



KINGFISHER
INTERNATIONAL

KI2600 Power Meter Training Manual

KI2600 Series Power Meters

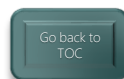


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1 General Features

- Autotest function
- Calibrated at multiple wavelengths (up to 31 λ)
- Industry standard connector adaptors: interchangeable or screw-on types
- Large, backlit, sunlight readable LCD display
- “Total Uncertainty” specification that covers accuracy over all power levels, temperatures, connector and fiber types.
- Power - Battery or micro-USB / USB-C
- Long battery life (up to 1000 hours)
- Memory – Internal or USB
- Data saved with time-date stamp
- Text ID: Text naming for test data
- Test tone detection
- Ribbon Fiber Test Capability
- Captive Dust Cap functions as tilt bail

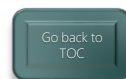


2 KI2600 Series Power Meter Overview / Keypad Layout



3. Getting Started

- [3.1](#) Select/determine test cord configuration
- [3.2](#) Install/uninstall Optical Connector Adaptor
- [3.3](#) Install/uninstall Batteries
- [3.4](#) Enable/disable Battery Charging
- [3.5](#) Switching On/Off Instrument



3.1 Select test cord configuration

Identify fibre type required for test cord and configuration required. Instrument supplied with SC connector adaptor as standard.

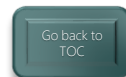
Standard type:



XL type:

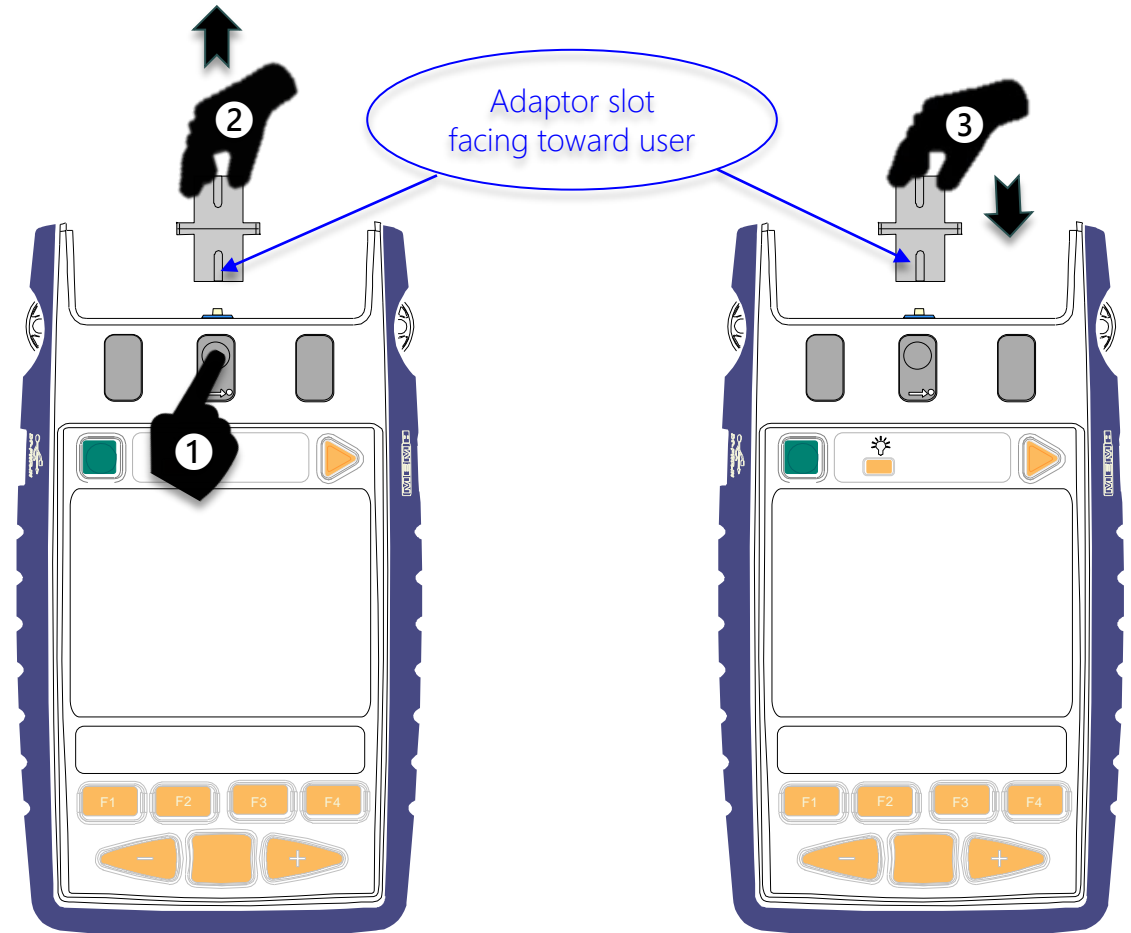


Note: Unlike light sources, power meters accept both PC and APC connectors.



3.2 Install / uninstall Connector Adaptor

- 1 Lightly press and hold Release Button with one hand.
- 2 Pull out existing adaptor with the other hand.
- 3 Push in a new adaptor.



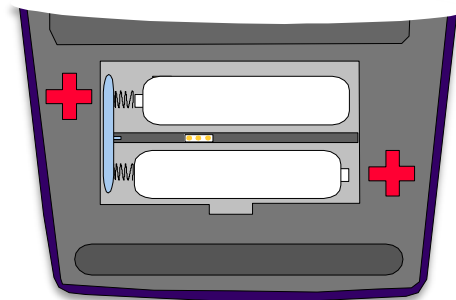
3.3 Install / uninstall Batteries

Caution: Battery charging on instrument must first be disabled when using non-rechargeable batteries. See next page for instructions to disable battery charging.

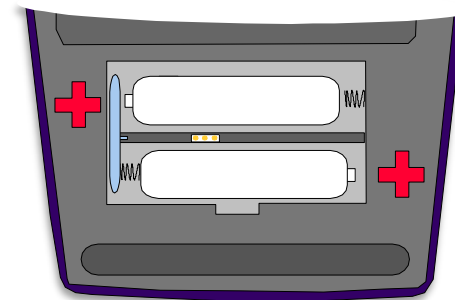
- 1 Unclip Battery Compartment Cover at rear of instrument.
- 2 Insert/remove batteries (take note of the battery +Ve terminal spring orientation of different instrument models, see images below).

Note:

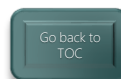
- Instrument's date/time setting holds for approx. 7 seconds during batteries change over.
- Use 2x Alkaline / Lithium AA cells or 2 x NiMH AA cells.
- Alkaline battery run time up approx. 1,000 hours.



