# KI 8000 Series

## VERSATILE LIGHT SOURCE


***USER INSTRUCTION MANUAL***

KI 8000-UM-5

# Operator Manual
# KI 8000 Series
# Versatile Light Source

Congratulations on your purchase of this instrument, which has been engineered to provide the best possible reliability, convenience and performance. To get the best use from your equipment and ensure its safe operation, please spend a few minutes to read this manual. It contains many useful hints & tips from experts in fibre optic measurements.



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## 1. INTRODUCTION

The KI 8000 Series Laser Light Sources are designed for use in testing fibre optic systems.

One or two LED or laser emitters may be factory fitted in any combination to suit the customer's requirements. This enables the instrument to be configured as a visible fault locator, or stable LED/Laser source at the various fibre wavelengths. Singlemode, multimode or plastic fibre types can be accommodated.

A variety of inexpensive fixed optical connector options are available.

Stability of laser sources is maintained by use of the laser back facet monitor photodiode, which is connected to circuitry that compensates for the temperature dependence of the laser diode characteristics.

Stability of the LED sources is maintained by use of digital temperature compensation which adjusts the drive current to compensate for LED temperature dependence.

The visible laser option at 635 nm provides a bright visible light for visual identification and fault location on both singlemode and multimode fibre. The singlemode output fibre on this option ensures identical safety levels under all conditions.

Laser options at 1310 nm, 1550 nm and 1310/1550 nm provide a good level of performance on singlemode applications.

## 1. INTRODUCTION

A range of modulation tones makes this unit the ideal universal source for fibre identifiers, or lock in detectors. 1 Hz is used to enhance the visibility of the visible fault locator. 270Hz, 1 KHz, 2KHz are standard test tones. A 50% duty cycle square wave with better than 1% frequency accuracy is provided.

The instrument makes efficient use of a single PP3 alkaline battery, providing typically 20~40 hours of run time. Selectable auto turn-off avoids accidentally running down the batteries.

Accessories include a rubber holster for drop protection, soft carry pouch, hard carry case, adaptor patch cords and optional re-chargeable batteries and charger.

Kingfisher power meters are the ideal compliment to this light source, and can be provided together in one carry case, to form an attenuation test kit.

Also available from Kingfisher:

Optical Power Meter
Stabilised Laser Source
Loss Test Set
Return Loss Meter
Attenuator
Talk Set
Cold Clamp

## 2. TYPICAL APPLICATIONS

- Attenuation testing of fibre optic lines, in combination with a Kingfisher optical power meter
- Fault location and fibre identification using the visible laser option.
- Generating test tones for use with fibre identifiers.
- Useful on all fibre types including singlemode, multimode, plastic coated silica and plastic fibre.
- Checking connectors, splices and other components.
- Useful in field, laboratory and production situations.

## 3. SPECIFICATIONS & ORDERING INFORMATION

**Size/Weight:**

35 x 150 x 80 mm / 150 gms

**Environmental:**

Operating: 5 to 55 °C, 95% RH
Storage : 20 to 75 °C, 95% RH

**Power:**

Typically 20 hours from one 9V alkaline cell.
Typically 14 hours from one NiCad cell.
(Doubled for modulated operation).
An external power input is available as an option.

**Display**

Wavelength 635 nm, 850 nm, 1300 nm, 1310 nm, 1550 nm / OFF (as relevant).
Modulation 0, 1, 270,1000, 2000 Hz
Low battery indicator
Timer

