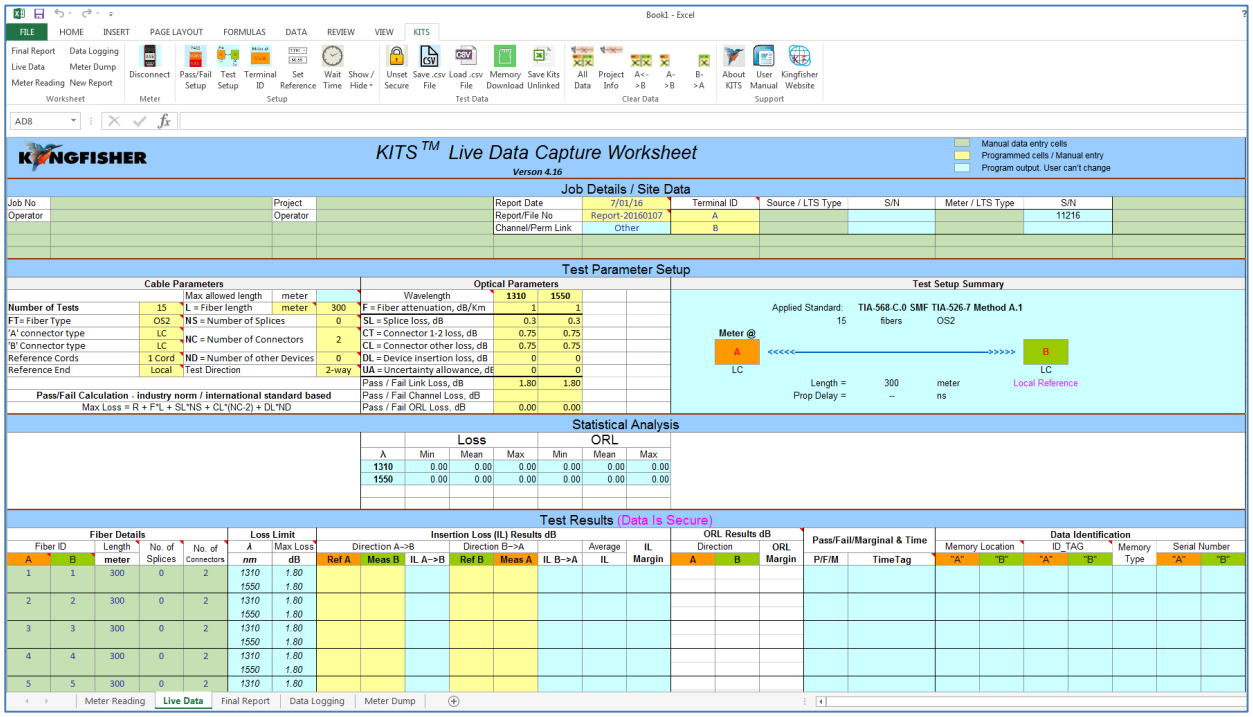
Kingfisher International

# User Manual
# KITS 4.16

# User Manual KITS™ 4.16

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**1. PURPOSE ..... 6**

**2. OVERVIEW ..... 6**

**3. WHAT'S NEW IN THIS VERSION ..... 6**

**4. FONT CONVENTIONS USED IN THIS MANUAL ..... 6**

**5. QUICK TOUR / DEMONSTRATION OF KITS™ ..... 7**

5.1 DEMO MODE TOUR ..... 7
5.2 LIVE MODE TOUR ..... 8
*5.2.1 Meter setup: ..... 8*
*5.2.2 Connecting meter to KITS™ software: ..... 8*
*5.2.3 Start KITS™: ..... 8*
*5.2.4 Working with "Meter Reading" worksheet: ..... 9*
*5.2.5 Working with "Live Data" worksheet: ..... 9*
5.2.5.1 Setting up & enter data to the worksheet ..... 9
5.2.5.2 Working with "Enable remote hold interlock" function. ..... 9
*5.2.6 ORL Measurements on "Live Data" worksheet: ..... 11*
*5.2.7 Saving data of "Live Data" worksheet into a CSV file: ..... 12*
*5.2.8 Loading data saved in a CSV file onto "Live Data" worksheet: ..... 12*
*5.2.9 Download data in meter memory onto "Live Data" worksheet: ..... 12*
*5.2.10 Working with "Final Report" worksheet: ..... 15*
*5.2.11 Working with "Data Logging" worksheet: ..... 15*
*5.2.12 Working with "Meter Dump" worksheet: ..... 15*
*5.2.13 Closing KIT software: ..... 15*

**6. QUICK REFERENCE GUIDE ..... 15**

6.1 KITS™ WORKSHEETS ..... 16
*6.1.1 Live Data Worksheet ..... 16*
*6.1.2 Final Report Worksheet ..... 16*
*6.1.3 Meter Reading Worksheet ..... 16*
*6.1.4 Data Logging Worksheet ..... 17*
*6.1.5 Memory Dump Worksheet ..... 17*
6.2 KITS™ SAVE CSV ..... 17

**7. COMPUTER & INSTRUMENT FIRMWARE REQUIREMENTS ..... 17**

7.1 COMPUTER ..... 17
7.2 INSTRUMENT ..... 17

**8. KITS™ SOFTWARE INSTALLATION ..... 18**

8.1 BEFORE INSTALLATION ..... 18
8.2 SETUP.EXE ..... 18
*8.2.1 Where are the KITS™ files located? ..... 19*
*8.2.2 Regional Configuration ..... 20*
*8.2.3 Re-enable or reinstall KITS™ if it does not startup properly ..... 21*
8.3 MUI FOR RUNNING KITS™ IN ANOTHER LANGUAGE ..... 22

**9. STARTING KITS™ & CONNECTING AN INSTRUMENT ..... 22**

**10. LIVE DATA WORKSHEET ..... 26**

10.1 OPENING & CONFIGURING LIVE DATA WORKSHEET ..... 26
10.2 THE 5 SUBSECTIONS IN LIVE DATA WORKSHEET ..... 29
*10.2.1 Header subsection ..... 29*
*10.2.2 Job Deail / Site Data subsection ..... 29*
*10.2.3 Test Parameter Setup subsection ..... 30*
*10.2.4 Statistical Analysis subsection ..... 30*
*10.2.5 Test Result subsection ..... 30*
10.2.5.1 "Fiber Details" columns: ..... 30
10.2.5.2 "Loss Limits" columns: ..... 31
10.2.5.3 "Insertion Loss (IL) Results dB" & "ORL Result dB" columns: ..... 31
10.2.5.4 "Pass/Fail/Marginal & Time" columns: ..... 31
10.2.5.5 "Data Identification columns": ..... 31
10.2.5.6 "Test Results (Data is Secure)": ..... 31



Copyright

10.3 TEST DATA ENTRY IN LIVE DATA WORKSHEET ..... 31
*10.3.1 Manual Data Entry (only when Data Secure Mode is unset) - Local referencing, one-way test.* ..... *31*
*10.3.2 One click data entry* ..... *33*
10.3.2.1 One click entry- local referencing, one-way test. ..... 33
10.3.2.2 One click entry - local referencing, two-way test ..... 34
10.3.2.3 One click data entry for ORL measurements ..... 35
*10.3.3 Data entry by downloading from instrument memory* ..... *37*
*10.3.4 Data entry by downloading from CSV files* ..... *38*
10.4 ASSOCIATED KITS™ COMMANDS OF LIVE DATA WORKSHEET ..... 40
*10.4.1 Worksheet: [Final report], [Live Data], [Meter Reading], [Data Logging], [Meter Dump], [New Report]* ..... *40*
*10.4.2 [Connect/Disconnect]* ..... *41*
*10.4.3 [Pass Fail Setup]* ..... *41*
*10.4.4 [Test Setup]* ..... *42*
*10.4.5 [Terminal ID]* ..... *43*
*10.4.6 [Set Reference]* ..... *43*
*10.4.7 [Wait Time]* ..... *44*
*10.4.8 [Show / Hide]* ..... *44*
*10.4.9 [Unset/Set Secure]* ..... *44*
*10.4.10 [Save .csv File]* ..... *44*
*10.4.11 [Load .csv File]* ..... *45*
*10.4.12 [Memory Download]* ..... *45*
*10.4.13 [Save Kits Unlinked]* ..... *45*
*10.4.14 Clear Data: [All Data], [Project Info], [A <-> B], [A -> B], [B -> A]* ..... *45*
*10.4.15 [User Manual]* ..... *45*
*10.4.16 [About KITS]* ..... *45*
*10.4.17 [Kingfisher Web site]* ..... *46*

**11. FINAL REPORT WORKSHEET ..... 46**

11.1 FINAL REPORT WORKSHEET ..... 46
11.2 ASSOCIATED KITS™ COMMANDS OF FINAL REPORT WORKSHEET ..... 47
*11.2.1 [Save .csv File]* ..... *47*
*11.2.2 [Save Kits Unlinked]* ..... *47*
*11.2.3 Show / Hide Details: [Show/Hide Job Details], [Show/Hide Cable Details], [Show/Hide Formula Section]* ..... *47*
*11.2.4 [User Manual]* ..... *47*
*11.2.5 [About KITS]* ..... *47*
*11.2.6 [Kingfisher Web site]* ..... *47*

**12. METER READING WORKSHEET ..... 48**

12.1 METER READING WORKSHEET ..... 48
12.2 ASSOCIATED KITS™ COMMANDS OF METER READING WORKSHEET ..... 48
*12.2.1 [Disconnect /Connect]* ..... *48*
*12.2.2 [Set Reference]* ..... *49*
*12.2.3 [Hold / Continue]* ..... *49*
*12.2.4 [Abs / Rel]* ..... *49*
*12.2.5 [Previous Wavelength] & [Next Wavelength]* ..... *49*

**13. DATA LOGGING WORKSHEET ..... 49**

13.1 DATA LOGGING ..... 50
*13.1.1 Automatic Data logging* ..... *50*
*13.1.2 Manual Data Logging* ..... *51*
13.2 VIEWING DATA WHILST LOGGING ..... 51
13.3 LOADING SAVED LOG FILES ..... 52
13.4 PRINTING LOG FILES ..... 52
13.5 ASSOCIATED KITS™ COMMANDS OF DATA LOGGING WORKSHEET ..... 52
*13.5.1 [Disconnect /Connect]* ..... *53*
*13.5.2 [Start AutoLog]* ..... *53*
*13.5.3 [Stop / Continue AutoLog]* ..... *53*
*13.5.4 [Clear Log]* ..... *53*
*13.5.5 [Manual reading]* ..... *53*
*13.5.6 [Save Reading]* ..... *53*



Copyright

*13.5.7 [Show Log Data Bottom] & [Show Log Data Top]* ..... *53*
*13.5.8 [Load .log File]* ..... *53*

**14. METER DUMP WORKSHEET** ..... **53**

14.1 METER DUMP WORKSHEET ..... 54
14.2 ASSOCIATED KITS™ COMMANDS OF METER DUMP WORKSHEET ..... 54
*14.2.1 [Disconnect /Connect]* ..... *54*
*14.2.2 [Download]* ..... *54*
*14.2.3 [Save as .csv]* ..... *54*
*14.2.4 [Clear]* ..... *55*
*14.2.5 [Save Kits Unlink]* ..... *55*

**15. EXTRACT MEMORY OF A METER DIRECTLY** ..... **55**

**16. CUSTOMISATION** ..... **55**

16.1 RENAMING WORKSHEETS ..... 56
16.2 MODIFYING THE LIVE DATA & LOSS TESTING WORKSHEETS ..... 56
*16.2.1 Modification Rules* ..... *56*
16.3 PROTECTING A WORKSHEET DESIGN ..... 56
16.4 DESIGNING A CUSTOMISED REPORT SHEET ..... 57
*16.4.1 XML Mapping Tips:* ..... *61*

**17. TECHNICAL TIPS** ..... **62**

17.1 RUNNING AN ADDITIONAL KITS™ WORKBOOKS ..... 62
17.2 OPENING AN OLD FORMAT KITS™ WORKBOOK ..... 62

**APPENDIX A SUPPORT** ..... **63**

**APPENDIX B RS232 / USB DRIVER CONFIGURATION & INSTALLATION** ..... **64**

B.1 RS232 ..... 64
B.2 USB POWER ..... 64
B.3 CHANGE METER PORT ..... 64
B.4 USB KI7000 SERIES ..... 64
B.5 USB KI2000 SERIES ..... 65
*B.5.1 Install KI2600 series device driver manually* ..... *65*
*B.5.2 Add/edit register, 'IgnoreHWSerNum' on a computer* ..... *66*

**APPENDIX C USE OF INTERNATIONAL AND OTHER STANDARDS** ..... **67**

C.1 INTERNATIONAL STANDARDS ..... 67
C.2 OTHER STANDARDS ..... 68

**APPENDIX D LICENSE & WARRANTY** ..... **71**

D.1 END-USER-LICENSE AGREEMENT FOR KINGFISHER INTERNATIONAL SOFTWARE ..... 71
D.2 SOFTWARE PRODUCT LICENSE ..... 71
*D.2.1 GRANT OF LICENSE. This EULA grants you the following rights:* ..... *71*
*D.2.2 DESCRIPTION OF OTHER RIGHTS AND LIMITATIONS* ..... *72*
*D.2.3 UPGRADES* ..... *72*
*D.2.4 COPYRIGHT* ..... *73*
*D.2.5 DUAL-MEDIA SOFTWARE* ..... *73*

**D.3 WARRANTY** ..... **73**



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## Record of Issues

If you have any suggestions for improvement to this document, please contact us at Kingfisher International Pty Ltd.

