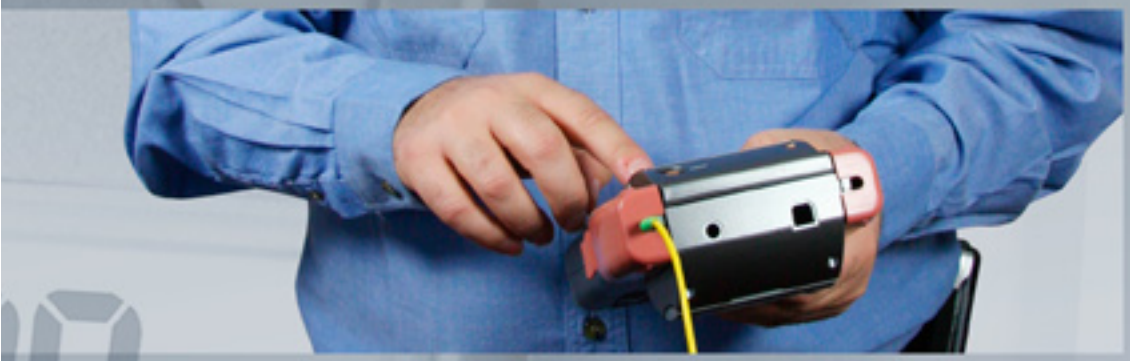
KINGFISHER INTERNATIONAL



2009
Short Form Catalogue

The Traceable Fiber Optic Testers

kingfisher.com.au

For over 23 years, Kingfisher has provided innovative and practical fiber optic test equipment, with a proven record of performance and reliability in over 70 countries.

Today we continue with this tradition, and offer many new solutions to reflect changing industry needs. Today's customers are asking for ease of use, more automation, and greater flexibility to cover a broad range of applications.

Kingfisher's commitment to quality is embodied in our modern management practices which emphasize a process of continued improvement in all aspects of the business.

Backed up by a professional team, founders Bruce and Rosmin Robertson continue with a simple philosophy "Honest business brings long term growth".

CALIBRATION TRACEABILITY

Kingfisher instrument calibrations have been fully traceable to fundamental standards since 1993. Our optical calibration laboratory is externally audited to ISO17025. Our instruments can be used to calibrate other instruments to ISO9001.

ilac-MRA NATA

WORLD RECOGNISED
TRACEABLE CALIBRATION
Accreditation No 4853

AWARDS

Kingfisher has received world wide recognition by key customers, national and state governments and industry bodies for instrument quality, technical and business innovation and export performance.

PRODUCT RANGE

- Loss test sets
- Power meters
- Light sources
- Fault finders & identifiers
- Return loss testers
- Inspection microscopes
- Attenuators
- Talk sets
- PC software
- Interchangeable connectors
- Optical calibration services

MARKET SEGMENTS

- FTTX
- Telco / CATV
- LAN / WAN
- Defence / Aerospace
- Education
- Plastic optic fiber (POF) / Automotive
- Manufacturing / QA

SERVICE & SUPPORT

Kingfisher standard instrument warranty and calibration cycle is 3 years. Warranty is extendable to 7 years.

Our carefully selected network of specialist distributors provide applications support and service in over 70 countries.

Kingfisher service turnaround time is less than two weeks.

QUALITY

Kingfisher equipment has proven its value and rugged reliability in regular use in the harsh and dusty Australian deserts, the steamy tropical conditions of Malaysia, and the extreme cold of Alaska. Our instrument reliability is amongst the best in the industry. We have had ISO9001 since 1994.

NCS INTERNATIONAL CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001

CE

WHY TEST FIBER OPTICS?

- Establish business confidence
- Litigation mitigation & brand protection during a disaster
- Improve service quality
- Ensure reliable system operation
- Debug systems before handover
- Routine preventative maintenance
- Identify fault ownership
- Identify manufacturing & installation defects
- The business value of failure is far greater than the cost of testing
- The business cost of under-testing is usually much higher than the cost of over-testing

WHAT TO TEST?

