   Menu Option list, page 2/2

6.10.1 SCAN Set option:

This option provide user with the choice of turning the "All Scan" function ON or OFF.   See picture below for the user interface.

When "All Scan" is "ON" ("Selected" is "OFF"): The instrument scans its optical input for all 18 wavelengths despite of the wavelengths selected in Select Lambda option (see section 6.10.2).

When ""All Scan" is "OFF" ("Selected" is "ON"): The instrument scans its optical input for the wavelengths selected only.
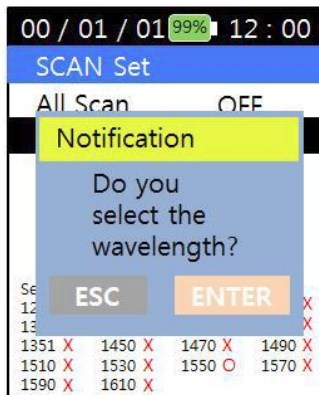
Use [▲,▼] to highlight "Selected" or "All Scan" and press [ENTER] to ON. When "All Scan" is ON, "Selected" will be automatically set to OFF and vise versa.
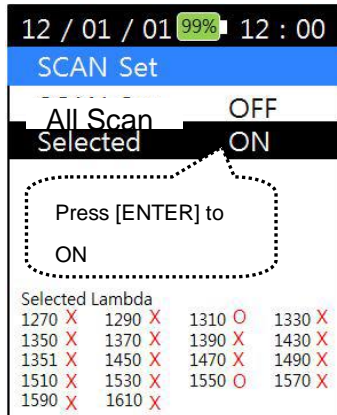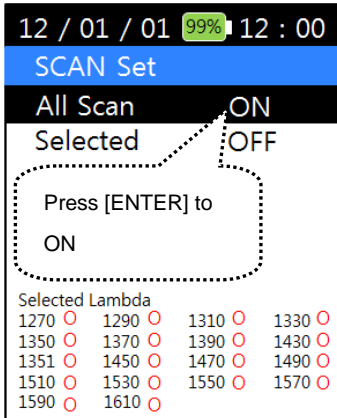
"O" indicates the selected wavelengths

"X" or **"–"** indicates the unselected wavelengths.

To select the wavelength/s, press [ENTER] on the display below;

Use [▲, ▼] to highlight the desired wavelengths from the available 18 wavelengths displayed in 2 pages. Press [ENTER] to toggle ON (select) or OFF (unselect) the highlighted wavelength. Press [ESC] to return to the option list of Menu.

6.10.2 Offset option

In PM (Power Meter) Modes, the displayed power measurements of all wavelengths are offset by the value pre-programmed in this option. See picture below for this option's user interface.
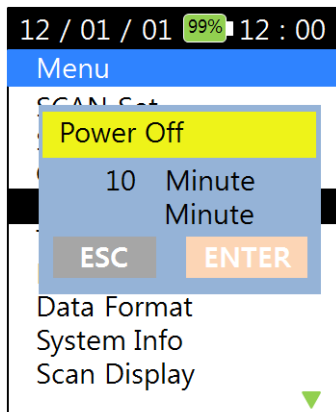
Press [ENTER], use the numerical keys to input the desired offset values (between -25.99 ~ +25.99 dBm). Use [▲ or ▼] to select "+" or "–" sign. Press [ENTER] to save the saving or press [ESC] to return to option list of Menu without saving.
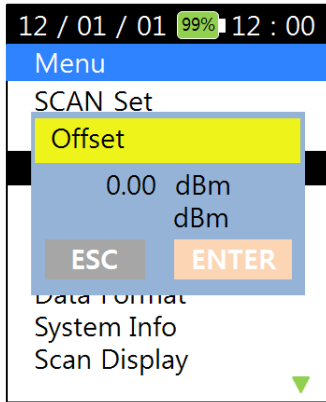
6.10.3 Auto Power Off

Use this option to program the time elapsed before the instrument is automatically switched off after the last key-press. See picture below for this option's user interface.