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We hope you enjoy using our software

| Issue | Issue Date. | Comments | Issue Author |
|---|---|---|---|
| 6 | Oct 2016 | 1. Section 5.2.2 & Appendix B.1: Removed the use of Kingfisher's USB-RS232 Adaptor from the instructions in these sections. This adaptor is now obsolete as Window10 does not support it.<br><br>2. Added in Appendix B with section B.5.2, instruction to add/edit register, IgnoreHWSerNum on a computer to work around connection problem between the software & meter. | TO Ng |

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# 1. PURPOSE

This User Manual describes the use of Kingfisher International's Test Reporting Software (KITS™) for Loss Testing.

It is assumed that the user has basic knowledge of both fibre optical testing and Kingfisher instrument operation.

# 2. OVERVIEW

KITS™ is an Excel based test and reporting program used for testing and reporting fiber optic power, attenuation, and integrated optical return loss.

Full-feature capability includes real time interactive data acquisition, data logging, a real time meter display, data file import / export, importing data from instrument memory, and manual data input.

Several International and National standards are built into KITS™. The user can add additional standards if required.

KITS™ provides fully customizable cable acceptance reporting layouts.

# 3. WHAT'S NEW IN THIS VERSION

**New in software version V4.16**

- Test Setup automation when meter in one way or two way AutoTest.
- User options for KITS™ start-up.
- User option to reconfigure Live Data sheet based on csv file or meter memory.
- Updated user interface from old command bars to Office ribbons.
- Added "Demo mode" for overview of KITS™ functions.
- New Live Data columns for local and remote meter numbers per fibre.
- Code rewritten to be computer system architecture neutral.
- A collection of sample KITS™ csv files included with KITS™ installation.
- Pop-up message to assist user to manually install USB2000 driver if necessary.

# 4. 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 bold font in double quotes, like "**Live Date" / "CONNECTED"** is a displayed field name, worksheet name, name of options, status etc. in Windows, Office, or KITS™.

The text in square brackets, such as [AUTOTEST], is an operation on the test instrument.


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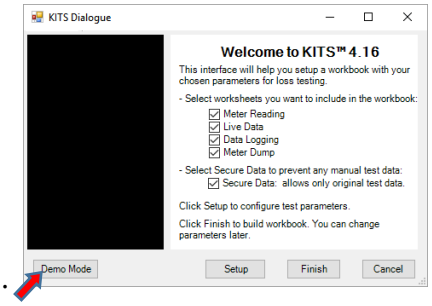
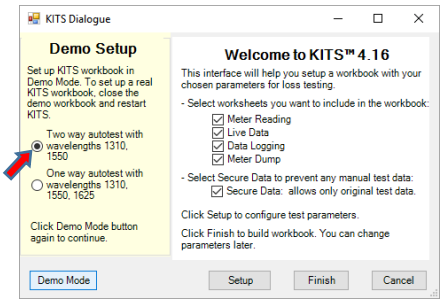
# 5. QUICK TOUR / DEMONSTRATION OF KITS™

It is assumed that the KITS™ software has already been installed on a PC, Notebook or Tablet. See **section 8** for KITS™ installing and **section 7** to check prerequisites.

User has the options to start KITS™ in Demo mode or Live Mode. Refer to **section 5.1** for a Demo Mode Tour or **section 5.2** for a Live Mode Tour. KITS™ software needs to be restarted to change from Demo to Live Mode or vice versa.

## 5.1 Demo Mode Tour

This is a simulation mode aimed at providing users with an overview of the KITS™ software. In this mode, only "**Meter Reading"** & "**Live Data"** worksheets are active with simulated meter readings. No such support for all other worksheets.

| Step | Procedure |
|---|---|
| 1 | Start KITS™ by double-click on **"KITS Wizard"** icon.<br>Alternatively navigate via the Windows Start menu.<br>e.g. ***[Start] -> [all Programs] -> [Kingfisher Kits] -> [Kits Wizard]*** |
| 2 | Select ***[Demo Mode]*** on the dialogue box below;<br>  |
| 3 | Select the "**Two way AutoTest**…." option and click ***[Demo Mode]*** again to go to "**Meter Reading"** sheet.<br>  |
| 4 | Watch how test data & results are displayed on the "**Meter Reading"** worksheet.<br><br>Change to **"Live Data"** worksheet and click on one of the yellow-highlighted cell under "**Test Results"** section and test data/results of the corresponding row will be entered automatically. Click on the yellow cells of the next few rows to enter more data. |
| 5 | Close and restart KITS™, select "**One way AutoTest**…." on the dialogue box (see section 2 above) this time. Repeat the steps in section 4 above and observe the differences in terms of the type of data being entered onto the worksheets. |



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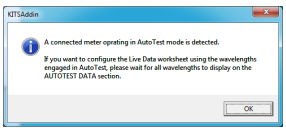
## 5.2 Live Mode Tour

This section provides users with step-by-step guidance for connecting test instrument to KITS™ software, and for working with the various worksheets and the associated commands.

| Step | Procedure | See more detail in… |
|---|---|---|
| **5.2.1** | **Meter setup:** | |
| I | To do a tour in this mode, you will need a KI2000 series source and meter, or any KI7000 series loss test set or power meter, and KITS™ software. | |
| II | Turn on the instruments. It is convenient to defeat the auto-timeout (for auto-off function) by holding down the green [Power] button for 3 seconds during turn on. | |
| III | Clear meter/instrument memory (assuming no stored data is wanted!):<br>*For KI2600,* select [Memory] mode, press and hold [Toggle Centre] button then press green [Power] button, 'clr' will be displayed until all memories are cleared.<br>*For KI7000, p*ress both [MR] and [Exit] simultaneously for 3 seconds. 'clr' will display. | |
| IV | Connect the source and meter ports with a test lead, and select [AutoTest] (on the source). The meter will briefly display 'auto', and then change to AutoTest mode without any intervention.<br>In Relative Meter Mode (dB R), press [Set Reference] on the meter to set references. | |
| V | Save say 12 new AutoTest meter readings into memory:<br>For KI2600, press [►] button 12 times (to store 12 readings).<br>For *KI7000,* press [M+] 12 times (to store 12 readings).<br>This stored data will be used later. | |
| **5.2.2** | **Connecting meter to KITS™ software:** | |
| | Connect the power meter or loss test set to the PC where KITS™ software has been installed, via a USB (KI2000 series) or a RS232 (KI7000 series) cable. | |
| **5.2.3** | **Start KITS™ :** | |
| | Start KITS™ by double-click on **"KITS Wizard"** icon. When started up, **"Meter Reading"** worksheet will be opened.<br>Since the connected meter is operating in AutoTest mode (setup in section 1.4 above), KITS™ will detect this and display a popup message below,<br>  <br><br>Click ***[OK]*** to close popup message, and wait for all wavelengths engaged in AutoTest to display in the AUTOTEST DATA section of the worksheet. This is to ensure that **"Live Data"** worksheet is configured with all the wavelengths engaged in Autotest. | Section 9<br><br>Step 6 of Section 9 |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| | | |
|---|---|---|
| **5.2.4 Working with "Meter Reading" worksheet:** | | |
| | Select "**KITS"** from Menu Bar to display the KITS™ commands in ribbon. Use the relevant commands to change between absolute ("**dBm"**) and relative ("**dBr"**) display modes. In relative mode, you can set the reference value (zero the dBr reading), or define it as any number.<br><br>**Note:** The wavelength control does not operate in AutoTest mode. | Section 12 |
| **5.2.5 Working with "Live Data" worksheet:** | | |
| ***5.2.5.1 Setting up & enter data to the worksheet*** | | |
| I | Change to **"Live Data"** worksheet (by either clicking on the relevant sheet tab, or select KITS™ command ***[Worksheet]*** -> ***[Live Data]***). | Section 10.1 |
| II | In Job Details / Site Data subsection of "**Live Data"** worksheet, note that the date, report number, Meter & Source serial number should have been entered automatically. Type some project-related text in the boxes, "**Job No"**, "**Project"** & "**Operator"**. Select KITS™ command, ***[Terminal ID]*** from ribbon, edit to rename the 2 terminal ID boxes which had been defaulted to "A" & "B" respectively. | Section 10.2.1 |
| III | Select KITS™ command, ***[Test Setup]*** for setup selections. Select ***[OK]*** to confirm the selections.<br><br>**Note:** At this stage, the Live Data worksheet should have been auto configured with all the wavelengths engaged in AutoTest, and displayed in subsection, **"Test Result"** of worksheet. | Sections, 10.1 (Step 5), 10.2.2 |
| IV | Select KITS™ command, **[*Pass/Fail Setup]*** for setup selections. Select standard from the "**Standard Selection**" options. The option, "Simple Limit" allows you to enter your own pass / fail parameter values. A number of interactive defaults in this screen guide the user towards the most common test configurations; however other configurations can also be selected. Select ***[OK]*** to confirm the selections, note that the values in the yellow cells of subsections Cable Parameters & Optical Parameters will be changed according to the standard selected. | Sections, 10.1 (Step 4), 10.2.2 |
| V | Select KITS™ command, ***[Unset Secure] / [Set Secure]*** to disable/enable Secure Data Mode. When Secure Data mode is enabled, it protects the worksheet against unauthorised or accidental manual data modification. | Section 10.2.4.6 |
| VI | Now you have set up your test. With the meter still in Autotest mode, move on to Test Results subsection of the worksheet. Click on a yellow cell under columns, "**Ref A or B"** or "**Meas A or B"** for Fiber ID, "1". You will notice that measurement data its results, instrument serial numbers & time tag etc. will be automatically entered in the row of Fiber ID, "1". Move on to enter data for next few Fiber ID in the same way and see how quickly and easily you can enter measurement from the meter and obtain their test results on the worksheet.<br><br>The values under **"FiberID"** columns i.e. the 1'st 2 columns, can be edited according to needs. | Sections, 10.3, 10.3.2 |
| ***5.2.5.2 Working with "Enable remote hold interlock" function.*** | | |
| | This function only works with a pair of identical KI7340 series Loss Test Set (LTS) connected at both ends of a DUT. It provides a useful communication aid to the operators at the DUT ends in coordinating their works. | |



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<table>
<tr><td>I</td><td>Connect the left ports of both LTS with a fiber cable with the appropriate connectors.</td><td></td></tr>
<tr><td>II</td><td>Connect either of the LTS to KITS™ via USB or a USB-RS232 Adaptor, OPT188 depending on the versions of instruments used.<br><br>The LTS connected to KITS™ becomes the “near end unit” of the DUT (connected fiber cable), and the other becomes the “far end unit”.<br><br>Start Autotest operation on the LTS unit connected to KITS™.</td><td></td></tr>
<tr><td>III</td><td>Start KITS™ and follow the prompted instructions to switch “Live Data” worksheet. The worksheet should have been configured as 2-way test automatically. Select command, [Test Setup] and check the option, “Enable remote hold interlock” on the Test Setup window.</td><td>Section 10.4.4</td></tr>
<tr><td>IV</td><td>Do steps ❶ ~ ❸ and take note the action/event sequences below.<br><br>
<table>
<tr><th rowspan="2">Step</th><th rowspan="2">Actions</th><th colspan="3">Events</th></tr>
<tr><th>KITS</th><th>“Near End Unit”</th><th>“Far End Unit”</th></tr>
<tr><td>❶</td><td>Click on a yellow cell on the row for Fiber ID, “1” to start auto-enter data on worksheet.</td><td>• Data entry for Fiber ID, “1” on worksheet completes after a KITS™ wait time</td><td>• Beeps once.<br>• Display is freeze” (LTS in Hold mode</td><td>Beeps twice.<br>Display is “freeze” (LTS in Hold mode)<br><br>Application in the field:<br>Near end operator makes use of this to signal far end operator that test data for the current fiber has been recorded by KITS™, time to move on to the next fiber .</td></tr>
<tr><td>❷</td><td>Briefly press [Hold] on “Far End Unit”</td><td>If a yellow cell on a Fiber ID row is clicked on before [Hold] on “Far End Unit” is pressed, see the subsequent events in Note 1 below.</td><td>• Beeps once<br>• Display is “unfreeze” (LTS in real time mode)<br><br>Application in the field:<br>Far end operator makes use of this to signal near end operator that a new fiber has been connected, test data entry on KITS™ for that fiber can now commence.</td><td>• Beeps once<br>• Display is “unfreeze” (LTS in real time mode)</td></tr>
</table>
</td><td></td></tr>
</table>


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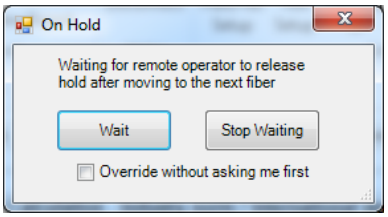
| | | | |
|---|---|---|---|
| | ❸ | Click on a yellow on the row for the subsequent Fiber IDs, to start auto-enter data on worksheet. | Each time when data entry for a Fiber ID completes, the events in steps ❶ & ❷ above repeats, until the "Remote hold interlock" function is disabled. See step V below on instructions to disable this function. |

**Note 1:**
The dialog box below will be displayed,




- If ***[Wait]*** is clicked: Both the LTS will remain in "freeze" (Hold) mode, and no data will be entered on the worksheet row which was clicked on until ***[Hold]*** on "Far End Unit" is pressed, after which the events that begin with step ❷ resumes.

- If ***[Stop Waiting]*** is clicked: The displays of both the LTS will "unfreeze" (reverted to real time mode), and data will be entered on the worksheet row which was clicked on. The events in steps, ❶ ~ ❸ then repeats.

  Note that, doing this in real field application may result in the worksheet being entered with test data of an unintended or wrong fiber.

- If option, **"Override without asking me first"** is checked, followed by a click on ***[Stop Waiting]:*** The displays of both the LTS will "unfreeze" (reverted to real time mode), and data will be entered on the worksheet row which was clicked on. The "Remote hold interlock" function will then be disabled.

