KI9600 Power Meter Training Manual

Revision 2

KI9600 SERIES POWER METER

Table of Content (TOC)

1. TYPICAL APPLICATIONS

- Measuring absolute power levels

- Measuring loss

- MultFiber ID and Tone detection with compatible light sources

- Versions for single mode, multimode POF/PCS & MPO cable

- General testing & maintenance

KINGFISHER
INTERNATIONAL

2. GENERAL FEATURES

- Entry level skill with Tamperlock

- Shirt-pocket size, with spring clip

- Battery life: up to 300 hours

- Interchangeable connectors

- Excellent re-connection repeatability

- Large sunlight readable display

- Up to 12 calibrated wavelengths

- Test tone & Multi-fibre ID identification

- Displays dBm, dB, linear, tone Hz

- Ruggedized, water & dust resistant

- Captive Dust Cap

- Power averaging mode for modulated signal

- Max / Min recording & display hold

- 3-year warranty & calibration cycle

- Made in Australia

KINGFISHER
INTERNATIONAL

3. MODELS

There are 2 available instrument model ranges:

- **KI9600A-X** (**X** = InGaAs, Ge, H3B or H5)

  Fitted with small area photodetectors, suitable for most SM & MM fiber of up to 100μm core diameter, with popular connector types.

- **KI9600XL-X** (**X**= Ge5, Ge7 or Si5)

  Fitted with wide area photodetectors, suitable for plastic fibre, MPO, ribbon and specialty fibre applications up to 3 mm core diameter.

  - Model with Ge5 (5 mm Ge photodetector) is suitable for 12 / 24 / 48 / 72 MPO

  -Model with Ge7 (7 mm Ge photodetector) is suitable 16 / 32 MPO.

Refer to Kingfisher website for full list of the available models.

4. PHOTODETECTOR TYPES

Several photodetector types are available for selection across the instrument model ranges to suit your application.

Refer to table below to choose photodetector type that suits your field, power and wavelength requirements.

Photodetector type	InGaAs	Ge	Si	H series
Application suitability	*Telco & CWDM* • Power Levels of up to +5 dBm • Most accurate detector type at Telco wavelengths	*LAN & Telco at 850 to 1550nm* • Power levels of up to +10 dBm • Not as accurate as InGaAs. • Can be affected by temperature • Not recommended above 1550 nm	*Wide area detector configuration - LAN at 850nm, POF* • Power levels of up to +5 dBm • limited to under 1000 nm • Available XL series meters only	*High power – CATV, DWDM* • Power level configurations of up to +24 dBm • Filtered InGaAs
KI9600A-X	☑	☑		☑
KI9600XL-X		☑	☑	