- Link loss (LTS or source + meter)
- Tx and Rx power (meter or LTS)
- Optical return loss (LTS)
- Transmission system operating margin (attenuator + meter)
- Continuity (various)
- Find a cable fault (various)

WHEN TO TEST?

- Installation of cable or equipment
- Warehouse logistics check
- At handover
- Routine maintenance
- Disaster recovery
- Change of network use
- Transmission equipment commissioning
- During cable or equipment manufacture or development

WHO TESTS?

- Warehouse staff
- QA staff
- Factory staff
- Transmission installation staff
- Routine maintenance staff
- Emergency restoration staff
- Research & development staff
- Varying levels of cable installation staff

- The importance of traceable calibration can be traced back to ancient trading practices
- The modern traceability system is a product of the French Revolution and is run from Paris
- Each major trading nation is a signatory
- Each major trading nation keeps its own physical standards which usually agree to about 1 in 10^9. For example, if weighing a large ship, this uncertainty is the weight of one golf ball
- Optical standards are imprecise in comparison, only about 1 in 10^3. Equivalent to the same ship having a weight uncertainty of a million golf balls
- Refusal to recognize measurements is regarded at a national level as being a serious non-tariff trade barrier

TRACEABILITY

For example :

	Australia	USA
Physical Standards	National Measurement Institute	NIST
Laboratory Accreditation	NATA	NIST and others
International Recognition	MOU and ILAC	

NATA = The National Association of Testing Authorities
NIST = National Institute of Standards and Technology
MOU = Memorandum of Understanding
ILAC = International Laboratory Accreditation Cooperation

TRACEABILITY & WHAT TO LOOK FOR

- Calibration certificates must clearly show the accreditation authority, laboratory registration number, and the laboratory address
- Calibration certificates need to state that the test procedure used is in compliance with the laboratory accreditation
- Reference to ISO9000 or any other quality standard is not traceable
- Serial numbered certificates
- Signature by an approved signatory

Please refer to Accreditation No as evidence of external audited Lab

Kingfisher: NATA accredited lab certificate published at http://www.nata.asn.au

INSTRUMENT GUIDE

		Light Sources				Power Meters						Loss Test Sets				Other Instruments						
		▼ KI 7400 Premium	▼ KI 7800 General	▼ KI 3800 Compact	▼ KI 9800 Pocket	▼ KI 7601 Premium + VFL	▼ KI 7600 Premium	▼ KI 3600 General	▼ KI 9600 Pocket	▼ WS λ Selective	▼ XL Large Area	▼ KI 7340 Two-Way + ORL	▼ KI 7740 Two-Way	▼ KI 7300 Premium	▼ KI 7700 General	▼ Attenuator	▼ Optical Talk Set	▼ Cold Clamp	▼ Visible Laser	▼ Inspection Microscope	▼ Connector Cleaner	▼ Clip-On Fiber Identifier
TELCO / CATV 1310 / 1550 nm	One-Way Loss, dB	●	●	●	●	●	●	●	●		●	●	●	●	●							
	Two-Way Loss, dB											●	●									
	Power, dBm, W					●	●	●	●		●	●	●	●	●							●
	ORL											●										
	Continuity	●	●	●	●	●	●	●	●		●	●	●	●	●		●		●			●
	Fault Locator					●												●	●			
	Connector Clean / Inspect																			●	●	
	Talk																●					
WDM / FTTH SAN / WAN	One-Way Loss, dB	●		●	●	●	●	●	●		●	●		●								
	Two-Way Loss, dB											●										
	Power, dBm, W					●	●			●	●	●		●								●
	ORL											●										
	Continuity	●	●	●	●	●	●	●	●		●	●	●	●	●		●		●			●
	Fault Locator					●												●	●			
	Connector Clean / Inspect																			●	●	
	Talk																●					
LAN 850 / 1300 nm	One-Way Loss, dB		●	●	●	●	●	●	●		●	●	●		●							
	Two-Way Loss, dB											●	●									
	Power, dBm, W					●	●	●	●		●	●	●		●							●
	ORL											●										
	Continuity		●	●	●	●	●	●	●		●	●	●		●		●		●			●
	Fault Locator					●												●	●			
	Connector Clean / Inspect																			●	●	
	Talk																●					
POF / PCS / EDUCATION	One-Way Loss, dB			●	●	●	●	●	●		●		●		●				●			
	Two-Way Loss, dB												●									
	Power, dBm, W					●	●	●	●		●		●		●							
	Continuity			●	●	●	●	●	●		●		●		●				●			
	Fault Locator					●													●			
	Connector Clean / Inspect																			●	●	
MANUFACTURING	One-Way Loss, dB	●				●	●					●		●								
	Two-Way Loss, dB											●										
	Power, dBm, W					●	●					●		●								●
	ORL											●										
	Continuity	●				●	●					●		●			●		●			●
	Fault Locator					●												●	●			
	Connector Clean / Inspect																			●	●	