  Note that, doing this real field application may result in the worksheet being entered with test data of an unintended or wrong fiber.

| | | |
|---|---|---|
| V | Repeat Step IV for as many Fiber ID as you wish, to familiarize with this function. | |
| VI | The **"Enable remote hold interlock"** function can be disabled by unchecking this option on the **"Test Setup"** window. | |

## 5.2.6 ORL Measurements on "Live Data" worksheet:

| | | |
|---|---|---|
| | If you have an ORL meter, then you may also perform the optical return loss readings. An ORL reading is performed from one end of the fiber using the 'source' or left port of the KI7000 ORL loss test set. | Section 10.3.2.3 |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| | | |
|---|---|---|
| I | ***1-way loss and ORL measurements:***<br>Connect KITS™ to the ORL meter and connect the fiber to be tested to the meter's left port. Check that the location setup correctly indicates to which end of the fiber the instrument is attached. Clicking on the required ORL reading cell for the selected location 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 (e.g. mandrel wrap) may be required at the remote end of the fibre.<br>Note that ORL measurement is not possible during one way Autotest mode. | |
| II | ***2-way loss and ORL measurements:***<br>If two way Autotest instruments are 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 fibre. Both instruments are connected to the fibre using their left port. 2-Way Autotest mode is initiated by pressing the [Auto Test] button on either instrument. | |

### 5.2.7 Saving data of "Live Data" worksheet into a CSV file:

| | | |
|---|---|---|
| | Select KITS™ command, ***[Save .csv File]*** to save existing data on **Live Data** worksheet to a CSV file named, *Example.csv* in a directory of the PC. | |

### 5.2.8 Loading data saved in a CSV file onto "Live Data" worksheet:

| | | |
|---|---|---|
| | In **"Live Data"** worksheet, select KITS™ command, ***[Clear All Data]*** to clear existing data in the worksheet. Select KITS™ command, ***[Load .csv File]*** to upload the data in the earlier saved file, *Example.csv* onto the "**Live Data"** worksheet. | Section 10.3.4 |

### 5.2.9 Download data in meter memory onto "Live Data" worksheet:

| | | |
|---|---|---|
| | This is an alternate way of entering data onto **"Live Data"** worksheet. The data saved in the memory of the meter can be downloaded onto the worksheet directly by first clearing (selecting KITS™ command, ***[Clear All Data]***) any existing data on the worksheet followed by selecting ***[Memory Download],*** follow the instructions prompted to complete data downloading.<br><br>A typical requirement in the field is to download & merge two single-direction test data saved in meter memory, onto a worksheet with two-way configuration. See example and instructions below.<br><br>Consider the test data saved in a KI7600 series meter memory below,<br><br>**Memory location** \| **Memory content**<br>1 ~ 2 \| Data for test direction A -> B for Fiber ID, 1 & 2 respectively<br>3 ~ 4 \| Data for test direction B -> A for Fiber ID, 1 & 2 respectively<br>5 \| Irrelevant test data<br><br>To download and merge the above test data onto **"Live Data"** worksheet with 2-way configuration, follow the steps below,<br><br>❶ *Configure worksheet for test direction A -> B:* Select command, ***[Test Setup]*** and check options for **"Test Directions"** & **"Meter Connected"** as shown below. | Section 10.3.3 |


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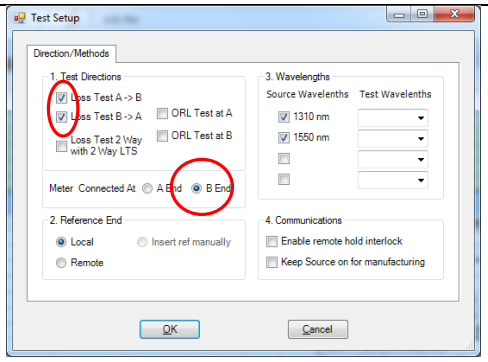
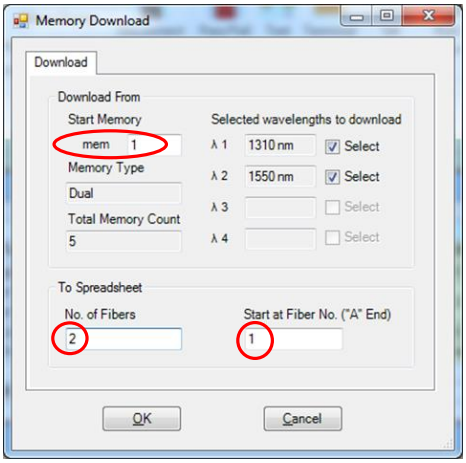
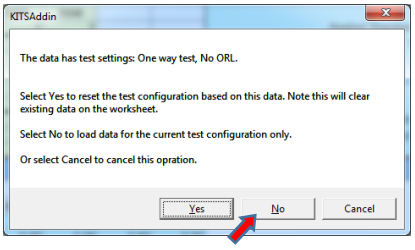


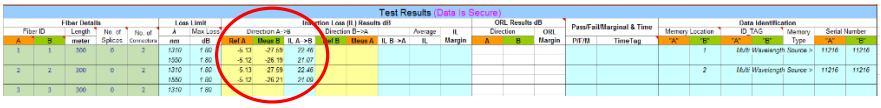

❷ *Select the 1'st 2'nd locations of meter memory to download:* Select command, ***[Memory Download]***. Enter "1" for **"Start Memory",** "2" for **"No. of Fibers"** and "1" for **"Start at Fiber No"** as below.




❸ *Click **[No]** on the popped up dialog box below to continue.*




Data for test direction A -> B in meter memory location will be downloaded onto worksheet as below.




❹ *Configure worksheet for test direction B -> A:* Select command, ***[Test Setup]*** and check options, for **"Test Directions"** & **"Meter Connected"** as shown below.



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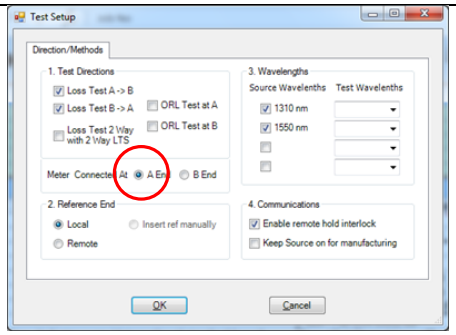
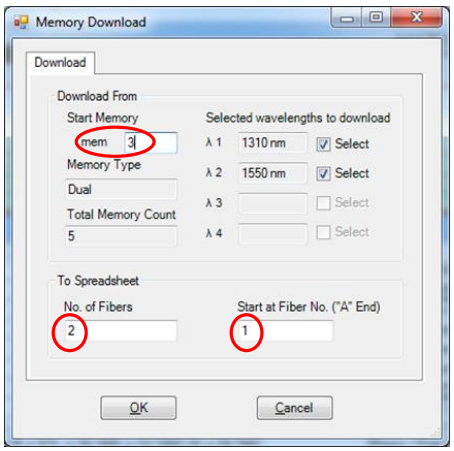
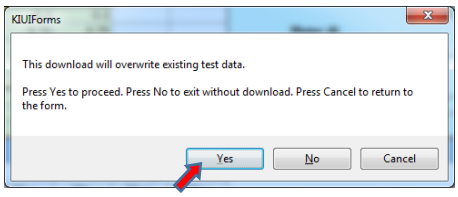


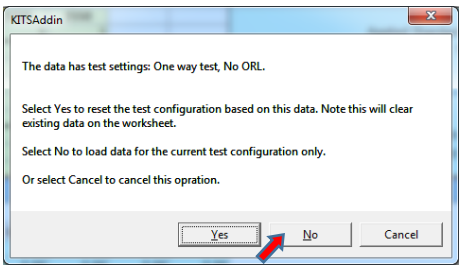

❺ *Select the 3'rd & 4'th locations of meter memory to download:* Select command, ***[Memory Download]***. Enter "3" for **"Start Memory"** and "2" for **"No. of Fibers"** and "1" for **"Start at Fiber No"** as below.




❻ *Click **[Yes]** on the popped up dialog box below to continue.*




❼ *Click **[No]** on the popped up dialog box below to continue.*





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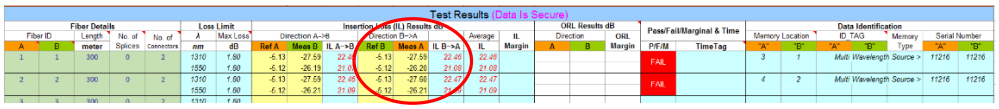
| | | |
|---|---|---|
| | Data for test direction B -> A in meter memory location will be downloaded and merged onto the worksheet as shown below.<br>  <br>**Downloading & merging data on KITS™ in the same manner, from memories of 2 meters can also be done by following the similar instructions in this section, except that it involves changeover of meters for test data download of specific directions.** | |
| **5.2.10 Working with "Final Report" worksheet:** | | |
| | Click on **"Final Report"** worksheet and wait for the "KITS please wait" pop up to disappear.<br>This worksheet contains a report which test data and test results are generated from entries in the **"Live Data"** worksheet. Only data for a max of 2 wavelengths will be displayed on this report. Select the KITS™ commands in **[Show / Hide Detail]** command group to include or exclude details in the report. | Section 11 |
| **5.2.11 Working with "Data Logging" worksheet:** | | |
| | Select KITS™ command, ***[Disconnect]***, set the Light Source to manual mode (i.e. not AutoTest). Wait 8 seconds while the meter quits AutoTest. Change to the **"Data Logging"** worksheet.<br>Select ***[Connect]*** followed by ***[Start AutoLog]*** in the KITS™ ribbon, name a file & location to save, and watch the data logging progresses. Try bending the patch-lead to create varying losses, and watch the graph auto-scale. You can interrupt this using ***[Stop]*** command, and then continue. You can easily change any of the auto-logging parameters. | Section 13 |
| **5.2.12 Working with "Meter Dump" worksheet:** | | |
| **12** | Go to **"Meter Dump"** worksheet and select KITS™ command, ***[Download]*** to download data in the meter onto the worksheet. You can ***[Clear]*** data on the worksheet or save it in a CSV file by selecting command, ***[Save as .csv]*** on the ribbon. | Section 14 |
| **5.2.13 Closing KIT software:** | | |
| | Close and save the workbook (with existing data and results) using Office's standard commands.<br>Note: When the saved workbook is reopened, KITS will start up automatically.<br>Alternatively, the workbook can be saved using KITS™, ***[Save Kits Unlink]*** (on the **"Live Data"** worksheet. The file saved in this way will no longer load KITS™. | Section 10.4.13 |

# 6. QUICK REFERENCE GUIDE

This Section provides a brief summary of the worksheets features.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## 6.1 KITS™ Worksheets

The KITS™ software has 5 worksheets named: -

1. Live Data
2. Final Report
3. Meter Reading
4. Data Logging
5. Memory Dump

Additional user designed worksheets can be added as required.

### 6.1.1 Live Data Worksheet

All loss testing data is entered into the **"Live Data"** worksheet.

- The "Live Data" worksheet can be configured for 1~4 wavelengths.
- The "Live Data" worksheet performs analysis.
- The "Live Data" worksheet can be configured to provide an international, local or user defined standard compliant report.
- The "Live Data" worksheet can be auto configured with wavelengths base on the memory contents downloaded from a meter, or the wavelengths engaged in an AutoTest operation.

Data can be entered into the "**Live Data"** worksheet by:-

- manual entry **(only if Data Secure Mode is unset)**
- clicking with a mouse during live testing or
- by memory download direct from instrument
- Import from CSV file.

### 6.1.2 Final Report Worksheet

The **"Final Report"** worksheet is used when the test data is required to be presented in an alternate format to that of **"Live Data"** worksheet.

- The **"Final Report"** worksheet is 'receive' only. All data is imported from the **"Live Data"** worksheet.
- The **"Final Report"** worksheet can be configured to display or hide different sections in the report by selecting the appropriate commands from KITS™ [Show / Hide Detail] command group.
- The **"Final Report"** worksheet can be configured to show test data of 2 wavelengths.

### 6.1.3 Meter Reading Worksheet

Typically used in a classroom situation or where a large display size is required.

- Basic meter functions available are: -
- Change wavelength
- Set reference
- Absolute or relative mode – dBm/dBr
- Hold


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- ORL

### 6.1.4 Data Logging Worksheet

Data logging is used when it is required to monitor power levels over a time period.

Typical applications include source stability, environmental induced changes and test jig failure timing.

Required logging parameters are: -

- Wavelength
- Size of log – number of samples
- Sample interval
- Absolute or relative mode – dBm/dBr

### 6.1.5 Memory Dump Worksheet

This is a straightforward procedure that is especially useful when an instrument's memory content is not known. All data in an instrument's Memory is extracted to a simple Excel worksheet. No analysis is performed. The data layout depends upon the instrument series.

## 6.2 KITS™ Save CSV

This program is independent of the KITS™ Wizard and is similar to the function in Memory Dump worksheet above. It is typically used when the host computer does not use Microsoft Office.

All data in an instrument's Memory is extracted to a CSV file and includes a checksum. No analysis is performed.

# 7. COMPUTER & INSTRUMENT FIRMWARE REQUIREMENTS

## 7.1 Computer

- Windows: 32 or 64 bit 10 / 8.x / 7 / Vista / XP.
- Apple: OSX (Mavericks) using Parallels 9.
- For full functionality: 32 bit Microsoft Office 2016 / 2013 / 2010 / 2007.
- "Save csv" Data file download utility only: MS Office is not required. This function doesn't work on WinXP.

KITS™ support for any non-English language Windows environments is as follows: -

- English language installations of Microsoft Office require a relevant language Microsoft Office MUI (Multilingual User Interface) to run in another language.
- Non-English language installations of Microsoft Office require an English language Microsoft Office MUI.

## 7.2 Instrument



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**KI2000 meter or loss test set (LTS):**

Firmware V0.27 and above. Earlier firmware versions may provide reduced functionality.

The firmware version is displayed on the instrument LCD during turn on. Firmware is field upgradeable. Details on how to upgrade the Firmware are on our web site.

http://www.kingfisherfiber.com/Fiber-Optic-Test-Equipment/KI2000-Firmware/Firmware.htm

**KI 7000 or loss test set (LTS):**

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 center.