## 3. SPECIFICATIONS & ORDERING INFORMATION

| Min. Output | | | | | |
|---|---|---|---|---|---|
| Model No. | Option | SMF dBm | MMF dBm | TYP FWHM | Standard Connector |
| K18010 | 850mn LED | - | -20 | 35 | Please specify |
| K18011 | 1300nm LED | -45 | -20 | 100 | Please specify |
| K18012 | 850/1300nm LED | - -45 | 850nm :-20 1300mn: -20 | 35 100 | ST (1 Port) |
| K18013 | 850nm LED 1300nm LED | - -45 | 850nm :-20 1300mn: -20 | 35 100 | ST/ST (2Port) |
| K18014 | 635nm laser 850nm LED | -3 - | 635nm : -3 850mn : -20 | 3 35 | Please specify (2 Port) |
| K18015 | 635nm laser 1300nm LED | -3 -45 | 635nm : -3 1300nm: -20 | 3 100 | Please specify (2 Port) |
| K18020 | 1310nm laser | -7 | -7 | 5 | Please specify |
| K18021 | 1550nm laser | -7 | -7 | 5 | Please specify |
| K18022 | 1310/1550 nm laser | -7 | -7 | 5 | Please specify (1 Port) |
| K18023 | 635/1300mn laser | 635nm: -3 1310nm: -7 | 635nm; -3 1310nm: -7 | 3 5 | Please specify (2 Port) |
| KI8024 | 635/1550nm laser | 635nm .3 1550nm: -7 | 635nm .3 1550nm: -7 | 3 5 | Please specify (2 Port) |
| KI8030 | 635nm laser | -3 | -3 | 3 | Please specify |
| K18031 | 850nm LED 1310nm Laser | - 1310: -7 | 85Onm : -20 1310: -7 | 35 5 | Please specify (2 Port) |

## 3. SPECIFICATIONS & ORDERING INFORMATION

**Stability:**
LED: 0.02 dB, Laser: 0.04 dB. ±2°C,
15 minutes, typical, after warm up.

SMF = 9.5/125 micron fibre
MMF = 62.5/125 micron fibre

**Connector:**
Please refer to brochure for current connector options. A wide variety of singlemode, multimode and APC connector styles are available.

**Standard Accessories:**
106 - Operation Manual
125 - Battery 9v PP3 1 pc

**Optional Accessories:**
171 - Rubber Holster
181 - Soft Carry Pouch
142 - Hard Carry Case with space for:
KI 6000 power meter and accessories
KI 8000 source and accessories
213 - ST FDDI Adaptor Set
(one ST/ST Patch-cord, one ST FDDI connector adaptor)
126 - External power jack, power pack supplied
126A - External power jack, no power pack supplied

Kingfisher International maintains an ongoing program of product improvement, and reserves the right to improve and amend specifications without notice.

## 4.1 SAFETY

This equipment complies with the following laser safety standards:

IEC825 1 and 21 CFR1 040.10, Class 1 (for infra red lasers and LEDs up to 1 mW):

LED options and infra red laser options

Devices in this category are classified as safe for use by technicians under normal viewing, **as long as magnifying devices are not used.**

IEC 825-1 and 21CFR1040.10, Class 2 (for visible lasers up to 1 mW):

Visible laser options

Devices in this category are classified as eyesafe on the assumption that the eye aversion response will protect the user

**It is the responsibility of the user to gain adequate training and familiarity with relevant safety issues and work practices before using this equipment.**

## 4.2 OPTICAL CONNECTOR

The optical connector is a precision component, and requires care in use. Please carefully observe the following:

- Never try mating incompatible or damaged connectors into the socket;
- Always clean the mating connector before mating;
- Always replace the dust cap after use.

To clean the connector, wiping gently with a soft lens tissue is normally adequate. For more thorough cleaning, alcohol can be used to dissolve dirt, followed by a blast of clean air to disperse any dust.

Do not use acetone or more active solvents which could dissolve the epoxy glue or plastic components used within the connector assembly.

Replacement of the optical connector must be performed at an authorised service centre.

## 4.3 POWER

This instrument runs off any 9V PP3 cell. An alkaline type cell will generally provide around 20 hours of operation, which in normal use will provide many weeks of use between battery changes.

For this reason, it is considered more convenient to use alkaline cells rather than rechargeable NiCad cells. However, the instrument may be used with NiCad cells, where about 14 hours of operation is achieved.

To ensure proper operation with NiCad batteries, use PP3 cells with the higher nominal rating of 8.4 V. Lower voltage batteries may cause incorrect operation of the low battery indicator.

NiCad batteries are removed for recharging. There is no charger circuit, which avoids the possibility of accidentally attempting to charge alkaline batteries, which can result in damage.

If your instrument has been fitted with an external power input, then using external power merely disconnects the battery, and does not provide any changing function.

The external input is a 3.5mm jack plug with +ve tip and accepts 9 volts DC only. Do not use any plug pack except those designed for a nominal 9 volt DC output.

The unit is diode protected from reverse battery and external power connection,

When used in the modulated mode, battery life is approximately doubled.


Figure 1
ATTENUATION TEST KIT
Showing KI6000 power meter, KI800 light source, rubber holsters and hard carry case.