ORL: Optical Return Loss

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● Intended Capability
○ Limited Capability

		Small Kit Style					Large Kit Style					
		KI-TK012 - Basic LAN Testing	KI-TK013 - Low Cost 850nm LAN Testing	KI-TK015 - Basic SM Testing	KI-TK020 - Basic FTTx Testing	KI-TK014 - POF Testing	KI-TK017 - SM & MM Contrator Certifier Kit	KI-TK016 - SM Certification	KI-TK019 - Premium SM Certifier	KI-TK022 - SM High-fiber-count Testing	KI-TK021 - Premium FTTx Testing	KI-TKxxx - Your Customized Kit Here
TELCO / CATV 1310 / 1550 nm	One-Way Loss, dB	○		●	○		●	●	●	●	●	●
	Two-Way Loss, dB									●	●	●
	Power, dBm, W	●		●	○		●	●	●	●	●	●
	ORL									●	●	●
	Continuity	○		●	●		●	●	●	●	●	●
	KITS™ Reporting software						●		●	●	●	●
WDM / FTTH SAN / WAN	One-Way Loss, dB	○		○	●		○	○	○	○	○	●
	Two-Way Loss, dB									○	○	●
	Power, dBm, W	○		○	●		●	○	●	●	●	●
	ORL									●	●	●
	Continuity	○		○	●		○	○	○	○	○	●
	KITS™ Reporting software						●			●	●	●
LAN 850 / 1300 nm	One-Way Loss, dB	●	●				●	○	○	○	○	●
	Two-Way Loss, dB											●
	Power, dBm, W	●	●	●		○	●	●	●	●	●	●
	ORL											●
	Continuity	●	●	●	●		●	●	●	●	●	●
	KITS™ Reporting software						●	●	●	●	●	●
POF / PCS / EDUCATION 470 / 520 / 660 / 850 nm	One-Way Loss, dB					●						●
	Two-Way Loss, dB											●
	Power, dBm, W					●						●
	Continuity	○	○			●	○					●
	KITS™ Reporting software											●

Fiber Test Kit Contents												
Case	OPT153, small kit case	●	●	●	●	●						
	OPT154, large kit case, Cletop Cleaner, Puffer Brush and cleaning sticks, Connector Cleaning Tools, Microscope, Optional Optical Fiber Identifier and Visible Fault Locator						●	●	●	●	●	
Source	KI 3809 660 nm visible					●						
	KI 3810B 850 nm		●									
	KI 3812B 850/1300 nm	●										
	KI 3818B-APC 1490/1550 nm				●							
	KI 3822B 1310/1550 nm			●				●				
	KI 7402C, ultra stable 1310/1550 nm								●			
	KI 7824C, 850/1300 & 1310/1550 nm						●					
Meter	KI 3600B-Si		●									
	KI 3600XL-Si					●						
	KI 3600B-Ge	●										
	KI 3600B-InGaAs			●	●			●				
	KI 7600C-InGaAs						●		●			
Two Way LTS	KI 7343C-InGaAs 1310/1550 nm + ORL									●		
	KI 7347C-InGaAs-APC 1310/1490/1550 nm + ORL										●	