☑   Available for the model range

5. INSTRUMENT OVERVIEW AND KEYPAD LAYOUT
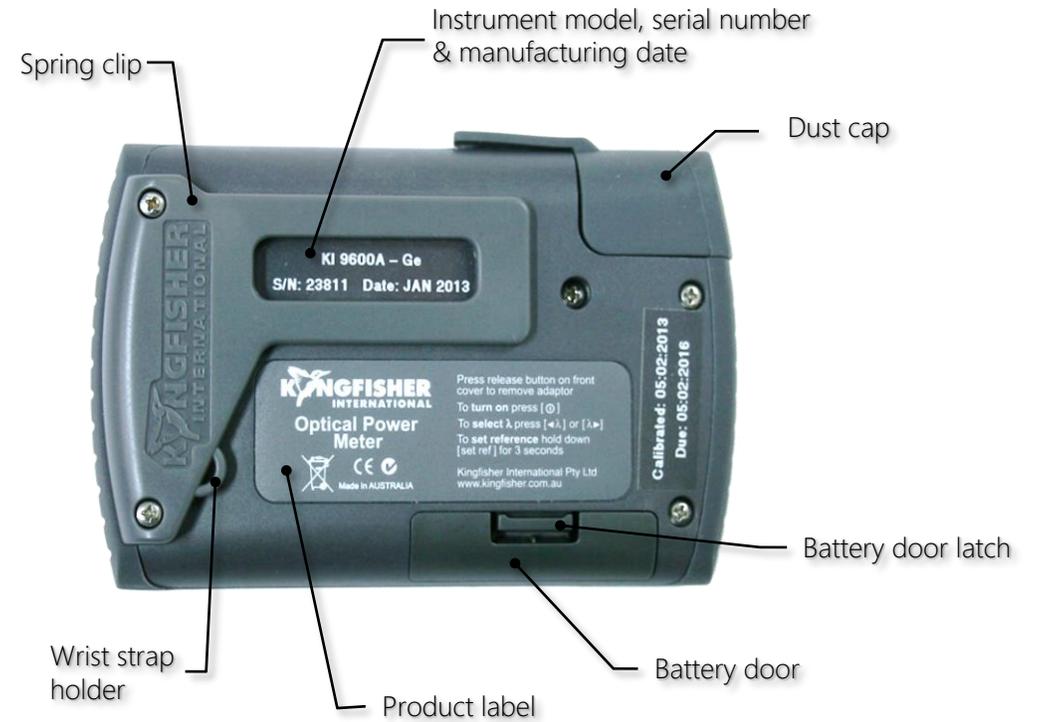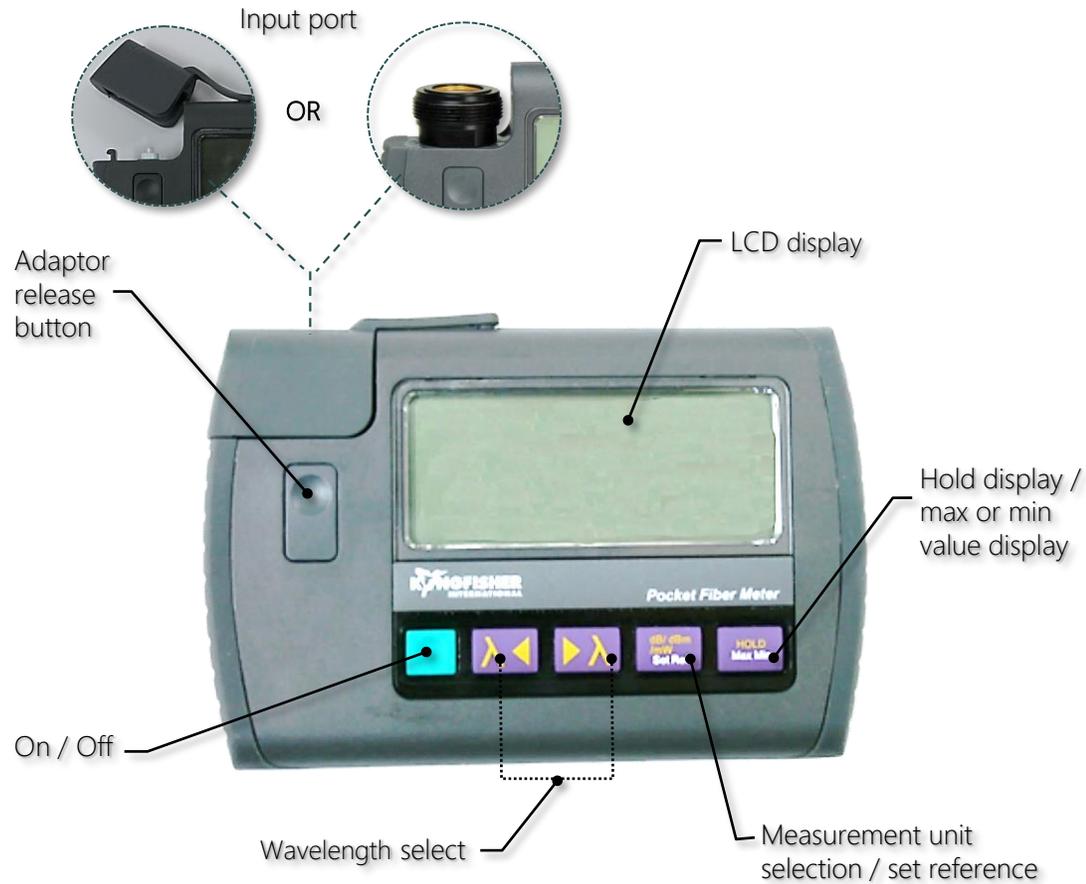
Input port

OR

LCD display

Adaptor
release
button

Hold display /
max or min
value display

On / Off

Wavelength select

Measurement unit
selection / set reference

Spring clip

Instrument model, serial number
& manufacturing date

Dust cap

KI 9600A – Ge
S/N: 23811   Date: JAN 2013

Calibrated: 05:02:2013
Due: 05:02:2016

KINGFISHER
INTERNATIONAL
Optical Power
Meter

Press release button on front
cover to remove adaptor
To **turn on** press [⏻]
To **select** λ press [◀λ] or [λ▶]
To **set reference** hold down
[set ref] for 3 seconds

Kingfisher International Pty Ltd
www.kingfisher.com.au

Made in AUSTRALIA

Battery door latch

Wrist strap
holder

Product label

Battery door

KINGFISHER
INTERNATIONAL

6. GETTING STARTED

6.1. Install Batteries

To install batteries:
• Pinch latch and lift battery door
• Insert 2 'AAA' cells
• Replace battery door

Battery life:

Up 300 hours using Alkaline batteries.

Low Battery Display:

The symbol, ⊟ is displayed when batteries are low.

Warning!

To avoid instrument damage, do not use lithium batteries, or other batteries with a nominal voltage greater than 1.8 V.

6.2. Turn Instrument On / Off

To turn on,
Press green button, ⬛.

Press once

1310 nm
-55.20 dBm
Hold

Pocket Fiber Meter

When instrument is on,

- It will automatically turn off 10 minutes (*auto-time-out*) after the last key press.

- If batteries are low, " ▭ " will be displayed.

- Press green button again will **turn off** instrument.

To disabled auto-time-out,
Press and hold green button, ⬛ when instrument is off.

- *Instrument will beep twice.*
- *"Perm" will be displayed indicating Auto Time Out is disabled.*

After beeping twice

Press & hold

Perm
on

Pocket Fiber Meter

Release green button

Press & hold

Perm 1310 nm
-55.20 dBm
Hold

Pocket Fiber Meter

KINGFISHER
INTERNATIONAL

6.3. Install / uninstall Adaptor On Instrument

For model range, KI9600A-XX

To install adaptor,
Push adaptor (in the orientation shown below) into instrument's connector port.