Earlier Models

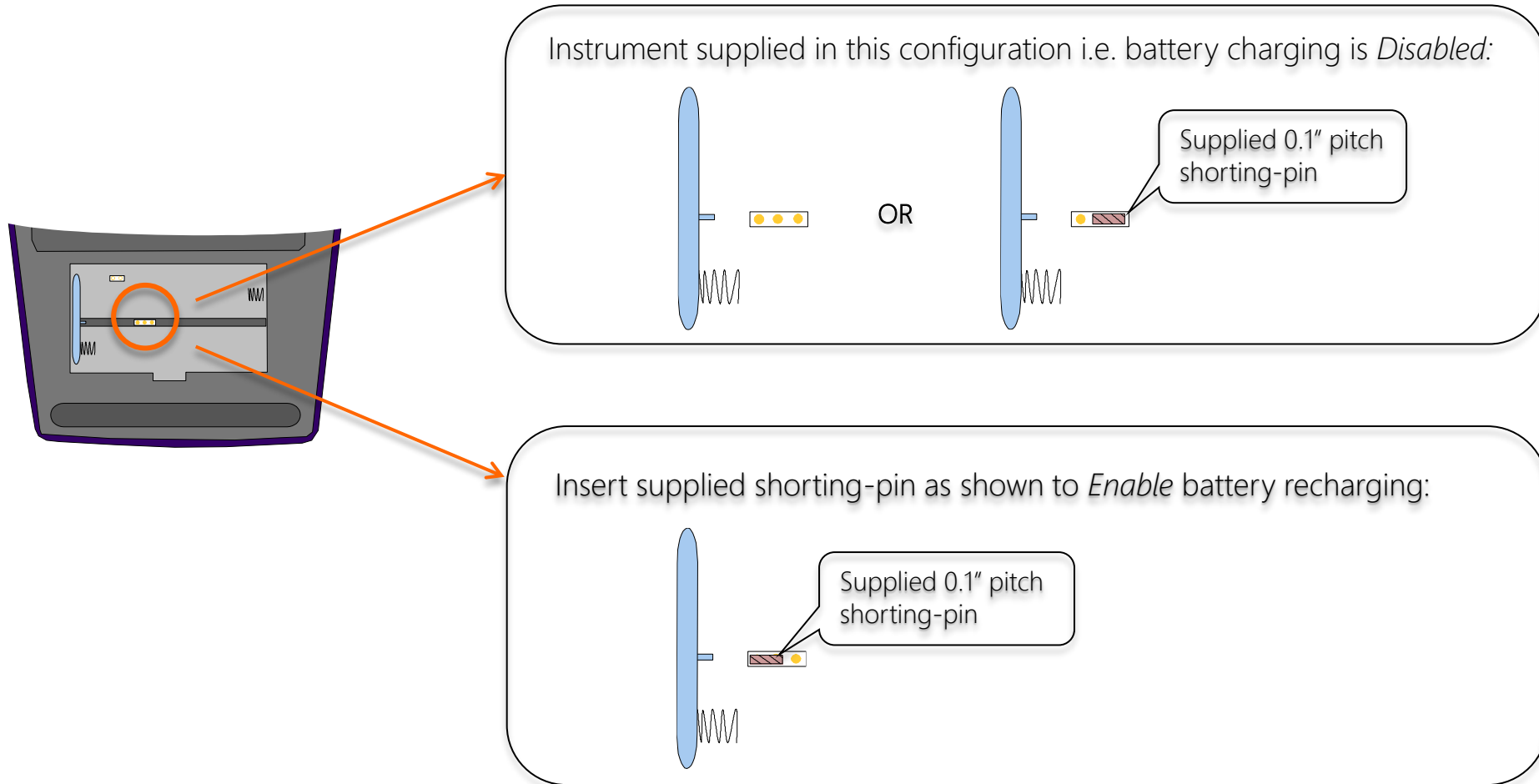


Current Models



3.4 Enable / Disable Battery Charging

To enable rechargeable batteries to be internally charged, this feature must be enabled by means of the supplied 0.1" pitch shorting-pin.



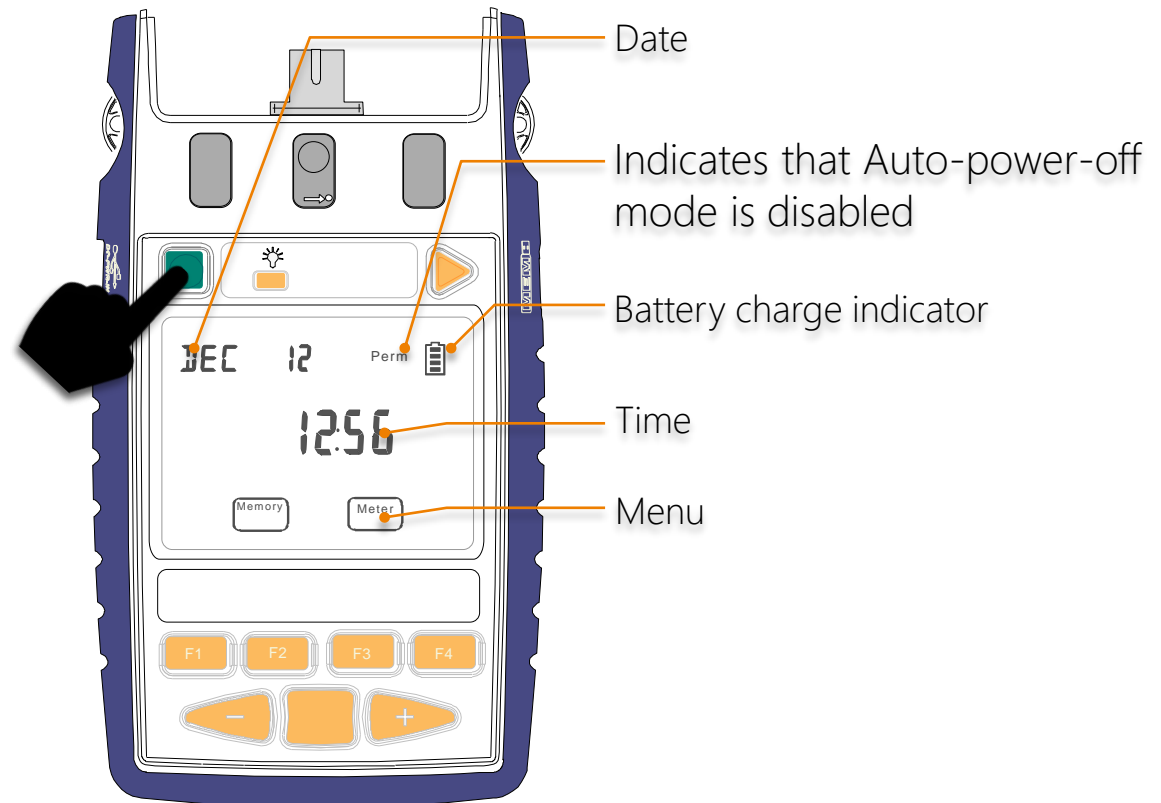
3.5 Switch On/Off Instrument

To switch on:
press the green, **[On/Off]** button.