# 8. KITS™ SOFTWARE INSTALLATION

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

The latest release of KITS™ is available for download on our web site
http://www.kingfisherfiber.com/Customer-Support.htm

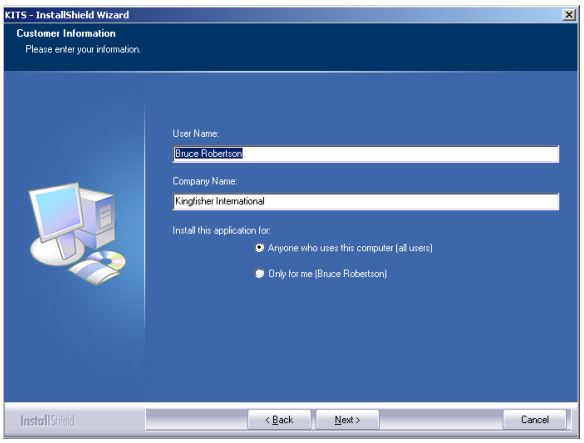
## 8.1 Before Installation

If updating from a previous version, you may like to back up existing data before proceeding.

Uninstall the older version AND REBOOT prior to installation.

Before installation, ensure that Microsoft Office is installed.

## 8.2 Setup.Exe

| Step | Installation Procedure |
|---|---|
| 1 | Run the KITS4.16.exe file. |
| 2 | Select ***[Next]*** |
| 3 | Enter Customer information.<br>  |
| 4 | Select ***[Next]*** |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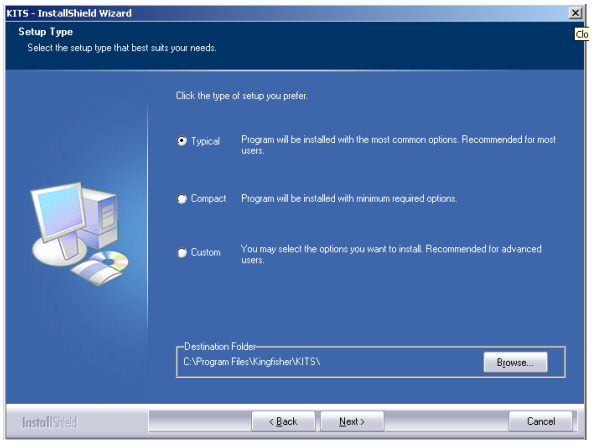
| | |
|---|---|
| 5 | Choose type of installation.<br>a. **"Typical"**<br>b. **"Compact"** - *for "Save CSV" function only*<br>c. **"Custom"**<br>  <br><br>In this instruction 'Typical' is assumed. |
| 6 | Select ***[Next]*** |
| 7 | Check particulars selected |
| 8 | Select ***[Next]*** |
| 9 | KITS™ program is installed |
| 10 | Select ***[Finish]***. |

During installation, if a pre-installed KITS™ software version is detected, user will be prompted to perform a repair, modify (custom) or uninstall.

### 8.2.1 Where are the KITS™ files located?

**Specification spreadsheets:**

The default directory for the Master Layout Spreadsheet, standards specification Excel files, 'Loss Test Standards.xls' and 'User-LossTest-Standards.xls' depends upon which version of the Windows operating system is being used and how the computer system is configured.

Typically, this will be either.

C:\Documents and Settings\All Users\Application Data\Kingfisher\KITS4
or
C:\Program Data\Kingfisher\KITS4

**Note:** For some users this may be a hidden directory. To unhide/show this directory:

In Window Explorer, press ***[Alt]*** on keyboard to bring up the Menu Bar, select ***[Tool]*** follow by ***[Folder Options…]***, click on tab, **"View"** & select **"Show hidden files, folders, and drives"**, click ***[OK]***.

**Application and configuration files:**

The default directory for the application and configuration files is: -

C:\Program Files\Kingfisher\KITS
or
C:\Program Files (x86)\Kingfisher\KITS



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**Note:** Due to security and administration requirements, Microsoft Windows often places application and configuration files in different locations depending on which version of Windows you are using and how it has been configured.

If the KITS™ files are not in the default directory, then: -

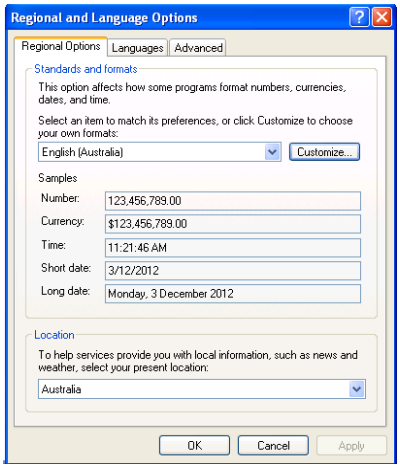
- To locate the KITS™ application files, locate the application shortcut in the Start Menu, right click it, click ***[Properties]***, and then click ***[Find Target]***.
- If you have lost the application shortcuts, try looking for either 'KITS' or 'Kingfisher' in the default Program Files directory on your computer.

**KI2000 Device Driver Files:**

Further information relating to the KITS™ RS232 and USB driver configuration files is contained in **Appendix B**
**RS232 / USB Driver configuration & Installation**.

### 8.2.2 Regional Configuration

Number configuration and distance units are set in the Windows, Regional and Language Options dialogue box.

| Step | Procedure |
|---|---|
| 1 | Start **Control Panel**. |
| 2 | Select ***[Regional and Language Options]***   |
| 3 | Select ***[Customize]*** |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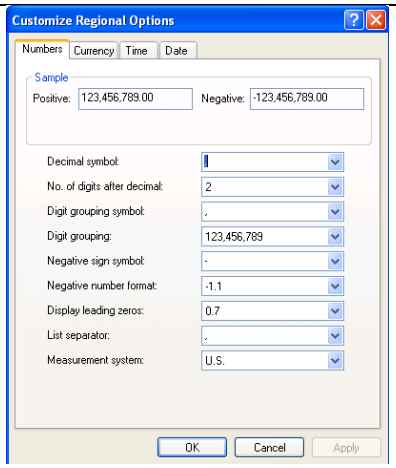
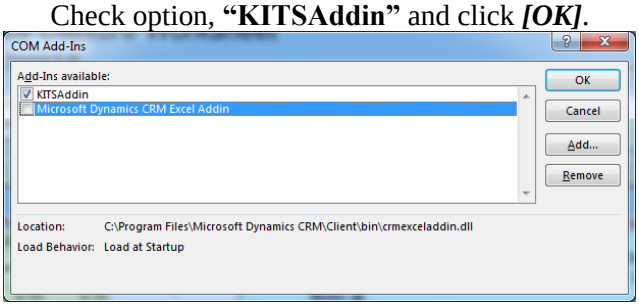
| | |
|---|---|
| |  |
| 4 | Enter required number moderators and distance units as required. |
| 5 | Select ***[OK]*** |
| 6 | Select ***[OK]*** |
| 7 | Close Control Panel |

### 8.2.3 Re-enable or reinstall KITS™ if it does not startup properly

In some occasions, if KITS™ starts inappropriately, it will only open a blank Excel spreadsheet. Try the following to re-enable the software.

| Step | Procedure |
|---|---|
| 1 | Click ***[Office Button]*** or select ***[File]*** from the Menu Bar of the opened spread sheet. |
| 2 | Select ***[Excel Options]***. |
| 3 | Select ***[Add-Ins]*** from the option list, select "**COM Add-ins"** from the drop-down menu at **"Manage:"** and click ***[Go]***. |
| 4 | Check option, **"KITSAddin"** and click ***[OK]***.<br>  |
| 5 | You may need to check the registry if KITS™ add-in is enabled. Run regedit.exe and go to the directory HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Office\Excel\AddIns. If the *LoadBehavior* key value of KITSAddin.AddinModule is not 3, change it to 3 (decimal). |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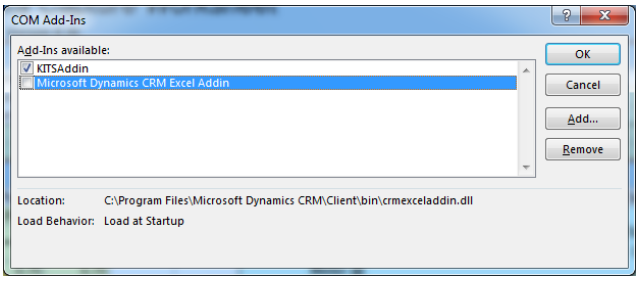
| | |
|---|---|
| 6 | This should re-enable KITS™ in most cases. If KITS™ still cannot run, a reinstallation is needed. AT Step 4 of the above, check option, **"KITSAddin"** and click ***[Remove]*** to remove it from the list.<br>  |
| **7** | Uninstall KITS™, reboot computer and reinstall the software. |
| 8 | KITS™ should be able to start normally. |

## 8.3 MUI for Running KITS™ in another Language

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™.

There are two scenarios which cause this message: -

1. English Windows. Non English Office.
2. Non English Windows.

There are various possible ways to fix this:

1. For English Language Installations of Windows / Office: Change the Windows operational language back to English:
   i. Go to ***[Start] / [settings] / [Control Panel] / [Regional and Language Options] / [Regional Options]*** tab.
   ii. Set both the "standards and formats" drop down to a version of English.
   iii. Then select the Languages tab, and set all "input language" details to a version of English. "Standards and formats" can be customised.
2. For non-English installations of Office: The English Language Office MUI (Multilingual User Interface) must be installed. The Microsoft MUI is a separate Microsoft product that allows users to use Office in other languages.
3. Leave the computer in the non-English language, but install the relevant Microsoft Office English MUI.

# 9. STARTING KITS™ & CONNECTING AN INSTRUMENT

The software can be started with or without an instrument connected.

The KITS™ start up program permits ***[Test Setup]*** configuration before or after the worksheet is fully opened.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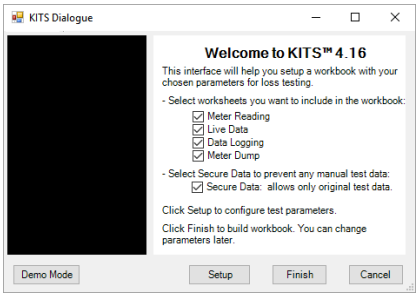
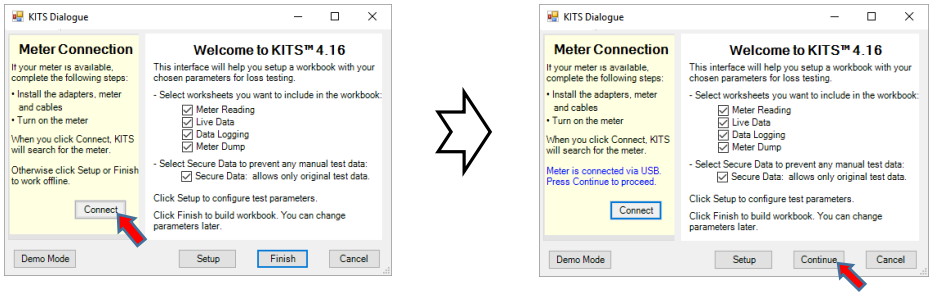
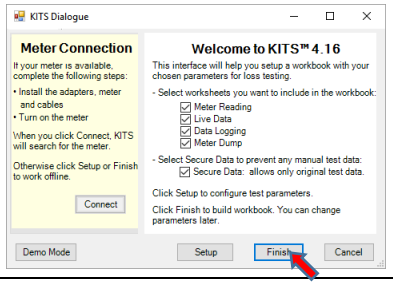
The procedure below assumes ***[Test Setup]*** configuration is to be performed after the KITS™ worksheets are fully opened.

In rare occasion, if KITS™ starts inappropriately as a blank Excel spreadsheet, see Section 8.2.3 for re-enabling or reinstallation of the software.

| Step | Starting KITS™ & connecting an instrument |
|---|---|
| 1 | On your desktop, double click on **"KITS Wizard"** icon.<br>Alternatively navigate via the Windows Start menu.<br>e.g. ***[Start] -> [all Programs] -> [Kingfisher Kits] -> [Kits Wizard]*** |
| 2 | Excel will start, with a screen "Welcome to KITS 4.16 " |
| 3 | Select ***[Finish]***.<br>  <br>Optionally uncheck the options to disable some worksheets and/or 'Secure Data' mode. |
| 4 | If no meter is connected at this stage, a dialogue box will display the instructions for Meter Connection.<br>*To connect a meter:* Physically connect a meter to the computer as per the instructions in **"Meter Connection"** section of the display. Select ***[Connect]*** followed by ***[Continue]*** on the subsequent display.<br>  <br>At this stage, if a KI2600 meter still fails to connect to the software even after making sure that it is powered up, and is properly connected using a USB cable, the Device Driver may need to be manually reinstalled (see Appendix B- section B.5.1), or the register, 'IgnoreHWSerNum' on the computer may need to added/edited accordingly (see Appendix B- section B.5.2).<br>*To continue without connecting a meter:* Select ***[Finish]*** to continue without connecting a meter to work off-line or for manual data entry.<br>  |