OPTICAL POWER METER

An optical power meter is used by itself to measure optical power levels. A power meter is used with a light source to certify attenuation and identify fiber ends using the in built tone detector. Instrument color code blue.

	KI 7600 SERIES	KI 3600 SERIES	KI 9600 SERIES
Software for certification, reporting, data logging & USB	✓		
Memory capacity 1900 dual λ results	✓		
Optional built in 635 nm visual fault locator	✓		
Traceable accuracy at calibrated wavelengths	1%	2%	2%
New technology InGaAs	✓	✓	✓
Number of calibrated wavelengths, including CWDM / DWDM	Up to 25	Up to 10	Up to 9
Large detector option for MTRJ, POF, ribbon fiber, MPO, SMI, TOSLINK, mini TOSLINK, HFBR series, 2.5 & 1.25 mm ferrules	XL Series	XL Series	XL Series
Wavelength selective for FTTx		WS Series	WS Series
Multi-λ Autotest compatible	✓	✓	
Measurement range options (dBm)	+27 ~ -70	+30 ~ -70	+24 ~ -70
Calibration cycle 3 year	✓	✓	✓
Simple operation with no warm up or dark current offset	✓	✓	✓
Display units dBm, dB, mW, µW, nW	✓	✓	✓
Universal interchangeable connector	✓	✓	✓
Max / Min recording & tone detector	✓	✓	✓
External power & backlight	✓		
Battery life (hours)	360	1200	300

OPTICAL LIGHT SOURCE

An optical light source is used with a power meter to certify attenuation, or with a power meter or clip-on fiber identifier to test continuity. Instrument color code yellow.

	KI 7400 SERIES	KI 7800 SERIES	KI 3800 SERIES	KI 9800 SERIES
Singlemode options	✓	✓	✓	✓
Multimode options		✓	✓	✓
Re-connection repeatability 0.1 dB	✓	✓	✓	✓
High stability	✓	✓	✓	✓
Warm up time	Zero	15 min	15 min	15 min
Traceable calibration certificates	✓	✓		
LED sources CPR compliant for 50 µm fiber with mandrel wraps for 50 & 62.5 µm fiber	✓	✓	✓	✓
Precision 1310/1550 nm LED SMF source	✓			
Multi-λ Autotest compatible	✓	✓	✓	
Max wavelengths on one port	4	4	2	3
CWDM source wavelength options	✓			
Universal interchangeable connector	✓	✓	✓	✓
Tone generator for use with other test equipment	✓	✓	✓	✓
External power & backlight	✓	✓		
Battery life (hours)	190	190	600	25

Light Source wavelength availability :

LED : 660 nm POF, 850 & 1300 MMF, 1310 & 1550 SMF
Laser : 635 nm, 850 nm VCSEL, 1270 - 1610 nm CWDM, 1310, 1550 & 1625 nm

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OPTICAL LOSS TEST SET

An optical loss test set combines a light source and power meter. The one-way loss test set displays link loss in real time, supports two-way testing via KITS™ software. Instrument color red.