Figure 2
Showing KI8000, rubber holster and hard carry case.

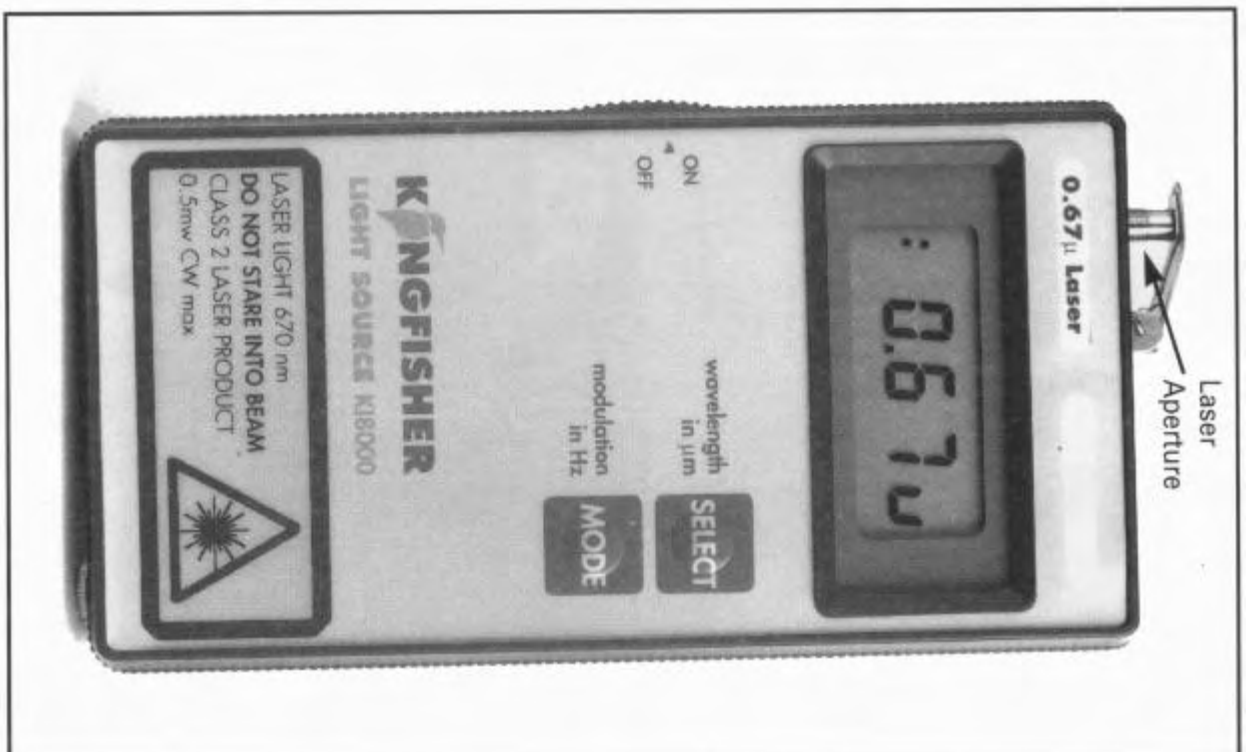


Figure 3
Showing front panel controls of KI8000, The laser warning label may change.