Slots on this side

1310 nm
-55.20 dBm
Hold

Pocket Fiber Meter

To uninstall adaptor,

❷ Grip & pull adaptor up

❶ Press down Release Button
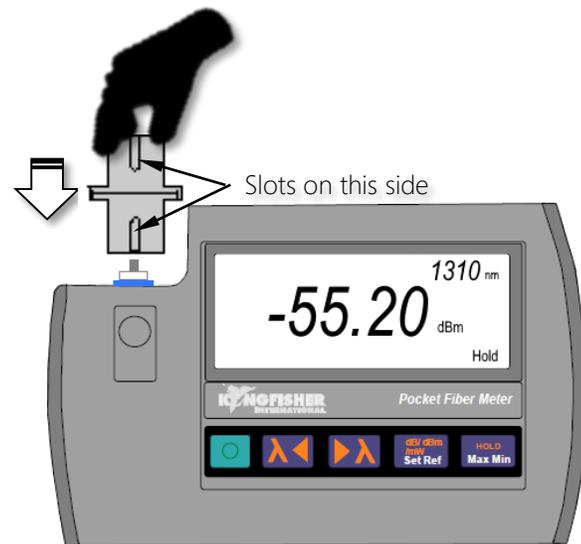
Note:
This model range comes with a SC/SC hybrid adaptor (see pic below) as standard accessory.

See Kingfisher website for other available hybrid adaptors.

6.4. Install / Uninstall Adaptor On Instrument (... continue)

For model range, KI9600XL-XX

To install adaptor,

Hold top part of adaptor and turn *clockwise* until fastened.
For MPO adaptor, rotate it clockwise until a "click" is felt. At this point the adaptor is rotationally aligned with the rectangular detector chip in the case of a power meter with Ge7 photodetector.

To uninstall adaptor,

Hold top part of adaptor and turn anti-*clockwise* until adaptor is detached.

Note:

This model range does not come with adaptor. User needs to order one or more suitable adaptor separately.

See Kingfisher website for available XL adaptors.

6.4. Instrument Operation

6.4.1. Power Measurement

To measure steady optical power levels connected to instrument's input port,

❶ Turn instrument on (Refer to section 6.2)

Connector of live fiber

Selected wavelength

1625ₙₘ
-24.17 dBm
Hold
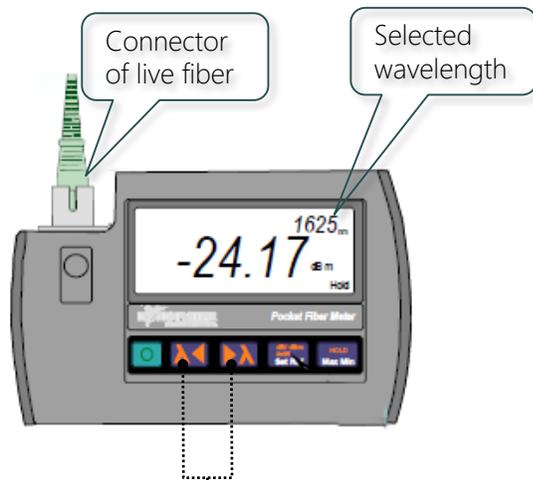
❷ Press either to select the wavelength matches with that of input power.

❸ Select measurement mode.

Press **[dB/dBm/mW Set Ref]** button to toggle between Absolute (dBm), Relative (dBR) & Linear (µW, mW, W) modes, see diagram on the right.

- *Absolute mode:* Measure actual power level (in dBm) at a particular location. Typically used during installation & maintenance activities.

- *Relative mode:* Measure power level 'relative' to a particular reference. Typically used for loss measurement. See next slide for operation detail.

- *Linear mode:* Measures power in watts (auto-range :nW, µW, W). Typically a laboratory measurement.

Note:
The instrument defaults to last measurement mode & wavelength setting at power on.

Absolute mode

1625ₙₘ
-24.17 dBm
Hold

Relative mode

1625ₙₘ
0.00 dBm 0.56 dBR
Hold

Linear mode

1625ₙₘ
3.83 uW
Hold

K🐦NGFISHER INTERNATIONAL
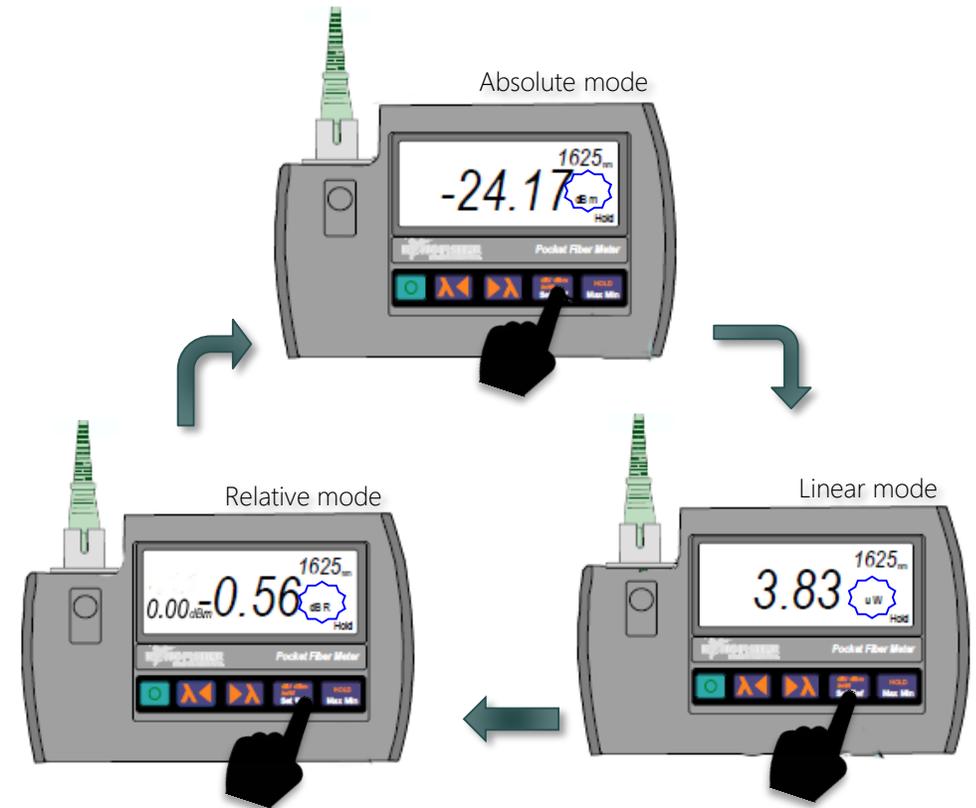
6.4.1. Power Measurement (... continue)