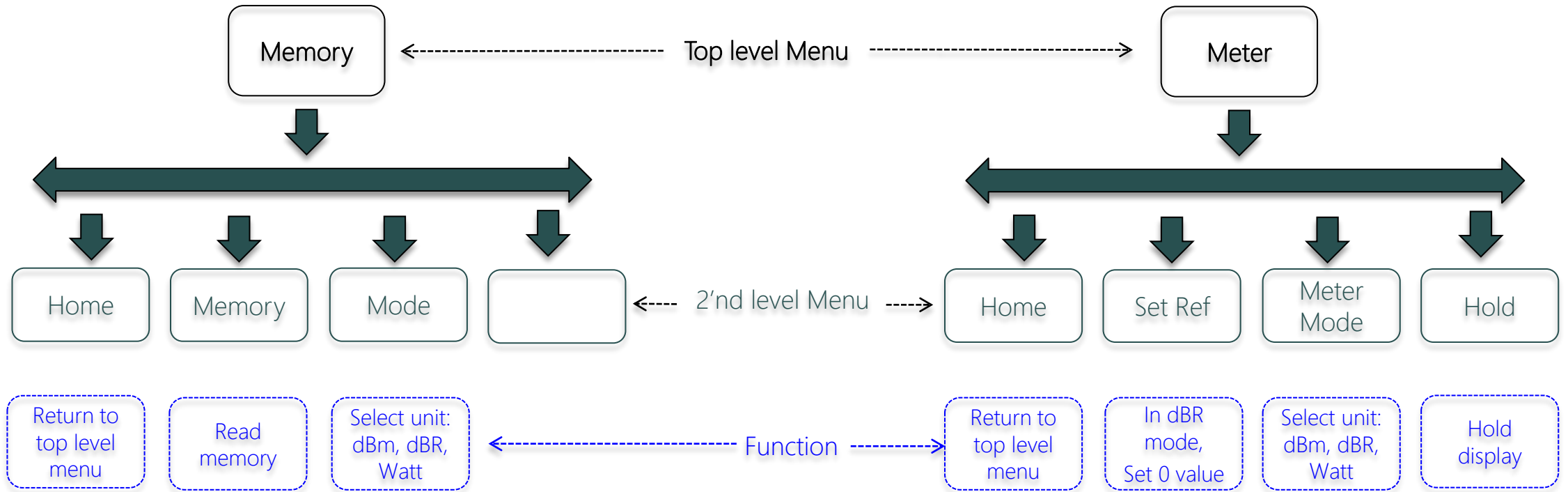
To switch off:
press the green, **[On/Off]** button again.

Note: the instrument will switch off automatically 10 minutes after it was switched on.

To defeat auto switch off mode:
Press **[On/Off]** & hold for 3 seconds.
Instrument will beep twice.
'Perm' will display on the upper RHS of the LCD.



4. Instrument Menu Structure



5. Modes Of Operation

5.1 Autotest:

- Automatically toggles between all wavelengths.
- Preferred mode for loss testing as testing time is greatly reduced.
- Minimises error as meter always displays correct wavelength.

5.2 Manual:

- Single wavelength operation.
- Preferred mode for level monitoring.

5.3 Test Tone Detection:

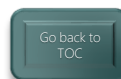
- Detect and displays incoming modulation frequency.

5.4 Slow Mode:

- Displays power level in the presence of test tone or low-level modulation.

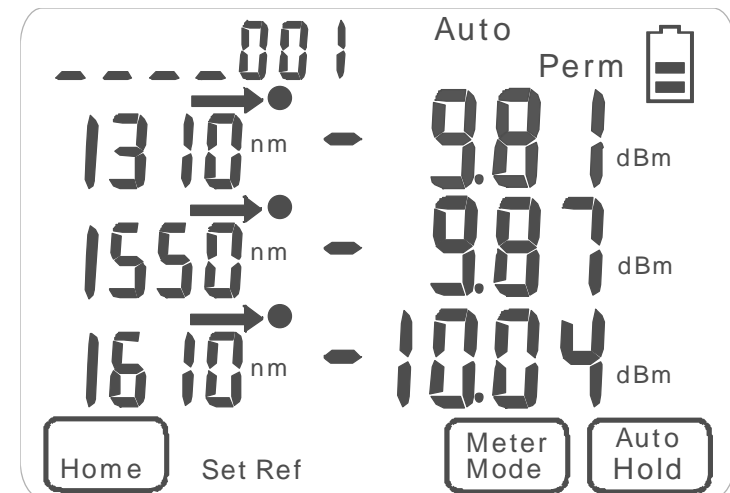
5.5 KITS software:

- Under software control.



5.1 Autotest Operation Mode:

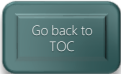
- Simplest mode for loss testing.
- When receiving light from a compliant source operating in Autotest mode, the meter will auto toggle between wavelengths.
 - Power meter receives data which contains wavelength, source serial number and nominal source output power.
 - If power meter not calibrated at an incoming wavelength, it will ignore it but remain in sync with other wavelengths.
 - If incoming power level too low at a particular wavelength it will ignore it but remain in sync with other wavelengths.
- When receiving light from a source operating in Autotest mode:
 - Screen displays up to 3 wavelengths at a time.
 - Screen toggles if more than 3 wavelengths being received.



5.2 Manual Operation Mode:

5.2.1 Switch to Meter function

At top level menu, press [F3].



5.2 Manual Operation Mode:

- 5.2.2 Select wavelength

Toggle [-] or [+] to select the desired wavelength.

Note:

- Most meters have the common wavelengths grouped together for speed of access when used in manual mode.
E.g. 850, 1300, 1310, 1550, 1625 nm are together.



5.3 Test Tone Detection Operation Mode:

When instrument is turned on, and test tone or low-level modulation is detected:

- Power meter will auto display frequency of the detected tone and beeps.
- To measure power level of the detected tone, Slow Operation Mode (refer to section 54) is used.

To defeat beeping:
At turn-On, hold [F2].

Note:

Doing so will turn off beeping of all keypad press too.

Example of a display with 1000 Hz modulation detected:



5.4 Slow Operation Mode:

Used when it is necessary to measure power in the presence of test tone or low-level modulation e.g. low data rate *SCADA (Supervisory Control And Data Acquisition) transmissions.

- When this mode is active, the meter's sample interval is increased.
- The symbol "∞" is displayed when this mode is active.
- Slow Mode can be activated/deactivated in 3 ways.

① When Meter is in Tone Detection Mode:

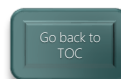
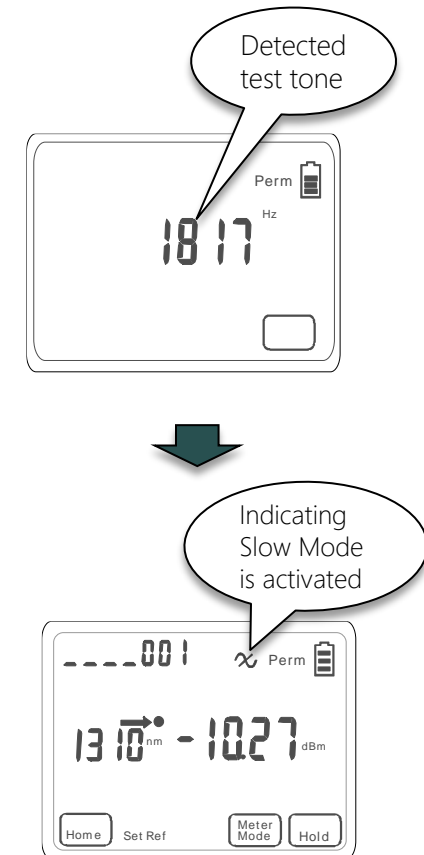
- To activate Slow Mode, press **[F4]**.
- To deactivate Slow Mode, press and hold **[F3]** & then press **[F4]**.

② When Meter is in Meter Mode:

- To activate Slow Mode, press and hold **[F3]** & then press **[F4]**.
- To deactivate Slow Mode, press and hold **[F3]** & then press **[F4]**.

③ During power up:

- To activate Slow Mode, press and hold **[F3]** then press the green **[On/Off]** button.
- To deactivate Slow Mode, press **[F3]** to enter Meter Mode. Press and hold **[F3]** & then press **[F4]**.



5.5 KITS™ Control Mode:

Direct Interface to KITS™ Testing & Reporting software, Instrument under computer control.

