



User Manual KITS™ V4.13

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1. KITS™ Overview

1.1. *What Does KITS™ Software Do?*

KITS™ is used for testing and reporting fiber optic attenuation, power, and return loss, typically while using Kingfisher KI7000 series test instruments. Test set up and data acquisition are controlled from KITS™, and include automatic, data logging, and manual (for other equipment compatibility).

KITS™ provides fully customisable cable acceptance reporting, and also data logging, meter memory dump, and a real time meter display.

KITS™ also provides a simple “one touch” utility to download instrument data into a csv file.

Typical applications include:

- Test, accept and report loss and ORL on fiber optic cable systems or components
- Facilitate (LAN) standards compliant two way cable loss & ORL testing
- Test, accept and report fiber optic Tx / Rx power levels
- Perform low speed data acquisition and display for monitoring, fault finding and general testing
- Use the live data display for classroom education, training etc
- Customise KITS™ into any other language
- Fully customised reporting capability to match customer requirements

KITS™ software connects to KI 7000 Series Power Meters or Loss Test Sets to perform real time data acquisition and instrument control. Measurement data from any other incompatible instrument can be entered manually.

This means that KITS™ can be used across any size of organisation as a true enterprise level solution for performing measurement, reporting and database entry. KITS™ data files can be easily imported to most databases through Excel import utilities built into commercial database software, or using Excel Smart Tags if used with Office XP or beyond.

Benefits include improved productivity, lower required skill level, fewer mistakes and extensive report customizing capability. KITS™ enables customized professional reporting to your customers, while making the measurement process simpler and faster.

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 related to reporting and database entry. KITS™ greatly reduces the field testing cost, and practically eliminates the office procedures.

KITS™ is built into Excel, which is a convenient out-of-the-box solution for most users, and can be easily customised in many ways.

Font conventions used in this manual

- The bold italic font, like *Kingfisher / Data Logging*, is used for a command (or a command sequence) in Windows menu system, whether it is for Windows, Office, or KITS™.
- The text in square brackets, such as [AUTOTEST], is an operation on the meter.

1.2. What's New in This Version

New in this version V4.13

- Updated Pass / Fail formula for 2 or 3 cord referencing
- Updated standard to allow different 1 or 3 cord uncertainty values
- Allow memory download from a meter with non contiguous memory cells
- Dynamically updated fiber number count in the user designed "New Report" worksheet
- Fixed an issue of cannot find USB meter in some computers
- Selective installation of user documents depending on user option of installing for all users or current user
- Simplified KITS™ software installation procedure

New in V4.12

- Updated support for Regional Language Options. KITS™ decides the spelling of Excel function names automatically for any user selected language, and thus no user intervention is required
- Updated support for choosing different decimal symbol and list separator from the system default
- Removed all ANSI dependent code to make KITS™ fully Unicode compatible
- Allow non numeric fiber ID (such as AAA-1) in Live Data sheet
- Moved KITS™ code to avoid any impact on other Excel applications
- Bug fix for Excel 2003 Standard support, where XML is not available

New in V4.11

- New function to work with different Regional Language Options. User can add Excel formula keywords to run KITS™ for another language
- Improved Test Setup summary diagram on the Live Data sheet
- Added the “Terminal ID Names” button to the Kingfisher menu bar
- Rearranged KITS support file folders to work for different versions of Windows
- Bug fixing and improved functions in memory download
- Bug fixing to manage data rows correctly in the Loss Testing sheet
- Update on chart scales and log interval in the Data Logging sheet

New in V4.10

- New Live Data worksheet for improved data capture and display during on-site loss testing, as well as for restricted reporting
- Any instrument of 1 – 4 wavelengths
- IEC 11801/14763-3 standards compliant pass fail testing. Custom standards easily added
- Redesigned menu system for better streamlining of KITS™ operations
- Full multiple customisations of loss testing reports
- Add or delete a KITS™ worksheet at any time
- Updated memory download to support the latest meter versions
- Meter reading sheet displays Autotest data when meter is in 1- or 2-way Autotest mode
- User editable KITS™ style workbook and resource files for customization to other languages
- Enhanced Windows/Office compatibility from Windows XP to Windows Vista and Office XP to Office 2007
- Eliminated the dependency on external text files for system configuration and user interaction
- Software internal data structures and function modules redesigned for any number of wavelengths
- The old Loss Testing Sheet is retained for backwards compatibility
- A large number of bug fixes

New in V3.03

- 2nd generation Windows XP compatible program using Microsoft .net technology
- Macros removed from spreadsheet
- Supports 1 - 4 wavelength instruments
- Faster loading & improved productivity
- Turns laser on for manufacturing specific applications

- Improved capacity
- Scans attached instrument for supported wavelengths
- Faster data logging
- Program Installation screens in English, French, German, Spanish and Chinese Simplified
- No need to re-customise templates every time KITS™ is updated
- Requires Windows 2000 or later, and Office 2000 or later

New in V3.02

- CWDM loss testing
- Protect test results with a password in Preferences
- Support for printing labels with custom fiber numbering
- Custom report filenames can be used
- Supports one wavelength memory download
- Last version to support Windows 95 / 98 / ME and Office 97 onwards

New in V3.00

- Improved support for two-way Autotest in Loss Testing Sheet
- Meter Reading Sheet support for Two-way Autotest and Return Loss
- Bug fixes and refinements
- Improved instrument communications response time
- Printing support for return loss
- Support for US distance units
- New digital security certificate
- Integrated update and set-up into one program

1.3. Versions & Support

For KITS™ versions that are currently supported, visit our Web site at www.kingfisher.com.au, contact your agent, or e-mail us to [Sales](#).

To receive technical support, let us know your KITS™ version and build date, located in KITS™, under *Kingfisher / about KITS*, and also your instrument firmware version and serial number. The instrument firmware version is displayed during instrument start-up, and the serial number is on the rear label.

If you have ideas for useful features or changes, please send your comments to [Bruce](#). We may be able to add your ideas to a future release.

1.4. System Requirements

- Microsoft Windows XP / Vista.
- Microsoft Office (Excel) XP / 2003 / 2007.
- Appropriate Microsoft MUI for running Excel in another language.
- 145 MB of disk space.
- RS232 or USB port. To use an RS232 instrument on a USB computer port, use Kingfisher option OPT188. This is a USB to RS232 converter which is installed on the computer as a device.
- Any KI 7000 series Power Meter or Loss Test Set with firmware version 5.00 or later. Earlier 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 KI76xx series Power Meter, a suitable Autotest compatible light source is required for optimum functionality when testing at more than one wavelength.
- Two-way loss testing (bi-directional) requires a pair of suitable two-way loss test sets.
- Successive link testing with a Power Meter or simple Loss Test Set can also be used to achieve Two-way loss testing. This method is much slower and requires data merging.
- Measurement of ORL (Optical Return Loss) requires one or two Two-way + ORL Testers.

1.5. Software Installation / Removal

If updating from a previous version of KITS™, perform a manual back-up of the previous version before proceeding.

It is recommended that any previous version of KITS be removed prior to installing the new version.

Before installation, first ensure that the following programs are installed:

- Microsoft Office XP or later (Excel is required).

The KITS™ installation package determines if required components or hotfixes are missing from your computer, and then installs them before installing the software. The installer may also request the user to change Office 2003 / 2007 settings as follows:

1. Go to **Start / Settings / Control Panel / Add/Remove Programs**. Click **Microsoft Office** and press the **Change** button.
2. Select **Add or Remove Features** then click the **Next (or Continue)** button.

3. **Office 2003 only:** Choose *Advanced customization of applications* and click *Next*
4. Enable both features below:
 - Under Microsoft Office / Microsoft Office Excel, enable .NET Programmability Support
 - Under Office Tools, enable Microsoft Forms 2.0 .NET Programmability Support

To install KITS™, the user must log into the computer using a profile with local administrator rights.

If installing KITS™ from a CD: Insert disk into CD drive, the CD will auto-start, and you can select the option to install KITS™.

- If installing KITS™ from a file: Double click on the setup.exe file, and the set-up program will start. In some IT configurations this file should be run from the local machine.
- Select *Yes* to accept the licence conditions.
- Specify if the icon should be visible to all users of this PC, or name a specific profile.
- Accept the default installation directory *C:\Program Files\Kingfisher\KITS*, or specify another directory (advisable to retain previous customisations).
- If setup is run again, the user will be prompted to perform a repair, modify (custom) or uninstall.
- Having now installed KITS™, run the program. You will be shown an initial “Welcome to KITS™ 4.12” screen which allows you to input parameters to configure your workbook. You can either click *Setup* to do your configuration at this point, or click *Finish* to start with a default workbook and do your configuration later.
- You may receive a screen “KITS™ installation needs your assistance” during the installation. Refer the section *Configuring Office 2003 or Office 2007* for further details.

Do not attempt to move the program or change related directory names after installation.

Note:

- To use a **full stop** or **comma** for the decimal point: This is set in the Windows Regional and Language Options. If it hasn't been done already, start *Control Panel* (either from *Start / Settings* or *Windows Explorer / My Computer*), then *Regional and Language Options / Customize* (in *Regional Options* tab), enter a full stop “.” or comma “,” for *decimal symbol* (in *Numbers* tab), and *OK*.
- To use **miles** for distances: This is also set in the Windows Regional and Language Options. If it hasn't been done already, in the same *Numbers*

tab, select "US" in *measurement system*, and **OK**. To use **km** for the distance select "Metric" for the measurement system.

