KI 2x400 Series

HANDHELD 2-WAY +LENGTH +ORL FIBER CERTIFIER

Test Applications

- SM, MM & both fiber types
- Tier 1 cable certification & reporting
- Bidirectional loss, length[*] & ORL[*] in one hook-up with integrated VFL (VisiTester)[*]
- Optical power, continuity & polarity

Revision 9

The KI 2x400 series is a fast, accurate and easy bi-directional Tier 1 certifier for multimode and single mode fiber. 2-Way loss, length[*] & ORL[*] pass/fail are displayed in real time on both instruments, at multiple λ, for one test hook-up per fiber.

The compact instrument is also a stand-alone light source, optical power meter and VFL[*].

The VisiTester[*] feature mixes a VFL laser with the test signal, making a connected test fiber obvious at the other end.

Excel-based reporting software provides tamper-proof and Standards-based Tier 1 certification and reporting, ensuring a combination of flexibility, productivity, and confidence. Datalogging, download and a real time mimic display are also included.

* Length, ORL and Visitester on selected instrument models

Features

- Ease to use, slim & versatile

- Loss, length[*] & ORL[*] tester for high fiber counts

- Real time pass / fail

- Sunlight readable & backlit LCD

- SM, MM (EF Compliant) & quad test options

- Large memory & USB key file dump

- Interchangeable connectors

- Real-time, secure PC reporting software

- Continuity test tone with Multi-Fiber ID

- VFL VisiTester[*] option

- Long battery life, USB external power

- >25 calibration λ, 1% accuracy

- ISO 17025 traceable calibration

- 3-year warranty

- 3-year recommended calibration cycle

- Made in Australia

KI 2x400 Series - Handheld 2-way +ORL +Length Fiber Certifier

A pair of fully featured KI 2x400 Loss Test Sets easily tests and reports fiber optic loss, length and ORL pass / fail against standards. Backed up by ILAC/ ISO 17025 traceable calibration, it is ideal for test applications requiring accuracy with high throughput.

The real-time and comprehensive test display helps the user ensure there is a good connection before storing a reading. This ensures superior accuracy, and makes fault finding easier and quicker.

Two identical instruments are used, one of them automatically takes over as the master, and the same information is displayed each end, which simplifies practical operation. The test procedure is the same for all fiber types.

The instruments provide flexible ways of working and, can be used with or without an on-site computer. They are compact, lightweight and have >80 hours battery life.

Associated KITS™ software is tightly integrated and provides an easy workflow to set up, test and report against standards and customer requirements, in a tamper-proof yet flexible reporting environment.

Test results can be stored in the 10,000 fibers memory, along with a text-input cable name and timestamp, and then dumped directly onto a USB memory key, providing limitless, secure and future-proof data handling. These secure files or instrument memory can then be downloaded into KITS™. Alternatively, if a computer is available on-site, live readings can be clicked directly onto a customer report using our proven KITS™ customizable Excel-based reporting software. Pass / Fail standards can be selected as: international, in-house or ad hoc, so the user can enter updated standards as appropriate.
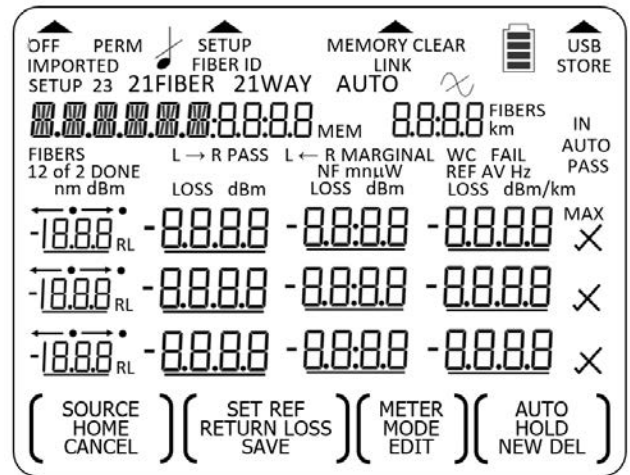
TWO WAY AUTOTEST SPECIFICATIONS

Using a pair of instruments, bi-directional test is achieved in real time over a single fiber with one hook-up, giving greatly superior speed, accuracy and ease of use compared to conventional two-step, two-fiber instruments. This saves training, skill, time, cleaning and materials, while also improving test confidence.

All 3 loss, length & ORL measurements are seamlessly integrated into the real time display. Loss referencing can be performed locally or remotely.

