KINGFISHER INTERNATIONAL

September 2008

Training Manual:
KI7600 Series Power Meters

Level 1, V2.0

kingfisher.com.au

ilac-MRA NATA

Victorian Manufacturing Hall of Fame

2002 Governor of Victoria Export Awards

VPN Victorian Photonics Network Great Achievement Award 2005

The Age DB Business Awards

Course Contents

1. General Features
2. Models
3. Detector Types
4. Instrument Care
5. Prepare instrument
6. Modes of operation
7. Display Modes
8. Built in visible laser (KI7601)
9. Memory Operation

1./ General Features

- Low skill operation
- Autotest capability
- Autotest compatible with Agilent N series instruments
- Calibrated at multiple wavelengths
- 1% factory calibration accuracy
- Supplied with calibration certificate
- Industry standard connectors – Including SFF
- High contrast LCD display with backlight
- Battery life – 190-360 hours
- DC power socket
- Memory
- USB Computer interface
- Test tone detection
- Built in VLS variant (KI7601)
- 3 year re-calibration interval
- 3 year warranty

2./ Models

There are two model styles:

- KI7600: the most popular.
- KI7601: fitted with a Visible source on left hand port

There are two Computer interface styles:

- Early instruments: RS232 port
- Current instruments: USB Type A port

RS232 & USB models have minor operational differences

3./ Detector Types

Choose detector to suit your application.

InGaAs: Telco & LAN

- Enhanced InGaAs with good response @ 850 nm
- Power Levels of up to +5 dBm
- Most accurate detector type at Telco wavelengths

H series: High power – CATV, DWDM

- Enhanced H3 with good response @ 850 nm
- Power level configurations of up to +27 dBm
- Filtered InGaAs

Other detector types available for specific wavelength and power requirements.

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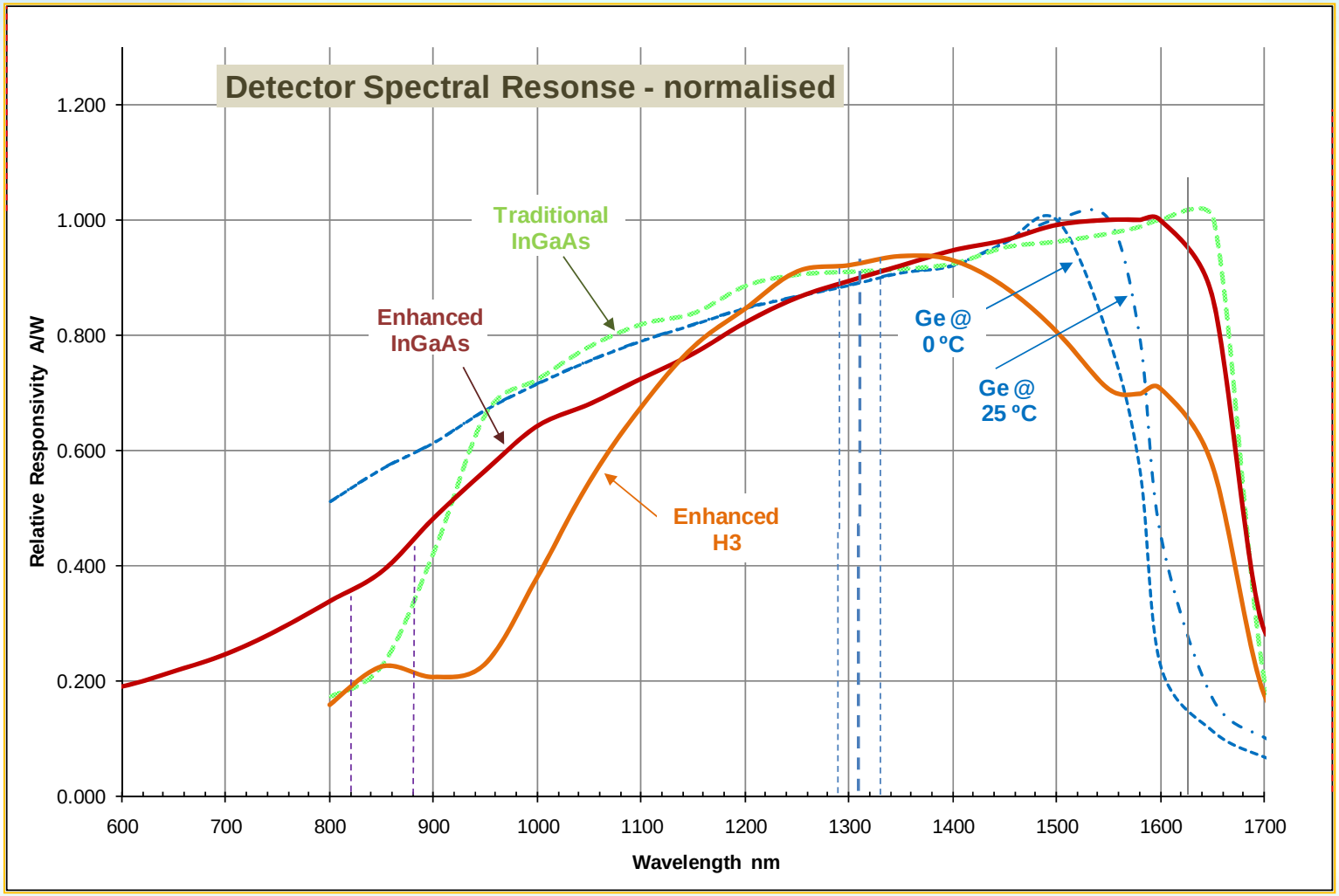
a./ Typical Detector Spectral responses



4./ Instrument Care

Keep the instrument in its carry case during storage and transport

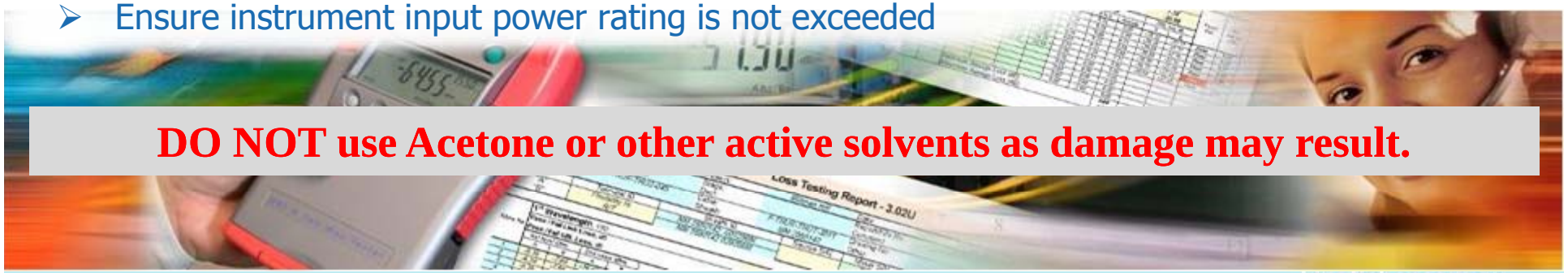
- Use only high quality 1.2-1.5 volt batteries. (Do not use lithium batteries)
- For prolonged storage remove batteries.

- The instrument is resistant to normal dust and moisture, however it is not waterproof.
- If moisture gets into the instrument, remove batteries & dry it carefully before reuse

- Where possible, keep instrument away from strong sunlight.

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

- Ensure instrument input power rating is not exceeded



5./ Prepare Instrument

a) Hand carry strap
b) Control buttons
c) Power supply – batteries & external
d) Turn On / Off
e) Fit / Remove adaptors
f) Test cord selection

a./ Hand carry strap

If required, fit provided hand carry strap:

- Provides enhanced on-the-job instrument care

b./ Control buttons

c./ Power supply - batteries

To Install Batteries.