To measure steady optical power levels connected to instrument's input port, in Relative mode,

❶ Select Relative mode (Refer to ❸ of last slide)

❷ Press and hold **[dB/dBm/mW Set Ref]** button until,

- Instrument stop beeping

- Displayed value turns to "0.00"
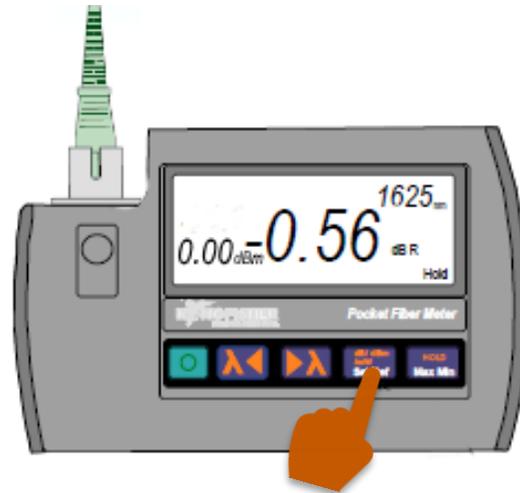
In real application, the instrument's input power should be connected directly to the output of a light source with a Reference Test Cord"

Reference value

Displayed value turns to "0.00". Values that displayed subsequently represent the differences between actual input powers and the reference value displayed on the left.
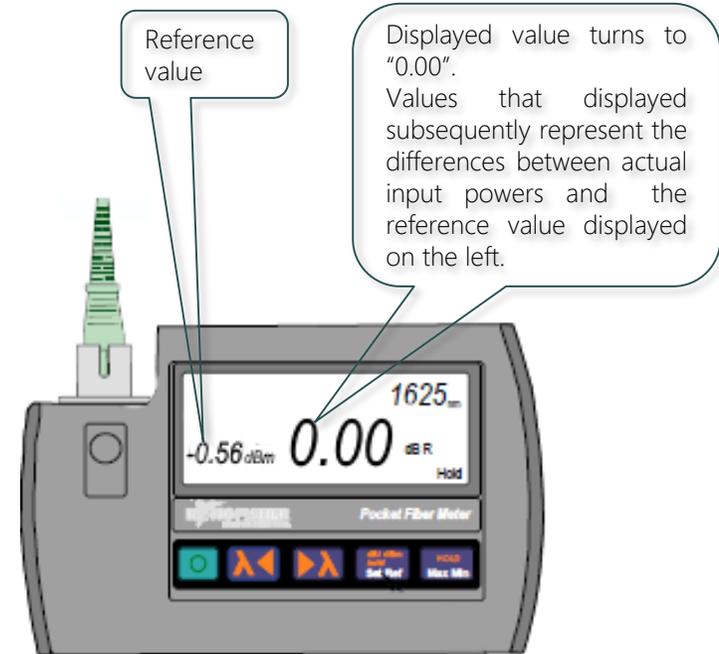
In real application, the instrument's input port should now be reconnected to DUT (fiber under test) with the same light source connected at the other end. The displayed value will be the loss measurement of DUT.

KINGFISHER INTERNATIONAL

6.4.2. Modulation Frequency Measurement

To measure frequency of modulated light (tone) connected to instrument's input port,