KINGFISHER KITS™ Live Data Capture Worksheet
Version 4.16

Job Details / Site Data

Job No	77/01/16	Report Date	7/01/16	Terminal ID	A	Source / LTS Type	S/N	Meter / LTS Type	S/N
Operator		Report/File No	Report-20160107	Terminal ID	B				11216
		Channel/Perm Link	Other						

Test Parameter Setup

Cable Parameters		Optical Parameters		Test Setup Summary	
Number of Tests	15	Wavelength	1310 1550	Applied Standard: TIA-568-C.0 SMF TIA-526-7 Method A.1	
Max allowed length	meter 300	F = Fiber attenuation, dB/Km	0.3 0.3	15 fibers OS2	
L = Fiber length	meter	SL = Splice loss, dB	0.75 0.75	Meter @ A LC	
FT = Fiber Type	OS2	CL = Connector 1-2 loss, dB	0.75 0.75	B LC	
NS = Number of Splices	0	DL = Device insertion loss, dB	0 0	Length = 300 meter	
'A' connector type	LC	UA = Uncertainty allowance, dB	0 0	Prop Delay = ns	
'B' connector type	LC			Local Reference	
Reference Cords	1 Cord				
Reference End	Local				

Statistical Analysis

Loss			ORL			
A	Min	Mean	Max	Min	Mean	Max
1310	0.00	0.00	0.00	0.00	0.00	0.00
1550	0.00	0.00	0.00	0.00	0.00	0.00

Test Results (Data is Secure)

Fiber Details		Loss Limit		Insertion Loss (IL) Results dB						ORL Results dB		Pass/Fail/Marginal & Time		Data Identification									
Fiber ID	Length	No. of Splices	No. of Connectors	A	Max Loss	Direction A->B		Direction B->A		Average	IL	Margin	Direction	ORL	P/F/M	TimeTag	Memory Location	ID TAG	Memory	Serial Number			
A	B	meter		nm	dB	Ref A	Meas B	IL A->B	Ref B	Meas A	IL B->A	IL	Margin	A	B	Margin	"A"	"B"	"A"	"B"	Type	"A"	"B"
1	1	300	0	2	1310	1.80																	
					1550	1.80																	
2	2	300	0	2	1310	1.80																	
					1550	1.80																	
3	3	300	0	2	1310	1.80																	
					1550	1.80																	
4	4	300	0	2	1310	1.80																	
					1550	1.80																	
5	5	300	0	2	1310	1.80																	
					1550	1.80																	

- Click results directly into workbook
- Standards based & user definable analysis
- Data Logging
- Equipment memory extract to KITS™ or CSV file
- Familiar Excel™ User Interface
- Inbuilt multi language support
- Customisable reports

See [Kingfisher website](#) for KITS™ user manual.



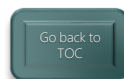
6. Measurement Display Mode:

There are 3 modes for measurement unit display i.e. Absolute dBm / Relative dBR mode / Linear (W) mode.

- **Absolute Mode:**
Measure actual power level at a particular location in decibels (dBm).
- **Relative Mode:**
Measure power level 'relative' to a particular location in decibels (dBR).
(This modes requires setting of references, see section 6.2)
- **Linear Mode:**
Measure power level at a particular location in watts (W).

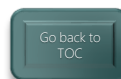
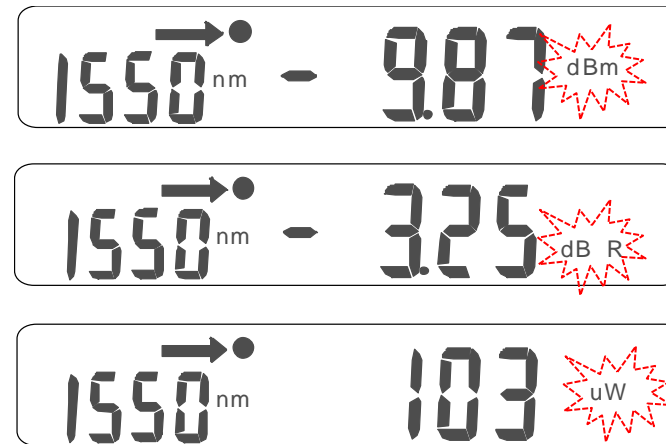
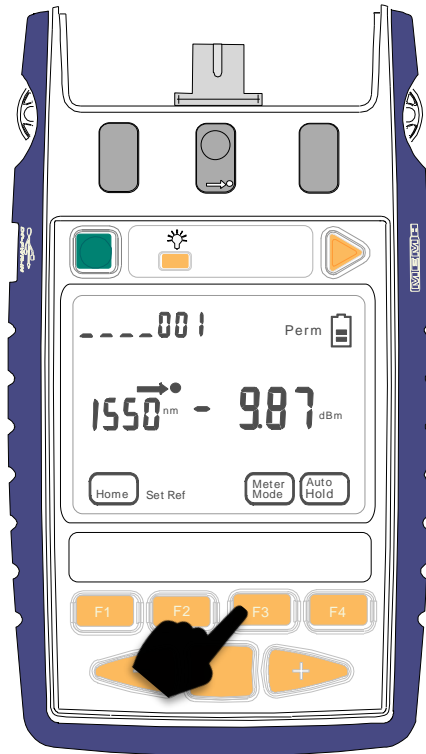
[6.1](#) Selecting Display Mode

[6.2](#) Setting Reference (in dBR mode)



6.1 Selecting Display Mode:

In Meter mode, press **[F3]** repeatedly toggles through Absolute(dBm), Relative(dBR) and Linear(W) modes.



6.2 Setting Reference (in dBR mode):

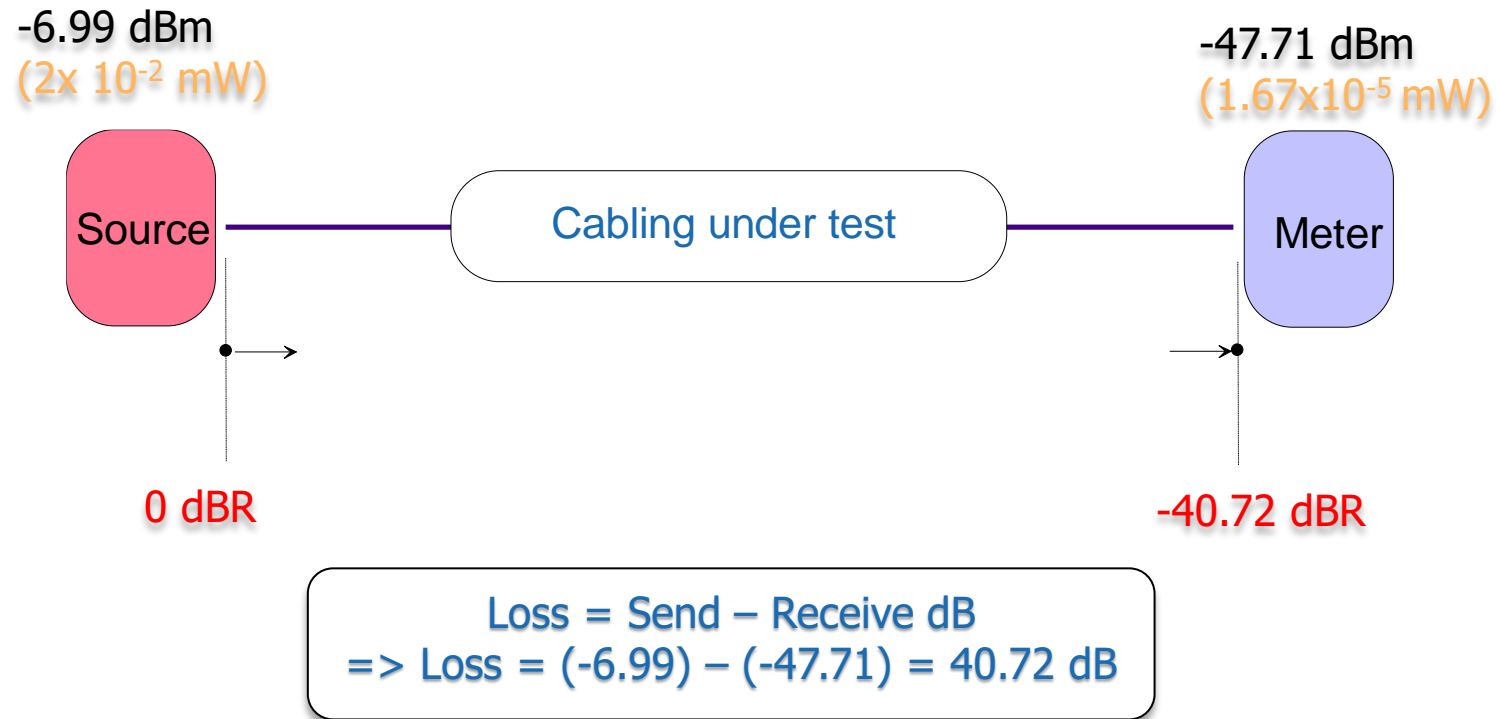
In dBR display mode:

- Press and hold **[F2]** for approx. 2 seconds.
- Meter will beep 4 times and the display values become "zero".



6.2 Setting Reference (in dBR mode) - *continue*

Example of loss measurement in dBR (Reference mode):



7. Memory Operations

[7.1](#) Internal Memory Clear

[7.2](#) Internal Memory Store

[7.3](#) Internal Memory Recall

[7.4](#) Dump to USB Memory



7.1 Internal Memory Clear

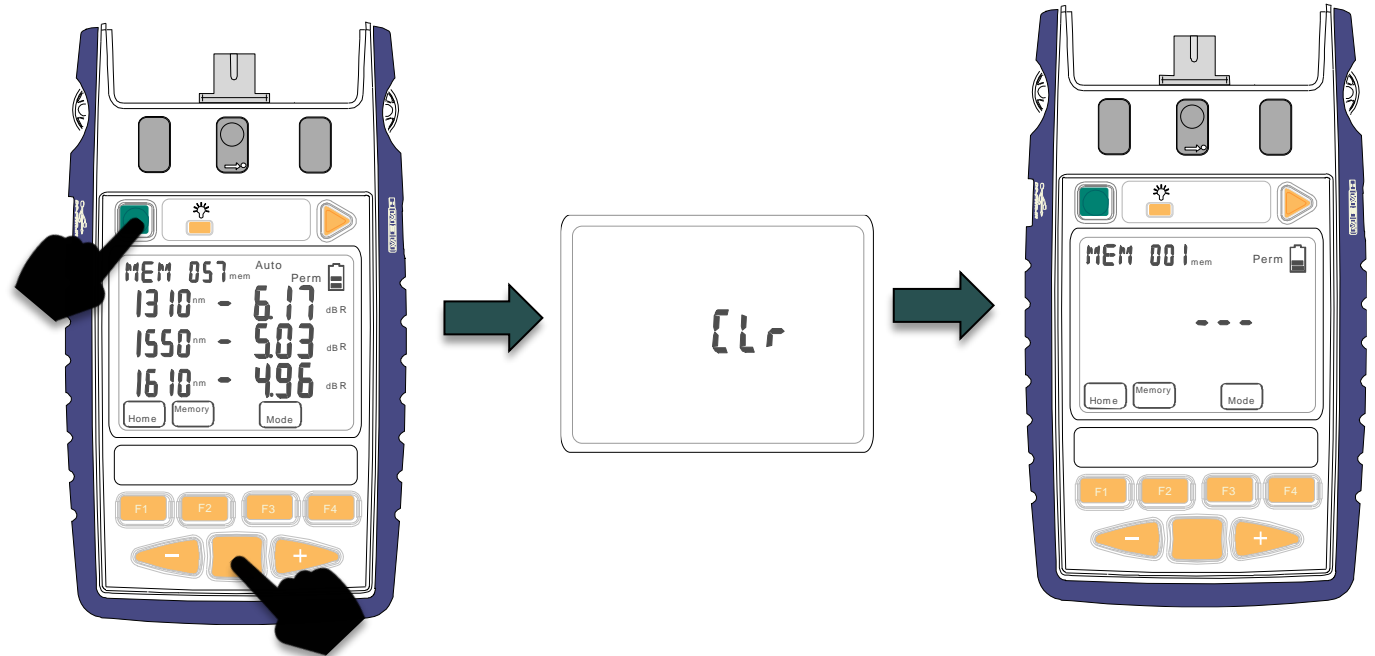
To enter Memory mode:

At top level menu, press [F2].

To clear memory (all):

- Press and hold [Toggle Centre] then press [On/Off]
- 'CLr' will be displayed for a few seconds

Note: Stored Text ID tags are not cleared by this procedure.



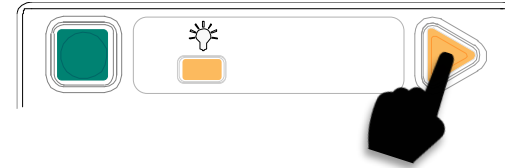
7.2 Internal Memory Store

In Meter or Autotest mode:

Press .




Note:

- Data will be stored in the current memory location displayed & instrument will beep once.
- The displayed memory location will increment.



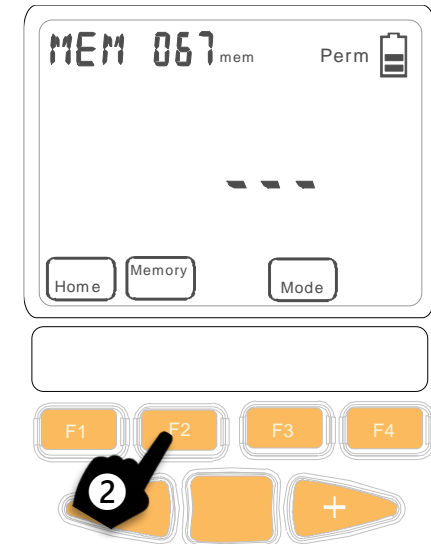
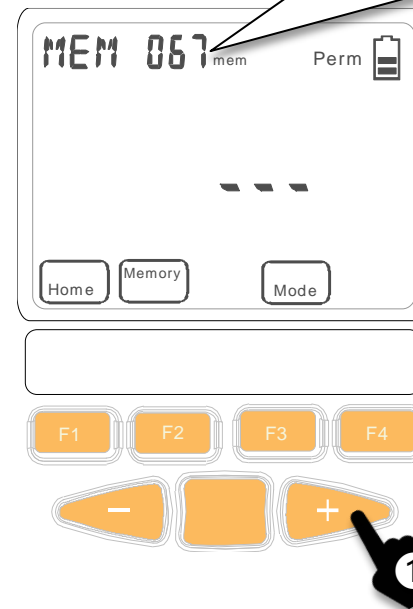
To save data to a specific memory location:

In Memory mode,

- 1 Toggle  or  to desired memory location.
- 2 Press and hold , Memory for 3 seconds.

Instrument will beep and new location is set. Future Memory saves (a press on ) continue from this location.

Display scrolling to show Current Text ID and memory location here.



7.3 Internal Memory Recall

Enter Memory mode:

At top level menu, press **[F2]**.

Note:

Content of last stored memory location will be displayed.