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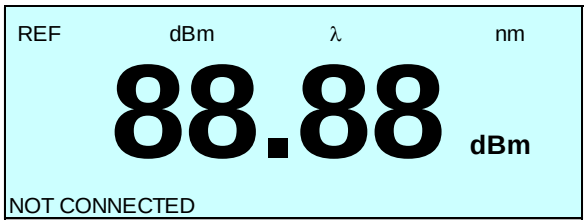
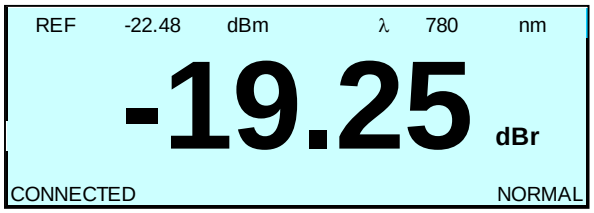
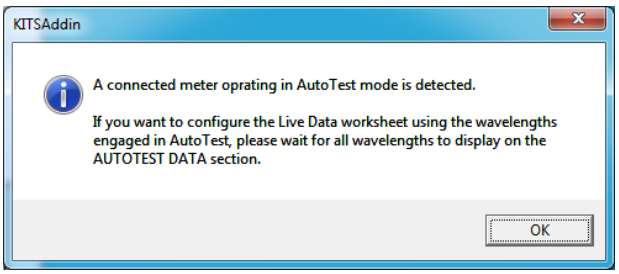
| Step | Starting KITS™ & connecting an instrument |
|---|---|
| 5 | The KITS™ splash screen will display.<br> |
| 6 | Upon completion, KITS™ will open the "**Meter Reading"** worksheet.<br>• With no meter connected, the screen will display "**88.88 dBm"** and "**NOT CONNECTED"**.<br>  <br>• With a connected meter operating in non-AutoTest mode, the screen will display the read power level and "**CONNECTED"**.<br>  <br>• With a connected meter operating in AutoTest mode, the popup message below will be displayed.<br>  <br>Click ***[OK]*** to close the popup message and wait untill all the wavelengths (along with their respective test data) are displayed in the **"AUTOTEST DATA"** section (see below) of the worksheet before switching to **"Live Data"** worksheet. |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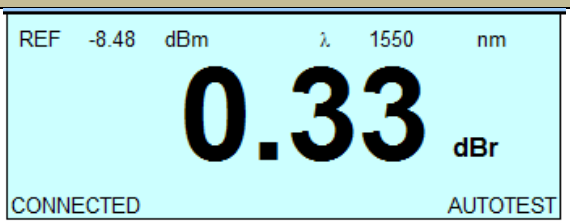
| Step | Starting KITS™ & connecting an instrument |
|---|---|
| |  <br>Real time test reading of all the wavelengths engaged in AutoTest will be recorded & updated in turn under **"λn"** columns.<br><br>Switching to **"Live Data"** worksheet now without waiting (as mentioned above) may result in a **"Live Data"** worksheet not configured with all the wavellengths engaged in the AutoTest.<br><br>**Note:** This auto wavelength configuration feature for "**Live Data"** worksheet is only available when a fresh KITS™ workbook starts with a connected meter operating in AutoTest mode. It is not available when a saved KITS™ workbook is opened or with the meter connected after KITS™ has started up. |
| 7 | Beside the opened **"Meter Reading",** there are 4 other worksheets i.e. **"Live Date"**, **"Final Report"**, **"Data Logging"** & **"Meter Dump"** in the KITS™ workbook if none of these worksheet was unchecked in Step 3 above. |

| AUTOTEST DATA | | λ1 | λ2 | λ3 | λ4 |
|---|---|---|---|---|---|
| Wavelength | nm | 1550 | 1310 | | |
| Power Reading | dBr | -8.15 | -8.17 | | |
| Source Power | dBm | -7.00 | -7.00 | | |
| Reference | dBm | -8.48 | -8.75 | | |

| | |
|---|---|
| Local Meter Serial Number | *25018* |
| Remote Source Serial Number | *11216* |

**Note:** If the meter does not connect, firstly check that the meter is turned ON and that the computer interface cord is connected. If still unable to connect, refer to **Appendix B RS232 / USB Driver configuration & Installation**.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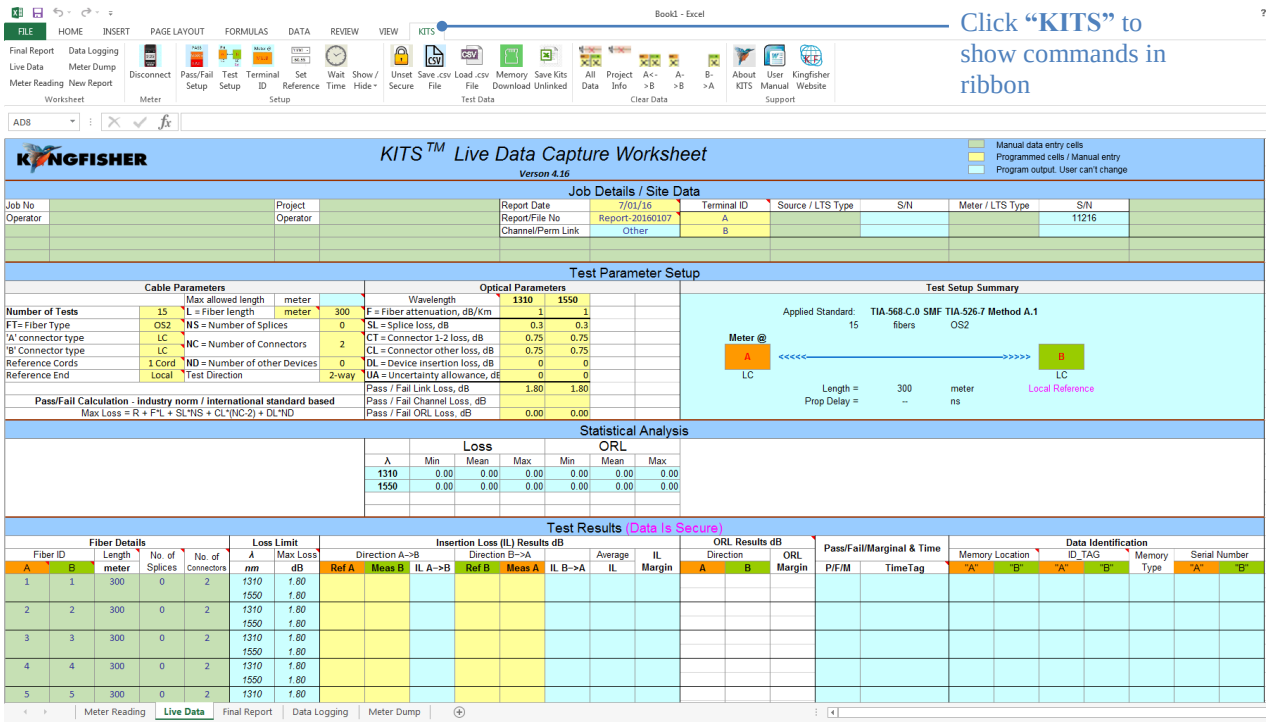
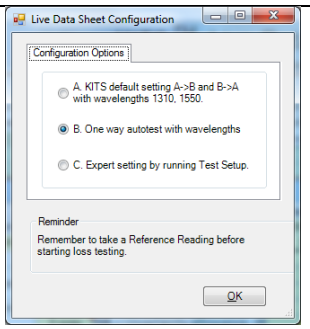
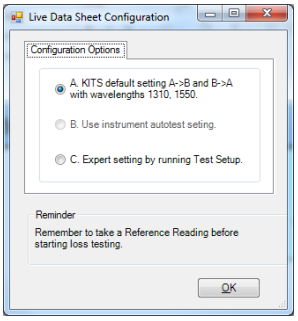
# 10. LIVE DATA WORKSHEET




## 10.1 Opening & Configuring Live Data worksheet

| Step | Opening & Configuring Live Data worksheet |
|---|---|
| 1 | Click on the Sheet Tab, **"Live Data"** on the Excel workbook, or ribbon button ***[Worksheet]*** -> ***[Live Data]***. |
| 2 | Select initial configurations for **"Live Data"** worksheet:<br><br>*If a meter operating in AutoTest mode is connected to the software:*<br>Option, **"B"** will be selected by default. Click ***[OK]*** now will automatically configure **"Live Data"** worksheet with all the wavelengths engaged in AutoTest.<br><br>  <br><br><br>*If no meter is connected or if a connected meter is operating in non-AutoTest mode:*<br><br>Select options, **"A"** (default) or **"C"**. If option **"C"** is selected, a "**Test Setup"** window (see of Step 5 of this section) will be prompted for manual configuration setup. Click ***[OK]*** to confirm selections.<br><br>  <br> |



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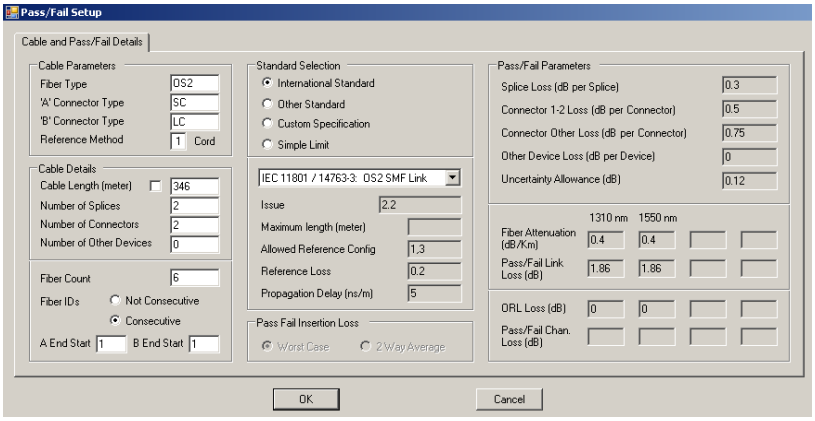
| | |
|---|---|
| 3 | The **"Live Data"** worksheet will be configured according to the option selected in Step 2 above, and with the corresponding columns of cells (in the "**Test Results"** subsection) for data entries highlighted in yellow. |
| 4 | Configure the **"Pass / Fail setup"** parameters<br>Select KITS™ command, ***[Pass/Fail Setup]***<br>• Enter test parameters: -<br>o Standard selection (should be selected first) ***<br>o Cable parameters<br>o Cable details<br>o Fibre count<br>o Fibre identification number<br>*** Once a standard is selected the following restrictions apply: -<br>• Specifications that are set by the standard are greyed as they are not user changeable.<br>• KITS will not allow a referencing method or length parameter at variance to the standard.<br>  <br>***** Hint**: The above submenu can also be opened by clicking on any of the yellow cells under **"Cable Parameters"** in the "**Test Parameter Setup"** subsection.* |

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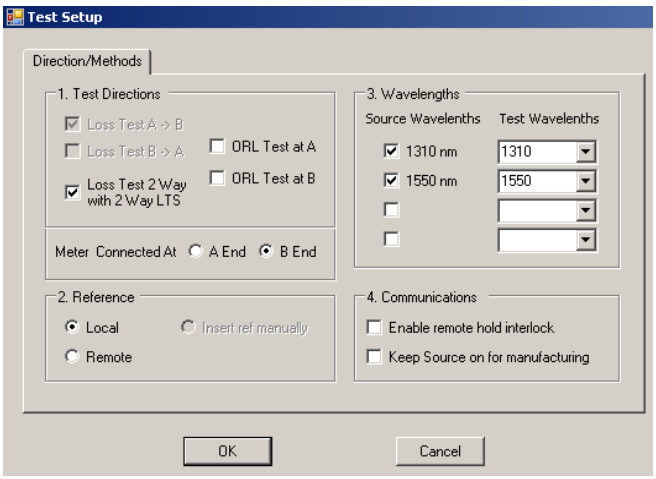
5

Configure the **"Test Setup"** (for test direction setting) parameters

- Select KITS™ command, Press ***[Test Setup]***
- Select test direction:
  - To test A->B tick the box 'Loss Test A->B'
  - To test in both directions using a source and a meter tick boxes 'Loss Test A->B' and 'Loss Test B->A'
  - If using a two-way Loss Test Set (LTS) to test in both directions automatically, tick the box 'Loss Test 2 way with 2 way LTS'
  - Enter the meter location e.g.
  - For testing A->B configure the meter at the B end.
  - To test B->A configure the meter at the A end.
- Configure for Local or Remote referencing.

  For an explanation of Local & Remote Referencing see Section 10.4.4.

- Choose wavelength(s) to be used for testing.




***Note:*** *Whilst the 'Test Setup' and the 'Pass/Fail Setup' sub-menus can be configured in any order; it is recommended that the 'Pass/Fail Setup' sub-menu be configured first to minimise any interaction between them.*

**Test Setup – Wavelengths: Additional information:**

1. If no Meter is connected, the KITS dropdown menu shows a range of common wavelengths to select from.
2. If a meter is connected, the available wavelengths are those within the meter.
3. In all cases, any arbitrary wavelength can be selected by typing its value into the appropriate drop down menu, E.g. 1383.



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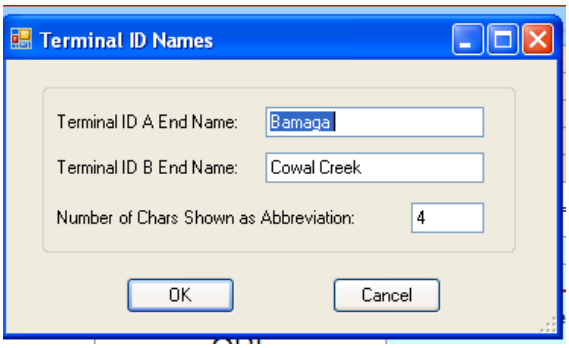
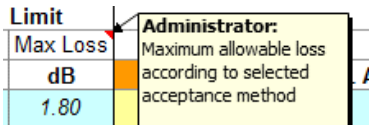
| | |
|---|---|
| 6 | Assigning Terminal ID Names<br>By default, the two terminal ends are called 'A' and 'B'. If required, the terminals can be given individual names for identification purposes.<br>To assign terminal names: -<br>• Select KITS™ command, ***[Terminal ID Names]***<br>• Assign names<br>• Assign number of characters used for name abbreviation.<br>• Click ***[OK]***<br>  |
| 7 | The Workbook is now configured and ready for test data entries. |

## 10.2 The 5 subsections in Live Data worksheet

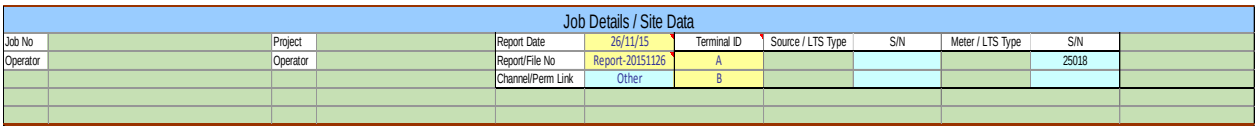
### 10.2.1 Header subsection

This subsection provides users with revision information of KIT™. It also provides explanations of the colour convention used for the cells on the worksheet. There are 3 categories of cells i.e. **Manual data entry cell**, **Programmed cells / Manual entry**, **Program output User can't change,** each represented by the colours as shown on the right side of this section.