Scenario I: When a standard tone (270, 1000, 200 Hz) from a compatible light source is detected at its input, the instrument will beep and display the corresponding frequency, see e.g. below.
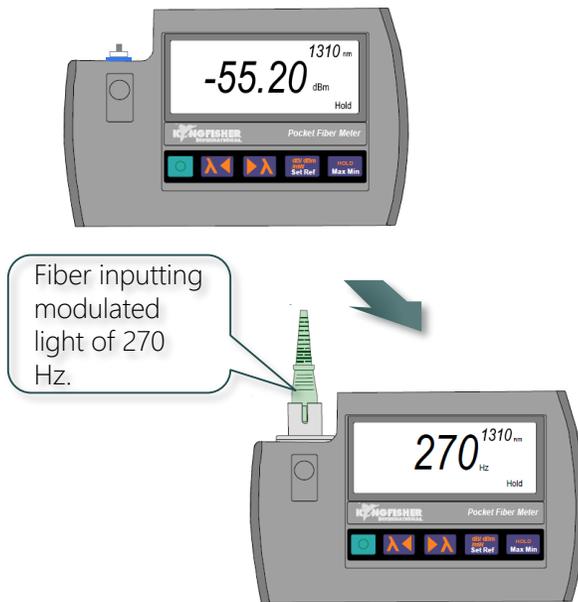
Scenario II: When a nonstandard tones between 200 & 2500 Hz is detected, the instrument will beep and display the corresponding frequency, see e.g. below.
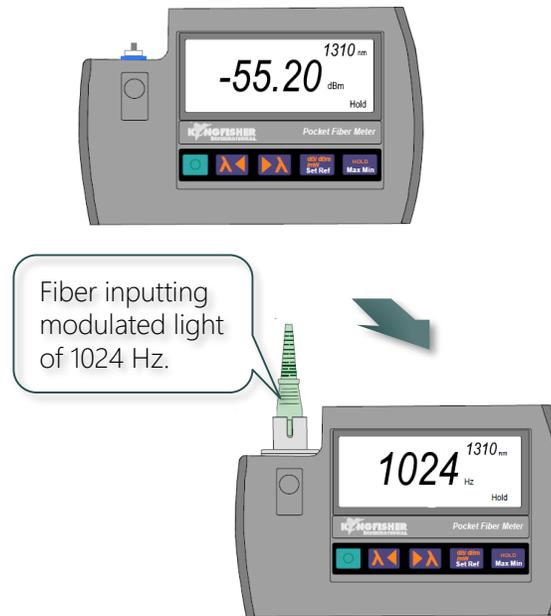
Note:

- This function works in any measurement mode i.e. Absolute, Linear or Relative.

- If SlowMode is enable now, average power of the modulated light will be displayed instead, refer section, 6.5.7.

- When modulated input light is removed, the instrument will return to the last measurement mode selected.

Fiber inputting modulated light of 270 Hz.

Fiber inputting modulated light of 1024 Hz.

6.4.3. Multifiber ID Identification

To identify and display a Multifiber ID received from a compatible light source,

When a Standard Multifiber ID (id01, id02,.......id12) from a compatible light source is detected at its input, the instrument will beep and display the corresponding id ,see e.g. below.

Set instrument at any measurement mode (Absolute, Linear or Relative), connect Multifiber ID outputted from light source to instrument's input port.

Fiber inputting light with Multifiber ID, id05 Hz.
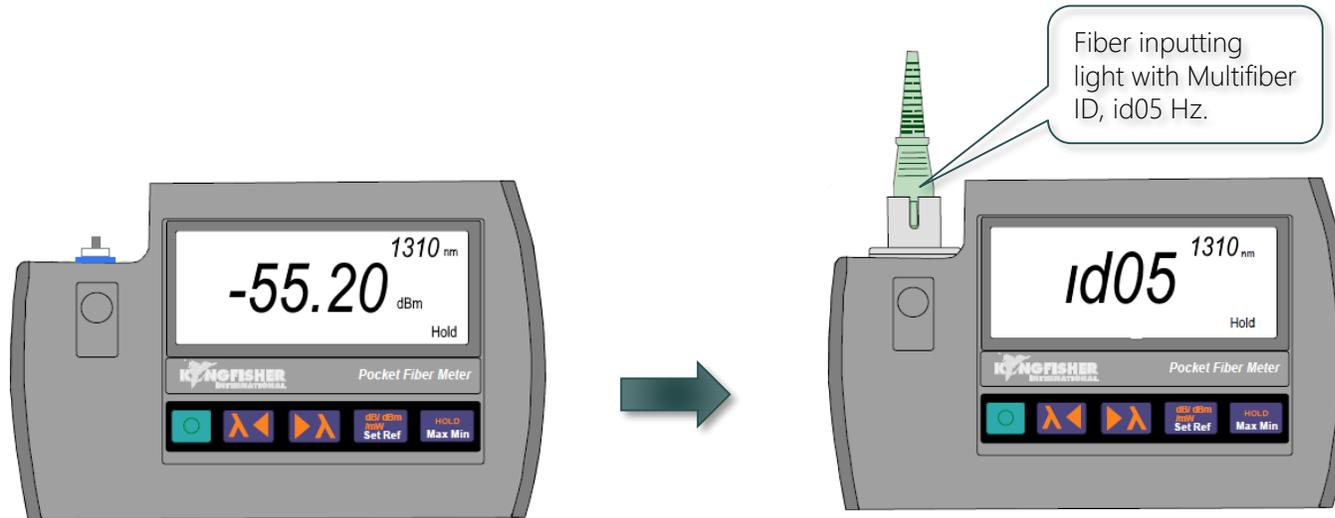
Note:

- If SlowMode is enable now, average power of the modulated light will be displayed instead, section, 6.5.7.

- When input light with Multifiber ID is removed, the instrument will return to the last measurement mode selected.

6.4.4. Tamperlock Mode

This feature enable user (a supervisor) to lock instrument down at selected wavelength for a specific application. It requires user defined keystroke to activate or de-activate.