VisiTester illuminates the test fiber, making the other end easy to find, particularly when cable or fiber labelling is mis-matched or missing.

A handy two-way Autotest communications feature helps both users step quickly through a large fiber array.

Fiber Type	Wavelengths	Length Range / Accuracy	Loss Range	Loss Repeatability / Linearity
MM	850, 1300 nm (62.5 µm) 850, 1300 nm (50 µm)	5.5 dB / 3 m or 1 % 3.5 dB / 3 m or 1 %	27 dB 24.5 dB	0.06 dB
MM	850, 1300 nm VisiTester (62.5 µm) 850, 1300 nm VisiTester (50 µm)	5.5 dB / 3 m or 1 % 3.5 dB / 3 m or 1 %	24 dB 21.5 dB	0.06 dB
SM	1310, 1550 nm	30 dB / 3 m or 1 %	47 dB	0.04 dB
SM	1310, 1490, 1550, nm 1310, 1550, 1625 nm	27 dB / 3 m or 1 %	44 dB	0.04 dB
SM	1310, 1550 nm, VisiTester	27 dB / 3 m or 1 %	44 dB	0.04 dB
SM	1310, 1490, 1550, nm, VisiTester 1310, 1550, 1625 nm, VisiTester	24 dB / 3 m or 1%	41 dB	0.04 dB

Note: for more detailed source & ORL specifications, refer Light Source and ORL specifications

ONE WAY AUTOTEST SPECIFICATIONS

Using a single instrument, the light source and power meter can be looped around in one-way Autotest mode, to measure loss only.

The 2-way test ports also operate as one-way Autotest light sources, compatible with other Kingfisher Autotest power meters, or as basic light sources

The power meter is also compatible with other Kingfisher Autotest sources with matching wavelengths.

One-way Autotest provides fast & easy loss testing at up to 3 λ, in one direction, along with the source nominal power level and λ, with either local or remote referencing.

Fiber Type	Wavelengths	Loss Range	Loss Repeatability / Linearity
MM	850, 1300 nm (62.5 µm) 850, 1300 nm (50 µm)	27 dB 24.5 dB	0.06 dB
MM	850, 1300 nm, VisiTester (62.5 µm) 850, 1300 nm, VisiTester (50 µm)	24 dB 21.5 dB	0.06 dB
SM	1310, 1550 nm	47 dB	0.04 dB
SM	1310, 1490, 1550, nm 1310, 1550, 1625 nm	44 dB	0.04 dB
SM	1310, 1550 nm, VisiTester	44 dB	0.04 dB
SM	1310, 1490, 1550, nm, VisiTester 1310, 1550, 1625 nm, VisiTester	41 dB	0.04 dB

Note: for more detailed source or meter specifications, refer light source or power meter specifications

OPTICAL POWER METER SPECIFICATIONS

The power meter port uses the same interchangeable connector adaptors as the other ports.

ISO17025 Traceable calibration at many wavelengths at 1% accuracy, and full linearity test, is the best in the industry.

The tight Total Uncertainty specification covers the full range of power levels, ambient temperatures, connectors and fibers, without user dark current offset.

The multi-Fiber ID feature tests common test tones and, can also positively identify 1 of 12 test tones from multiple test sources. This can speed up continuity / polarity testing.

Please enquire for non-standard power meter configurations such as high-power detectors up to +33 dBm, POF / MPO. MTP / MXC applications, special connectors, wavelength selective detectors, special calibrations etc.

Response λ Nm	Damage level dBm	Calibration λ nm	Power range dBm	Tone & Autotest Min dBm	Midrange linearity[1] dB	Calibration Accuracy[2] %	Polarization Sensitivity[5] dB	Total Uncertainty dB[3,4]	λ Sensitivity ± 30 nm[4] dB
InGaAs detector									
600 ~ 1700	+15	*780, 820, 850, 980* **1270, 1290, 1300, 1310, 1330,** **1350, 1370, 1390, 1410, 1430,** **1450, 1470, 1490, 1510, 1530,** **1550, 1570, 1590, 1610, 1625,** 1650	+10 ~ -60 +10 ~ -70	-45 -50	0.04	1 % (0.06 dB)	< 0.05	0.3	0.03
Ge detector									
600 ~ 1650	+20	*635, 650, 660, 780, 820,* 1590, *1610, 1625, 1650* **850, 880, 910, 940, 980, 1270,** **1290, 1300, 1310, 1330, 1350,** **1370, 1390, 1410, 1430, 1450,** **1470, 1490,** 1510, 1530, 1550, 1570	+15 ~ -50 +15 ~ -60	-40 -50	0.06	1 % (0.06 dB)	< 0.05	0.5	0.03
					Typical	Typical	max	typical

Note **1**: Mid-range linearity excludes top 5 dB and bottom 10 dB of range.