**Note:** Additional information for some of the cells on the worksheet is also available via their respective Excel Comment (indicated by a red triangle at the top-right corners of these cells). Placing the cursor on these cells will display contents of the comments as shown in the example below;




### 10.2.2 Job Deail / Site Data subsection



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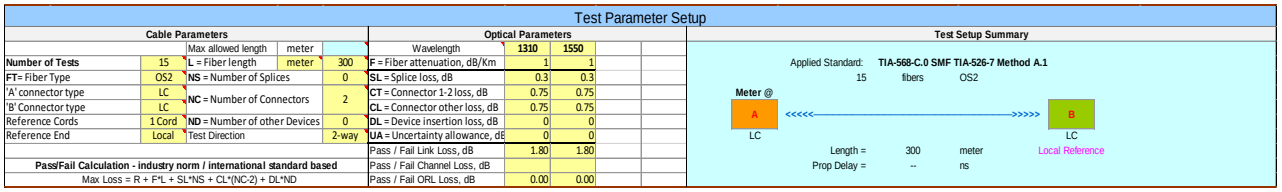
Project specific data is entered to the worksheet in this subsection of the worksheet.

In the current implementation, cells with a header such as 'Job No', 'Operator', etc. and any data in their associated green cells will be automatically copied to the **"Final Report"** worksheet. All other green cells are left to the user.

By default, this subsection is shown and can be hidden using the KITS™ command group, ***[Show / Hide]***.

## 10.2.3 Test Parameter Setup subsection



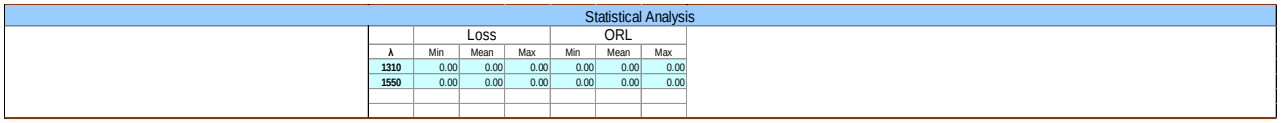

This subsection of the worksheet shows the cable & optical test parameters and a test configuration diagram.

The terminal identification (ID) name boxes are coloured orange or green when a meter is connected, and grey when there is no connection.

The values of the **"Cable Parameters"** and **"Optical Parameters"** varies according to the Standard selected via KITS™ command ***[Pass /Fail Setup]***, see section **10.4.3**.

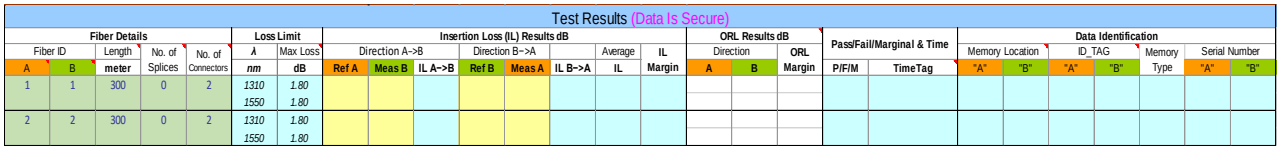
By default, this subsection is shown and it can be hidden or shown using the KITS™ command group, ***[Show / Hide].***

## 10.2.4 Statistical Analysis subsection




This subsection of the worksheet provides test statistical analysis. The statistical analysis table is filled out automatically when new data is entered.
For Manual data entry, the statistical data is calculated only after an operation that includes a recalculation of the statistics (such as running ***[Test Setup]***, or saving and reopening a file).
This subsection is shown by default and can be hidden or shown using the KITS™ command group, ***[Show / Hide]***.

## 10.2.5 Test Result subsection




### *10.2.5.1 "Fiber Details" columns:*

The values in the cells under these columns are automatically entered based on the settings in the **Cable Parameters"** & "**Optical Parameters"** in "**Test Parameter Setup"** subsections. Alternatively, these cells can be manually edited in Non Secure Mode.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#### *10.2.5.2 "Loss Limits" columns:*

The values under column, **"λ"** are entered automatically according to the configuration option selected in Step 2 of Section 10.1. The values under columns, **"λ"** and **"Loss Limit"** can be changed using KITS™ commands, ***[Test Setup]*** & ***[Pass/Fail Setup]***.

#### *10.2.5.3 "Insertion Loss (IL) Results dB" & "ORL Result dB" columns:*

Columns labelled as **"RefA"**, **"MeasB"**, **"RefB"**, **"MeasA"**, **"A"** & **"B"** are editable only in Non Secure Mode. These columns of cells are usually highlighted in yellow according to the configuration option selected in Step 2 of section 10.1, or the setup via KITS™ commands, ***[Test Setup]***. If a column is set white, no data should be entered.

#### *10.2.5.4 "Pass/Fail/Marginal & Time" columns:*

Values in the cells of these columns are not manually editable but computed and populated automatically.

#### *10.2.5.5 "Data Identification columns":*

For data downloaded from a meter, the information such as memory location, ID Tag assigned, Memory type and instrument serial numbers will be automatically populated in the cells of these column. These cells are not manually editable.

#### *10.2.5.6 "Test Results (Data is Secure)":*

"(Data is Secure)" shown beside **"Test Results"** subsection header indicates that the worksheet is in Data Secure Mode. Secure Data Mode is set as default when the KITS™ workbook is installed.

Data Secure Mode is used to protect the worksheet against unauthorised or accidental manual data modification.

In this mode, manual data entry on the worksheet is not allowed. Only data entered via clicking of the mouse during live testing, memory download, file import are permitted.

If manual data entry is required, the Data Secure Mode can be disabled via KITS™ command, ***[Unset Secure].*** When Data Secure Mode is disabled, **"(Data is NOT Secure)"** will be shown beside **"Test Results"** subsection header.

## 10.3 Test Data Entry in Live Data Worksheet

Test measurement data can be input into the "**Test Results"** subsection of **"Live Data"** worksheet in 4 ways: -

- Manual entry **(only if Data Secure Mode is unset)**
- Clicking with a mouse during live testing (one click entry)
- By memory download direct from meter
- Import from CSV file.

### 10.3.1 Manual Data Entry (only when Data Secure Mode is unset) *- Local referencing, one-way test.*

The example below assumes: -

- Local Referencing.
- Test direction configuration: Test A->B



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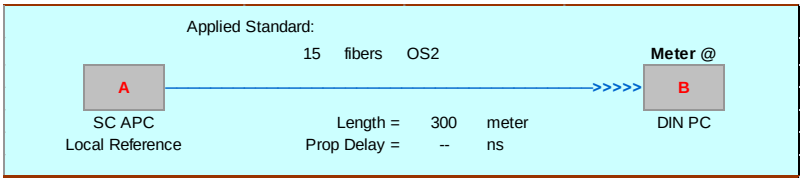
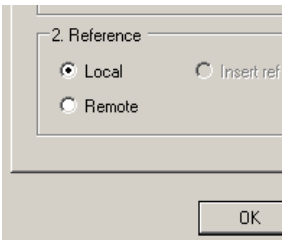
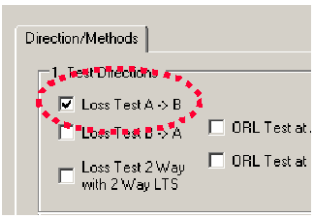
| Step | Manual data entry, one way, local reference Procedure |
|---|---|
| 1 | The test configuration drawing below shows the current configuration including 'Meter' location.<br>  |
| 2 | If required, re-configure the 'reference type' via KITS™ command so that test data will be correctly entered.<br>To configure: -<br>• Select ***[Test Setup]***<br>• Select option, **"Local"** for **"Reference"**.<br>• Click On ***[OK]*** To Confirm<br>  |
| 3 | If required, re-configure the test direction via KITS™ command.<br>In this example we are testing A->B<br>To configure: -<br>• Select ***[Test Setup]***<br>• Select option, **"Test Directions A->B"** for **"Test Direction"**.<br>• Click on ***[OK]*** to confirm.<br>  |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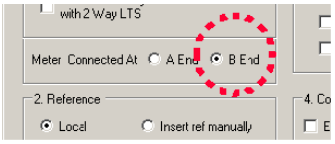
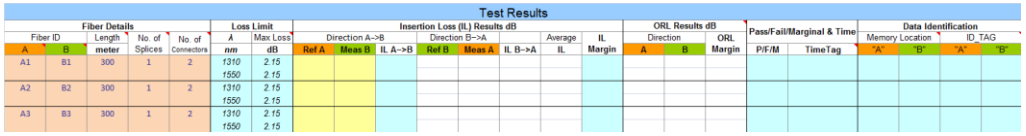
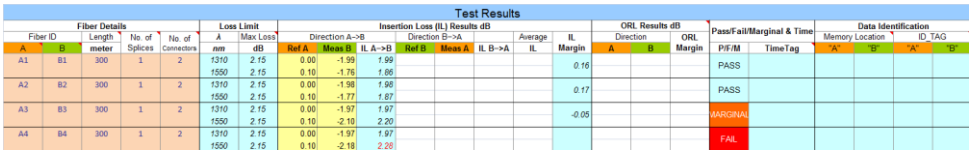
| Step | Manual data entry, one way, local reference Procedure |
|---|---|
| 4 | If required, re-configure the meter location via KITS™ command so that test data will be entered in the correct direction.<br>In this example we are testing A->B<br>To configure: -<br>• Select ***[Test Setup]***<br>• Select option **"B End"** for **"Meter connected at"**<br>• Click on ***[OK]*** to confirm.<br>  <br>Important: Meter end selection is relevant only for two-way test. For example, test direction A->B and meter at A is not a valid configuration. |
| 5 | Enter the test data as required into the yellow columns/cells under the headings Ref A and Meas B.<br>• **Ref A**: Transmitted power. Power level that is sent from the 'A' end to the 'B' end.<br>• **Meas B**: Received power. Power received at the 'B' end.<br>  |
| 6 | When all required test data for a particular fibre has been entered, KITS™ will display the test result analysis.<br>• Test failed test results are shown in red and indicated as 'FAIL' in the P/F/M column.<br>• Marginal results are normally accepted as a Pass.<br>Further guidance for the treatment of marginal results can be found in International Standard ISO/IEC 14763-2.<br>  |

## 10.3.2 One click data entry

### 10.3.2.1 One click entry- local referencing, one-way test.

This can be performed with the instruments operating in AutoTest mode.

The example below assumes: -

- Instruments operating in AutoTest mode
- Use of a source and a meter at each end (or a simple Loss Test Set at each end.)
- Local Referencing.
- Test direction configuration: Test A->B.



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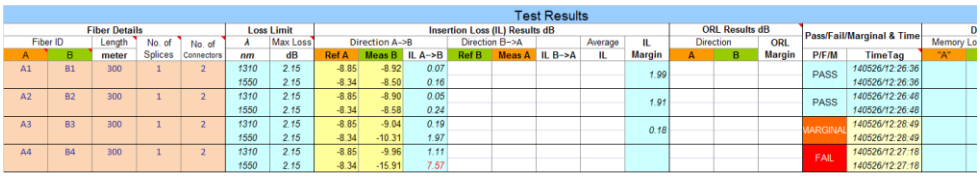
| Step | AutoTest, one way, local reference Procedure |
|---|---|
| 1 | Configure the worksheet as per Sections 10.3.1 above. |
| 2 | Connect meter to the KITS™ software.<br>If the meter is turned On and connected to the computer when KITS™ starts, KITS™ will automatically connect. |
| 3 | In the KITS™ worksheet, click on 'Ref A' or 'Meas B' for the relevant fibre number.<br>• Test data will be automatically entered.<br>• KITS™ will automatically analyse the results.<br>• Pass/Fail assessment is based upon the Pass/Fail configuration.<br>  <br>• Test failed test results are shown in red and indicated as 'Fail' in the P/F column.<br>• Marginal results are normally accepted as a pass.<br>• Fibres that are re-tested are marked in the 'Time Tag' column.<br><br>**Note 1:** KITS™ will not accept data clicked into the wrong cells.<br>**Note 2:** Test data wavelength must match KITS™ configuration. |

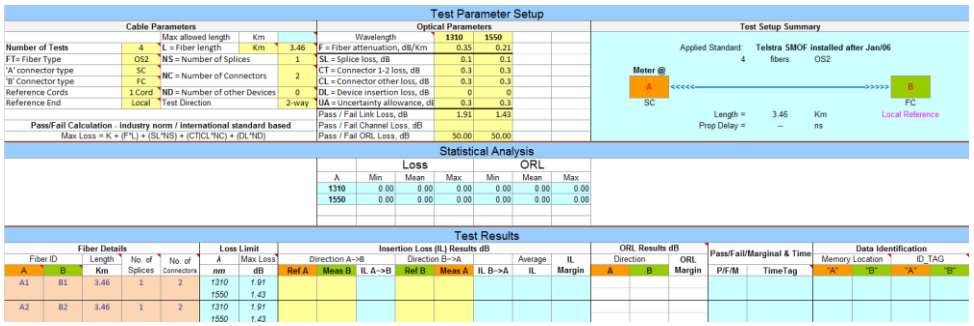


### 10.3.2.2 One click entry - local referencing, two-way test

This can be performed with two instruments operating in AutoTest mode.