Press [ENTER], use numerical keys to input a time (between 5 ~ 600 minutes) and press [ENTER] again to save setting or press [ESC] to return to Menu Option list without saving.

6.10.4 Time Set option

Use this option to set the date and time of the instrument. See picture below for this option's user interface.

Use the numerical keys to enter the date and time and press [ENTER] to save setting or press [ESC] to return to Menu Option list without saving.
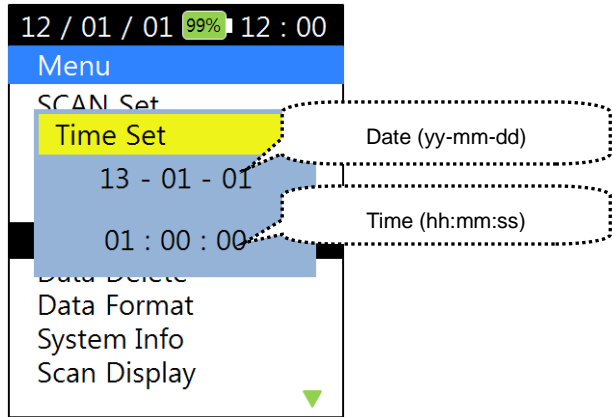

6.10.5 Data Delete option

Use this option to delete selected test data records from instrument's internal memory. See picture below for this option's user interface.

Use [▲, ▼] to highlight the test data record file to be deleted and press [ENTER] to select the file. Press [ENTER] to confirm that "Data will be deleted" or press [ESC] to quit without deleting and return to the file list display.
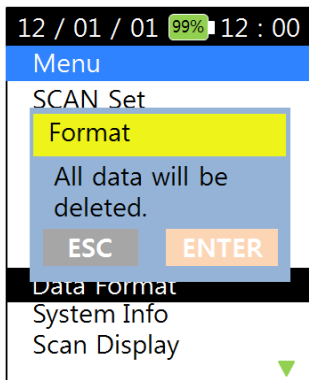
Press [ESC] to return to Menu Option list.
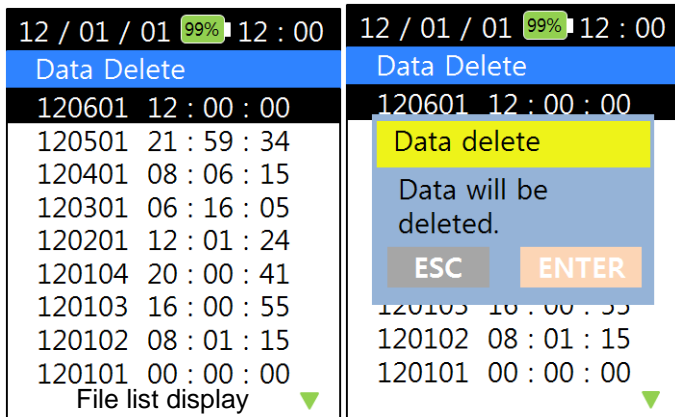
6.10.6 Data Format option

Use this option to delete all test record files saved in instrument's internal memory. See picture below for user interface of this option.

Press [ENTER] to confirm that "All data will be deleted" or press [ESC] to return to Menu Option list without deleting any record file. See picture below.

6.10.7 System Info option

Use this option to display the instrument's system information, see picture below.
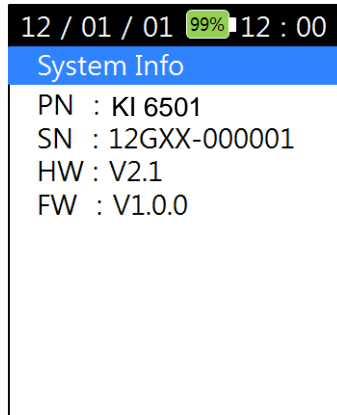

6.10.8 Scan Display option

Use this option to program instrument to display (work only with Scan Mode, section 6.5) optical input scan result in the following options;

- Display the scanned wavelengths detected with power values only.