To display content stored in a specific memory locations:

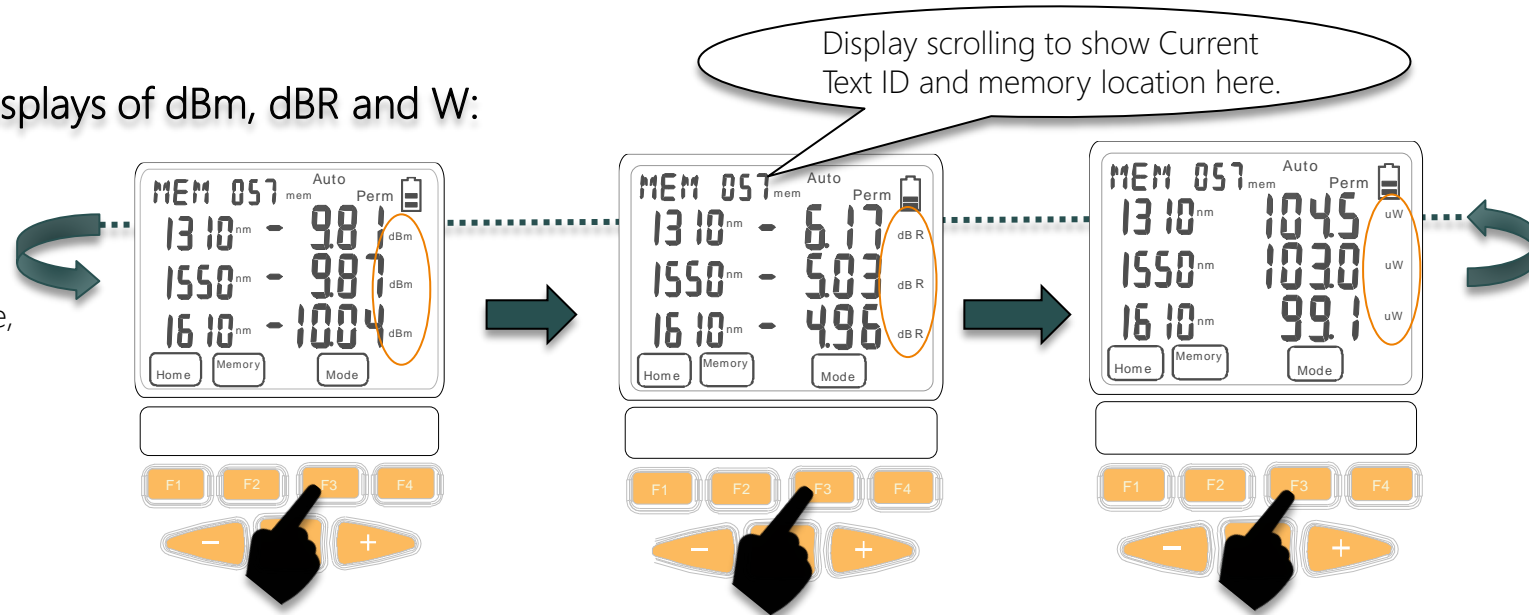
Press **[-]** or **[+]**.

To toggle between unit displays of dBm, dBR and W:

Press **[F3]** continuously.

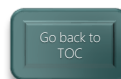
Note:

For data stored in Autotest mode, 'auto' is displayed.



To exit Memory mode:

Press **[F1]**.



7.4 Dump To USB Memory

Instrument must be in Memory Mode to detect inserted USB memory stick

1 Enter Memory mode:

At top level menu, press **[F2]**.

2 Insert USB memory stick into instrument's USB-A port.

Note:
'USB' will be shown on the LCD.

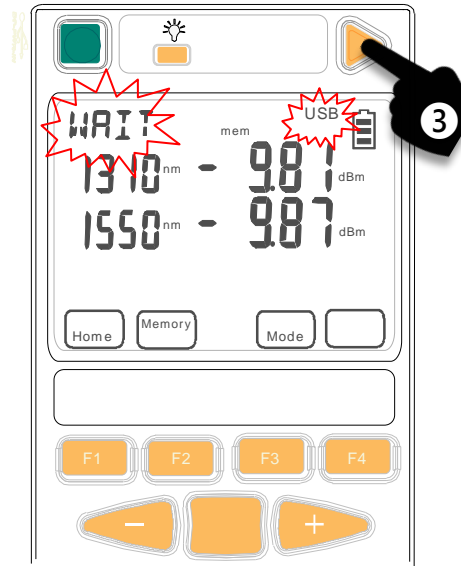
3 Press **[▶]** to start Memory dump.

Note:

- 'WAIT' will display whilst USB memory is being configured.
- A buzzer will sound during memory dump.
- Do not remove USB stick until 'USB' has stopped flashing

Sample data dumped from instrument to USB:

Mem	Date	Time	Type	ID_Tag	RemSN	W1	Pwr1	Ref1	Nom1	W2	Pwr2	Ref2	Nom2
	Memory Image from KI2X00 SN: 202 Time in 24h format. Wavelengths in nm. Optical Power values in dBm.												
1	7/02/32	11:57	Meter	AAAA022	0	1610	-19.36	-19.36					
2	7/02/32	12:44	2WIAuto	AAAA023	11216	1310	-18.88	0.3	-7	1550	-19.33	0.4	-7
3	7/02/32	12:44	2WIAuto	AAAA024	11216	1310	-18.88	0.3	-7	1550	-19.33	0.4	-7
4	7/02/32	12:44	2WIAuto	AAAA025	11216	1310	-18.88	0.3	-7	1550	-19.33	0.4	-7

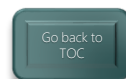


8 Other features

[8.1](#) Instrument Date/time Setting

[8.2](#) Min-Max Values Display

[8.3](#) Text ID



8.1 Instrument Date / Time Setting

1 Enter Date/time setting mode:

When instrument is OFF, press and hold **[On/Off]** & **[Toggle Centre]** at the same time.
Release the keypads as soon as the date/time setting display comes on.

2 Select date/time item for setting:

Press **[Toggle Centre]** or **[F3]**, the selected item will be blinking.

The order of Date Time setting:
Hour -> Minute -> Month -> Date -> Year

To modify the selected time/date:

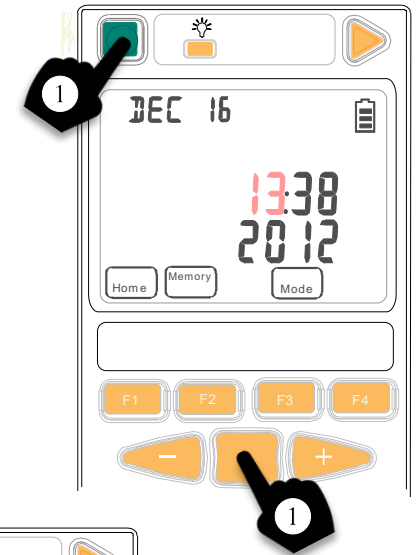
Press **[-]** or **[+]**.

To save settings & exit Memory mode:

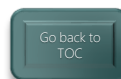
Press **[F2]**.

To exit without saving:

Press **[F1]**.



Note on loss of power: If batteries are removed for longer than about 20 seconds, Date/Time settings are lost.



8.2 Min-Max Value Display

Maximum & Minimum power readings are continuously recorded & displayed.