- **Office XP tip:** MS Outlook is usually installed as part of MS Office. If the Outlook Journal function is not used, you can speed up all other applications by turning this off. Open Outlook, select **Tools / Options / Journal** tab, and de-select all items in 'Also record files from'. Click **OK** and *exit*.
- **If KITS™ seems to hang for no reason** on a laptop, this may be due to the laptop power management settings. KITS™ is a real-time data acquisition program, and computer power management settings may need to be modified or disabled.

1.6. Configuring Office 2003 and Office 2007

If during installation you see the screen "KITS™ installation requires your assistance" please modify your Office 2003 or Office 2007 installation. When you click **Finish**, KITS™ setup will close. Perform these steps *before* you start KITS™ setup again.

Configuring Office 2003

1. Go to **Start / Settings / Control Panel / Add/Remove Programs**. Click **Microsoft Office** and press the **Change** button.
2. Select **Add or remove features** then click the **Next** button.
3. Tick **Choose advanced customization of applications** and click **Next**
4. Enable *both* features below
 - Under Microsoft Office select Microsoft Office Excel, enable .NET Programmability Support
 - Under Office Tools enable Microsoft Forms 2.0 .NET Programmability Support

Configuring Office 2007

1. Go to **Start / Settings / Control Panel / Add/Remove Programs**. Click **Microsoft Office** and press the **Change** button.
2. Select **Add or remove features** then click the **Continue** button.
3. Enable *both* features below
 - Under Microsoft Office select Microsoft Office Excel, enable .NET Programmability Support
 - Under Office Tools enable Microsoft Forms 2.0 .NET Programmability Support

If the installation program prompted you for both Office 2003 and Office 2007 then your PC has both Office 2003 and Office 2007 installed. You will find Microsoft Office has two entries in the Control Panel. You should enable .NET Programmability Support in both.

This enables Excel to use the .net Framework, an essential requirement for KITS™. After this re-start the KITS™ installation from the beginning.

1.7. Installing Office MUI for Running KITS™ in Another Language

Microsoft Office Multilingual User Interface Pack (MUI) is a separated product that allows users to switch user interface languages in Office.

If you use non-English Windows, or choose another language from “**Regional and Language Options**”, you may receive an error message “Old format or invalid library ...” when you start KITS™. In this case, you need to install the Office MUI for that language. If you selected language is “close enough” to the language which MUI has been installed already, you may not receive the error message.

Follow the normal software installation procedure to install the Office MUI for you selected language.

If you still have any problem with the language, you may also need to install Windows MUI, another separated product from Microsoft.

KITS™ uses Excel formulae for its operations. The spellings of the function names in formulae differ from language to language. KITS™ 4.12 decides the spelling of the function names automatically for any user selected language, and thus no user intervention is required.

1.8. Online Manual

- **Help Hints.** The on-line help icon links to this user manual, which encourages users to learn faster.
- There are two different help arrangements: an on-line html document, and a separate MS Word document. The Word document can be easily edited by users to allow for specific work instructions, languages etc. To print the MSWord manual, go to the KITS™ directory, open the *User Guide.doc* file, and print it.
- To return to the spreadsheet, use the ‘**back**’ button on the Web toolbar (normally a light blue arrow on left side), or select Excel on the Windows start bar.

2. KITS™ Start up

2.1. General Overview

The KITS™ Excel workbook contains five worksheets (plus user created report sheets), and an interface to a KI 7000 Series ORL & Two-way Loss Tester, One Way Loss Test Set or Power Meter. The software provides fully interactive control & measurement acquisition.

- **Live Data Sheet** - For cable acceptance testing applications. This enables parameters to be set up for pass / fail testing and performs the test of up to 4 wavelengths per test. Its main functions are on-site test configuration and acquisition, though the sheet can be printed “as is” for reporting.
- **Loss Testing Sheet** – This worksheet provides backwards compatibility with report formats in previous versions of KITS™. It is a reporting part of cable acceptance testing applications, supporting up to 2 wavelengths. Test data cannot be directly inputted to this sheet, all data is obtained from the Live Data Sheet using Excel formulae.
- **Data Logging Sheet** - For flexible data logging of loss at one wavelength, including a graph and statistical functions.
- **Meter Reading Sheet** - This provides a large real time power meter display on your computer screen, and includes a data table to display Autotest data that is otherwise hidden on the instrument display.
- **Meter Dump Sheet** - For a simple instrument memory dump.
- **New Report Sheet** – Created by the end users, initially not in the KITS™ workbook.

KITS™ is developed using Microsoft .Net 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 modify the KITS™ Excel spreadsheets. User instructions, language and extra reporting data fields are easily changeable.

2.2. Getting Started

1. Connect a KI 7000 series power meter or loss test set to an RS232 or USB serial port on the computer, using the supplied connecting lead. Ensure the jack plug is pushed fully into the instrument. Alternatively use the OPT188 USB to serial converter cable. This (or any other suitable RS232 - USB adaptor) must first be installed as a device on the computer, and the

installation is specific to particular USB port. We suggest either label the one USB port, or install on all USB ports.

2. If a new RS232 lead is needed, the connection details are as follows. Some (out of spec) serial ports need a 10 K resistor in the D connector across wires 1 & 2.

	Wire 1	Wire 2	Wire 3
Instrument Jack Plug	Body (Gnd)	Ring (Tx)	Tip (Rx)
9 Pin D connector	Pin 5 (Gnd)	pin 2 (Rx)	Pin 3 (Tx)
25 pin D connector	Pin 7 (Gnd)	Pin 3 (Rx)	Pin 2 (Tx)

3. Turn on the instrument(s) and computer. Use suitable fiber optic jumper cables to connect instrument test ports to obtain a reading, and set the instrument(s) to Autotest. Refer to the instrument user manuals if needed.
4. On the computer screen, select the **KITS™** wizard icon. The “Welcome to KITS™ 4.12” popup form will appear.
5. Tick the sheets to be included in the new workbook, and click the **Setup** button to run the two setup forms to enter parameters.
6. KITS™ scans available ports to find the attached meter. If this fails, check the connection, ensure the meter is on, and try again. Alternatively, KITS™ can work offline for basic workbook setup without a meter connected.
7. If Meter Reading is ticked on start up, the first worksheet to appear on the KITS™ workbook is Meter Reading sheet.
8. When KITS™ finds the meter, the meter reading display will appear live on the computer screen. If the instrument is in Autotest mode, the table in the lower half of the screen will fill with real time data. See **Autotest**.
9. When **Disconnect** is displayed (on a screen button), the meter is connected to the KITS™. Live instrument measurements or memory downloads can be transferred to KITS™. In this mode, the computer controls the instrument, and the meter front panel buttons are inoperative.
10. When **Connect** is displayed, the instrument is not connected. Click the button to toggle meter connect/disconnect.
11. User can directly manipulate the instrument controls using buttons on the KITS™ menu system or worksheets.
12. Note the sheet tabs at the bottom of the screen. Click on them to navigate various KITS™ worksheets.
13. Data can be entered manually into the Live Data Sheet. This is also useful when entering data from other types of instruments, over an intercom etc. Manual data entry can be disabled and protected by password, which prevents accidental over-writing of data or undesired manual input. See the section on Live Data sheet operations for more details.

- **Excel tip:** To improve your screen display, on the Excel 2003 main toolbar, you can select **View / Full Screen**; and select **View / Full Screen** again to return to normal display. On Excel 2007, you can select **View / Workbook Views / Full Screen**; and press the **Esc** key to return to normal display (or alternatively use ALT-V-U to enter full screen mode and the **Esc** key to return to normal).

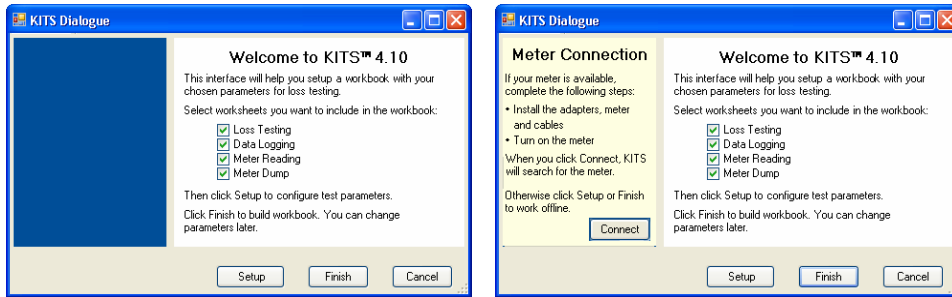
2.3. Quick Tour / Demonstration

This quick tour provides 3 example scenarios. The first one demonstrates loss measurement using a Source and Power Meter or simple Loss Test Set (Assuming KITS™ software is already installed). The second one illustrates the much simpler operation using Two-way Tester. And the third one shows the simplest way to download meter memory data to the KITS™ workbook.

This section is a general demonstration of KITS™. There is more information on each option in this manual.