The example below assumes: -

- Instruments operating in AutoTest mode
- use of a KI734x at each end
- Local Referencing
- Test direction configuration: Test A<->B.

| Step | AutoTest, two way/bi-directional, local reference Procedure |
|---|---|
| 1 | Configure KITS™ as per **Sections** 10.1.1 above for two-way / bidirectional testing. |
| 2 | Connect meter to the KITS™ software.<br>• If the meter is turned on and connected to the computer when KITS™ starts, KITS™ will automatically connect. |
| | If not, click on KITS™ command, ***[Connect]*** to connect meter to KITS™ software. |
| 3 |  |





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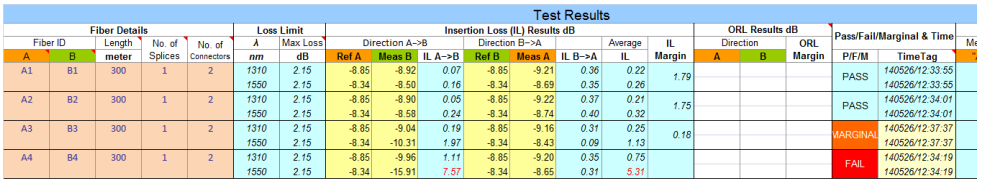
| Step | AutoTest, two way/bi-directional, local reference Procedure |
|---|---|
| 4 | In the worksheet, click on **"Ref"** or **"Meas"** for the relevant fibre number.<br>• The test data will be automatically entered onto the worksheet.<br>• KITS™ will automatically analyse the results.<br>• Pass/Fail assessment is based upon the Pass/Fail configuration.<br>  <br>• Test result failures are shown in red and indicated as 'Fail' in the P/F column.<br>• Marginal results are normally accepted as a pass.<br>• Fibres that are re-tested are marked in the 'Time Tag' column.<br><br>**Note 1:** KITS™ will not accept data clicked into the wrong cells.<br>**Note 2:** Test data wavelength must match KITS™ configuration. |

Test Results

| Fiber Details | | | | | Loss Limit | | Insertion Loss (IL) Results dB | | | | | | | | ORL Results dB | | | Pass/Fail/Marginal & Time | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fiber ID | | Length | No. of Splices | No. of Connectors | λ | Max Loss | Direction A->B | | | Direction B->A | | | Average | IL Margin | Direction | | ORL Margin | | |
| A | B | meter | | | nm | dB | Ref A | Meas B | IL A->B | Ref B | Meas A | IL B->A | IL | | A | B | | P/F/M | TimeTag |
| A1 | B1 | 300 | 1 | 2 | 1310 | 2.15 | -8.85 | -8.92 | 0.07 | -8.85 | -9.21 | 0.36 | 0.22 | 1.79 | | | | PASS | 140526/12:33:55 |
| | | | | | 1550 | 2.15 | -8.34 | -8.50 | 0.16 | -8.34 | -8.69 | 0.35 | 0.26 | | | | | | 140526/12:33:55 |
| A2 | B2 | 300 | 1 | 2 | 1310 | 2.15 | -8.85 | -8.90 | 0.05 | -8.85 | -9.22 | 0.37 | 0.21 | 1.75 | | | | PASS | 140526/12:34:01 |
| | | | | | 1550 | 2.15 | -8.34 | -8.58 | 0.24 | -8.34 | -8.74 | 0.40 | 0.32 | | | | | | 140526/12:34:01 |
| A3 | B3 | 300 | 1 | 2 | 1310 | 2.15 | -8.85 | -9.04 | 0.19 | -8.85 | -9.16 | 0.31 | 0.25 | 0.18 | | | | MARGINAL | 140526/12:37:37 |
| | | | | | 1550 | 2.15 | -8.34 | -10.31 | 1.97 | -8.34 | -8.43 | 0.09 | 1.13 | | | | | | 140526/12:37:37 |
| A4 | B4 | 300 | 1 | 2 | 1310 | 2.15 | -8.85 | -9.96 | 1.11 | -8.85 | -9.20 | 0.35 | 0.75 | | | | | FAIL | 140526/12:34:19 |
| | | | | | 1550 | 2.15 | -8.34 | -15.91 | 7.57 | -8.34 | -8.65 | 0.31 | 5.31 | | | | | | 140526/12:34:19 |

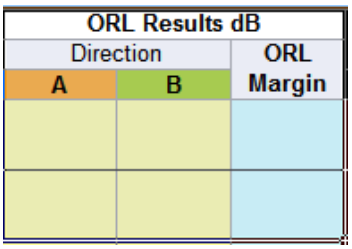
### 10.3.2.3 One click data entry for ORL measurements

If you have an ORL meter, then you may perform all the tests detailed in Sections 10.3.1 & 10.3.2 above plus Optical Return Loss (ORL) measurement.

#### 10.3.2.3.1 One click data entry for ORL measurements – AutoTest mode

An ORL equipped Kingfisher instrument operating in two-way AutoTest mode automatically measures ORL. Depending upon the test set up selected, KITS™ may already be configured for ORL measurement.

- When configured to record ORL, the "**ORL Results dB"** columns, in "**Live Data"** worksheet will be coloured yellow.



| ORL Results dB | | |
|---|---|---|
| Direction | | ORL |
| A | B | Margin |
| | | |
| | | |

If needed, configure the worksheet for 2-way ORL measurement as per below:

| Step | Setup 2-Way ORL measurement |
|---|---|
| 1 | Select ***command, [Test Setup].*** |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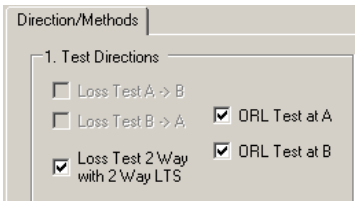
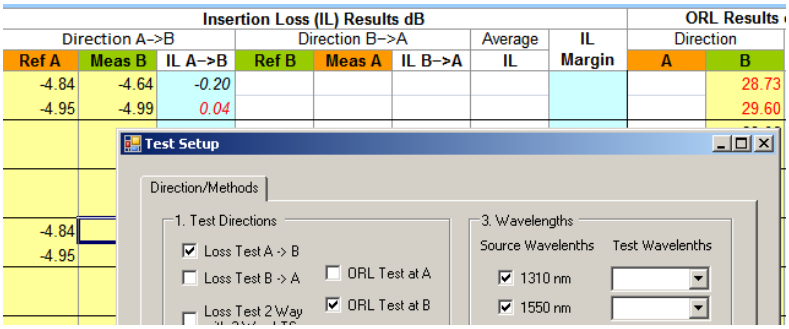
| Step | Setup 2-Way ORL measurement |
|---|---|
| 2 | Select options, **[ORL Test at A]** and **[ORL Test at B]** for **"Test Directions".**<br>  |
| 3 | Set up the KI734xx series 2-way ORL instruments into 2-way mode and connect them to KITS™. |
| 4 | In the KITS™ worksheet, click on 'Ref', 'Meas' or ORL for the relevant fibre number.<br>• The test data will be automatically entered in the worksheet. |

**Note 1:** If the circuit under test has a small insertion loss, the instrument's ORL isolation may not be sufficient for accurate ORL readings. In such situations, a manual measurement should be considered. Refer Section 10.3.2.3.2 below.

**Note 2:** The standard KI734xx series 2-way ORL meters have an ORL isolation of about 25 dB. ORL isolation can be optionally increased to about 50 dB at time of purchase. Most existing SMF instruments can also be modified.

### 10.3.2.3.2 One click data entry for ORL measurements – meter in manual mode

Manual ORL measurement is usually performed with the Far End connected to an ORL terminator. Configure KITS™ for ORL measurement as per below.

| Step | Manual ORL measurement |
|---|---|
| 1 | Select command, ***[Test Setup].*** |
| 2 | Select option, **[ORL Test at A]** or **[ORL Test at B]** for **"Test Direction"**.<br>• To measure ORL as seen from the 'A' end select option, **[ORL Test at B]**<br>• To measure ORL as seen from the 'B' end select option, **[ORL Test at A]**<br>  |
| 3 | If necessary, terminate the Far End in an ORL termination. |
| 4 | On the worksheet, click on a yellow **"Ref", "Meas"** or "**ORL"** cell for the relevant fibre number and wavelength.<br>• The test data will be automatically entered in the worksheet. |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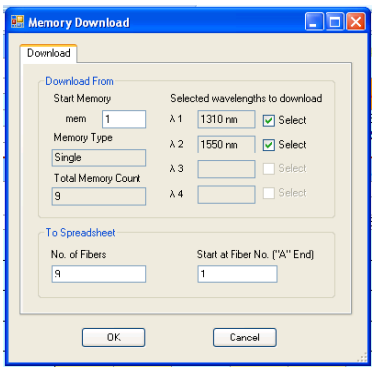
### 10.3.3 Data entry by downloading from instrument memory

The instrument memory contents can be selectively dumped and mapped into the **"Live Data"** worksheet directly via KITS™ command, ***[Memory Download]***.

- Memory download should not be performed with the instrument in AutoTest mode.
- All wavelengths data in the instrument memory will be downloaded onto the "**Live Data"** regardless of the wavelength configuration configured using ***[Test Setup]*** command.
- If unsure of the instrument memory contents, perform a memory dump first using the **"Meter Dump"** worksheet (see Section 14) or **"Save Csv"** program (see section 15).

The example below assumes: -

- Use of a source and a meter at each end (or a simple Loss Test Set at each end.)
- Data in instrument memory was saved during either AutoTest or Manual test mode.
- Worksheet configuration (via Test Setup command): Reference End: Remote: Test Direction: A->B

| Step | Memory download Procedure |
|---|---|
| 1 | Select command, ***[Connect]*** followed by ***[Memory Download].*** |
| 2 | The "**Test Result"** subsection of the **"Live Data"** worksheet will be automatically configured with the test wavelengths according to the contents in the instrument's memory. |
| 3 | The **"Memory Download"** pop-up will open & shows info of the data contents in instrument memory.<br>• If no pop-up: the meter is not connected.<br>  |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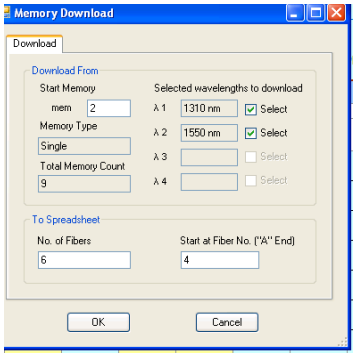
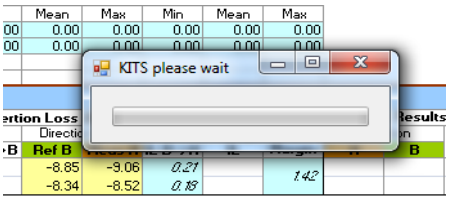
| Step | Memory download Procedure |
|---|---|
| 4 | Select: -<br>• Meter memory location to start downloading data from: **"Start Memory"**<br>• Wavelengths to be downloaded: **"Select wavelengths to download"**<br>• Number of memory locations / results to be downloaded: "**No. Of Fibers"**<br>**(**User may need to enter the appropriate number in this field in order to load all or part of the data from instrument memory to the worksheet)<br>• Fibre number in Live Data worksheet to begin the download at: **"Start at Fiber No. ("A" End)"**<br>For example; download from Memory location 2, data for 6 fibres starting at fibre 4, see figure below;<br>  |
| 5 | Click ***[OK]*** to begin memory download.<br>A 'KITS please wait' dialogue box will open during download, closing automatically when download is completed.<br>  |

### 10.3.4 Data entry by downloading from CSV files

The data contents saved in a CSV (Comma Separated Values) file can be selectively dumped and mapped into **"Live Data"** worksheet directly via KITS™ command, ***[Load .csv File]***.

| Step | CSV File Download Procedure |
|---|---|
| 1 | Configure the "**Live Data"** worksheet as per Section 10.1 (Steps 4~7). |
| 2 | Select command, ***[Load .csv File].***<br>**Note:** If the CSV file contains data exported from a meter memory using;<br>- KITS™ function, **Save Csv** or<br>- KITS™ Command, ***[Save as .csv]*** on ***"Final Report"*** worksheet or<br>- Memory dump (data saved in USB memory stick from KI2600 series)<br><br>Note: the "**Live Data"** worksheet provides a user selectable option to automatically configure the worksheet with the wavelengths and test direction matching the CSV file. |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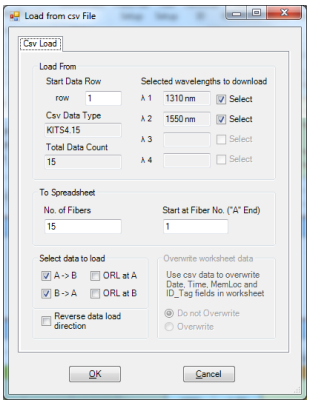
| Step | CSV File Download Procedure |
|---|---|
| 3 | In the **"Open"** pop-up, select the saved CSV files to initiate the downloading process.<br><br>**Note:** As part of KITS Secure Data feature, CSV file which has been edited/resaved is not downloadable on the worksheet in Secure Data Mode. On the prompt, if the user presses OK to continue, KITS™ will set the worksheet as "Data is NOT Secure" and load the data.<br><br>*For testing purposes, a collection of sample KITS™ CSV files are included with KITS™ installation.*<br><br>*User may view these files from the directory,* ***C:\ProgramData\Kingfisher\KITS Sample Files****.*<br><br>*There are 4 categories of CSV files in the subdirectories:*<br>*- Files exported from KITS (live data read from meter)*<br>*- Files exported from KITS (data read from memory of meter)*<br>*- Files exported from meter using Save Csv*<br>*- Files saved in USB dump* |
| 4 | Select: -<br>• Row number in CSV file to start downloading data from: **"Start Data Row"**<br>• The numbers of fibres on the worksheet to map the downloading data: "**No. Of Fibers"**<br>• Select/deselect the data for the wavelength/s to be downloaded: - check/uncheck the boxes near the wavelength numbers<br>• Test direction or ORL option of the data to be downloaded: "**A->B"** or **"B->A"** or **"ORL at A"** or **"ORL at B"**<br>**Note: "ORL at A"** and/or **"ORL at B"** must be selected in order for ORL data in CSV file to be successfully downloaded onto the worksheet.<br>Note: If a field is greyed out, that is because it is not selected in configuration. Run ***[Test Setup]*** to select the field.<br>• Fibre number in "**Live Data"** worksheet to begin the download at: **"Start at Fiber No. ("A" End)"**<br><br>For example; download from **row**, 1 of the available 15 rolls of data in the csv file, map it on 15 Fibers on the **"Live Data"** worksheet starting from the 1'st **Fiber No**, see figure below;<br>  <br><br><br>Click ***[OK]*** to proceed. |