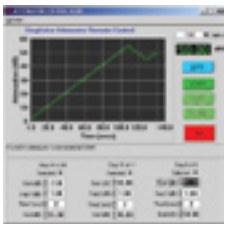
	KI 7300 SERIES	KI 7700 SERIES
Warm up time	Zero	15 min
LED sources CPR compliant for 50 µm fiber with mandrel wraps for 50 & 62.5 µm fiber		✓
Power meter accuracy	1%	2%
Over 22 calibrated CWDM / DWDM λ	✓	
Fast and easy to use	✓	✓
Multi-λ Autotest compatible	✓	✓
Singlemode / multimode options	✓	✓
Max wavelengths on one port	4	2
Memory capacity 1900 dual λ results	✓	✓
Software for certification, reporting, data logging, label printing & USB	✓	✓
Universal interchangeable connector	✓	✓
Re-connection repeatability 0.1 dB	✓	✓
Tone generator & detector	✓	✓
Max / Min recording	✓	✓
Max / Min recording	✓	✓
Local & remote referencing	✓	✓
External power & backlight	✓	✓
Battery life 190-360 hours	✓	✓

OPTICAL TWO-WAY LOSS / ORL TEST SET

The easiest to use test equipment with comprehensive and highly automated testing capability. The two-way loss test set displays average two-way loss in real time, with an optional integrated ORL tester. It's the fastest and most accurate field instrument available today and is used for high volume loss /ORL testing. It can also be used as power meter, light source and ORL meter. Instrument color code red.

	KI 7340 SERIES	KI 7740 SERIES
Real time display of average two-way loss, with Pass / Fail function	✓	✓
ORL test integrated with Autotest	✓	
Warm up time	Zero	15 min
LED sources CPR compliant for 50 µm fiber with mandrel wraps for 50 & 62.5 µm fiber	✓	✓
Power meter accuracy	1%	2%
Over 22 calibrated CWDM / DWDM λ	✓	
Fast and easy to use	✓	✓
Multi-λ Autotest compatible	✓	✓
Singlemode / multimode options	✓	✓
Max wavelengths on one port	4	2
Memory capacity 1200 dual λ results	✓	✓
Software for certification, reporting, data logging, label printing & USB	✓	✓
Universal interchangeable connector	✓	✓
Re-connection repeatability 0.1 dB	✓	✓
Tone generator & detector	✓	✓
Max / Min recording	✓	✓
Local & remote referencing	✓	✓
External power & backlight	✓	✓
Battery life 190-360 hours	✓	✓

AUTOMATED VARIABLE OPTICAL ATTENUATOR



An automated variable optical attenuator is used for optical margin testing on transmission systems, and also for general linearity testing. Instrument color code grey.

	KI 7010 SERIES
Excellent linearity, ORL, PDL and PMD specifications	✓
Very low λ sensitivity suitable for CWDM & DWDM testing	✓
Accurate absolute attenuation calibration	✓
High productivity motor driven instrument	✓
Universal interchangeable connector	✓
Wide attenuation range, 2 ~ 60 dB	✓
Input power capability, +30 dBm	✓
15 automation programs can be stored & recalled	✓
Attenuator automation software	✓
Singlemode or multimode models	✓
Battery life > 200 hours	✓

ATTENUATOR AUTOMATION SOFTWARE

- Easy sequencing and control from a PC
- Ideal for automation of many practical testing sequences
- Max 4 calibrated wavelengths
- Auto-discovery of attached attenuator
- Remote control command set available upon request

OPTICAL TALK SET

Optical talk sets are used during installation and maintenance to provide a temporary voice channel over a single fiber.

	KI 020 SERIES
Typical 250 km distance range over one fiber	✓
Hands-free full duplex headset or speaker phone operation	✓
Built-in conferencing on one or more fiber spans	✓
Mid-span conferencing capability via optional clip-on probe	✓
Connection to unterminated Fiber ends via optional clip-on probe	✓
Easy to use, reliable, Field proven talk sets	✓
All talk sets are identical, so no A/B matching problems	✓
Universal interchangeable connector	✓
Excellent voice quality	✓

OPTICAL FIBER IDENTIFIER

An optical fiber identifier is used to identify a live fiber, check continuity or verify a route. Long distance capability.