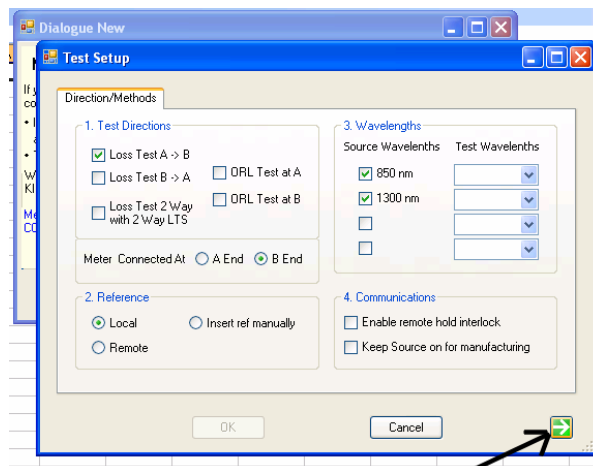
A. Using a KI 7000 Series Source and a Power Meter

1. Turn on the instruments. It is convenient to defeat the auto-timeout by holding down the green [POWER] button for 3 seconds when turning on.
2. Assuming no required test data stored, clear the power meter's memory.
To do this, hold down :-
RS232: [CANCEL] & [RECALL MEMORY] together for a few seconds until 'clr' is shown.
USB: [MR] & [Exit] together for a few seconds until 'clr' is shown
3. Connect the Source and Meter ports with a test lead, and press [AUTOTEST] (on the source). The meter will briefly display 'auto' and then change to Autotest mode without any intervention.
4. Save say 4 new Autotest meter readings into memory, i.e. press [STORE] / [M+] 4 times.
5. Connect the Power Meter to the PC with the RS232 or USB lead. The RS232 connector on the instrument is an audio jack style connector marked 'RS232'. The nine pin D type connector is suitable for a typical PC.
6. Start KITS™ wizard. This will launch KITS™ to build a new workbook.
7. For this quick tour, in the Welcome dialogue box, select all 4 checkboxes. Click the **Setup** button. If a connected meter is not detected, a "Meter Connection" panel will appear. Check if a meter is securely connected and power switched on, and click the **Connect** button and then the **Setup** button again.



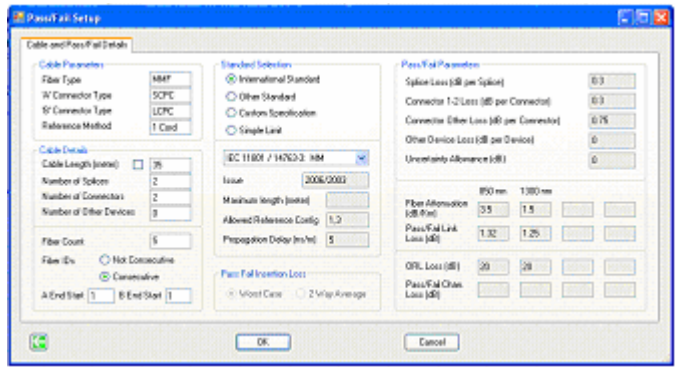
8. This will bring you to the Test Setup dialogue form.

In the Test Setup form, you can select any of 'Loss Test A -> B', 'Loss Test B -> A' readings. Select to which end the instrument is connected to KITS™. Select wavelengths for testing. The checkboxes under “Source Wavelengths” are sources found from the connected instrument, and other wavelengths in the dropdown lists under “Test Wavelengths” are meter wavelengths. If the connected instrument is a power meter, there is no Source Wavelengths. You can manually select from the dropdown lists any wavelengths for test.



Fill in parameters for the test configuration and click the right arrow icon to move to the Pass/Fail Setup form.

In the Pass/Fail Setup form, fill in the cable details as required, and enter the number of fibers you are testing. Select an International or Other Standard, or select “Custom” and change default parameters, or select “Simple Limit” and enter simple Pass/Fail numbers.




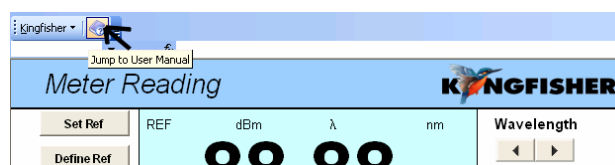
Fill in parameters in this form. Click **OK** to complete the setup.

If the setup is not complete at this stage (you clicked the **Finish** button on the Welcome dialogue, or **Cancel** in a setup form), you can do it later using the KITS™ menu items in the Live Data sheet.

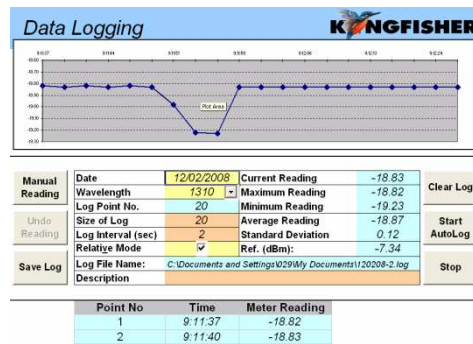
9. A new KITS™ workbook will open with the Meter Reading sheet active, and display meter readings in real time. Since the meter is in Autotest mode, all relevant loss testing data is also displayed in the table below, and updated in real time. Use the on-sheet buttons to start and stop the display, disconnect and re-connect the meter, and change between absolute and relative display modes, etc. In relative mode, you can set the reference value to zero, or define it as any number. The wavelength up/down buttons do not operate in Autotest mode.



10. Click the on-line help button  (the rightmost icon in the Kingfisher toolbar) which is common to all KITS™ worksheets and you will find detailed, clear and concise operational instructions written by technical staff for technical staff. Alternatively you can find help from the toolbar by selecting **Kingfisher / User Manual (Word)** or **User Manual (HTML)**.



- Set the Light Source to manual mode (ie. not [Autotest]). Wait for 8 seconds while the meter quits Autotest. Switch to the Data Logging sheet (use tab at the bottom of the screen. If the Data Logging tab is not present, click **Kingfisher / Data Logging**). Click **Start Autolog** (on the sheet), name a log file, and watch the progress of data logging. Try bending the patch lead to create varying losses, and watch the graph auto-scale. You can interrupt this by selecting **Stop**, and then continue. You can easily change any of the auto-logging parameters.



- Switch to the Live Data sheet. Set the Light Source to [Autotest] mode.

Note: The 'Date', 'Report/File No' and 'Meter S/N' cells have been automatically inserted.

In the cells with a brownish background (this colour indicates the cells requiring manual data entry), type some project-related text, such as Job No, Project, etc. Select the cell under the "Terminal ID" sub heading with yellow background (this colour indicates the data is filled in by KITS™ but it also allows manual data entry), the **Location Setup** popup form is launched. Enter the location names of the two ends of the fiber.

- To set the reference value, click **Setup / Set Reference**, and set or define a reference value (with the meter still in Autotest mode).

The screenshot shows the 'Live Data Capture Worksheet' interface. It includes a 'Job Details / Site Data' section with fields for Project, Stage, Duct, Cable, Sheath, Date, Report/File No, Channel/Perm Link, Drawing No, and Other. Below this is a 'Terminal ID' table and a 'Test Results' table.

Terminal ID	Sheath ID	Source type	Source S/N	Meter type	Meter S/N	CAL Y/N	Operator Name
"A" THUX			K13822	11942		Y	Brian C
"B" BMAG				K17600	11943	Y	Peter S

Fiber ID	A	Insertion Loss (IL) Results dB				ORL Results dB			Pass/Fail & Time
		Direction A->B	Direction B->A	Average	IL Margin	Direction	ORL Margin	P/F	
1	4	850							
2	5	850							
		1300							

- Now you have set up your test. With the meter still in Autotest mode, click on a Ref A or Meas B cell (yellow background), and you will get reference A values and Measurement B values entered for all wavelengths of the selected fiber. The other cells (in light blue colour which indicates system output) are filled in automatically.

15. Go ahead, fill some more values, and see how quickly you can work like this.

Note how any results which fail the setup parameters are shown in red. Note also that any fibres which have been retested are marked in the TimeTag column.

Fiber ID		λ	Insertion Loss						Average			ORL Results dB			Pass/Fail & Time	
"A"	"B"	nm	Ref A	Meas B	IL A->B	Ref B	Meas A	IL B->A	IL	Margin	Direction		ORL	Margin	P/F	TimeTag
1	4	850	-26.11	-27.24	1.13										FAIL	2/10.29.36
		1300	0.00	-26.11	26.11											2/10.29.36
2	5	850	-27.24	-27.24	0.00					1.25				PASS	2/10.36.35	
		1300	-27.24	-27.24	0.00										2/10.36.36	
3	6	850	-27.24	-27.24	0.00					1.25				PASS	2/10.32.04	
		1300	-26.12	-26.12	0.00										2/10.32.04	
4	7	850	-27.24	-27.24	0.00					1.25				PASS	2/10.32.30	
		1300	-26.12	-26.12	0.00										2/10.32.30	
5	8	850														

16. The Live Data Sheet contains several areas which can be selectively displayed or hidden. These are Job Details (on by default), Pass/Fail Setup and Test Summary. The Pass/Fail Setup area is useful when providing a report to your customer whilst the Test Summary area is particularly useful during testing as it shows your test configuration. To show or hide these areas click on *Setup*, then choose *Job Details*, *Pass/Fail Setup* and/or *Test Summary*.