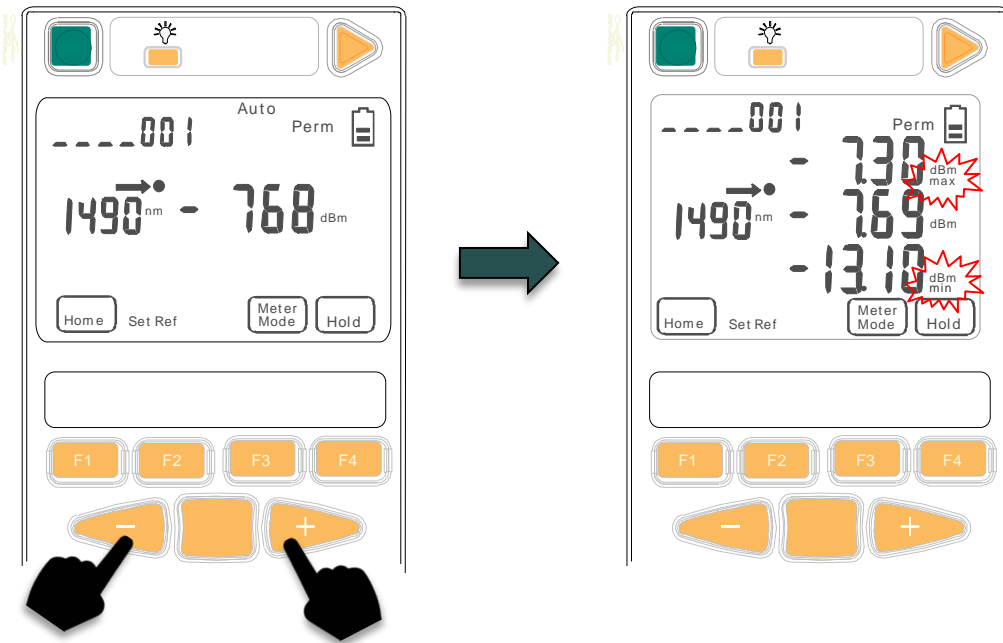
(This function is disabled during Autotest).

To display Min-Max values:

Press [-] and [+] simultaneously.

To hide Min-Max values:

Press [-] and [+] simultaneously again.



8.3 Text ID

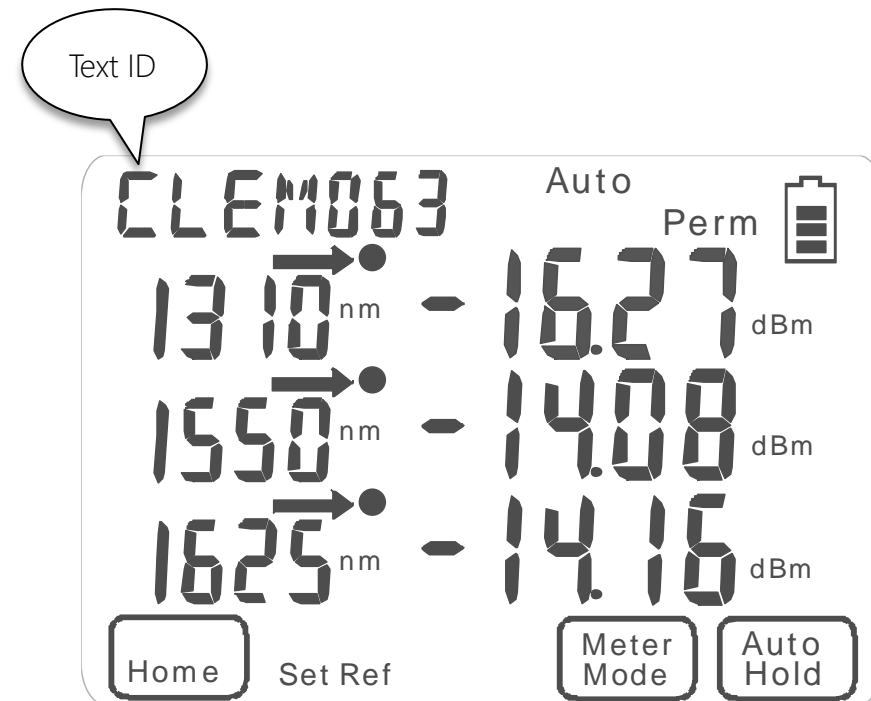
This feature is used in conjunction with instrument memory-save to identify a location or a cable.

- Max 20 individual text ID tags can be created in instrument.
- Format is 4 letters, followed by 3 digits.
- The last 3 digits auto increment.
- e.g. CLEM062, CLEM063 etc.

[8.3.1](#) Creating A New Text ID Tag

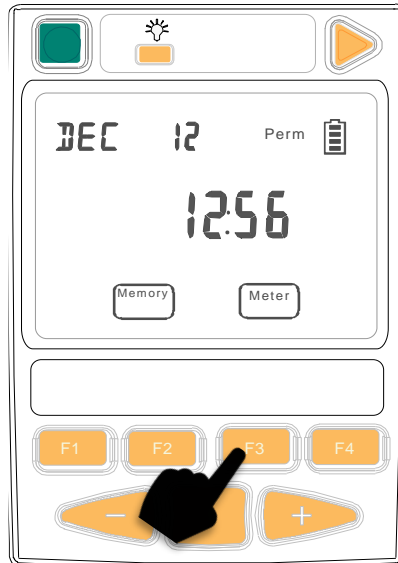
[8.3.2](#) Selecting/using The Created Text ID Tag

[8.3.3](#) Deleting The Create Text ID Tag

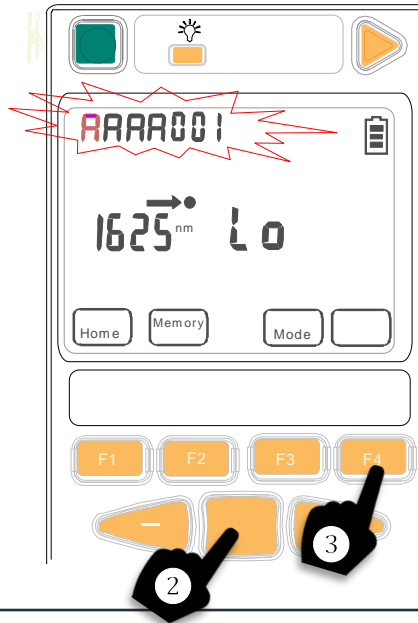


8.3.1 Creating A New Text ID Tag

- 1 At top level menu, press **[F3]**:
To enter Meter mode.



- 2 Press **[Toggle centre]**:
The current ID tag in used will be displayed and flashing.
- 3 Press **[F4]**:
The displayed ID tag will be reset to the default, **AAAA 001** for new ID creation.



- 4 Press **[Toggle centre]**:
To select the position of the ID tag for editing. The selected position of the ID tag will be blinking.

- 5 Toggle **[-]** and **[+]**:
To edit the ID tag.

- 6 Press **[F2]**:
To Save & Exit.

Note:
The newly created ID tag will be defaulted as the new current ID tag being used.

OR

- 6 Press **[F1]**:
To exit without saving.