- Hold instrument in both hands with battery compartment uppermost and with thumbs resting on battery compartment latch.
- Press latch down and push away from case.
- Insert batteries.
  - Insert 'AA' cells using the supplied AA-C battery converters.

Battery life.

Alkaline 'C' batteries : 360 hours meter, 190 hrs VFL
Alkaline 'AA' batteries : approx 75 hours meter

Low Battery Display.

Indicator shows when approximately 10 hours left.

Power Supply - external

All Instruments:

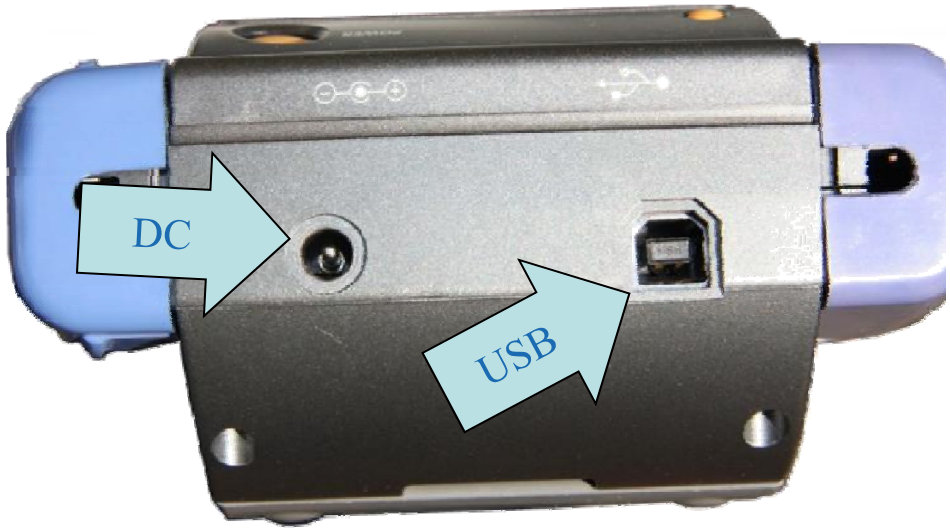
- External power supply disconnects the batteries
- Rechargeable batteries must be removed for charging

RS232:

- Via the DC power socket

USB:

- Via the DC socket or via the USB cord



Plug Pack Requirements:

- 2.5 mm DC power plug
- 6-12 V DC @ 300 mA maximum
- +Ve pin

d./ Turn On / Off

10 minutes auto Off or Permanent operation

Low battery indicator

Push the oval [POWER] button to turn ON or OFF

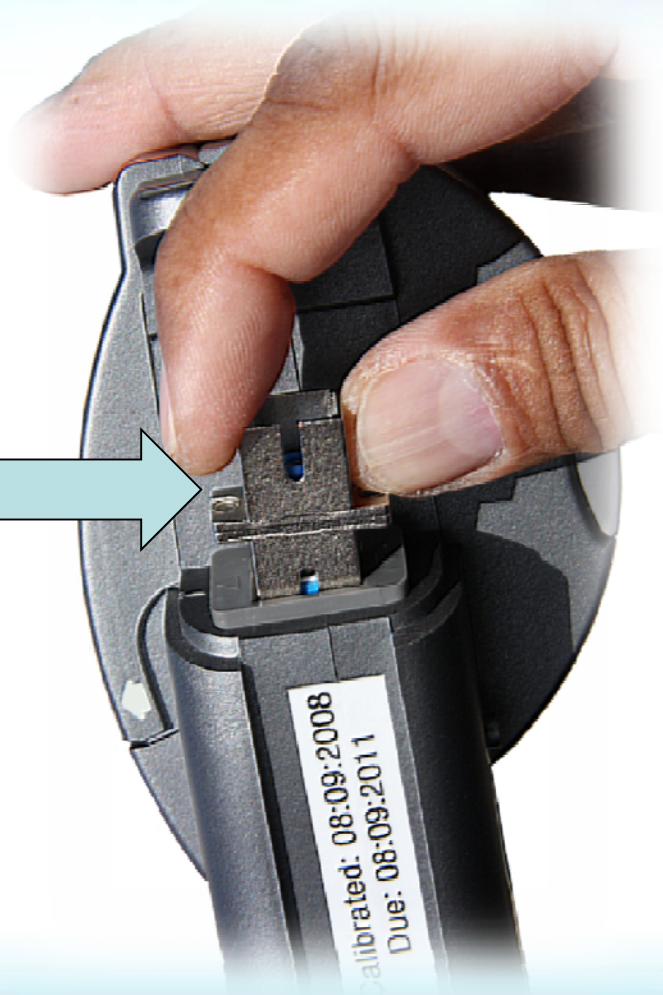
To defeat auto time out. Hold down [POWER] for 3 seconds during turn ON

e./ Adaptor - fitting

Industry standard SC adaptors

- We recommend ceramic/zirconia sleeves

Slot to outside



Adaptor - removal

Current models:

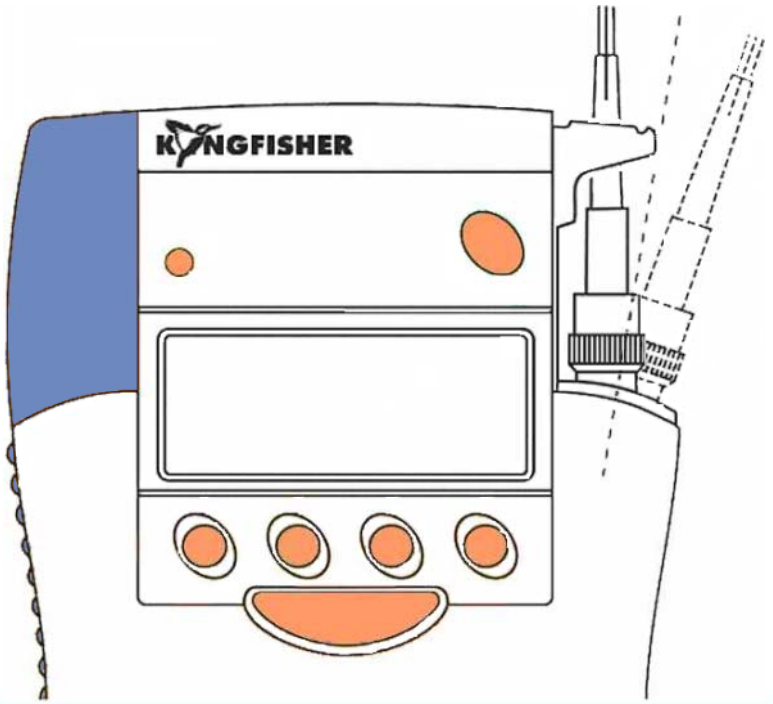
- Locate quick release button on rear of instrument at base of connector housing
- Push and hold button in
- Pull out existing adaptor
- Fit new adaptor

OR

- Remove as per 'early models'

Early models:

- Move adaptor interface to mid position
- Pull out existing adaptor
- Fit new adaptor



f./ Test cord selection

Power meters accept PC and APC connectors.