KINGFISHER KITS™ Live Data Capture Worksheet										4.10 Beta Test Release		
Cable Parameters					Optical Parameters							
FC= Fiber Count	5	L = Fiber length	meter	35	F = Fiber attenuation, dB/Km	850	1300					
FT= Fiber Type	MMF	NS = Number of Splices	meter	2	SL = Splice loss, dB	3.5	1.5					
'A' connector type	SCPC	NC = Number of Connectors		2	CT = Connector 1-2 loss, dB	0.3	0.3					
'B' Connector type	LCPC	ND = Number of other Devices		0	CL = Connector other loss, dB	0.75	0.75					
Reference Method	1 Cord	Test Direction		A to B	DL = Device insertion loss, dB	0	0					
Reference Type	Local				UA = Uncertainty allowance, dB	0	0					
Pass/Fail Calculation					Pass / Fail Link Loss, dB	1.32	1.25					
Max Loss = (FL) + (SL*NS) + (CT)CL*NC + (DL*ND) + UA					Pass / Fail Channel Loss, dB							
					Pass / Fail ORL Loss, dB	20.00	20.00					
Statistical Analysis												
Loss					ORL							
λ	Min	Mean	Max		Min	Mean	Max					
850	0.00	0.23	1.13		0.00	0.00	0.00					
1300	0.00	5.22	26.11		0.00	0.00	0.00					
Applied Standard: IEC 11801 / 14763-3: MM												
5 fibers MMF										Meter @		
THUX										BMAG		
SCPC										LCPC		
Local reference												
Length = 35 meter												
Propagation Delay = 175 ns												
Test Results												

B. Using a KI 734x Series ORL & Two-way Loss Test Set

If you have an **ORL meter** then you may do all the same tests as above, and perform the optical return loss readings as well. An ORL reading is performed from one end of the fiber using the 'source' or left port of the KI 734x ORL & Two-way Loss Test Set.

If you have an **ORL meter** then you may do all the same tests as above, in addition to Optical Return Loss (ORL) testing.

An ORL reading is performed from one end of the fiber using the 'source' or left port of the KI 734x ORL & Two-way Loss Test Set.

Single instrument

1. Connect the instrument to the test circuit and to KITS™ as per scenario A above. Ensure that the instrument is in manual mode, not Autotest. ORL measurement is not possible for 1 Way Autotest mode.
2. Click on the required ORL reading cell for the selected location. This will automatically initiate the ORL measurement for the selected wavelength and insert the result in the cell. Depending upon the type and purpose of the test, a non reflective termination (eg a mandrel wrap) may be required at the remote end of the fibre.

Pair of two-way KI7340 series Autotest instruments

If a pair of **two-way KI7340 series** Autotest instruments is used at each end of the fibre under test, then all measurements for that fibre (including ORL from each end) can be automatically entered following a single click on any measurement cell related to that fiber. Both instruments must be connected to the fiber using their left port.

1. Connect the instrument to the test circuit. In this configuration, both instruments are connected to the fiber using their left port.
2. Press the [AUTO TEST] button on either instrument to initiate the two-way Autotest mode.
3. Connect to KITS™ as per scenario A above.
4. Now you have set up your test. With the meter still in Autotest mode, click on any Ref, Meas or ORL cell (yellow background), and you will get Reference, Measurement and ORL values entered for all wavelengths of the selected fiber. The other cells (in light blue colour which indicates system output) are filled in automatically.

Switch to the Loss Testing sheet (use tab at bottom of screen. If the Loss Testing tab is not present, select **Kingfisher / Loss Testing**). The data area is filled with test data obtained from the Live Data sheet using Excel formulae. Click the 1st or 2nd wavelength cell (with yellow background) to bring out a popup form, from which to choose another wavelength.

Go back to the Live Data Sheet. **Print** the worksheet and then select “**Save As ...**” to save the workbook to your choice of file folder. The print-out is your un-customized report Select one of the **Clear** buttons to clear the report data.

A traditional KITS™ style report for any 2 wavelengths can produced via the Loss Testing worksheet. Alternatively you may design your own report layout using the inbuilt XML based New Report feature discussed elsewhere in this manual.

C. Download Memory Data from any Meter to KITS™

Memory may be downloaded into either the Meter Dump worksheet or into the Live Data worksheet.

- A download to the Meter Dump worksheet sends all the meter's memory into a Meter Dump worksheet. No filtering or formatting is performed.
- A download to the Live Data worksheet sends all the meter's memory that matches specified selection criteria into Live Data worksheet. Filtering is performed on wavelength and memory location.

In this Overview we will perform a meter download into the Meter Dump worksheet.

1. Prepare the meter with some data stored in its memory and connect to an RS232 or USB port (Follow steps 1 to 5 of scenario A above).
2. Start a new KITS™ workbook with Meter Dump selected, or open a saved KITS™ workbook and click ***Kingfisher / Meter Dump***.
3. Click the Download button on the toolbar, all memory data will be downloaded to the worksheet.

D. Using Save CSV

KITS™ has an option to download data from KI7000 instrument memory directly into a text file.

1. Connect the instrument to the RS232 or USB port of the PC.
2. Click ***Start / Kingfisher / Save CSV***.
3. In the ***Open*** box specify a filename and choose the location to save the file.
4. Click the ***Close*** button and the data will be saved to this text file. (When the instrument does not show the ^{RS232 or USB} symbol the download is complete).

3. Using KITS™

3.1. Autotest

Autotest synchronises source and meter wavelengths and transfers data along the optical fiber being measured. It requires both Source and Meter (or both Loss Test Sets) to be Autotest compatible instruments.

Any combination of KI3800 Source, KI74xx Source, KI78xx Source, KI 7600 Meter, KI73xx Loss Test Set or KI77xx Loss Test Set can be used provided a "Source" test port is connected to a "Meter" test port for one way testing, or a "two-way" port is connected to a "two-way" port for two way testing, and both ports must have at least one common wavelength.

- Initiate 'Autotest' by clicking [AUTOTEST] on the **Light Source** (or one **Two-way Tester**), after which the meter will switch to 'Autotest' mode.
- The Meter Reading sheet will automatically show Autotest data in the table.
- If a dual, 3 or 4 wavelength Source and Meter are used, the Live Data sheet can be automatically filled in all values at each mouse click or keystroke (ie. both Ref and Meas values for all wavelengths in one direction).
- If 'two-way Autotest' capable instruments are used at each end of a fibre, the Live Data sheet can be automatically filled in with all values by a single mouse click or keystroke (ie both Ref and Meas values for all wavelengths for each direction, plus the ORL reading in each direction). This is up to a total of 24 measurements with one mouse click or keystroke.
- The collection of remote Autotest measurement data is made possible because a Light Source port can transmit data in one direction to a Power Meter port. A pair of two-way ports can transmit data in both directions.

3.2. Using the Kingfisher Menu System

KITS™ provides a menu system as a standard Office toolbar. To view this toolbar, click **View / Toolbar** and then select **Kingfisher** in Excel 2003 or earlier Excel versions, or click **Add-Ins** in Excel 2007. The toolbar is loaded only when the user opens a KITS™ workbook and will be removed from Excel when a non-KITS™ workbook is open.

The menu system is composed of a number of menu groups and command buttons. The **Kingfisher** menu group and Help button (the rightmost icon in

the Kingfisher toolbar) are common to all KITS™ worksheets, while the other menu groups and command buttons present only on a relevant worksheet.

Click on a menu item or command button will trigger an action. That includes loading or activating a KITS™ worksheet, connecting/disconnecting the instrument, popping up a Windows form for setup, changing data or hiding/showing a region in the worksheet, or a combination of them. The operation is interactive and intuitive. No training is required if the user has the basic knowledge of fiber optical testing and Kingfisher Meters operation.

3.3. Using the Meter Reading Sheet

The Meter Reading display shows various status indicators, e.g.

1. Connect / Disconnect
2. Normal / Autotest
3. Absolute power in dBm units, relative power in dBr units
4. Reference value in dBm
5. Current calibration wavelength in nm
6. Hold
7. Return Loss / Normal

The Meter Reading sheet allows the user to:

- See that the instrument is connected and software is working correctly
- Update a reference value from the computer
- View the optical power or return loss reading on the computer screen from a distance
- View a live table of one or two-way Autotest data, when the power meter is in one or two-way Autotest mode, and
- Change wavelengths, and hold /continue display updates

Operations can be as follow (most of these operations directly control the meter):

8. Click **Connect**, if “Connect” is displayed, to connect KITS™ and the power meter
9. To stop / resume the display update, click the **Hold/Continue** button.
10. To change the wavelength display, click the ◀ or ▶ up/down button. (not in Autotest mode)
11. To toggle absolute / relative modes, click the **Abs/Rel** button.
12. To toggle Return Loss / Normal, click the **Ret Loss/Normal** button.

13. Under the main display, the Autotest display shows live data when Autotest is in operation.
14. To set the current meter reading as the new reference, click *Set ref* (not available in two-way Autotest mode).
15. To enter a reference manually, enter the reference value in the textbox, and click *Define ref* (not available in two-way Autotest mode).

3.4. Using the Live Data Sheet

The Live Data sheet automates the task of Optical Attenuation Testing, Acceptance and, partially, Reporting. The first part of this section is a general description. For specific operation details go to sub-sections below.