	KI 6151 SERIES	KI 6171 SERIES
Applications	Long distance	Short to medium distance
Active display of traffic or test tone	✓	✓
Core power display	✓	✓
4 easy-change chucks for : bare fiber, patch cords & ribbon fiber	✓	✓
Low false detection rate combined with excellent sensitivity	✓	✓
Auto turn-off	✓	✓
Very easy to use	✓	✓

VISUAL FAULT LOCATOR

A visual fault locator is used to find faults, perform continuity testing, and verify a signal path on most types of fiber over short distances up to a few km.

	KI 6351 PEN STYLE
Wavelength	635 nm
Emission	Pulsed
Connector	2.5 mm
Optional adapter of 2.5mm - 1.25mm	✓
IP67 rated waterproof, durable & drop resistant construction	✓
Class 2 laser device, 0.6 mW or -2.2 dBm typical power output	✓
Batteries	2 x AAA
Battery life (hours)	80

A unique patented precision optical fault locator for use with an OTDR.

	COLD CLAMP
Overcomes OTDR distance accuracy limitations when finding optical faults	✓
Finds hidden optical faults, within 1 meter, over long distance	✓
Reduces network hazard and days of labour as exploratory trenching is eliminated	✓
Minimizes community disruption and excavation damage	✓
Finds faults and breaks in fibre cables where there is no visible evidence	✓
Minimizes service disruption, since it can be used on a live system	✓
Field Proven. Telcordia (Bellcore) report available on request	✓

A handheld fiber inspection microscope is ideal for connector inspection during installation and maintenance.

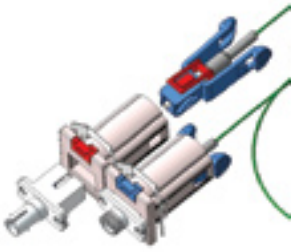
	KI 6600
Laser safety filter	✓
Dual illumination of Coaxial & Oblique for end face inspection & exhibit different characteristics	✓
Rugged body	✓
Easy one button press operation	✓
Magnification of x200	✓

KI6620 Video Fiber Inspection Scope is used to inspect and record the end face condition of an unmated fiber optic connector. OPT6620 is an optional probe for viewing the end face of socketed fiber optic connectors.

	KI 6620
Inspection of unmated connectors	✓
Inspection of mated connectors using additional OPT6620	✓
Universal connector options for 2.5 mm & 1.25 mm connectors	✓
Specific connector options for SC, LC, FC, MPO connectors	✓
Intrinsically eye safe	✓
Built-in Cleaner Cassette	✓
USB connection & handy computer software	✓

Kingfisher mandrel wrap mode filters are used to improve loss testing accuracy on multimode optical fiber. They comply with standard TIA-EIA-568-B.1 Clause 11.3.3, when used with 2 - 3 mm test cords and 50 and 62.5 µm core fiber.

	OPT701
Simply improve multimode power and loss testing	✓
Comply with TIA/EIA-568-B standards	✓
Unique hinged clip eases attachment and removal of test cord	✓
Includes mandrels for both 50 and 62.5 µm core fiber	✓



Panel mount universal optical connector.

	G2
Practical and inexpensive OEM solution for all 2.5 & 1.25 mm optical connectors	✓
Uses industry standard hybrid connector adaptors	✓
Adaptors to LC, MU, SC, FC, ST, LSA (DIN47256), E2000, F3000, SMA and 2.5mm universal style	✓
Connector ferrule easily accessible for cleaning	✓
User changeable connector style	✓
Tool-less field service	✓

KITS™ software is a flexible solution for data capture, analysis and reporting of fiber optic attenuation, power & optical return loss (ORL). KITS™ dramatically improves testing productivity, lowers skill level, minimizes errors and enhances report customizing capability. KITS™ can be used across any size of organization as a true enterprise level solution for performing measurement, reporting and data entry. KITS™ is built into Excel. It is a convenient out-of-the-box solution for most users, and can be easily customized in many ways.