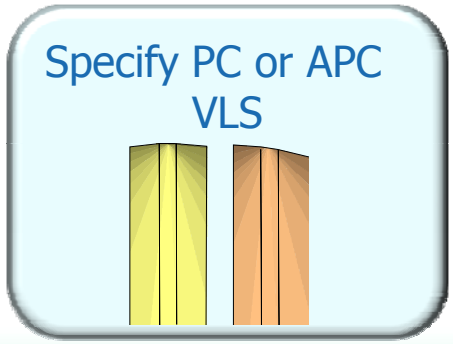
KI7601 has built in visible laser source (VLS)

- Must specify visible source to be PC or APC when ordering

Instrument ports are colour coded:

VLS connector:

- PC housing: **BLUE**
- APC housing: **GREEN**



6./ Modes of Operation

4 main modes of operation

a) Autotest:

- automatically toggles between all λs
- Preferred mode for loss testing as testing time is greatly reduced.
- Minimises error as meter always displays correct λ.

b) Manual:

- Single λ operation
- Preferred mode for level monitoring.

c) Modulated:

- Displays incoming modulation frequency

d) KITS software:

- Under software control

Simplest mode for loss testing

When receiving light from a compliant source operating in Autotest mode, the meter will auto toggle between λs

- 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.

b./ Manual Mode

If not in power meter mode

- Press [Power Meter]

To select wavelength

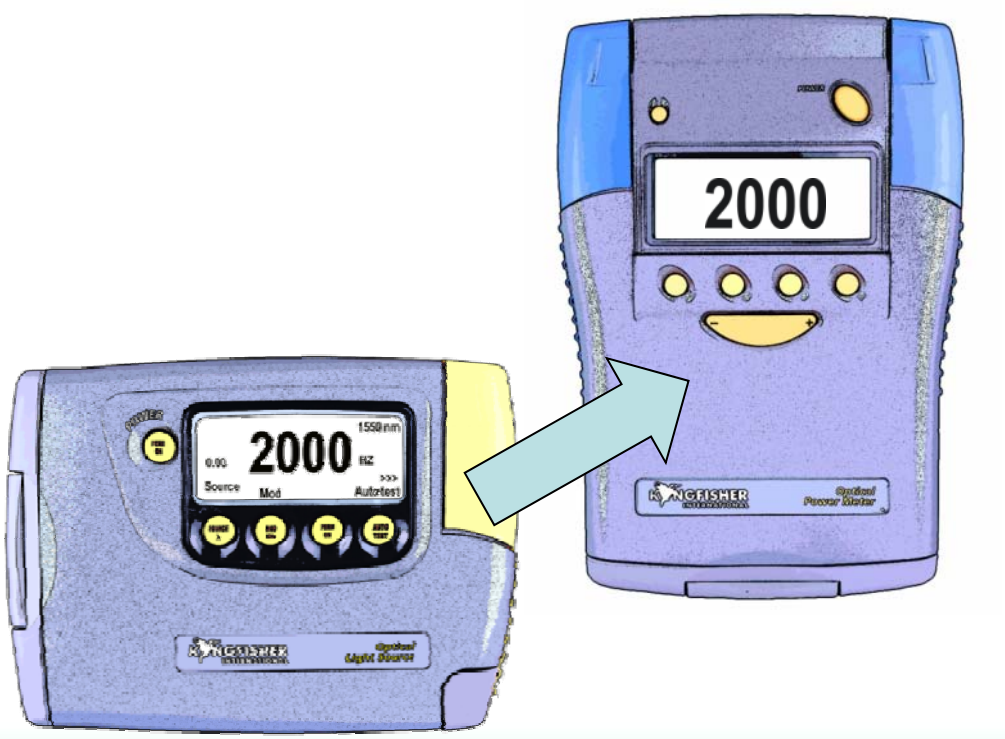
- Toggle [-/+].

Note:

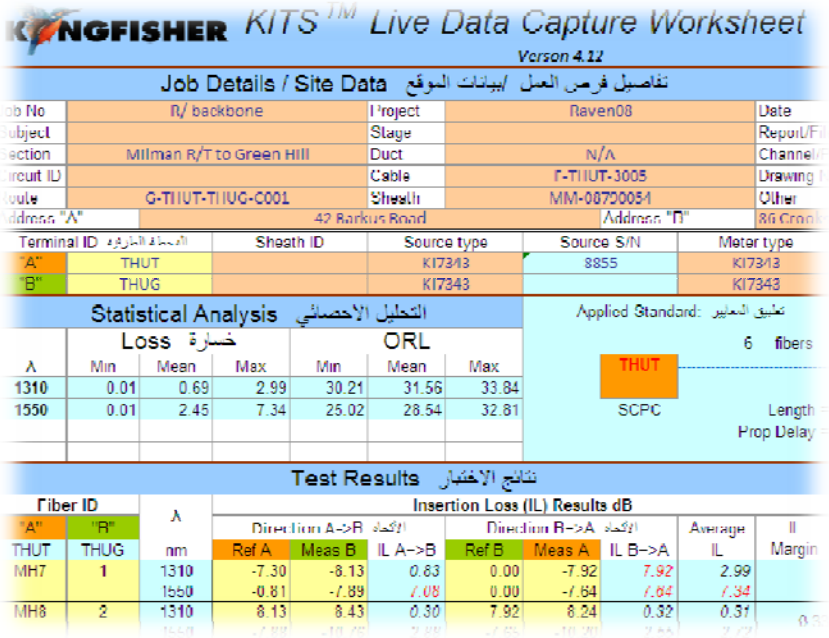
- Wavelength toggle is not circular
- Most meters have the common wavelengths grouped together for speed of access when used in manual mode.
  E.g. 850, 1300, 1310, 1550, 1625 nm are together

When receiving test tone or low level modulation

- Power meter displays modulated frequency and beeps
- Built in feature cannot be disabled



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



KINGFISHER KITS™ Live Data Capture Worksheet

Version 4.12

Job Details / Site Data تفاصيل فرص العمل /بيانات الموقع

Job No	R/ backbone	Project	Raven08	Date
Subject		Stage		Report/Fi
Section	Millman R/T to Green Hill	Duct	N/A	Channel/
Circuit ID		Cable	T-THUT-3005	Drawing
Route	G-THUT-THUG-C001	Sheath	MM-08700051	Other
Address "A"	42 Barkus Road		Address "B"	86 Crook

Terminal ID المحطة الطرفية		Sheath ID	Source type	Source S/N	Meter type
"A"	THUT		KI7343	8855	KI7343
"B"	THUG		KI7343		KI7343

Statistical Analysis التحليل الاحصائي

Applied Standard: تطبيق المعايير

	Loss خسارة			ORL		
λ	Min	Mean	Max	Min	Mean	Max
1310	0.01	0.69	2.99	30.21	31.56	33.84
1550	0.01	2.45	7.34	25.02	28.54	32.81

6 fibers

THUT

SCPC

Length

Prop Delay

Test Results نتائج الاختبار

Fiber ID		λ	Insertion Loss (IL) Results dB							
			Direction A->B الاتجاه			Direction B->A الاتجاه			Average	Il
"A"	"B"									
THUT	THUG	nm	Ref A	Meas B	IL A->B	Ref B	Meas A	IL B->A	IL	Margin
MH7	1	1310	-7.30	-8.13	0.83	0.00	-7.92	7.92	2.99	
		1550	-0.81	-7.89	7.08	0.00	-7.64	7.64	7.34	
MH8	2	1310	8.13	8.43	0.30	7.92	8.24	0.32	0.31	

Data downloaded from S/N 16503 , Date/Time 080911 1008

Fibre	Lambda	Reading	Ref	ORL	Remote Reading	Remote Ref	Remote ORL	Remote S/N
1	1310	-9.3	0.3					17094
1	1550	-9.21	0.22					17894
2	1310	-9.31	0.3					17894
2	1550	-9.07	0.22					17894

- Familiar Excel™ User Interface
- Inbuilt multi language support
- Memory extract to Excel spreadsheet or CSV file
- One Click Real Time Data Capture
- Standards based & user definable analysis
- Data Logging
- User Customisable reports
- Fee for service user customisation service