Operations on this sheet include:

- Control all general test parameters, which can be printed on the report.
- Set the Pass/Fail criteria from a standard, a simple limit value, or from a custom formula.
- Use the Job Details section of the sheet for general record keeping.
- Use the Pass/Fail Setup section for particular test details such as fiber count, test parameters and so on.
- Use the Test Summary section to show test statistics analysis and a simple diagram of test setup configuration.
- The test Results section at the bottom of the sheet contains test data and Pass/Fail results.
- The data cells are colour coded:
 - Brownish background cells for user manual input;
 - Light yellow cells for system automatically inserted data but also allowing user input;
 - Light blue cells for system output that the user cannot change; and
 - White cells mean no data.

Generally using the mouse to click in a yellow data cell will trigger an automatic data insertion from the connected instrument in one or more data cells.

- The cells used as headings for A and B meter specific data are coloured orange and green respectively. If the meter is connected to the A end, the background of the B cell in the diagram will become white; and vice versa.
- Use *Setup* menus to configure the spreadsheet automatically to enable a wide variety of operating methods, such as number of wavelengths, test directions, and combinations of memory downloads or direct data entry. [Appendix A](#) is a summary of possible combinations.

- Dump the contents of an instrument's memory into the spreadsheet, mapped as required. Results from several instruments can be put into one report.
- The spreadsheet supports Autotest operations. This automatically and simultaneously displays as many wavelength results as possible, and captures additional data that is transmitted from source to meter. Autotest is started from the **Light Source**. If 'Two-way Tester' instruments are used, two-way Autotest may be started from either end.
- Save reports and files in various file formats for compatibility with other software.
- Clear part or all data. This is handy when creating multiple reports, since the project information generally only changes slightly between each report.
- Attempts to over-write previously entered data will be prompted before the old data is erased. Acquired data can be password protected (set in the preferences dialog box) to prevent alteration.
- The Time Tag cells record the last time the test was performed. If the test is repeated, the cell will change background colour and insert a comment for attention.
- The Min, Mean, Max columns in the Statistical Analysis section show the lowest, average, and highest margins for a given wavelength between the Pass/Fail limits and the measured values. This is a handy way of examining consistency of results.
- The diagram appears to the right of the Statistical Analysis section is a summary of the test configuration for quick reference.

Suggested Operating Sequence for Live Data Sheet

1. To get to the Live Data sheet, select the *Live Data* tab at the bottom of the screen, or *Kingfisher / Live Data* menu item.
2. If previous unwanted data is in the sheet, select *Clear* on the toolbar, and select one of the menu items to clear the data. If the sheet protection is removed, normal Excel Delete commands can be used, but is less convenient.
3. Fill relevant project description text in the brownish cells. This text will be printed on reports, but does not affect the test data or Pass/Fail criteria.
4. The default 'Date' and 'Report/File No' names are inserted automatically. The latter is used as default file name for saving test data as a log file (.rlg). You can manually overwrite these two cells.
5. Click in the Terminal ID "A" or "B" cell will bring out the *Location Setup* form to specify test location names and number of characters as abbreviation. Terminal IDs will also appear in the diagram and the test data section.
6. Select *Setup* to define the required test or the viewing of the worksheet.

- **Pass/Fail Setup** specifies the optical parameters such as the number of fibers, cable details and pass/fail criteria for each wavelength.
 - **Test Setup** specifies test directions, in which end the meter is connected, local / remote referencing methods, and wavelengths being tested. [Appendix A](#) summarizes the possible combinations. To minimise Sub Menu interaction, *Pass/Fail Setup should be performed before*
 - **Set Reference** provides a convenient form to view and set the optical reference value. To set up the meter to display the required value, select **Set**. To manually set the reference value, type in the value and select **Define**.
 - **Protect Manual Data Entry** protects the worksheet against unauthorised or accidental manual data modification. The default setting is no protection. To set up this option, a **password** is requested. Once the protection has been applied, the password can only be removed or changed after re-entering the original password. **Don't lose your password!**
 - **Set Autotest Wait Time** allows user to choose the time interval to receive update of Autotest readings.
7. Also under **Setup**, 3 show/hide menu items allow user to choose which sheet sections to view and print:
- **Show/Hide Job Details** toggles in between showing or hiding the Job Details / Site Data section to provide more sheet viewing flexibility.
 - **Show/Hide Pass/Fail Setup** toggles in between showing or hiding the Pass/Fail Setup section for cable and optical parameters.
 - **Show/Hide Test Summary** toggles in between showing or hiding the Test Summary section for Statistical Analysis and test setup diagram.
8. To enter the measurement data, select a yellow cell. You can also enter the reference value automatically, and calculate the Pass/Fail status. In Autotest configuration, you can enter all values simultaneously, relevant to the settings in **Setup**.
9. If using 1 way instruments, bi-directional measurements can be achieved by performing single direction measurements from each end. The second set of values can be entered directly or downloaded.
10. When the report is complete, save the report using the standard Excel **Save** or **Save As** command.
11. Select **Test data** to manage save and load of the test data
- **Save as KITS Log File** saves test parameters and data to a text based KITS™ data file (file extension .rlg).
 - **Load to Current Workbook** loads the test parameters and data from the saved .rlg data file to the current Live Data sheet, and replaces test configuration parameters by those from the saved data file.

- ***Merge with Current Workbook*** allows user a choice to decide whether to replace the parameters on the current worksheet, if a swap of “A” and “B” end data is required, which data to load, and if the data can be overwritten.
- ***Memory Download*** gives quick access to the memory download dialogue.

Load or Merge Log Data for Live Data Sheet

The Load or Merge command allows import to the current worksheet the test log data from another instrument and/or saved by another computer.

Click ***Test Data / Load to*** or ***merge with Current Workbook***, then select a log file (*.rlg) to open. If the log file has a different set of wavelengths, fiber count, or fiber ID start number from the current workbook, a popup message will provided this information to the user.

In the Merge function, user can select:

- Whether or not to use the stored Job Details / Site Data in the log file
- Whether or not to use the stored Cable/Optical Parameters
- Whether to load data straight A to A and B to B, or swap A and B ends
- In loading data, whether to overwrite existing data cells, or only fill in when the cells of the current workbook are blank
- Individual selection of A to B, B to A, ORL at A, and ORL at B data

Load is a special case of merge where the saved data will overwrite all test data in the worksheet as well as test parameters.

Memory Download for Live Data Sheet

The instrument memory contents can be selectively dumped and mapped into a Live Data sheet.

You can select particular blocks of instrument memory, and select how to map them onto the worksheet. [Appendix A](#) is a summary of possible combinations of actions.

1. Select ***Setup / Test Setup***. In this Sub-Menu ‘test direction, ‘wavelength’ and ‘meter reference ocation’ is specified.
2. Specify ***Meter connected at***. This determines how the data will be transferred. Refer to [Appendix A](#) to review the options.
3. Specify required wavelengths. Up to 4 wavelengths may be specified.
4. Save the change if any and select ***Test Data / Memory Download***.

5. In the dialog box, select the **Start Memory** location. This determines the first instrument memory block to download. A ‘Select’ checkbox indicates if the memory data for that wavelength is to be downloaded. You may need to change the spreadsheet wavelengths for a proper download. **Type** shows if the stored measurement is for Autotest ('Dual' or 'Dual Two Way') or Manual ('Single').
6. Specify **No. of Fibers** to download. This determines the number of sequential memory blocks that will be downloaded.
7. Specify **Start at Fiber No.** This determines the first fiber in the spreadsheet to start download memory data.
8. Select **OK**, and the data will appear on the spreadsheet in the requested location and format.

Memory download supports 'Power' and 'Reference' readings only.

3.5. Using the Data Logging Sheet

The Data Logging sheet supports data logging whether the meter is in Power Meter, one-way or two-way Autotest mode. But the reading may become unreliable when the instrument is in one- or two-way Autotest mode.

Manual Data Logging

1. Select the **Data Logging** tab.
2. To clear existing data, select the **Clear Log** button.
3. To set the wavelength, use the arrow buttons next to **Wavelength**.
4. Select the relative mode if required using **Relative Mode**.
5. Optionally add a **Description**, which can be any text you like.
6. For each click of **Manual Reading**, a data point is logged. The data point index and the size of the log is automatically incremented.
7. To undo the last reading, select **Undo Reading**. This decreases the data point index, but not the size of log value.
8. To save the data log, Click the **Save Log** button and enter file name in the dialog box.
9. The following statistical information is updated with each new data point: max, min, mean, standard deviation and current reading.
10. Click **Show Log Data Top** on the toolbar to show the bottom of the data logging area; and click again to show the top.
11. A saved log can be later brought back into the spreadsheet. On the toolbar select **Load Log** and then select the log file name.

12. To print, select *Print / 'Data + Summary', 'Graph + Summary' or 'Graph Only'*.

Automatic Data Logging

Automatic data logging allows user to specify the number of data points and log time interval. During the data logging, each data point is automatically written to the specified log file, minimising data loss in case of a process interruption.

1. To select the wavelength, use the arrow buttons next to *Wavelength*.
2. Define *Size of Log*.
3. Define *Log Interval (sec)*.
4. To select relative mode, select *Relative Mode*.
5. Optionally add a *Description*, which can be any text you like.
6. To clear existing data, select *Clear Log*.
7. Click *Start Autolog* to start. You will be asked to enter a log file name. While logging is in progress, each data point is written direct to disk.
8. The log finishes when the number of log points reaches the specified size of log. To stop a log before it is completed, use *Stop*. Click *Continue* to continue Autolog.