OPTICAL COMMUNICATIONS TEST APPLICATIONS

- Test, accept & report cable loss
- Test, accept & report ORL
- Test & report Tx / Rx power levels
- Standards Compliant Cable Testing
- Data logging
- Education and Training

FEATURES

- Easy to use, productive & flexible
- Familiar Microsoft® Excel user interface
- Use on or off site
- Flexible test standards compliance
- Real time instrument control
- One-click data directly into reports
- Full custom report capability
- Password protection of data
- Enterprise level IT solution
- Compatible with Kingfisher Autotest

KITS™ software includes Cable Acceptance Reporting, Data Logging, Meter Memory Dump, and a Real Time Meter Display. It works with all KI7000 series Power Meters and Loss Test Sets and it is optimized for KI7000 two-way Loss Test Sets, to achieve the industry's fastest and most flexible cable acceptance testing.

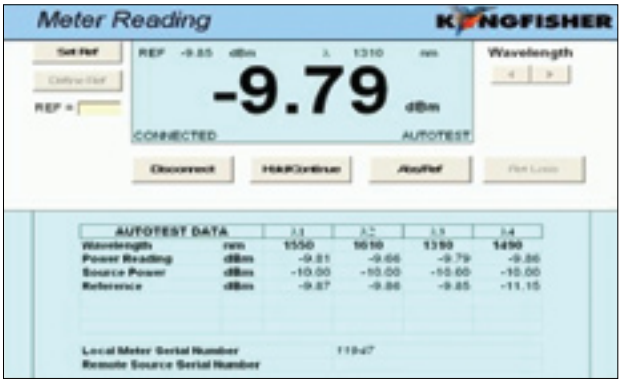
In typical fiber optic cable acceptance testing operations, about 50% of the testing cost is related to field operations and the other 50% is related to office procedures such as reporting and database entry.

KITS™ greatly reduces the field testing cost, and practically eliminates the office procedures. KITS™ can form an essential element in the creation and maintenance of a corporate database of cable information.

CABLE LINK & OPTICAL RETURN LOSS (ORL) TESTING

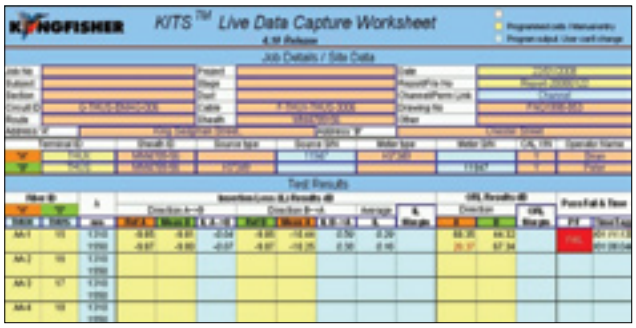
- Test, accept & report on loss, ORL & power
- 1- 4 wavelengths
- Industry's fastest two-way test
- One-way loss & ORL test
- Merge 2 one-way tests to achieve two-way result
- Standards compliant pass / fail analysis
- Build multiple fully customized reports
- Perform low speed data acquisition and display for monitoring, fault finding and general testing
- Use the live data display for classroom education, etc
- Customize KITS™ into any other language

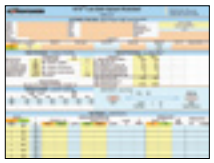
Meter Reading Sheet provides a large real time power meter display on your computer screen, and includes a data table to display Autotest data.



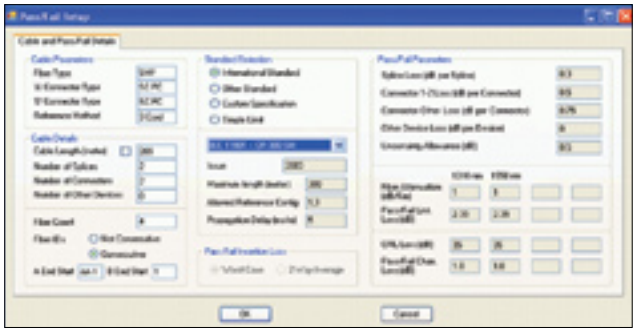
Data Logging Sheet is for flexible data logging of loss at one wavelength, including a graph and statistical functions.