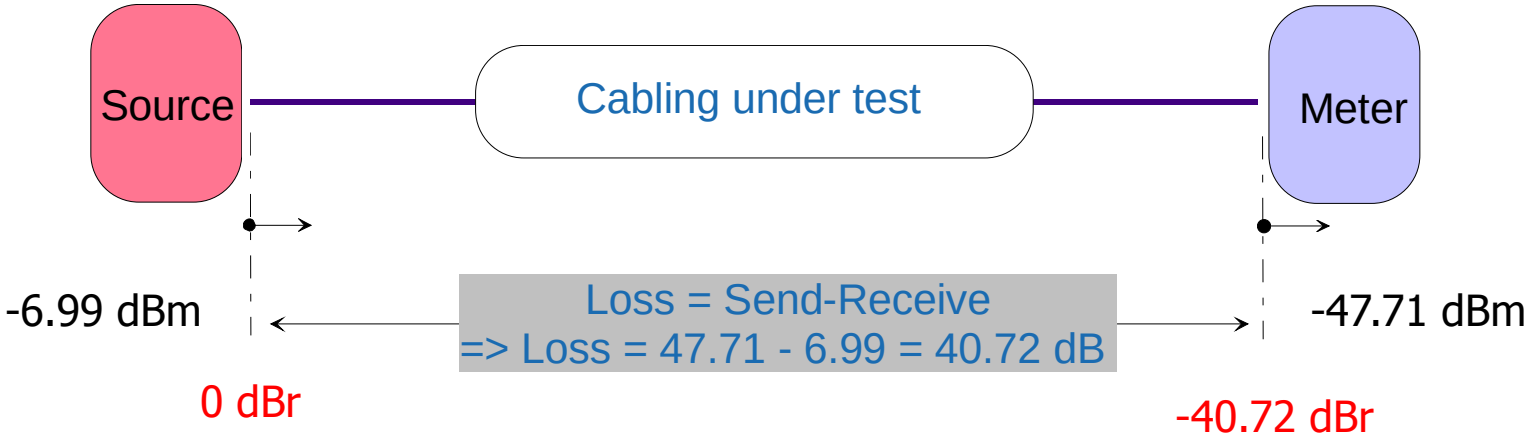
7./ Display Modes

a) Absolute dBm / Relative dBr mode
b) Setting the Reference
c) Log dBm / Linear W mode

a./ Absolute / Relative Mode

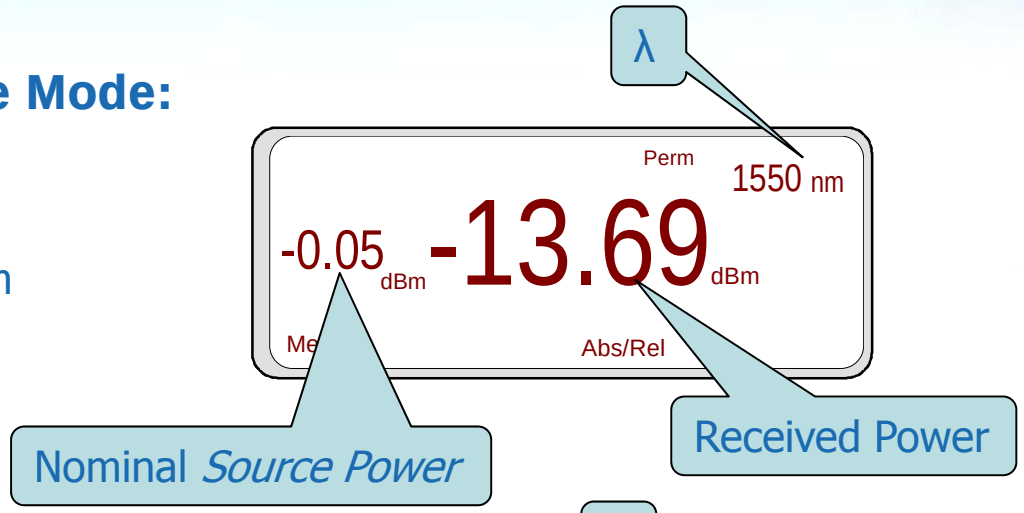
Absolute Mode:
Measure actual power level at a particular location – dBm

Relative Mode:
Measure power level 'relative' to a particular location - dBr



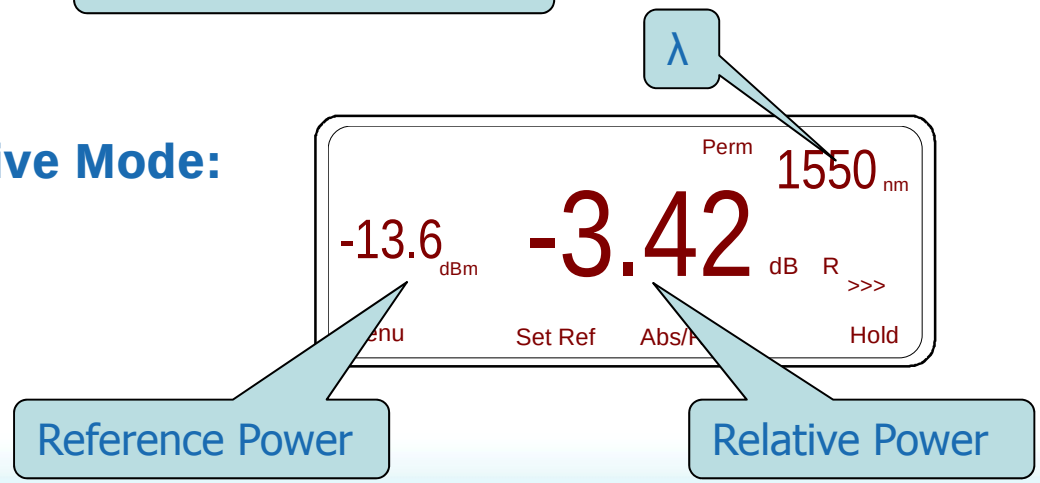
Main display features - Absolute Mode:

- Calibrated wavelength – nm
- Received power - dBm
- Nominal 'Autotest' source power dBm
  - Only if Autotest source



Main display features - Relative Mode:

- Calibrated wavelength - nm
- Relative received power - dBr
- Reference power - dBm



Toggle Absolute / Relative Mode

If not in power meter mode:

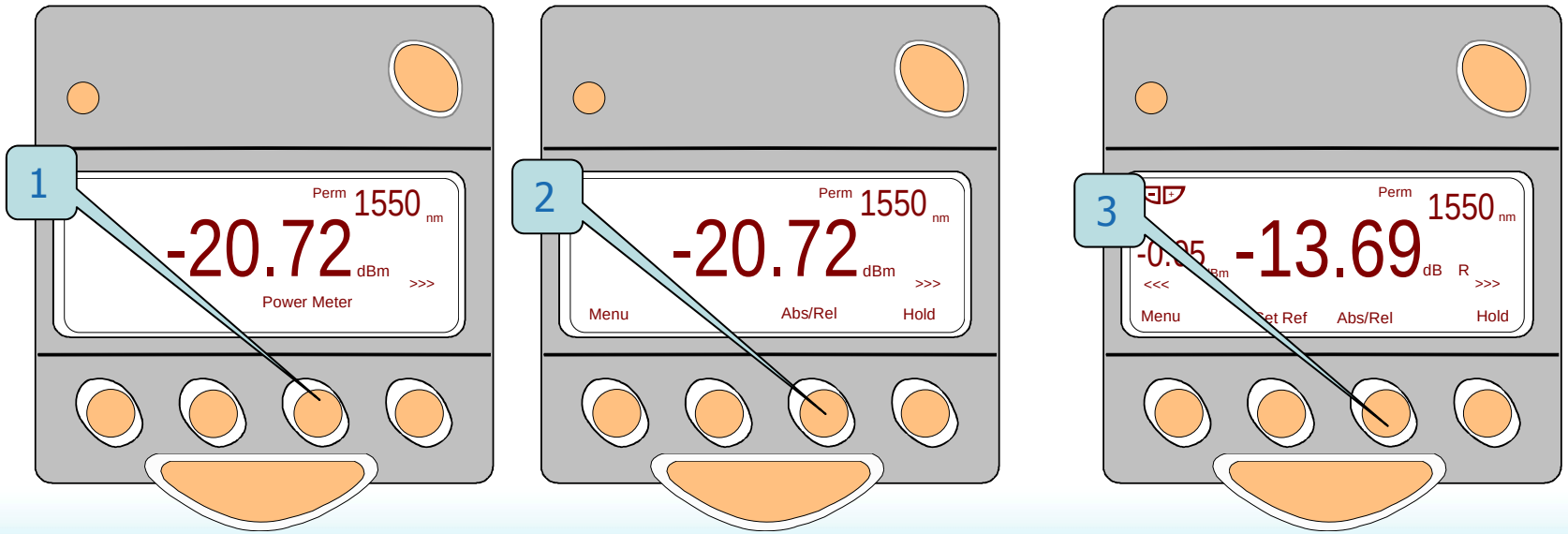
- Press [Power Meter] *(1)*

To enter Relative mode (dBr)

- Press [Abs/Rel] *(2)*

To return to Absolute mode (dBm):

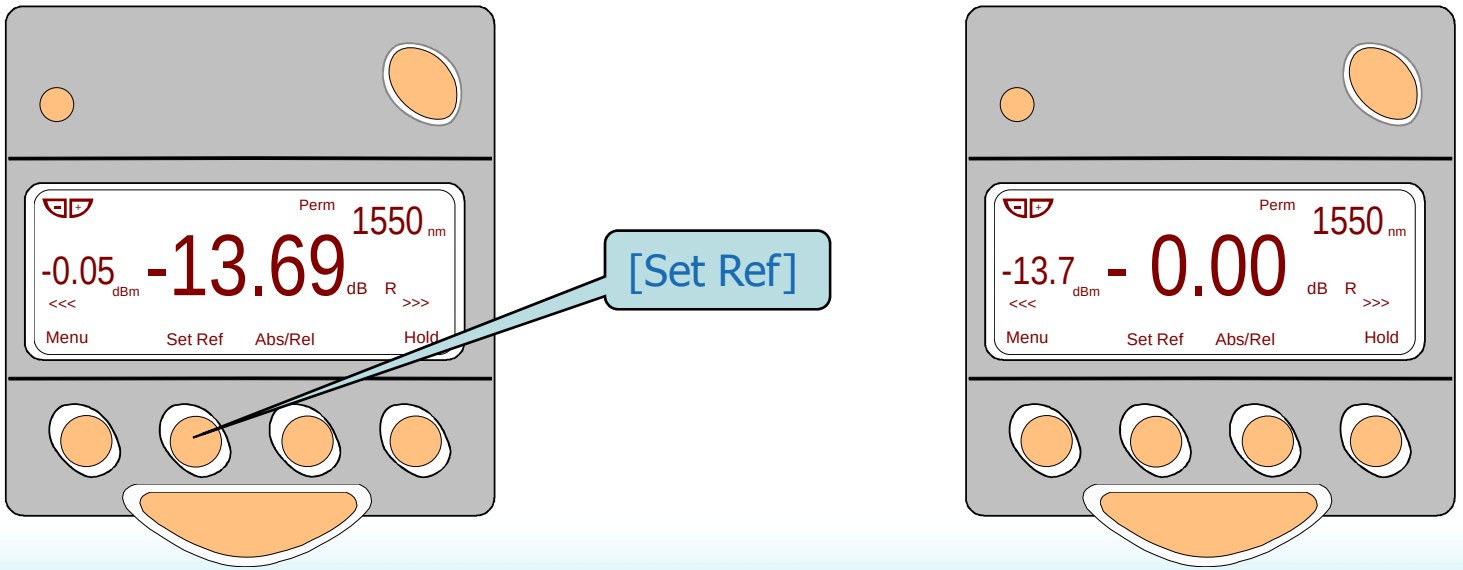
- Press [Abs/Rel] *(3)*



b./ Setting the Reference

Must be in Relative mode dBr not Absolute mode dBm

- Press and hold soft button [Set Ref] for 3 seconds
  - Meter will beep 5 times
  - Autotest mode: meter will display 'busy' & zero at all incoming wavelengths
  - Manual mode: zero at indicated wavelength
  - Meter will not zero if display is 'Lo'
  - Referencing is retained at power off.



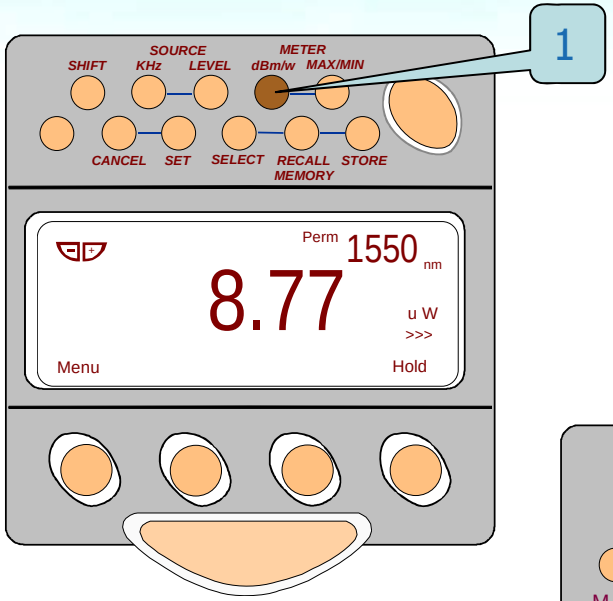
c./ Log / Linear Mode

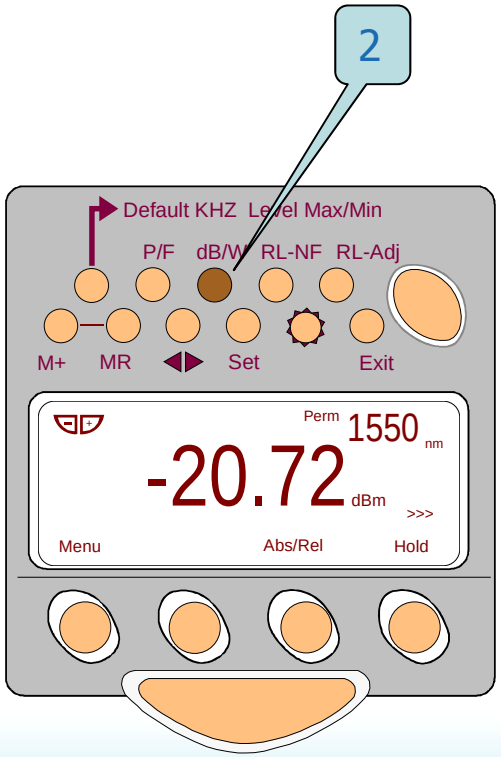
To enable:

- Open hidden keypad
- RS232: press [dBm/w] *(1)*
- USB: press [dB/W] *(2)*

To return to dB mode:

- Repeat above key press





- Must be in manual mode to switch between log & linear modes.
- Linear display functions in both Manual & Autotest
- Resets to log (dBm) mode at power off

8./ KI7601 - Visible Laser

To turn On:

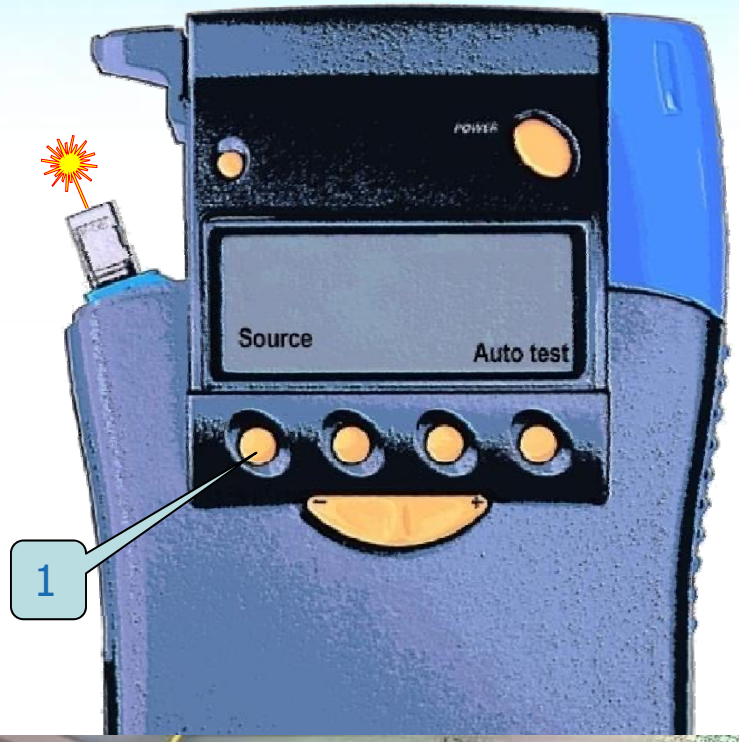
- Press [Source] *(1)*

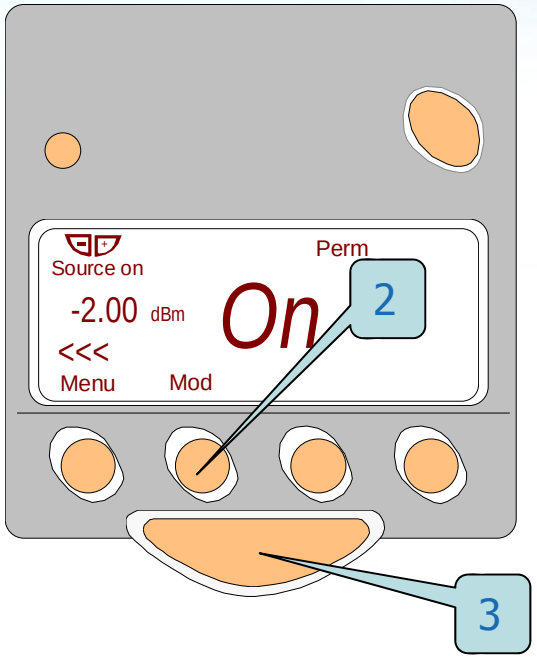
To toggle flashing:

- Press [Mod] *(2)*

To turn Off:

- Toggle [-/+] *(3)*





9./ Memory Operation

a) Memory clear

b) Memory store

c) Memory store at a location

d) Memory recall

e) Memory extract to computer

a./ Memory clear

Instrument must be in Manual mode, not Autotest

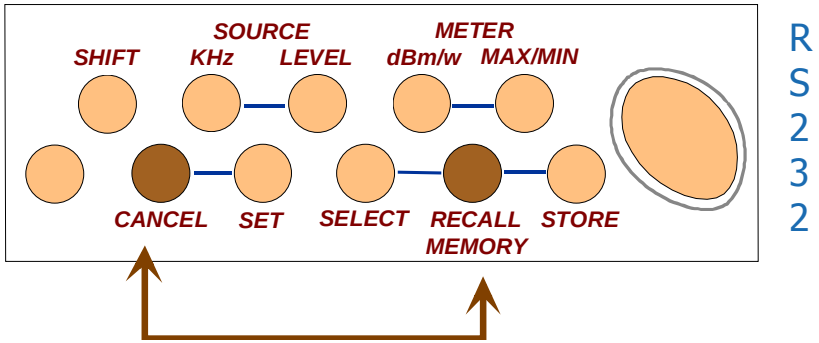
Open hidden keypad:

RS232:

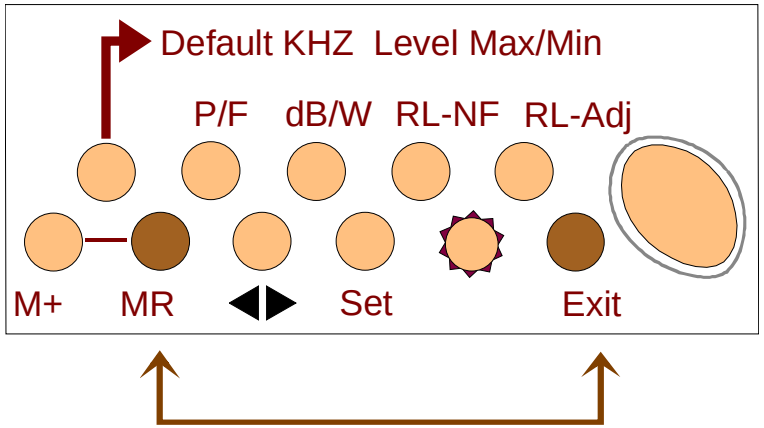
- Press [CANCEL] and [RECALL MEMORY] simultaneously and hold for a few seconds.

USB:

- Press [MR] and [EXIT] simultaneously and hold for a few seconds.



RS232



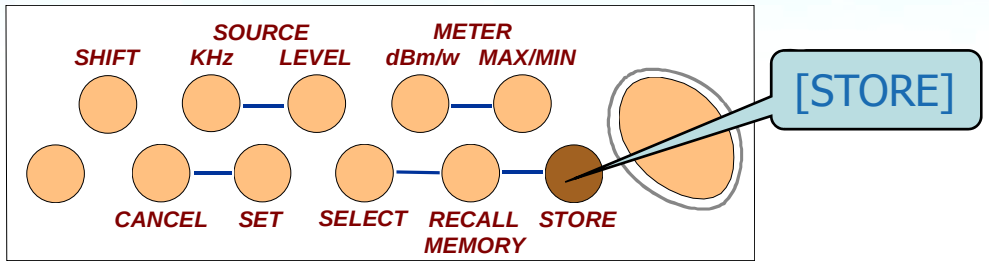
USB

Meter will beep 5 times

'**clr**' will display when memory cleared.

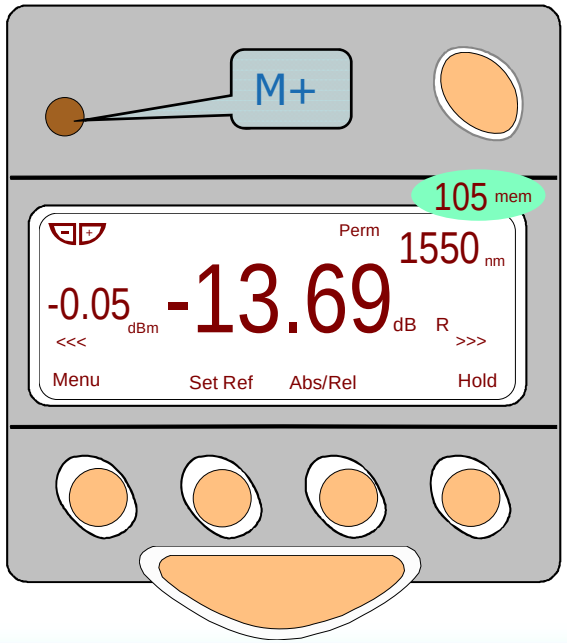
RS232:

- Open hidden keypad
- Press [STORE]



USB:

- Press [M+]



During Store operation

- Display will blank or display BUSY
- Meter will beep once
- Memory location displayed top right side

A full memory is indicated by a repeating buzzer

In Autotest stores:-

All λs transmitted, Absolute Power, Reference value and S/N of the remote unit

c./ Memory – RS232 Store at a location

Exit Autotest Mode:

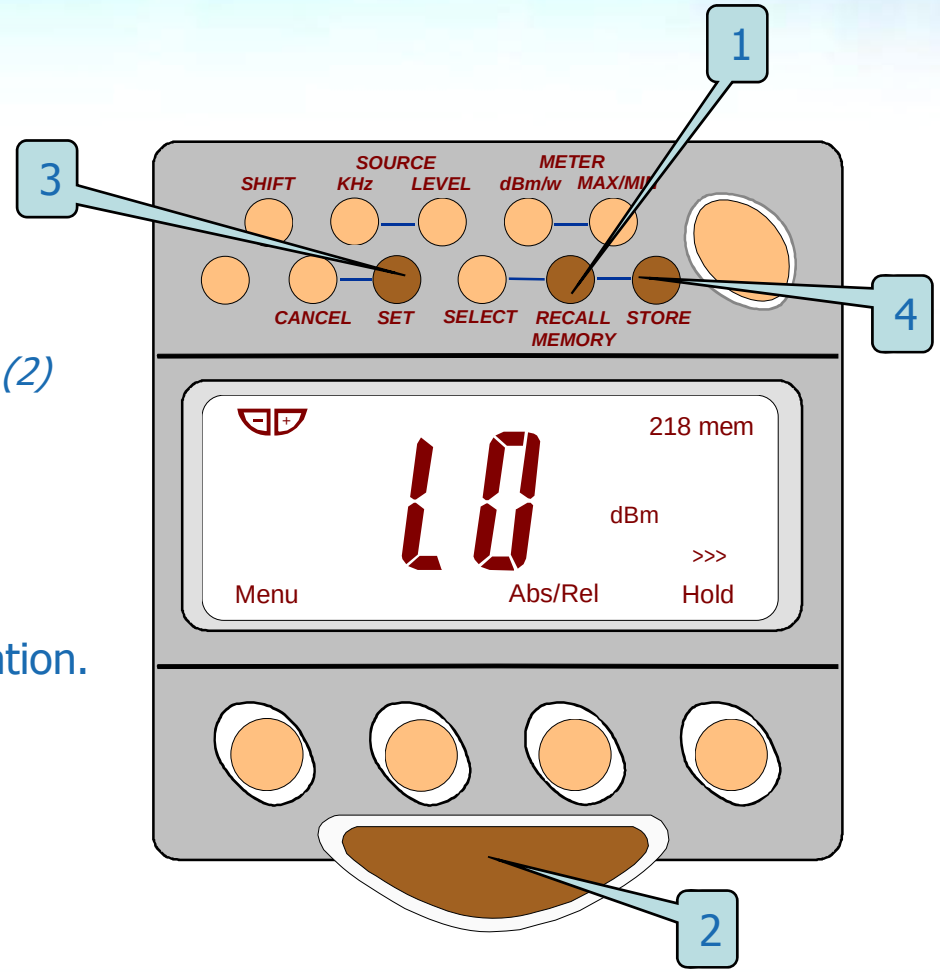
Open hidden keypad

- Press [RECALL MEMORY] *(1)*
- Toggle [-/+] to desired memory location *(2)*
- Press [SET] *(3)*
- When ready - Press [STORE] *(4)*

Note: memory writes continue from this location.

Typical use:

- Match memory location to fibre number



c./ Memory - USB Store at a location

Exit Autotest Mode:

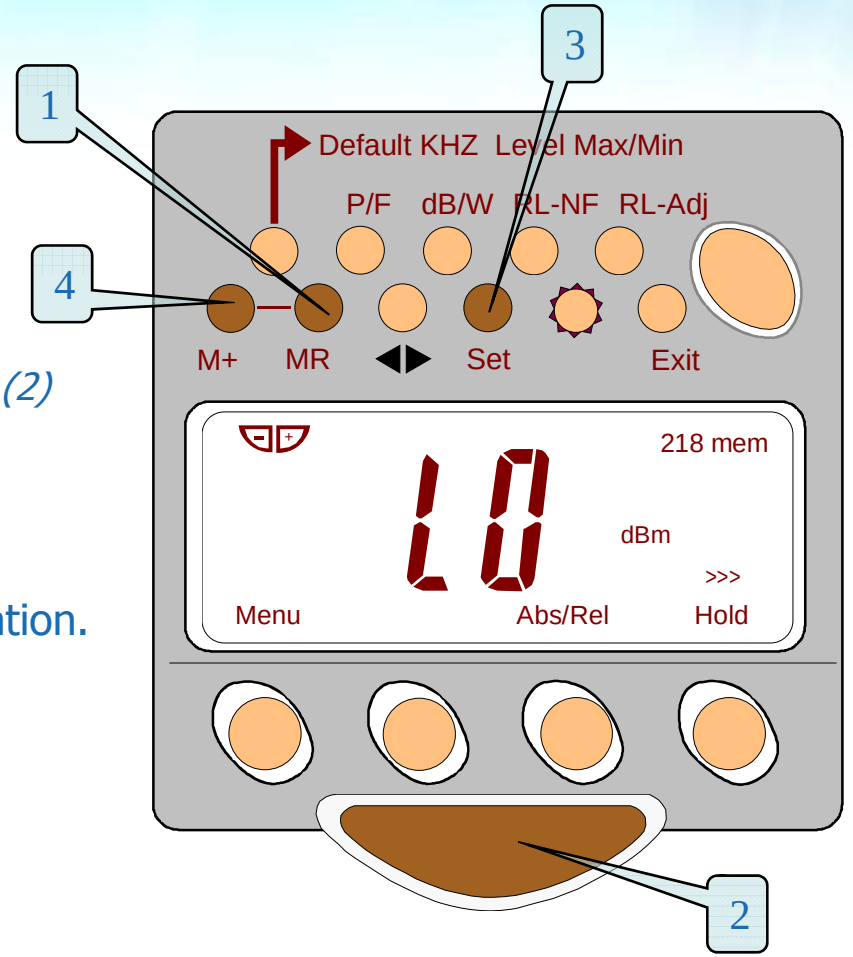
Open hidden keypad

- Press [MR] *(1)*
- Toggle [-/+] to desired memory location *(2)*
- Press [Set] *(3)*
- When ready - Press [M+] *(4)*

Note: memory writes continue from this location.

Typical use:

- Match memory location to fibre number



d./ Memory – Recall – RS232

Exit Autotest Mode

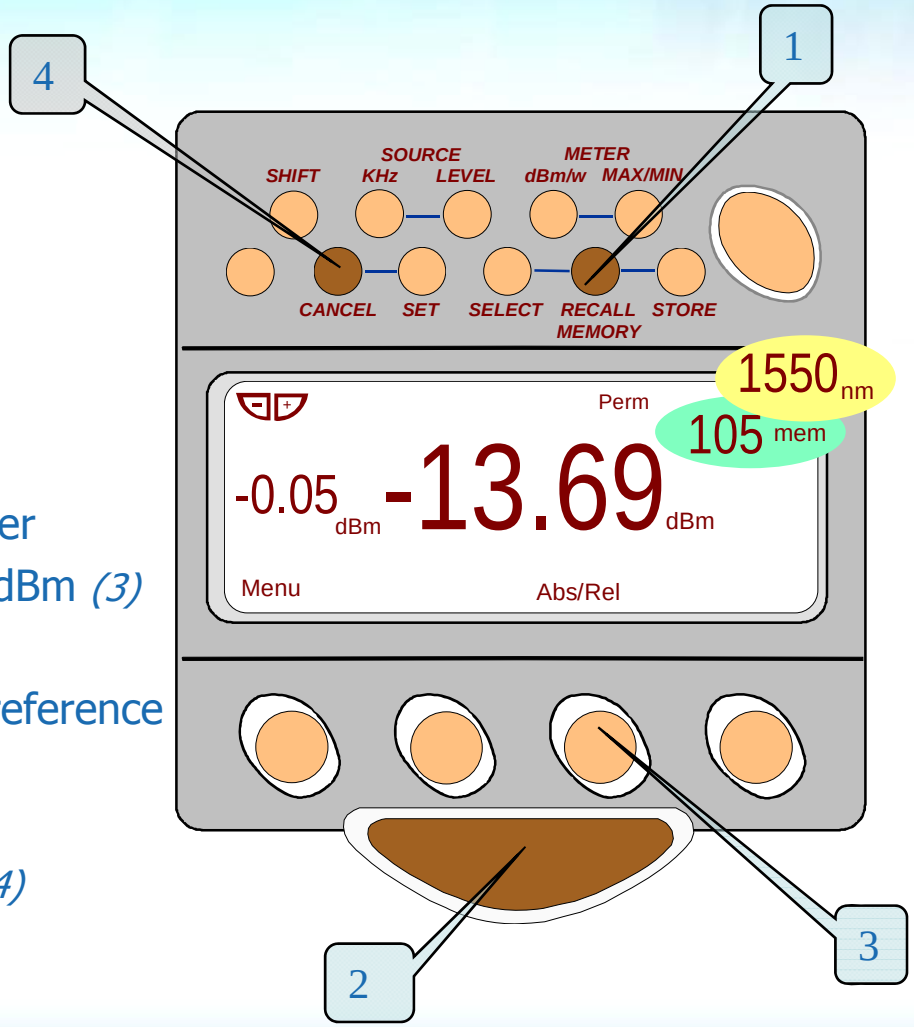
Open hidden keypad

RS232:

- Push [RECALL MEMORY] *(1)*
- Toggle [-/+] to desired memory location *(2)*

Display alternates between λ and memory number

- Push [ABS/REL] to alternate between dBr & dBm *(3)*
  - dBr: Reference shown on LHS of LCD.
  - Hint: Push & hold [ABS/REL] to display reference in display centre.
- Press [-/+] to scroll λ and memory *(2)*
- Exit memory display by pressing [CANCEL] *(4)*



d./ Memory – Recall – USB

Exit Autotest Mode

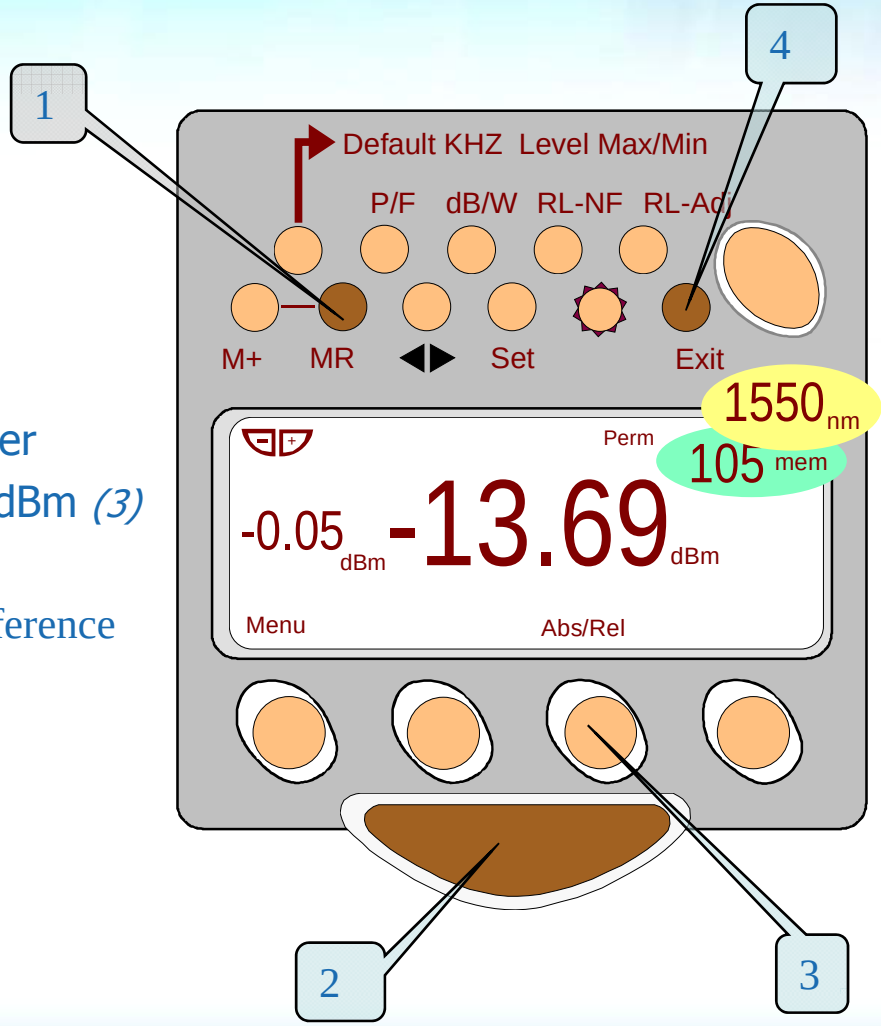
Open hidden keypad

USB:

- Push [MR] *(1)*
- Toggle [-/+] to desired memory location *(2)*

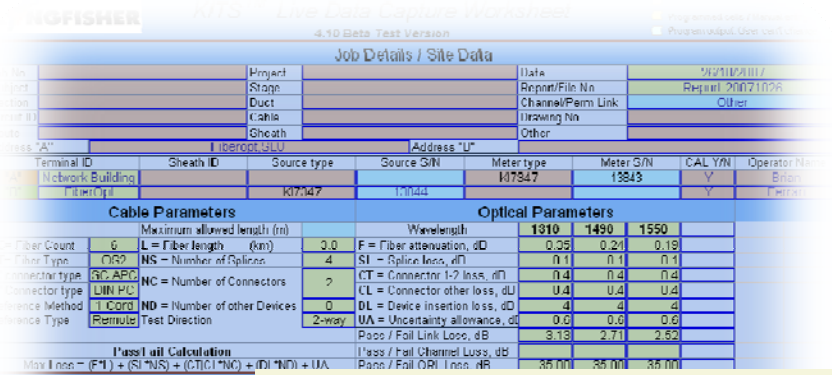
Display alternates between λ and memory number

- Push [ABS/REL] to alternate between dBr & dBm *(3)*
  - dBr: Reference shown on LHS of LCD.
  - Hint: Push & hold [ABS/REL] to display reference in display centre.
- Press [-/+] to scroll λ and memory *(2)*
- Exit memory display by pressing [Exit] *(4)*



e./ Memory Extract to Computer

Memory retrieve to computer is covered in the KITS™ training PPT



Fiber	Lambda	Reading	Ref	Remote S/N
1	1310nm	-7.27	-8.13	16549
1	1550nm	-7.16	-7.88	16549
2	1310nm	-7.27	-8.13	16549
2	1550nm	-7.16	-7.88	16549
3	1550nm	-60.95	-7.88	16549
4	1310nm	-39.94	-8.13	16549
4	1550nm	-30.28	-7.88	16549
5	1310nm	-39.93	-8.13	16549
5	1550nm	-30.28	-7.88	16549
6	1310nm	-43.18	-8.13	16549
6	1550nm	-41.76	-7.88	16549

Download to KITS software or to CSF file

KITS:
Familiar Excel™ user interface

CSV File:
For those who do not use Microsoft Office

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Application Notes

Comprehensive selection available at

www.kingfisher.com.au/ApplicationNotes.htm

CE ISO 9001 7 YEAR EXTENDED WARRANTY 3 YEAR STANDARD WARRANTY