To activate Tamperlock mode,

With instrument turned on at selected wavelength and measurement mode,
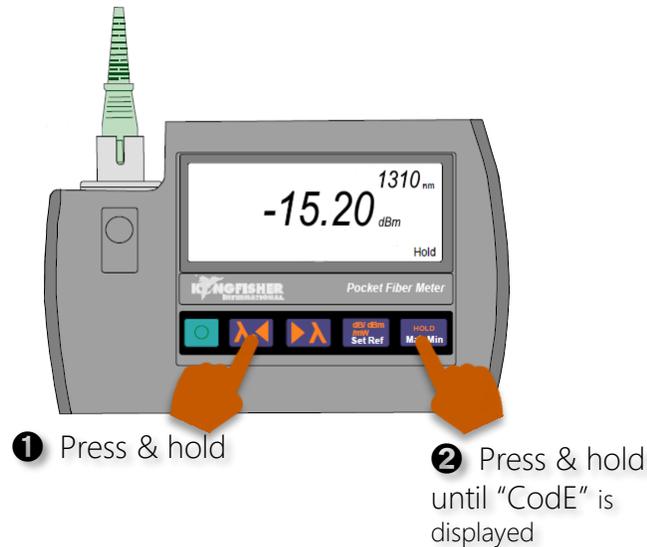
❸ Enter a 6-key sequence using any keys except ⬚. Pressing this button will cancel the activation process.

Record down the keystroke sequence for future use.
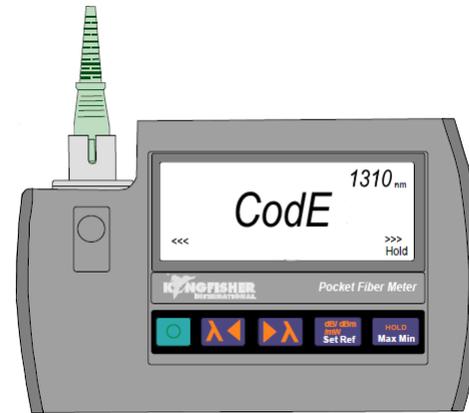
Upon successful activation,
- "Lout" is displayed momentarily
- User can only turn source or instrument on or off
- Temperlock mode remains activated at power off. *See next slide for deactivation of this mode.*

❶ Press & hold

❷ Press & hold until "CodE" is displayed

Indicating Tamperlock mode is activated
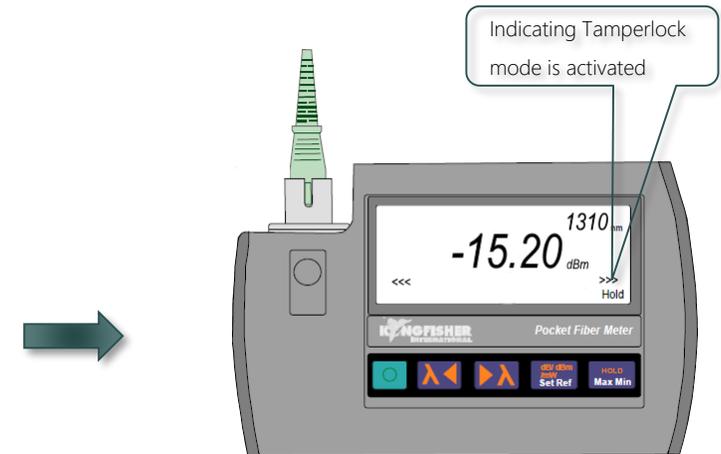
6.4.4. Tamperlock Mode (... continue)

To deactivate Temperlock Mode,

❶ Turn off instrument.

❷ Press & hold both buttons.

❸ Press until "CodE" is displayed.

❹ Enter the 6-key sequence that was used for Tamperlock Mode activation.

Indicating no. of fail attempts
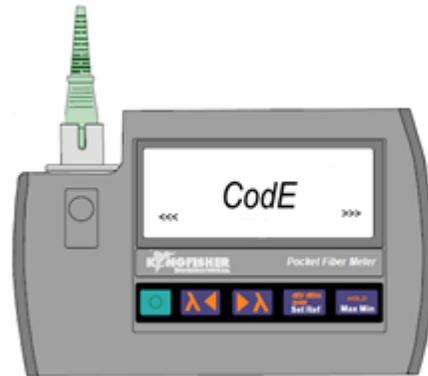
FAIL

In case a wrong 6-key sequence is entered, "FAIL" will be displayed indicating unsuccessful deactivation, Instrument will then turn off itself.

Tamperlock mode will be deactivated after 3 fail/unsuccessful attempts.

"PASS" will be displayed momentarily indicating successful deactivation.

PASS

-15.20 dBm 1310 nm   Hold

KINGFISHER INTERNATIONAL

6.4.5. Min & Max Display Function

This function is useful where measurements need to be monitored over a time period.

At any measurement mode (Absolute, Linear or Relative), press and hold [HOLD Max Min] to toggle between instantaneous, minimum (max) and maximum (max) values in the sequence as shown below,