Live Data Sheet is for cable acceptance testing and instant pass /fail analysis at up to 4 wavelengths. Its main functions are on-site test configuration and acquisition. Project related information is also stored with the testing data. This sheet for the field test crew remains unchanged as extra custom reports are added.





PASS / FAIL ASSESSMENT



KITS™ is developed using Microsoft .Net and XML technology. This enables powerful features to be embedded within a program format that looks and feels like a familiar Excel application.

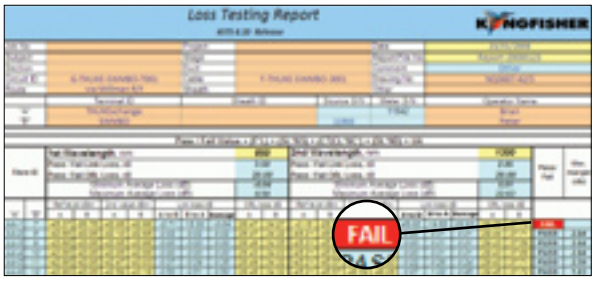
An intermediate level Excel user can easily modify the KITS™ Excel spreadsheets, user instructions, language and extra reporting data fields.

Manual data entry is available for Live Data Sheet. It can also be disabled and protected by password.

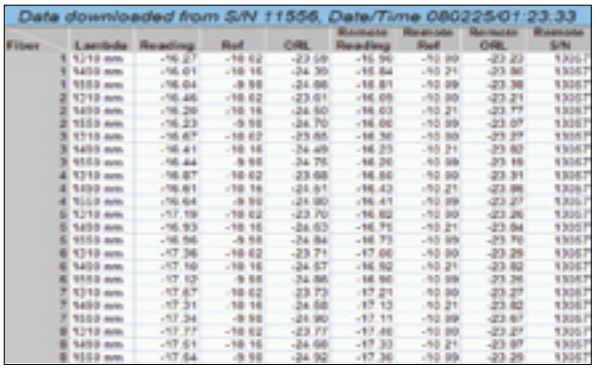
USING TEMPLATE - KITS™ software is supplied with a default Excel workbook. You can easily create a new KITS™ workbook, customize and save as an Excel workbook or template, and reopen it. That is very handy for working on assorted jobs, changing languages, terminology, and so on.

On-line help is available for quick assistance.

Loss testing report sheet is a default reporting sheet which also provides backwards compatibility with report formats in KITS™ version 3.03 or earlier, and is suitable for typical 2 wavelength testing.



Meter Dump Sheet is for a simple instrument memory dump.



SYSTEM REQUIREMENTS

- MS Windows XP / Vista and
- MS Office (Excel) XP / 2003 / 2007 English, or MS Office XP / 2003 / 2007 English & Other Language MUI, or MS Office XP / 2003 / 2007 Other Language & English MUI
- USB or RS232 communication port.

INSTRUMENT CAPABILITY

- Any KI 7000 series Power Meter or Loss Test Set with firmware version 5.00 or later. Older firmware versions may provide reduced functionality. The firmware version is displayed on the instrument LCD during turn on. Firmware upgrades must be performed at a service centre.
- If using the software with a KI 76xx series Power Meter, a suitable Autotest compatible light source is required for optimum functionality when testing at more than one wavelength.
- Measurement of Two Way (bi-directional) Loss with optional ORL requires a pair of suitable Two-Way Loss Test Sets.
- Successive link testing with a Power Meter or simple Loss Test Set can be used to achieve bi-directional loss measurements, although this will be much faster if done in one step with a Two-Way Tester.

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