    OR

- Display all the wavelengths selected for scanning.

See pictures below for the user interface. Use [▲, ▼] to toggle between "All" and "Measured" and press [ENTER] to select the desired display mode.

Display mode "Measured" – to display wavelengths detected with power values only.

Display mode "All" – to display all wavelengths selected for scanning.
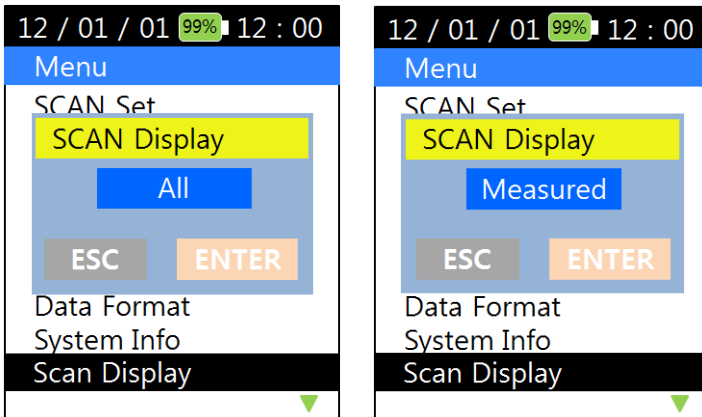
6.10.9 PM Scan Mode option

This option provides an alternative method (to that in section 6.3) of programming PM Modes (see section 6.4) to operate in Auto or Manual condition. See picture below for the user interface.

Use [▲, ▼] to toggle between Auto and Manual. Press [ENTER] to save setting or press [ESC] to return to option list of Menu without saving.

00 / 01 / 01 99% 12 : 00
Menu
Scan Mode

Scan Mode

Manual

ESC   ENTER

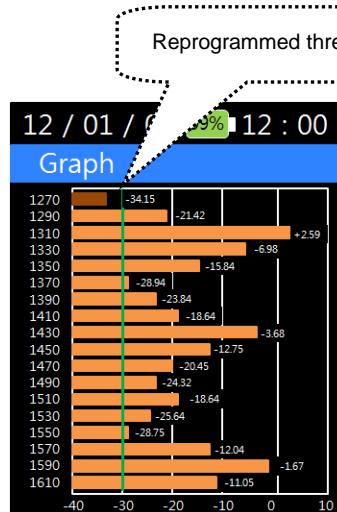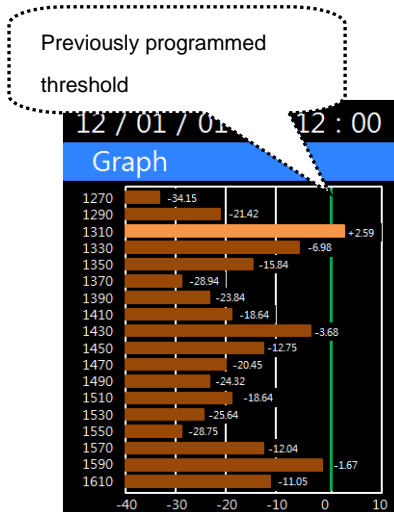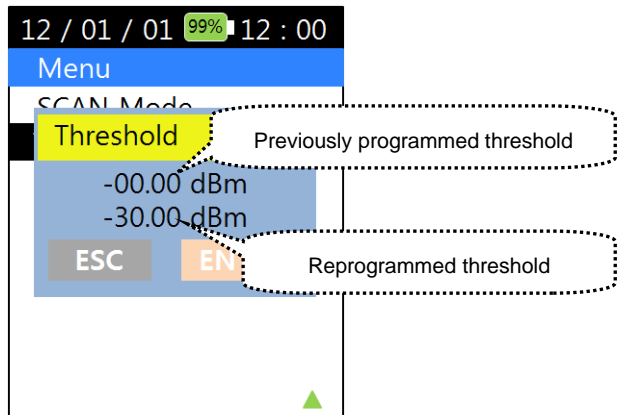Programmable to
Auto or Manual
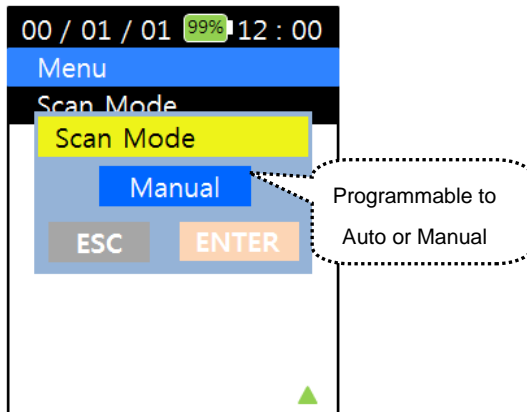
6.10.10 Threshold option