Note **2**: Calibration condition: non coherent light, -35±5 dBm, 23±1°C, ±1 nm, 10±3 nm FWHM, PC ceramic connector, 100 µm fiber.

Note **3**: Includes contributions of: varying optical connector types, calibration uncertainty, linearity over temperature & range, and fiber core diameter up to 200 ·m.

Note **4**: At calibration wavelengths in bold type.

Note **5**: For APC connector only.

LIGHT SOURCE SPECIFICATIONS

The emitters feature excellent repeatability and stability. Re-connection repeatability is < 0.1 dB, which contributes to exceptional test confidence.

LED sources are Encircled Flux (EF) compliant, to provide the most consistent and reliable testing results.

The Zero Warm Up (Ultra Stable) source option uses a unique optical design, to provide zero warm up, ultrahigh temperature stability, and is unaffected by varying back reflection. It provides unmatched test stability in arduous conditions.

The multi-Fiber ID feature tests common test tones and, can also

positively identify 1 of 12 test tones from multiple test sources. This can speed up continuity / polarity testing.

Please enquire for non-standard source configurations such as other wavelengths, power levels, connectors etc.

Up to 2 test ports with 6 assorted LED or laser emitters can be custom specified per instrument, making this a versatile tester for mixed multimode / single mode fiber testing.

Laser options can be compliant with CWDM standards to cover typical cable qualification for O, E, S, C, & L bands, including the water absorption peak, 1625 and 1650 nm.

	1310 / 1550 nm F-P Laser	1490 / 1625 nm CWDM[6] Laser	850 / 1300 nm LED	Comments
Power accuracy		± 1 dB		Refer to ORDERING INFORMATION for nominal power level
Short term stability (dB) KI27400[7] / KI23400[8]	0.04 / 0.03	0.06 / 0.04	0.01	
Stability over temp (dB) KI27400 / KI23400	0.6 / 0.2	0.6 / 0.2	0.35	Typical / Max
λ initial tolerance (nm)	20	6.5	NA	At 25 °C
λ width, nm	3	< 1	NA	FWHM, typical
λ nm/°C	0.4	0.1	0.4	Typical
Mode Controlled Source	NA	NA	Mode controlled	50/125 compliant: IEC 61280-4-1 {Ed.1.0}, TIA/EIA 526-14A & TIA TSB-178.
Reconnection repeatability (dB)	0.1	0.1	0.05	95 % confidence
Laser output power	Adjustable over 7 dB in 0.01 dB steps		NA	-
Modulation	270 Hz, 1 kHz, 2 kHz ± 2 %, 12 Multi-Fiber ID tones, 2 Hz blink for VisiTester			-

Note 6: CWDM laser wavelengths: 1270, 1290, (1310), 1330, 1350, 1370, 1390, 1410, 1430, 1450, 1470, 1490, 1510, 1530, (1550), 1570, 1590, 1610 nm

Note 7: For 15 min, typ. ± Δ 2°C, after warmup, ORL < -25 dB

Note 8: For 15 min, max, ± Δ 3°C

VisiTester SPECIFICATIONS

The unique VisiTester option mixes a powerful VFL with Two-Way Autotest, so at the far end, the active test fiber winks, making the fiber to be tested obvious to the user. The VFL can also be selected in stand-alone mode, for typical fault-finding

applications. In this mode, The VFL is mixed with a test tone for a clip-on fiber identifier. This mixed signal extends practical fault-finding options since a clip-on fiber identifier can be used simultaneously with VFL.

Parameters	Values
Wavelength (nm)	650 ± 5
Power dBm	-1 ± 1 SM / MM fiber
Laser Safety	Class 1, IEC60825-2
Blink rate (manual)	CW or 2 Hz

ORL SPECIFICATIONS

The full-featured ORL meter can operate in stand-alone mode or integrated with Autotest.

In two-way Autotest, the ORL is measured each end of the link, and the results displayed on both instruments.

A Zero-function compensates for residual reflections, and to provide extended measurement range with improved linearity. A User-Calibration Mode compensates for losses in a test set-up, which improves overall accuracy.

For testing PC-polish connector patch lead ORL at both ends, a high port isolation option is available, which is an ideal solution for high throughput acceptance testing during manufacture and QA.