3.6. Using the Loss Testing Sheet

The Loss Testing worksheet cannot be used for manual data input. The Loss Testing worksheet derives all its input from the Live Data worksheet.

In KITS™ 3.x and earlier versions, the Loss Testing sheet was the main data acquisition and report generation sheet. Realising it is impossible to satisfy all different needs of reporting in one worksheet, from KITS™ 4.10 an attempt is made to separate the two functions. The Live Data sheet is the place to perform all data acquisition functions (including input of job details and site data). The Loss testing sheet is retained in this release to give users a familiar view of KITS™ reporting sheet.

After filled some data in the Live Data sheet, user can select the Loss Testing tab (or click *Kingfisher / Loss testing*) to view the Loss Testing sheet. The data cells are filled in automatically using Excel formulae. By default, it uses the data of the first and second wavelength. User can choose different wavelengths by click on either the 1st or 2nd wavelength cell (with yellow background).

The three show/hide menu items under *Show/Hide Details* allow user to choose which sheet sections to view and print:

- **Show/Hide Job Details** toggles in between showing or hiding the Job Details / Site Data section.
- **Show/Hide Cable Details** toggles in between showing or hiding the cable parameters.
- **Show/Hide Formula Section** toggles in between showing or hiding the pass/fail formula parameters.

All other functions previously implemented for this sheet have been moved to the Live Data sheet.

3.7. Using the Meter Dump Sheet

The Meter Dump sheet provides a simple and convenient way for the user to download and view the loss test data stored in an instrument.

Unlike the Live Data sheet where only the memory readings that match the selected wavelengths are downloaded, the Meter Dump sheet downloads all data from meter memory.

Click on **Add-Ins / Download** button, all memory cells are downloaded to the sheet.

4. KITS™ Advanced Functions

4.1. Customising the Workbook

Add or Delete a KITS™ Worksheet

KITS™ 4.13 has 5 worksheets: Live Data, Loss Testing, Data Logging, Meter Reading, and Meter Dump. Depending on the application, some sheets may not be needed and thus can be removed from the KITS™ workbook. This can be done either by not including a sheet in initial setup, or using the standard Excel *Delete Worksheet* command during the operation.

A deleted KITS™ worksheet can be added to the workbook at any time during the operation. To do so, select *Kingfisher* / *<Sheet name>*. If the required sheet is not in the workbook, it will be loaded and initialised with the current setup parameters.

Because the Loss Testing sheet relied on the Live Data sheet for test data, it does not function properly without the Live Data sheet.

User can change a sheet name to any other text accepted by Excel. KITS™ remembers the new sheet name when the workbook is saved.

Change Meter Port

Users normally do not need to consider the meter port as KITS™ finds the port automatically on connection. The sequence is that KITS™ searches an available USB port first, and then search for an RS232 port.

The *Change Meter Port* menu item is useful if multiple KITS™ applications are running in the same computer (e.g. in a laboratory situation). In this situation, the user may need to specify the COM port manually for a particular instance of KITS™.

Save a Template

The KITS™ software is supplied with a default Excel workbook. You can easily create a new KITS™ workbook and customise it. Then use File Save As to save as a Workbook or Template. To use the customised workbook simply reopen it. This is very handy for working on assorted jobs, changing languages, terminology, and so on.

For detailed instructions, see [Appendix C – KITS™ Localisation Instructions](#)

Customised templates are also useful to store parameters such as printer settings, custom hyperlinks etc, which must be correctly selected when the template is stored.

Excel tip: To save the workbook as a template, select *File / Save As...*, then select *Template (*.xlt)* in the “Save as Type” dropdown list (Excel 2003 and earlier) or *Excel Button* (top left corner of Excel) / *Save As... / Other Formats / Excel Template (*.xltx)* (Excel 2007). By default Excel will save the file under the folder <Drive>:\Documents and Settings\<Your login id>\Application data\Microsoft\Templates. After saving, Excel will add a shortcut to this template on the *Recent Documents* list.

Excel tip: The supplied template is protected to prevent accidental alteration. To enable changes, on the Excel toolbar, select *Tools / Protection / Unprotect Sheet* (Excel 2003 and earlier) or *Review / Unprotect Sheet* (Excel 2007).

User tip: Many users prefer to create several customised worksheets with distinctive names. Using Explorer they right click on the customised files to make them write protected. When used, as the file is write protected Excel will automatically prompt for a different file name.

Change KITS™ Master Layout Template Workbook

KITS™ uses an Excel workbook KitsXls.xls (typically installed under <Drive>:\Documents and Settings\All Users\Application Data\Kingfisher\KITS4) as the Master Layout template for starting a new KITS™ workbook or adding a new worksheet.

KITS™ allows customisation in some cells of the workbook. If you change these cells, the changes will appear in all future new KITS™ workbooks or worksheets.

KITS™ uses colours to indicate different types of cells (See the top right corner of the Live Data sheet for an interpretation).

- User can freely change the text in a cell of white background. This is often useful for a limited localisation to another language (Refer to Appendix C for full scale localisation).
- The Live Data sheet has some cells in purple colour. User can change their values if the KITS™ default parameters are not desirable. Purple is used as an indicator for changing the template only. These cells will have yellow background colour in a KITS™ workbook.
- Don't add or delete a cell, row or column. The current implementation of KITS™ 4.1x does not support this change.

4.2. Designing a Customised Report Sheet

From years of experience in customer support, it is recognised that a generic report sheet format can never satisfy different user needs. A new report generating function is provided in KITS™ that allows users to design their own report sheets and automatically populates the test data to the custom designed report sheets.

1. Create a new or open a saved KITS™ workbook, set up all parameters for the Live Data sheet.
2. From the Kingfisher menu bar, click **New Report**. A “New Report Sheet” form will pop up.
3. Enter in a sheet name. Choose data layout option A or B (A is the layout of the Loss Testing sheet, where one Excel row has data for all wavelengths of one fiber. B is the layout of the Live Data sheet, where one Excel row has data for one wavelength and data for one fiber is grouped in consecutive rows). For option B, you can tick checkboxes to decide which wavelengths to include in the report. By default the new report sheet uses the same XSD (XML Schema Definition) file as used by the Live Data sheet. You can customise this file and supply it to the new report. XML Map Name shows the name of the XML map for this sheet. It is empty before the sheet is created.
4. Click **Ok** to complete. A new sheet is created which contains a picture frame with instructions to customise a report sheet. Read and delete this frame before you start designing the sheet (or copy it somewhere else as you may need to revisit it).
5. Design the layout of the sheet as you work on a normal Excel worksheet. Or if you have an existing worksheet to use as a template, you can copy part or whole sheet and paste to the new report sheet.
6. In KITS™, click the Excel menu item **Data / XML / XML Source** (Office 2003) or **Developer / XML / Source** (Office 2007) to open the XML Source pane. A dropdown list on the top of the pane shows the XML maps in the workbook. KITS_Map is used by the Live Data sheet, and each new report sheet has an XML map named KITS_Map1, 2, 3, You need to use the right map for this report sheet otherwise the data cannot be populated correctly.
7. You can drag and drop an XML element to a cell in the report sheet. Or right click the mouse on the XML element in the pane and select **Map element ...** or **Remove element**.
8. If you choose layout option A, you will map each wavelength data in its selected columns. In the XML map, use elements under KITS/Test Data to map the first wavelength, KITS/Test Data2 the second wavelength, etc. If you choose option B, use only KITS/Test Data for mapping.
9. To test your mapping, click **Populate Data** to map the data from the Live Data sheet. The current implementation copies the data from the Live Data sheet instead of using formulae, as Excel may not show the data correctly for the XML mapped cells.

10. If not satisfied, click **Clear Data** to clear all mapped cells (but not other cells), change your mapping, and populate data again.

OPTICAL FIBRE CABLE TESTS													
<small>Kingfisher International 312 Fibres Tables Workbook for KITS411</small> <small>Report Version 1.04.06.2008</small>													
INSERTION LOSS (IL) AND OTDR END TO END LINK LOSS (LL) TABLES													
WorkbookID	Sheet : 1			Project :	Date :	27/06/2008							
Route:	File No: Report-20080627												
Terminal	ESA	Sheath ID	OTDR	Light Source	Power Meter	Operator							
"A"	A End State		REQ002007										
"B"	B End State												
Length (L) km	0.120		No of Fibres	12		Total Splitters	2		Total Connectors	2			
Sheath Fibre No.	1310	1310nm	1310nm	IL	1550nm	1550nm	1550	IL	OTDR LINK LOSS	1550	IL LL	Check	Line
Fibre Index	Fibre Index	A-B	A-B	(A-B)1	A-B	A-B	(A-B)2	A-B	A-B	B-A	LL	1550.00	System ID
1	1	Pass	Pass		Pass	Pass						Pass	
2	2	Pass	Pass		Pass	Pass						Pass	
3	3	Pass	Pass		Pass	Pass						Pass	
4	4	Pass	Pass		Pass	Pass						Pass	
5	5	Pass	Pass		Pass	Pass						Pass	
6	6	Pass	Pass		Pass	Pass						Pass	
7	7	Pass	Pass		Pass	Pass						Pass	
8	8	Pass	Pass		Pass	Pass						Pass	
9	9	Pass	Pass		Pass	Pass						Pass	
10	10	Pass	Pass		Pass	Pass						Pass	
11	11	Pass	Pass		Pass	Pass						Pass	
12	12	Pass	Pass		Pass	Pass						Pass	