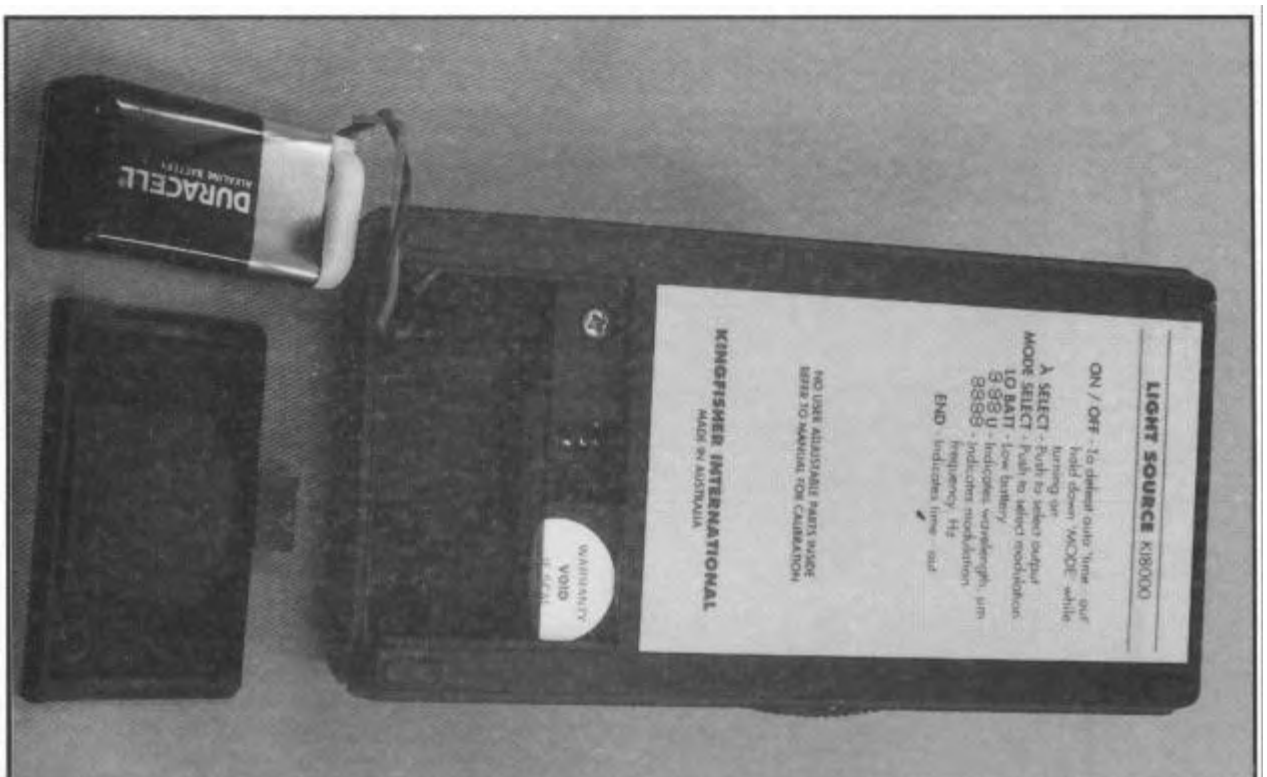


Figure 4
REAR VIEW OF KI 8000

## 5.1 INSPECTION

On arrival, please carefully inspect for any obvious physical damage, and if any damage is found, file a claim with the carrier immediately. Keep all packaging material for inspection by the relevant insurers. See back of manual for returns instructions.

## 5.2 TURNING ON, CONTROLS & DISPLAY

Find the battery compartment at the rear of the instrument, slide off the cover and connect the single PP3 battery.

The ON/OFF knob is on the side of the instrument. Slide the switch 'ON' and the display will read:

OFF This indicates the unit is ready for action, but no optical sources are activated.

LO BATT This indicates the battery is nearly exhausted.

ERR 1, 2 The battery saving switched inverter has failed, the unit needs service.

If the battery voltage is too low, the unit will lock out and not operate.

Once you have established the 'OFF' indication, you will notice a colon slowly winking. This indicates that the auto timeout will turn off the source and put the unit in a low power mode about 10 minutes after the last button actuation. This situation is denoted by 'end' on the display.

To defeat the auto timeout, push down the 'mode' button for a few seconds whilst turning the unit on. The colon will stop flashing .

To select the appropriate optical emitter, push the 'select' button. The nominal wavelength of the activated mitter will be indicated on the display, in nm.

To select any modulation function, push the 'mode' button. The modulation frequency in Hz will be displayed.

In use, the display will alternately display the operational wavelength and modulation function.

To turn the unit off, move the slide switch to the 'off' position.

## 5.3 CONNECTING A PATCHCORD

Please read section 4.2 'optical connector' to avoid damaging the connector port.

To get optimum performance in your measurement application, it is important to have correct test patch-cords, in good condition. Particular consideration needs to be given to:

- Connector style, eg. ST, SMA, SC, FC, Biconic, D4, DIN etc.
- Fibre type. The important parameter is the core diameter which is commonly:

| | |
|---|---|
| 9.5µ 10µ | Singlemode (glass) |
| 50µ, 62.5µ 100µ | Multimode (glass) |
| 280µ | Plastic clad silica |
| 1 mm | Plastic fibre |

Due to the variety of systems in use, it is impossible to give reliable guide lines on connectors and fibre types, and it is up to the user to ensure equipment has been specified correctly. However, Kingfisher sales and support offices will endeavour to provide assistance where needed.