Use this option to program the threshold level which is visible when the scanned data is presented on graphical format.

Use the numerical keys to enter a new valid threshold value (-40dBm ~ +10 dBm) and use [▲, ▼] for "+" or "-" sign selection. Press [ENTER] to save the new threshold setting.

See pictures below for examples.

Previously programmed threshold

Reprogrammed threshold

Previously programmed threshold

Reprogrammed threshold

6.10.11 Graph Color

This option provides choices of displaying graphical test result in different colour format.

See pictures below for the user interfaces. Use [▲, ▼] to toggle between the available selections, "Single" (displays peak wavelengths in same color) and "Multi" (displays peak wavelengths in different colors) and press [ENTER] to save setting of pres [ESC] to quit without saving.
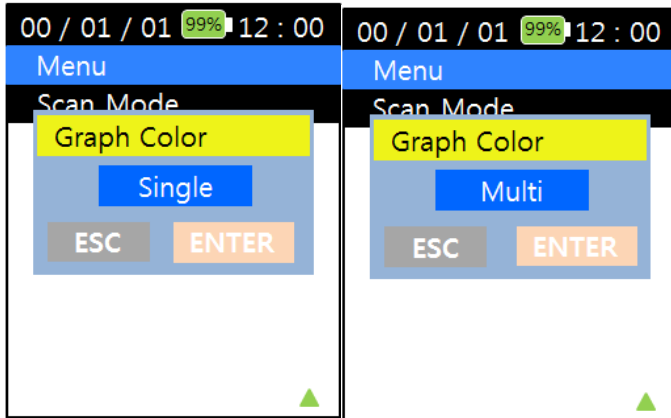
7. Charging of Instrument

Link the mini-USB connector on instrument (see section 5, Instrument Layout) to a PC's USB port or a USB-charger using the provided USB cable. The Charging Status LED (see section 5, Instrument Layout) will light up to indicate the status of charging as described below;

Red light – charging in progress

Green light – fully charged

This battery indicator, displayed on instrument's LCD indicates that the instrument is being charged.

Note that when linked to an external power supply, the instrument is still

operable in the events that;

- the internal battery has been totally discharged
- the internal battery has been removed

8. Packaging Content

Item Description	Quantity
KI 6501 Optical CWDM Power Meter	1
User manual	1
USB cable (USB–min USB)	1
CD (Data Management Software)	1
Carry strap	1

9. Maintenance

1. Keep the sensor's surface in the optical connector clean and free of dust or other contaminant by cleaning them regularly.

2. Do not use unclean or nonstandard adapters.

3. Change adapter carefully if necessary and keep any spare adapter in dirt/dust free environment.

4. When the instrument is not in use, keep the optical connectors covered with dust caps at all the time. Exposing the sensor for a long period of time will allow dust to be accumulated on surface of the sensor; this will in turn result in measurement inaccuracy.

5. Consider leaving test cords connected to the instrument at all times. This will prolong the life of the instrument's optical connector.