Parameters	Laser		LED
	1 or 2 λ	3 or 4 λ	
Range	0 ~ 65 dB	0 ~ 60 dB	0 ~ 40 dB (62.5 μm) 0 ~ 37 dB (50 μm)
Port isolation	Standard > 30 dB; Optional > 50 dB		> 22 dB
ORL accuracy	0 ~ 50 dB: 0.5 dB 50 ~ 65 dB: 1 dB after zero offset	0 ~ 45 dB: 0.5 dB 45 ~ 60 dB: 1 dB after zero offset	0 ~ 30 dB: 0.5 dB 30 ~ 45 dB: 1 dB after zero offset
Resolution	0 ~ 50 dB: 0.01 dB 50 ~ 65 dB: 0.1 dB	0 ~ 45 dB: 0.01 dB 45 ~ 60 dB: 0.1 dB	0 ~ 30 dB: 0.01 dB 30 ~ 45 dB: 0.1 dB
λ available	See source options in *LIGHT SOURCE SPECIFICATIONS*		

GENERAL SPECIFICATIONS

The practical interchangeable optical connectors are dust & drop protected and are very simple to swap over or clean. SC adaptors are supplied, with others available including small form factor LC and universal styles. The metal-free adaptors avoid damaging contamination of connectors in high power systems.

The instrument has excellent battery life. Flexible instrument power options include alkaline or rechargeable batteries, with a jumper selectable on-board battery charger. External power is via micro USB. The custom LCD is clearly sunlight readable, operates over a wide temperature range, and has a reliable LED backlight.

Memory operation is simple, with 10,000 fiber capacity, and the memory can be easily dumped directly onto a USB key, providing effectively infinite capacity. Auto-incrementing identification text is stored with each test result and, can meet standard based labelling schemes. The user can go back and re-test a fiber.

Firmware & software updates (with standards and other updates) are free.

Parameters	Value	Parameters	Value
Battery life	Laser/LED source: 80 hours in Autotest, typical Power meter: 1000 hours, typical	Operating/Storage	-15 to 55 °C / -25 to 70 °C
Size	190 x 105 x 35 mm (7.5 x 4.1 x 1.4")	Relative humidity	0 ~ 95 %
Weight	420 gm (0.9 lb.) / Shipping 1.5 Kg (3.3 lb.)	Tone detection	150 ~ 9900 Hz ± 1 %
LCD size	74 x 55 mm / 2.9 x 2.2"	Recommended calibration cycle	3 years
Case	Polycarbonate / rubber edges & corners, moisture resistant, 1-meter drop tested	Power	2 Alkaline AA cells or 2 x NiMH AA cells, user selectable charging; Ext power input via micro-USB; Selectable auto-off, low battery indicator, backlit display
Dust cap	Captive, functions as tilt bail when open		
Memory	Test results & timestamp for 8,000 fibers, unlimited on USB memory key		

Australian and international patents. Technical data is subject to change without notice as part of our program of continuous improvements. Class 1 Laser / LED infra-red device compliant with IEC60825-2.