When performing multimode measurements with a light source, it is necessary to use a mandrel wrap ( or some other method ) to achieve equilibrium modal distribution. Refer to the KI6000 power meter manual for details on this technique

## 6. CARE OF YOUR INSTRUMENT

- Please observe the comments in section 4.2 about maintaining the performance of the optical connector
- Use only high quality fully sealed alkaline batteries to avoid the possibility of damage due to battery leakage
- During transport and storage, place the instrument in in appropriate place to avoid vibration, heat or moisture.
- Avoid leaving the unit in direct sunlight, particularly when operating. Store in a cool place.
- Whilst being reasonably resistant to dust and moisture, the unit is not waterproof.
- The instrument housing can be safely cleaned by most mild cleaning solvents. Do not use acetone or other plastics dissolving chemicals.

## 7. MAINTENANCE

**Important! All maintenance:**

This equipment contains delicate and expensive fibre optic and opto electronic components. **Do not open unless:**

The warranty has expired

You are authorised to do so

You have familiarity with handling optical fibres You have laboratory facilities

You have read section 4.1 on safety, and have appropriately certified calibrated power meters and patch-cords available to check the optical emission level of the unit.

**Please note:** There are no user adjustable components internally. Electronic malfunction would imply returning the unit to an authorised service centre.

**CAUTION!** This unit contains static sensitive devices. Full anti static handling procedures should be used when handling the circuits.

**CAUTION!** Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

**CAUTION!** Adjustment of internal potentiometers is not advised, since this can result in damage to the optical emitters, or incorrect operation. The unit has been adjusted for optimum operation of the emitters fitted for your application.

Never allow a hot soldering iron to touch the optical fibres. This will cause instant damage. If using a soldering iron, make certain that any fibres are protected from contact with the heat.

Do not attach probes to an operating circuit, since such action could cause damage to sensitive optical emitters.

## 7. MAINTENANCE

### Opening the instrument

1. Disconnect and remove the battery

2. Undo the 2 screws in the battery compartment.

3. Separate the two halves of the instrument by pulling apart at the battery end

4. The pcb solder side and optical devices will be revealed. Stop here to clean or change optical connectors

5. To get to the electronic components, remove the two pcb retaining screws. The pcb and optical interface can then be removed as an operational unit.

6. Assembly is the reverse process. Take care not to accidentally trap and crush any optical fibres during assembly.

### Optical connector maintenance

This will depend on wavelength, device type and connector option, since some options integrate the optical device into the emitter, and other options have a short adaptor patch-cord internally.

If the optical device is integrated into the optical port, the only possible maintenance is cleaning of the port.

If the optical device is pigtailed (laser options), it is possible to dismantle the connector for thorough cleaning, or splice on a new pigtail.

### Display / controls:

Operator display and controls are as follows:

| | |
|---|---|
| LCD display | Kingfisher custom display |
| Slide switch: | Mors 25336N |
| Push buttons: | Alps SKHKAA |

Other electronic malfunction would be best corrected by an authorised Kingfisher service centre.

## 8. INSTRUMENT RETURNS

Before returning an instrument for repair, please check with Kingfisher or its authorised representative to obtain a Return Materials Authorisation (RMA) number.

Please specify the nature of required repair work to help ensure fast response.

## 9. DISCLAIMER & 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 or its representatives if accidental damage or inconvenience result from use or attempted repair of the equipment.

Kingfisher products are guaranteed against defective components and workmanship for a period of 1 year from the date of delivery, unless otherwise specifically stated in the original purchase or contract agreement.

This warranty specifically excludes damage to the optical connector, or incorrect use. Opening the unit will invalidate the warranty. Liability is limited solely to repair of the equipment.

**Address & Contact Details**

Attn Customer Service Dept
Kingfisher International Pty. Ltd.
30 Rocco Drive
Scoresby, Victoria 3179, Australia

Tel: (03) 9757 4100
Fax: (03) 9757 4193

International
Tel: 613 9757 4100
Fax: 613 9757 4193

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|---|---|
| **W. Coast USA** | **- phone late business hours** |
| **E. Coast USA** | **- fax only** |
| **Europe** | **- phone early business hours** |
| **Japan** | **- phone normal business hours** |
| **New Zealand** | **- phone afternoon** |

## 10. ENGINEERING NOTES