Tips Working with a New Report Sheet

- An XML element can be mapped only once. If you do want a piece of data to appear in another cell, you can use an Excel formula to refer to the mapped cell.
- The XML element with a blue rectangular in its icon (📁) is called a repeating element which allows the element to appear any number of times. This is used to map an array of data. The first cell is for the title with the data mapped to the rows below. You can either use this title as the heading or supply your own heading and hide the title element.
- To remove a mapped repeating element, first do **Remove element** from the XML pane, then click on the mapped element (where the dropdown icon still appears), click Excel menu **List / List / Convert to Range** (Office 2003) or **Design/Convert to Range** (Office 2007) to convert the area to normal Excel range. After that, you can remap the element.
- To know which XML is mapped to the current report sheet, open the XML pane, click on a mapped cell, the pane will show the map with the element that is mapped to the cell selected. Alternatively, click the **Setup** button, the XML Map Name in the popup form shows the name of the map.
- If you map repeating elements to adjacent columns in the sheet you may receive an “XML map is not exportable” error when you try to export the XML data. Click **Options** in the XML pane, and deselect **Automatically Merge Elements When Mapping**. Or you can insert a column in between two XML mapped lists and set its width to 0 (but this may affect other rows in the sheet).
- You can copy the XSD file KitsXml40.xsd (typically under <Drive>:\Documents and Settings\All Users\Application Data\Kingfisher\KITS4) to another file, remove the elements in KITS/Test Data[234] that are not needed and rearrange the remaining elements so that KITS/Test Data[234] can be mapped to an XML list as a whole. Run **Setup** to change to the new XSD file name.
- Save your workbook after each major step in case some undesired changes may not be undone.

4.3. Technical Tips in Using KITS™

Run the Second KITS™ Workbook

Due to the restriction in resource sharing, only one KITS™ workbook can run within one Excel application. To run the second KITS™ workbook, user can start another Excel application (*Start / programs / Microsoft Office / Excel*), then open an existing or new KITS™ workbook.

The two KITS™ workbooks run each in its own workspace without interfering with another.

Re-enabling the KITS™ Add-In

KITS™ runs as an Excel Add-In named KIAddin. Occasionally this Add-In may become disabled. When this happens, you can follow these steps to re-enable it (in Excel 2007):

1. Click the *Office* button (the top left corner of Excel), then click *Excel Options / Add-Ins*
2. If KIAddin is disabled, you can see it in the list “Disabled Application Add-Ins” (near the bottom)
3. In the drop down list (at the bottom), select *Manage: Disabled Items / Go*
4. Select *KIAddin / Click Enable / Close*
5. Back to the same drop down list, select *Manage: COM Add-Ins / Go*
6. Select *KIAddin / Ok*

In Excel 2003 and earlier: Click *Help / about Microsoft Office Excel / Disabled Items...* Select KIAddin and then *Enable*.

If KIAddin is not visible in the list of disabled items, you need to run “Add or Remove Programs” from Windows Control Panel to repair KITS™.

Opening an Old KITS™ Workbook

If you have a workbook saved by an earlier release of KITS™, it may not work properly with the new release because of the changes made to the program as well as sheet layout. Open the workbook in Excel and see how much existing data is still available. You may still be able to retain some of the data.

In the worst case, you can create a new KITS™ workbook, enter the setup parameters following the settings of the old one, and manually copy the data you want to keep and paste it to the new KITS™ workbook.

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*Thanks for staying with us
We hope you enjoy using our software*

6. Appendices

Appendix A - Data Transfer from Meter(s) to Kits™

Assumption: If a direct transfer, or later download, is performed between an instrument and KITS™, there is no difference in what is transferred.

Test Directions	Reference Options	Kits connected to meter at	Reference		Measure		ORL	
			A	B	A	B	A	B
A to B	Remote Reference 2 power meters used	A	X					
		B				X		
	Local Reference 1 power meter used	A						
		B	X			X		
	Manual Reference 1 power meter used	A						
		B				X		
B to A	Remote Reference 2 power meters used	A			X			
		B		X				
	Local Reference 1 power meter used	A		X	X			
		B						
	Manual Reference 1 power meter used	A			X			
		B						
Bi-Directional using successive testing	Remote Reference 2 power meters used	A	X		X			
		B		X		X		
	Local Reference 1 power meter used	A		X	X			
		B	X			X		
	Manual Reference 1 power meter used	A			X			
		B				X		
ORL at A ORL at B		A					X	
		B						X
Two-way Autotest Bi-Directional	2 x Two-way + ORL Testers used	A	X	X	X	X	X	X
		B	X	X	X	X	X	X

A remote reference is usually performed on a "long" link where it is inconvenient to use one power meter to measure the power at both the ends of the link.

Two power meters are used to perform one loss test in one direction. One power meter is used to measure the Reference Level (eg the light source output power), and the other meter is used to measure the 2nd value at the other end of the link. These measurements are performed sequentially, to minimise the effect of source drift over time. However in this test sequence, the absolute measurement accuracy of the two meters becomes critical. To overcome this defect, this method is commonly combined with in a two-step bi-directional test sequence, and the losses in both directions are averaged. Using this bi-directional process eliminates meter absolute accuracy as a source of measurement error.

A **local reference** is performed when one power meter is used to measure both Reference Level and 2nd value measurements. This is commonly used in a situation where both ends of a system can be accessed readily by the one meter (for instance loop-back testing, or bench testing).

So **Bi-Directional testing** is commonly used with the remote referencing method in situations where the two ends of the system are far apart. This method eliminates the effect of absolute calibration discrepancies between two power meters. This method is affected only by short-term source stability and power meter linearity. Source long term stability and meter calibration accuracy are both eliminated. So this is the preferred method for telecom use.

Manual reference is performed when the reference values are entered into the KITS™ worksheet manually.

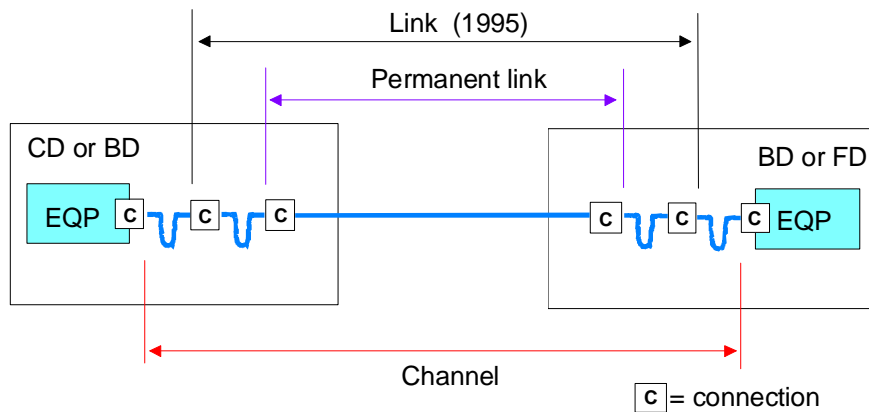
Appendix B - Use of International and Other Standards

KITS™ 4.10 introduced the option of Standards based testing. When selected, KITS™ automatically configures the workbook with a set of pre-defined parameters for Pass/Fail assessment.

Two standard based options are provided:

International Standards (File name: Int-LossTest-Standards.XLS)

International Standards can be referenced. As installed, this workbook is preconfigured for 11 International Standards, being 3 IEC Permanent Link, 6 IEC Channel and 2 spare standard locations. The file is write protected. Additional standards can be added if desired. Should other International Standards be required to be referenced, contact your nearest KI distributor or Kingfisher International directly.



Other Standards (File name: User-LossTest-Standards.XLS)

As installed, this workbook is preconfigured for 6 user definable standards. Supplied as a Read/Write enabled worksheet it can be write protected if required.

Writing your own standard specifications

You can modify or add to the existing Other Standard list. The data field functions & requirements are:

Column A: No.

If required, set mouse point to the No. column of the last standard, press Enter, and enter data to the other columns of the row to add another standard.

Column B: Standards (Protected) / User Definable.

Enter name of the standard or local specification here.

Column C: Issue No

Enter version number of the standard or local specification here.

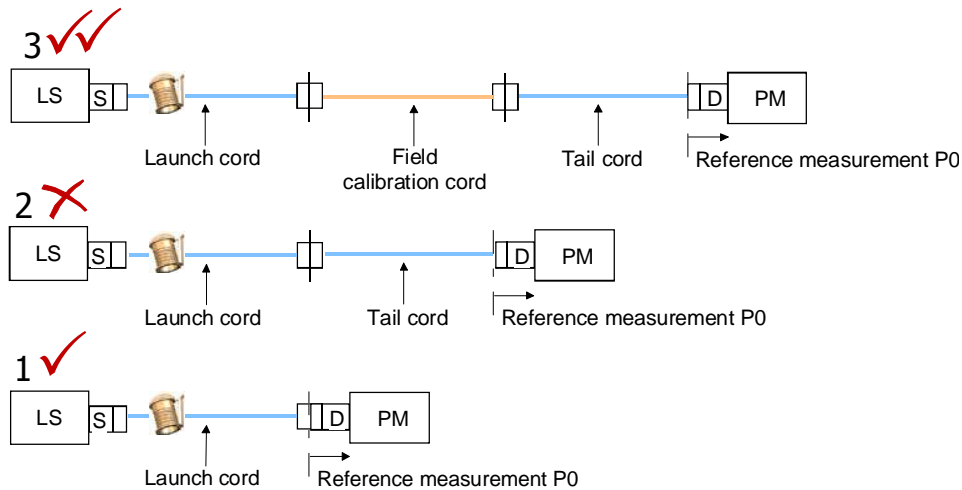
Column D: Pass/Fail Insertion Loss

This cell defines the way in which test results are assessed for a Pass/Fail condition. When testing to International Standards, this is usually assessed against the Worst Case single direction result. By comparison, many telcos assess their Pass/Fail criteria against the two-way average.