ORDERING INFORMATION

Description	Source Power (dBm) @ Fiber Type (µm)					Ports	P/N
	Laser	LED			VisiTester		
	SMF	SMF	50	62.5	SMF		
	Refer to LIGHT SOURCE SPECIFICATIONS for Power Accuracy specifications						
KI27400 series: Loss Testing only							
Instrument, LTS-2W 850-1300 nm, Ge	-	-35	-25.5	-23	-	2	KI27403-Ge
Instrument, LTS-2W 1310-1550 nm, InGaAs	-3	-	-	-	-	2	KI27422-InGaAs
Instrument, LTS-2W 1310-1550 nm APC, InGaAs	-3	-	-	-	-	2	KI27422-InGaAs-APC
Instrument, LTS-2W 1310-1490-1550 nm APC, InGaAs	-7	-	-	-	-	2	KI27427-InGaAs-APC
Instrument, LTS-2W 1310-1550-1625 nm APC, InGaAs	-7	-	-	-	-	2	KI27410-InGaAs-APC
Instrument, LTS-2W 850-1300 nm, 1310-1550 nm, Ge	-3	-35	-25.5	-23	-	3	KI27424-Ge
Instrument, LTS-2W 850-1300 nm, 1310-1550 nm APC, Ge	-3	-35	-25.5	-23	-	3	KI27424-Ge-APC
KI27400 series: Loss Testing & Length (some models have VisiTester)							
Instrument, LTS-2W Length VisiTester, 850-1300 nm, Ge	-	-39	-29.5	-27	-1	2	KI27403LV-Ge
Instrument, LTS-2W Length VisiTester, 1310-1550 nm, InGaAs	-7	-	-	-	-1	2	KI27422LV-InGaAs
Instrument, LTS-2W Length VisiTester, 1310-1550 nm, InGaAs, APC	-7	-	-	-	-1	2	KI27422LV-InGaAs-APC
Instrument, LTS-2W Length VisiTester, 1310-1490-1550 nm APC, InGaAs	-10	-	-	-	-1	2	KI27427LV-InGaAs-APC
Instrument, LTS-2W Length VisiTester, 1310-1550-1625 nm APC, InGaAs	-10	-	-	-	-1	2	KI27410LV-InGaAs-APC
Instrument, LTS-2W Length, 850-1300 nm, 1310-1550 nm, Ge	-3	-35	-25.5	-23	-	3	KI27424L-Ge
Instrument, LTS-2W Length, 850-1300 nm, 1310-1550 nm APC, Ge	-3	-35	-25.5	-23	-	3	KI27424L-Ge-APC
KI23400 series with Loss, Length, ORL (some models have Ultra Stable sources or VisiTester)							
Instrument, LTS-2W ORL Length VisiTester, 850-1300 nm, Ge	-	-39	-29.5	-27	-1	2	KI23403OLV-Ge
Instrument, LTS-2W ORL Length VisiTester, 850-1300 nm, 50 um, Ge	-	-39	-29.5	-27	-1	2	KI23403OLV-Ge-50U
Instrument, LTS-2W ORL Length VisiTester, 1310-1550 nm U/S, InGaAs	-7	-	-	-	-1	2	KI23422OLV-InGaAs
Instrument, LTS-2W ORL Length VisiTester, 1310-1550 nm U/S, InGaAs, APC	-7	-	-	-	-1	2	KI23422OLV-InGaAs-APC
Instrument, LTS-2W ORL Length VisiTester, 1310-1490-1550 nm U/S APC, InGaAs	-10	-	-	-	-	2	KI23427OLV-InGaAs-APC
Instrument, LTS-2W ORL Length VisiTester, 1310-1550-1625 nm U/S APC, InGaAs	-10	-	-	-	-	2	KI23410OLV-InGaAs-APC
Instrument, LTS-2W ORL Length, 850-1300 nm, 1310-1550 nm, Ge	-3	-38	-25.5	-23	-	3	KI23424OL-Ge
Instrument, LTS-2W ORL Length, 850-1300 nm, 1310-1550 nm APC, Ge	-3	-38	-25.5	-23	-	3	KI23424OL-Ge-APC

Please enquire for instrument with other combinations of wavelength, power levels, PC/APC connectors and measurement capabilities.

STANDARD ACCESSORIES

Description	Quantity
SC/SC (OPT046) Hybrid adaptors	1 per port
SC/LC (OPT076) Hybrid adaptors	1 per port
SC/ST (OPT040) Hybrid adaptors	1 per port
SC PC Terminator to check ORL reading (OPT703)	1
SC APC Terminator to check ORL reading (OPT704)	1
PC-to-APC Test Lead to check ORL reading (OPT705)	1
50 & 62.5 µm fiber mandrel wrap set for Multimode sources (OPT701)	1 set
USB cable (A-B type)	1
Carry Pouch	1
Wrist Strap	1
Operation manual	1
QA certificates	1 set
ILAC/ NATA traceable calibration certificates including: Power Meter, Light Source, Two-way detector	1 set

OPTIONAL INTERCHANGEABLE CONNECTOR ADAPTORS

This instrument is supplied with metal-free sleeve optical interchangeable connector adaptors. The source ferrule type is fixed, and customer specified as either PC or APC. The power meter is for both PC & APC. Green is associated with APC. You can order any number of connector adaptors. Order quantity one per port. Universal adaptors are recommended to be used only on power meter ports.

Description	P/N	Description	P/N
FC	OPT051	E2000/LSH, Green	OPT060G
ST	OPT040	E2000/LSH	OPT060
LC	OPT076	1.25mm universal	OPT084
MU	OPT080	2.5mm universal	OPT081
HFBR	OPT078	F3000	OPT072
LSA / DIN47256	OPT071	SMA	OPT082

OPTIONAL ACCESSORIES

Description	P/N
Option, Carry Case for 2 Instruments	OPT153
Option, Carry Case includes Cletop-style cleaner & Cleaning Sticks	OPT154B