Instantaneous value

-15.20 1310 nm dBm
Hold

Maximum value

-12.55 1310 dBm
max
Hold

Minimum value

-18.35 1310 dBm
min
Hold
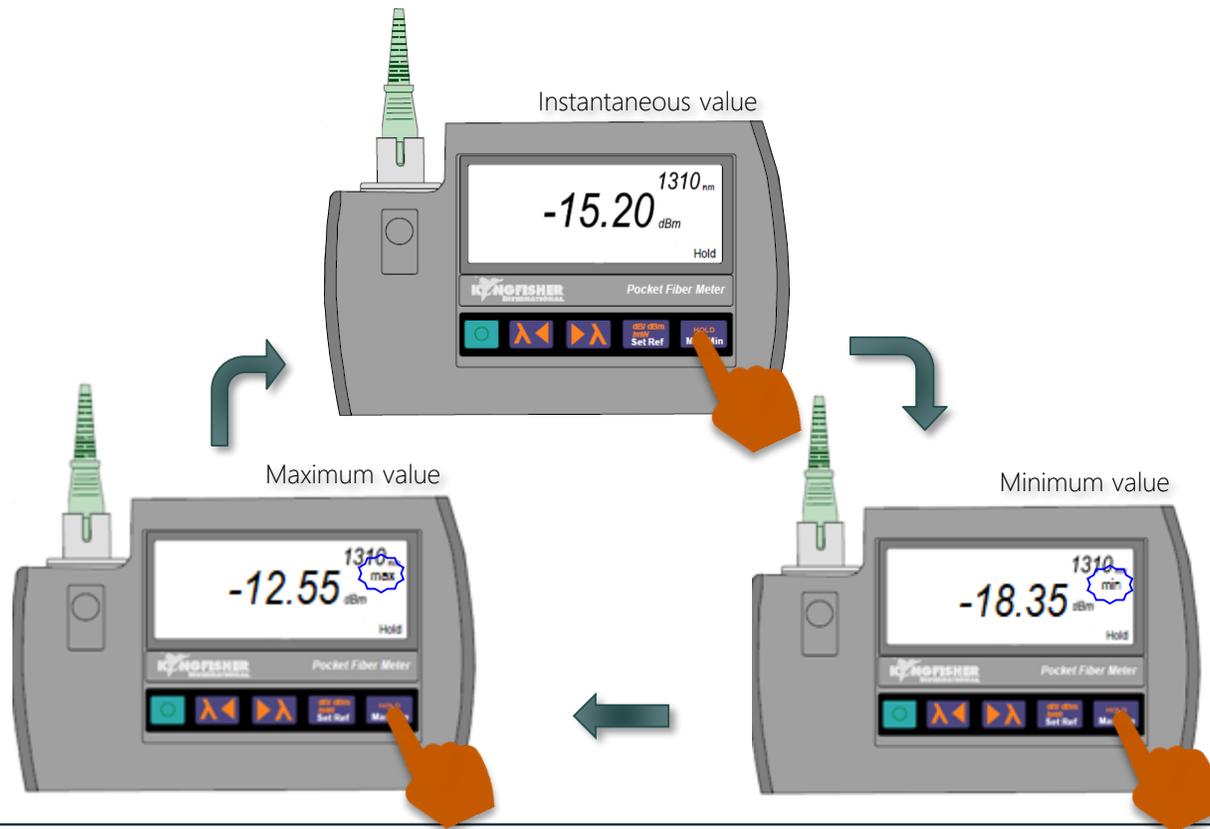
To reset max/min values:

• Toggle to another wavelength and back using [λ◄] [►λ]

or

• Turn instrument off and then back on

6.4.6. Hold Display Function

This function is useful where you needs to to note down a reading, or to show a measurement to a third party.

At any measurement mode (Absolute, Linear or Relative), press [HOLD Max Min] will freeze the displayed value after a beep. When Hold function is activated the "Hold" symbol blinks.

Blinking
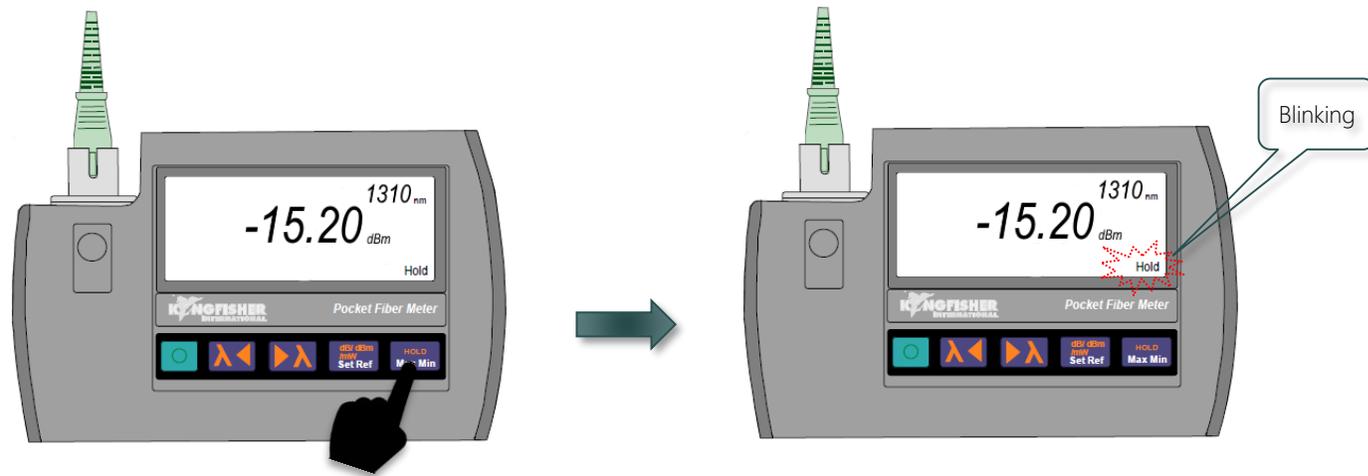
To deactivate Hold function,

Press [HOLD Max Min] again.