Enter an 'A' for two-way average a 'W' for Worst Case assessment here.

Column E: Allowed Reference Configuration.

The number of test cords permitted to be used in establishing a reference condition may be defined. E.g. for International Standards, only 1 or 3 lead referencing is permitted.



Enter the allowed test cord referencing configurations, separated by a comma. Thus to permit all 3 configurations use 1,2,3. For 1 & 3 lead referencing only enter 1, 3.

Column F: Connector 1-2 Loss dB

Some standards mandate that the two end connectors shall have a lower maximum allowable loss to any other mated connectors that may be in the DUT.

Enter the Maximum Allowable loss in dB for the first two or end connectors here. You must also enter a value for any subsequent mated connectors under 'Connector other loss'.

Column G: Connector Other Loss dB

Enter the Maximum Allowable loss in dB for any subsequent mated connectors here.

Column H: Splice Loss dB

Enter the Maximum Allowable splice loss in dB here.

Column I: ORL

Enter the Maximum Allowable ORL in dB here. Values can be +Ve or -Ve. KITS™ will use absolute values.

Column J: Uncertainty Allowance dB

If required enter here the measurement uncertainty in dB. A +Ve value will result in this number being added to the calculated maximum link loss whilst a -Ve value will be subtracted. Common values are 0.3 or 0.

Column K: Max Length m

Enter any maximum allowable length here in metres.

Column L: Propagation Delay ns
 Given length, KITS™ can automatically calculate the propagation delay in ns.
 $PD = \text{length}_m * (1000 * IOR) / C$. Where IOR is the cables Index of Refraction and C is the speed of light.
 For example: IOR = 1.469 => 4.90 ns/m, IOR = 1.490 => 4.97 ns/m.
 For International Standards based testing use 5 ns.

Columns M-X: Wavelength parameters
 Specifications in dB/Km or maximum loss for up to 4 wavelengths may be entered here.

Required parameters are:

1. Wavelength, nm
2. dB/km, or
3. Maximum allowable loss dB

Appendix C - KITS™ Localisation Instructions

KITS™ is supplied with an English user interface. It can be localised to another language by anyone with a reasonable working knowledge of Excel and general programming:

- Most test items within worksheet cells can be changed in Excel. But some are output of the KITS™ program and thus can not be changed in this way.
- Items in the KITS™ menu bar, dialog windows and error messages are defined in separate resource files, which can be customised using Microsoft™ localisation tools.

Languages such as Chinese, Arabic etc require special font sets and other language specific programs so that the computer can display the correct symbols.

KINGFISHER KITS™ Vivere di lavoro di acquisizione dei dati														
Version 4.12 Italian														
Dettagli di posti di lavoro / dati del sito														
Lavoro No	Progetto			Data										
Client	Contraente			Report/File No			Report-20080215							
Sezione	Dritto			Canale/Link Perm.										
Circuito ID	Via cavo			Disegno No										
Rotta	Guaina			Altro										
Indirizzo "A"		Indirizzo "B"												
Terminale ID	Guaina ID	Tipo di origine	Origine S/N	Contatore tipo	Metro S/N	CAL Y/N	Nome operatore							
"A"	A													
"B"	B													
Parametri via cavo					Parametri ottici									
FC= Fibra count	6	L = Lunghezza fibra	meter	0	F = Filtra di attenuazione, dB/Km	0.35	0.19							
FT= Fibra di tipo	SMF	NS = Numero di impiombature		0	SL = Giunzione perdita, dB	0.1	0.1							
'A' Tipo di connettore	SCAPC	NC = Numero di connettoni		2	CT = Connettore 1-2 perdita, dB	0.4	0.4							
'B' Tipo di connettore	SCAPC	ND = Numero di altri dispositivi		0	CL = Connettore altre perdite, dB	0.4	0.4							
Metodo di riferimento	1 Cord	DL = Device insertion perdita, dB		0	UA = Indennità di incertezza, dB	4	4							
Tipo di riferimento	Remote	Direzione di prova		2-way	Pass / Fail Link perdita, dB	0.00	0.00							
Pass / Fail Calcolo					Pass / Fail Canale perdita, dB									
Max perdita = (F*L) + (SL*NS) + (CT*CL*NC) + (DL*ND) + UA					Pass / Fail perdita ORL, dB									
35.00					35.00									
Analisi statistica					Standard applicati: Telstra SMOF after 01/06									
perdita					1 fibers OS2									
ORL					SC APC <<<<<< >>>>>> DIN PC									
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								
Lunghezza = 0 meter														
Prop Delay = -- ns														
Risultati della prova														
Fiber ID	A	Insertion perdita (IL) Risultati dB				ORL Risultati dB								
"A"	B	Direzione A->B	Media	IL	Direzione	ORL	Pass/Fail	e Ora						
A	B	nm	Ref A	Meas B	IL A->B	Ref B	Meas A	IL B->A	Margine	A	B	Margine	P/F	TimeTag

Modifying Spreadsheet Cells

1. KITS™ uses KitsXls.xls (typically under *<Drive>:\Documents and Settings\All Users\Application Data\Kingfisher\KITS4*) as the layout template when creating a new workbook. You need to decide if you should make changes in the template, so that the changes will apply to all future workbooks, or make changes only for an existing workbook.
 2. The Kitsxls.xls workbook is not protected. That leaves the user organisation to decide if or how to protect it.
 3. To make changes in an existing workbook, remove sheet protection (using **Tools / Unprotect Sheet** menu in Excel) and then modify the text in the cells as required.
 4. Remember to re-apply sheet protection, if applicable, when the required changes are done!
- Cells that change contents during the running of the program need not be changed. They are overwritten by the program.
 - Do not modify the contents of cells containing formulae.
 - The explanatory note in the upper right corner of the Live Data sheet is a drawing. To change this, delete it and make a new drawing. The drawing should be grouped together into a single item.

Localising Menu Bars, Dialog Boxes and Error Messages

KITS™ installation package supplies a set of .resources files to the end user for localisation. The file names look like *KIUIForms2003.ctlxxxToolbar.resources* or *KIUIForms2003.frmyyy.resources*. The former is the resources file for a User Control, where xxx is the name of the module it is applied to, and the latter is for a Form, where yyy is the name of the form. KITS™ 4.11 has 8 *ctl* and 20 *frm* resources files.

The resources file for a User Control contains a Toolbar which defines the texts of the top level command buttons and menus. It also contains a number of Context Menus which are used to define:

- Texts of the second level menu items to appear on the toolbar
- Dialogue messages to present to the user
- Texts to appear in worksheet cells or on-sheet GUI controls, and
- Texts used by KITS™ to output to an external file

The resources file for a Form contains texts for all controls to appear in the GUI form. It may contain one or more Context Menus which are used to define:

- Texts of the menu items that may need to change during the application

- Texts for a dropdown list, and
- Dialogue messages to present to the user when the form is open.

Following is a step by step guide to localise the KITS™ resources files. It has been tested in the Windows XP/Visual Studio 2003 environment. The actual steps may be different in another environment.

1. Localizing a Resources File with WinRes.exe

WinRes.exe is a Windows based localization tool (typically under C:\Program Files\Microsoft Visual Studio .NET 2003\SDK\ v1.1\Bin). Launch WinRes from Windows Explorer and open a resource file for editing, e.g. frmTestSetup.resources. Change the text of the controls on the GUI form. Adjust sizes and locations if necessary.

If the text of a control is changeable at the runtime, or a pop-up message is required when the form is active, the extra text messages are stored in the Context Menu section of the form (in WinRes, context menu items can only be accessible from the Properties window).

To save a localised version, click the Save As command on the File menu. The tool displays the Select Culture window. Double-click the appropriate culture. The tool saves the file, using the naming convention that the runtime expects for localized resource files. For example, if you localize for German in Germany, the tool saves the file as frmTestSetup.de-DE.resources.

Repeat the above procedure for all .resources files that need localization.

2. Creating a .dll File with Al.exe

After all resources files for another culture are generated, run command al (typically under C:\Windows\Microsoft.NET\Framework \v1.1.4322\) to generate a localized .dll file. For example:

```
al /t:lib /embed:
KIUIForms2003.ctlKingfisherToolbar.de.resources
/embed: KIUIForms2003.frmTestSetup.de.resources
/embed: <any other ctl and frm resources files to
be included> /culture:de /out:
KIUIForms2003.resources.dll
```

compiles a KIUIForms2003.resources.dll file for the German culture.

Command al has to be run under its current directory (or a system variable is defined to include this path), as it needs to access other files under that directory.

After the file KIAddin2003.resources.dll is generated, copy it to the satellite assembly directory for running the KITS™ application in another

language (typically under <KITS installation directory>
\Kingfisher\KITS\de\).

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