8.3.2 Selecting/using A Text ID Tag Created

1 At top level menu, press **[F3]** to enter Meter mode.

2 Press **[Toggle centre]**: The existing ID tag being used will be displayed and blinking.

3 Press **[-]** or **[+]**: To display/select the desired ID tag from those created earlier (if available).

4 Press **[F2]**: To save the newly selected ID tag for use & Exit.

OR

4 Press **[F1]**: To exit without saving.



Go back to
TOC

8.3.3 Deleting A Created Text ID Tag

1 At top level menu, press [F3] to enter Meter mode.

2 Press [Toggle Centre]:
The existing ID tag being used will be displayed and blinking.

3 Press [-] or [+]:
To display/select the desired ID tag from those created earlier (if available) for deletion.

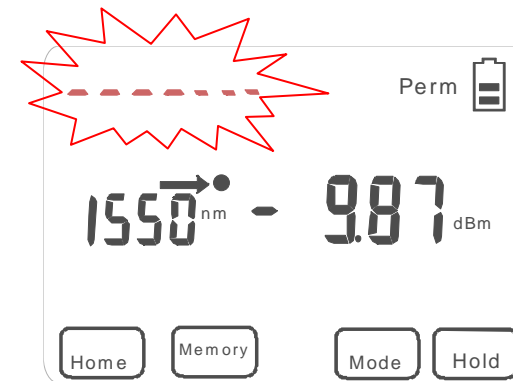
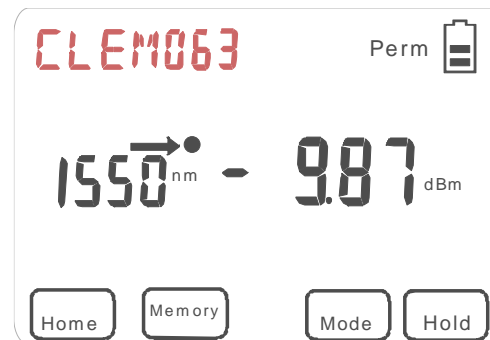
4 Press [F3]:
To confirm the selection of ID tag
Note: The 1st alphabet of the selected ID tag will be blinking.

5 Press [F4]:
To proceed with the deletion.
Note: The selected ID tag will be replaced by a row of flashing dots/dashes.

6 Press [F2]:
To confirm deletion.

OR

6 Press [F1]:
To exit without changing.



9. Instrument Firmware

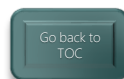
The KI2000 series Firmware can be end-user upgraded.

To update Firmware:

- Instrument Firmware must be r0.12 or higher.
- KI2000 USB device driver software must be installed.

[9.1](#) Checking Firmware Version

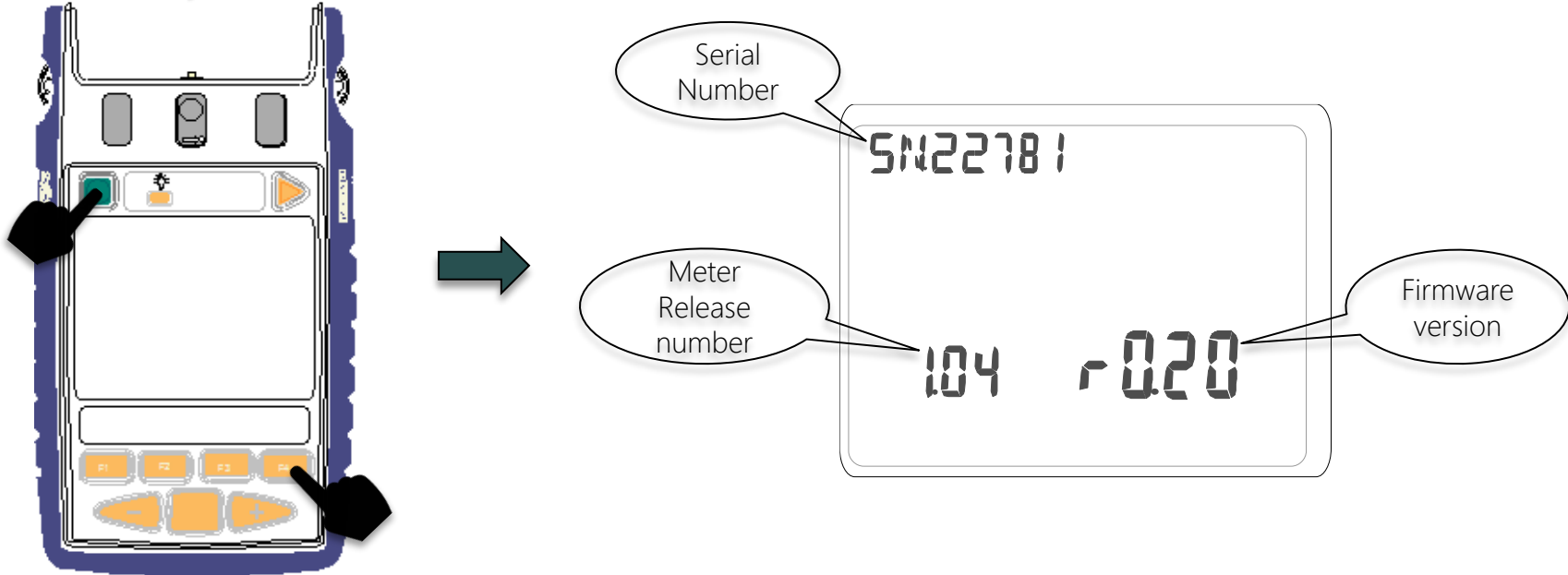
[9.2](#) Firmware Upgrading Procedure



9.1 Checking Firmware Version

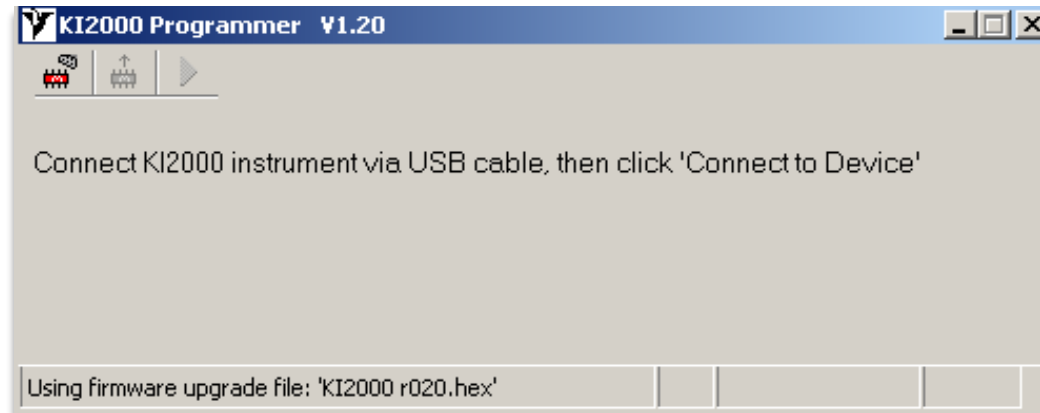
The instrument Firmware version can be checked during instrument switch-on.

When instrument is off, hold down **[F4]** and **[On/Off]**:
The instrument will switch on, and serial number and firmware version is displayed whilst **[F4]** is held.



9.2 Firmware Upgrade Procedure

- 1 Download and extract the Firmware Update program from Kingfisher web site.
- 2 Connect instrument to computer.
- 3 Run Firmware Update program (*KI2000 programmer vx.xx.exe*) downloadable free from [Kingfisher website](#).
- 4 Follow procedures as detailed in the Firmware Update instruction in PDF (*KI2000 Programming Instructions*).



10 Instrument Care

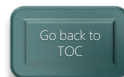
- Keep the instrument in a carry case during storage and transport
- Use only high-quality batteries.
- For prolonged storage remove batteries.
- The instrument is resistant to normal dust and moisture however, it is not waterproof.
- If moisture gets into the instrument, remove batteries & dry it out carefully before using it again.
- Where possible, keep instrument away from strong sunlight.
- Clean the instrument case using Isopropyl-alcohol (IPA) or other non-solvent cleaning agents.
- DO NOT use Acetone or other active solvents.



Application Notes

Comprehensive selection available at

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



Thank you for your attention

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