Note:

Hold function does not work while instrument is detecting frequency or Multifiber ID.

KINGFISHER INTERNATIONAL

6.4.7. SlowMode Function

This function is used when measuring power levels on unstable signals, or signals that accidentally trigger tone detection.

Slowmode function can be activated in the scenario below,

- Scenario I: When instrument is off

- Scenario II: When instrument is on & measuring steady power levels

- Scenario III: When instrument is on & detecting frequency or Multifiber ID

  Refer to function activation instruction of each scenario on the next 3 slides.

When this function is activated,

- Frequency & Multifiber ID detections are disabled

- Measurement integration time is extended

- The display will show average optical

6.4.7. SlowMode Function (... continue)

Scenario I: When instrument is off   ◄ Back to Slowmode Function
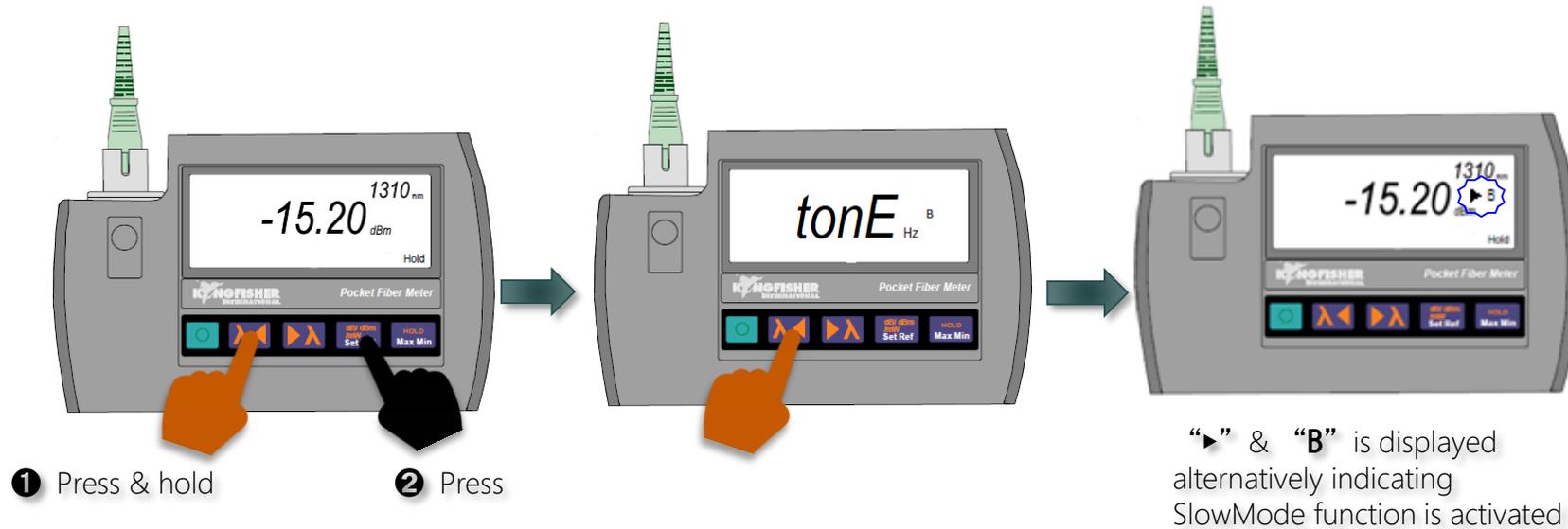
❷ Press   ❶ Press & hold

"►" & "B" is displayed alternatively indicating SlowMode function is activated

To exit SlowMode function,

Press & hold [λ◄] , then press [Set Ref] .

or

Turn instrument off and than back on.

6.4.7. SlowMode Function (... continue)

Scenario II: When instrument is on & measuring steady power levels

❶ Press & hold   ❷ Press

"►" & "B" is displayed
alternatively indicating
SlowMode function is activated

To exit SlowMode function,

Press & hold [icon], then
press [icon].

or

Turn instrument off and
than back on.

6.4.7. SlowMode Function (... continue)

Scenario III: When instrument is on & detecting frequency or Multifiber ID

"▶" & "B" is displayed alternatively indicating SlowMode function is activated

To exit SlowMode function & return to frequency/Multifiber ID detection,

Press & hold [λ◀], then press [dB/ dBm mW Set Ref] .

6.4.8. Firmware Revision Display Function

This function displays the firmware version of instrument

Firmware version

After releasing

❷ Press to turn on instrument

❶ Press & hold

Press & hold

7. INSTRUMENT CARE

- Keep the instrument in a carry case during storage and transport

- Use only high quality batteries.

- For prolonged storage remove batteries.

- The instrument is resistant to normal dust and moisture, however it is not waterproof.

- If moisture gets into the instrument, remove batteries & dry it out carefully before using it again.

- Where possible, keep instrument away from strong sunlight.

- Clean the instrument case using Iso-Propyl-Alcohol (IPA) or other non solvent cleaning agents.

- DO NOT use Acetone or other active solvents as damage may result.

KINGFISHER
INTERNATIONAL

Application Notes

Comprehensive selection available at

https://www.kingfisherfiber.com/Application-Notes.aspx

The End

Prepared by: TO Ng

Date prepared: 11 Dec 2017

@kingfisherfiber   kingfisherfiber.com

K NGFISHER
INTERNATIONAL