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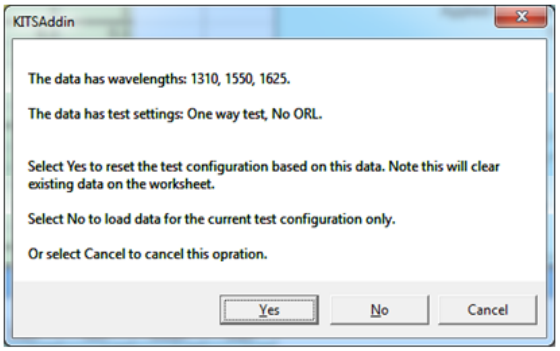
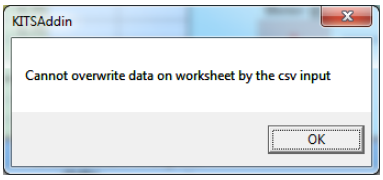
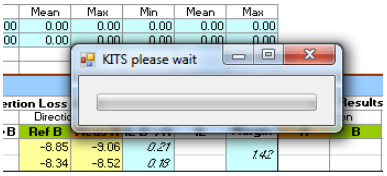
| Step | CSV File Download Procedure |
|---|---|
| 5 | If the CSV file to be downloaded contains wavelengths which are different from that configured in **Step 1**, the pop-up below will be displayed.<br>  <br>Select **[Yes]** or **[No]** or **[Cancel]** accordingly to proceed. |
| 6 | If the pop-up below is displayed, click on [OK].<br>Clear all data on the worksheet using the KITS™ *Clear Data* command, ***[All Data]*** and go back to Step 2 to reinitiate data download process.<br>  |
| 7 | A 'KITS please wait' dialogue box will open during download, closing automatically when download is complete.<br>  |

## 10.4 Associated KITS™ Commands of Live Data Worksheet

Click on KITS™ Menu Tab to display all available KITS command on the worksheet's ribbon. If only some of these commands are displayed, click on the tab for any other worksheet followed by switching back to this worksheet, to refresh the ribbon with all the available commands.

### 10.4.1 Worksheet: *[Final report], [Live Data], [Meter Reading], [Data Logging], [Meter Dump], [New Report]*

Users can alternatively use this commands to switch between the worksheets with the KITS™ software instead of clicking on the Excel Sheet Tab.

- ***[Final report]:*** To go to **"Final Report"** worksheet
- ***[Live Data]:*** To go to **"Live Data"** worksheet
- ***[Meter Reading]:*** To go to **"Meter Reading"** worksheet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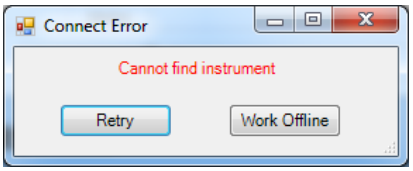
- ***[Data Logging]:*** To go to **"Data Logging"** worksheet
- ***[Meter Dump]:*** To go to **"Meter Dump"** worksheet
- ***[New Report]:*** Used to design a custom report layout. See **section 16 Customization.**

### 10.4.2 *[Connect/Disconnect]*

Click to connect or disconnect the instrument to KITS™. If the error below pops up after a connect command, make sure that the meter is turned on, unplug and re-plug USB connection between meter and computer, select ***[Retry]*** to connect again.

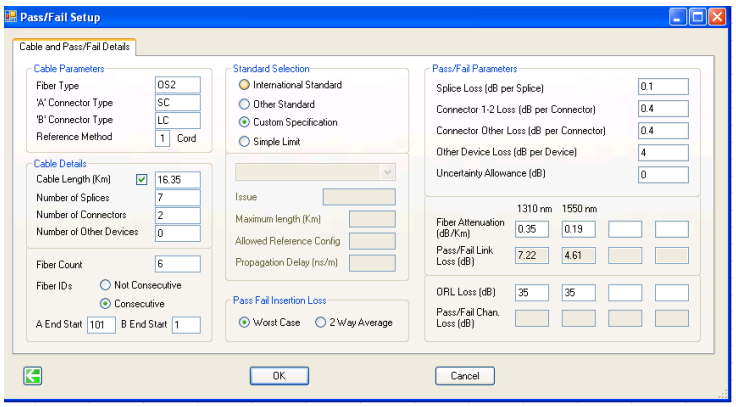



If the above does not solve the problem, see section B.5.1 of Appendix B for manual installation of device driver.

### 10.4.3 *[Pass Fail Setup]*

This command is used to configure the workbook for: -

- Standard selection.
- If a local or international standard is selected, then the various pass/fail parameters defined in the standards will be 'greyed out' to prevent alteration.
- Cable build details such as connector type, length, fibre count, number of splices etc.
- The number of test cords used in referencing the test instruments is also set here.
- Measurement uncertainty.
- Pass/ fail/ marginal result based upon worst case or two-way average loss.




**Note:** Some standards restrict and or specify the allowable test cord referencing method. KITS will warn regarding this if necessary.

***Definition of Pass / Fail / Marginal Result***

The ISO & IEC standard organisations define the following:

**Pass Result**

Measured value which meets the specified requirement and where the absolute value of the difference between the measured value and the specified requirement is greater than the stated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measurement uncertainty. *Provided any apparent gain does not exceed the measurement uncertainty."*

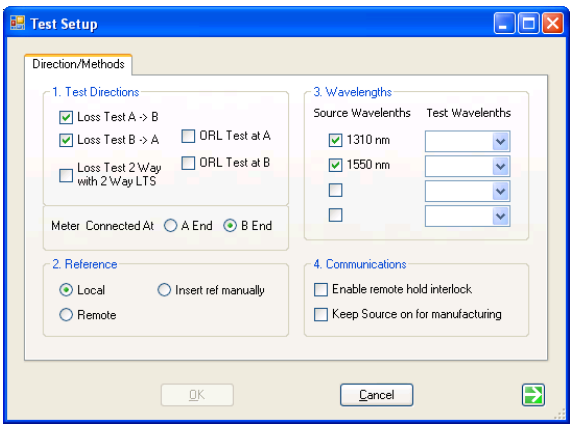
**Fail Result**
Measured value which fails to meet the specified requirement and where the absolute value of the difference between the measured value and the specified requirement is greater than the stated measurement uncertainty.

**Marginal Result**
Measured value which differs from the specified requirement, by an amount not exceeding the stated measurement uncertainty.

### 10.4.4 *[Test Setup]*

This command is usually used after the 'Pass/Fail' configurations. It is used to configure the workbook for: -

- Test direction – one way, two-way with a source and meter or two way using a two way LTS.
- ORL measurement included or not.
- DUT 'end' at which the Power Meter is connected.
- Type of referencing used – Local or Remote, see Note 2 below.
- Wavelengths to be tested – maximum of 4.
- User communication function selections, see Note 3 below.




**Note 1:**

Whilst the ***[Test Setup]*** and the ***[Pass/Fail Setup]*** sub-menus can be configured in any order, it is recommended that when testing to a Standard, that the ***[Pass/Fail Setup]*** sub-menu be configured first to minimise any interaction between them.

E.g. the standard may specify testing at two wavelengths, however the user may only be testing at one wavelength.

**Note 2:**

**Local / Remote Referencing Definition**
Whilst the terms 'Local' and 'Remote' referencing are used internationally, there is often some confusion.

**Local:**

- A Local Reference is performed when one power meter is used to measure both the Reference Level and the far end measurement.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- The two instruments that will be used to measure the DUT loss are co-located when referenced.
- Local Reference 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).
- With a Local Reference the meter can be configured to read the loss directly in dBr.

**Remote:**

- A Remote Reference is usually performed on a "long" link where it is inconvenient or impractical to use one power meter to measure the power at both the ends of the link.
- In a Remote Reference two power meters are used. One power meter is used to measure the Reference Level (e.g. the light source output power), and the other meter is used to measure the received level at the other end of the link.
- With a Remote Reference, a calculation must be made to determine the loss.

**Note 3:**

**"Enable remote hold interlock"** option

To work with this option, a pair of identical KI7340 series Loss Test Sets must be used. This option provides a useful communication aid to the operators at both ends of a DUT in coordinating their tasks i.e., the far end user knows when a reading has been saved in KITS™, and the near end user knows when the far end user has moved to the next fiber, and so is ready for the next reading. For detail operations in this mode, see steps under 5.2.5.2 of section, 5.2 (Live Mode Tour).

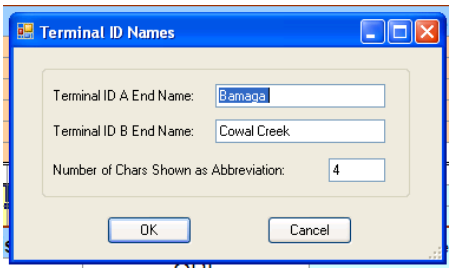
**"Keep Source on for manufacturing"** option

When this option is selected, KITS will defeat the auto-timeout (for auto-off function) of the Light Source. To reactivate the auto-timeout, unchecked this option in Test Setup window, switch off the unit then turning it back on by briefly pushing its [POWER] button.

### 10.4.5 *[Terminal ID]*

This command is used to specify the names of the two ends to be tested: -

- The A & B end test location names e.g. Bamaga
- The number of characters to be used for abbreviation.
  e.g. 4 => BAMA, 3 => BAM




### 10.4.6 *[Set Reference]*

The ***Set Meter Reference*** sub-menu provides a convenient form to either:-

- Set the Reference Value,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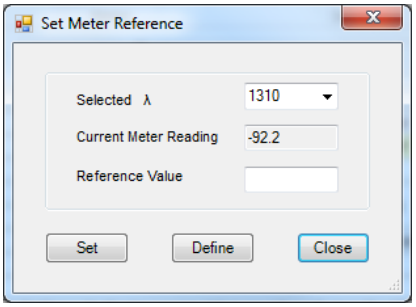
**Select λ** from the drop-down list, click ***[Set]*** to set the value in "**Current Mater Reading"** as reference for the selected wavelength.

- Define the Reference Value,

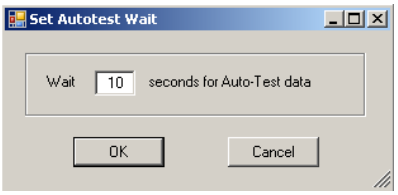
  **Select λ** from the drop-down list, enter a value for "**Reference Value"** & click ***[Define].*** The entered value will become the reference for the selected wavelength.

**Note:**
i. The **"Set Meter Reference"** popup is only available when an instrument is connected.
ii. This feature is not functional in AutoTest mode.
iii. This is a per wavelength setting.




### 10.4.7 *[Wait Time]*

This command allows user to choose the time interval to receive update of Autotest readings. Default is 10 seconds.




### 10.4.8 *[Show / Hide]*

Users have the options to show or hide the different subsection of the "Live Data" worksheet using the command options below;

- **"Hide/show Job Detail"** to hide/show subsection, "**Job Detail / Site Data"**
- **"Hide/Show Pass Fail Setup"** to hide/show subsection, **"Test Parameter Setup"**
- **"Hide/Show Test Summary"** to hide/show subsection, **"Statistical Analysis"**

### 10.4.9 *[Unset/Set Secure]*

These commands are used to enable or disable the Secure Data Mode, see Section 10.2.4.6.

### 10.4.10 *[Save .csv File]*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Select this command to save existing test data/results on **"Live Data"** worksheet in a CSV file. Data/result will be saved in CSV file with checksum. CSV file that has been resaved will not be reloadable or loaded only in non-secured data mode on KITS™. This is a KITS™ secured data feature to prevent unauthorized data alteration.

### 10.4.11 [*Load .csv File]*

Download and map test data/results saved in a CSV file onto **"Live Data"** worksheet, see Section 10.3.4.

### 10.4.12 *[Memory Download]*

Download and map test data/results saved in the memory of a meter onto **"Live Data"** worksheet, see Section 10.3.3.

### 10.4.13 *[Save Kits Unlinked]*

Normally when a KITS™ workbook is opened, it will automatically start the KITS™ software. When required, use this command to save the workbook as Unlinked to the KITS™ software. This file will later open in Excel as per a normal workbook.

Once performed, the action CANNOT be undone.

| Step | Unlink KITS™ workbook |
|---|---|
| 1 | Open the workbook to be Unlinked<br>• Ensure workbook display layout is as required.<br>• Once Unlinked, the action CANNOT be undone |
| 2 | Select command, ***[Save KITS Unlink]*** |
| 3 | Type in file name and select directory to save the worksheet. |

### 10.4.14 Clear Data: *[All Data], [Project Info], [A <-> B], [A -> B], [B -> A]*

These commands are used to clear all or part of the test data/results. Operation is self-explanatory.

### 10.4.15 *[User Manual]*

Click to access the User Manual for KITS™.

Alternatively, the User Manual can be: -

1. Located on your computer as detailed in Section 8.2.1 above.
2. Downloaded from the Kingfisher International web site.

### 10.4.16 *[About KITS]*

Displays the current KITS™ version number and release date.


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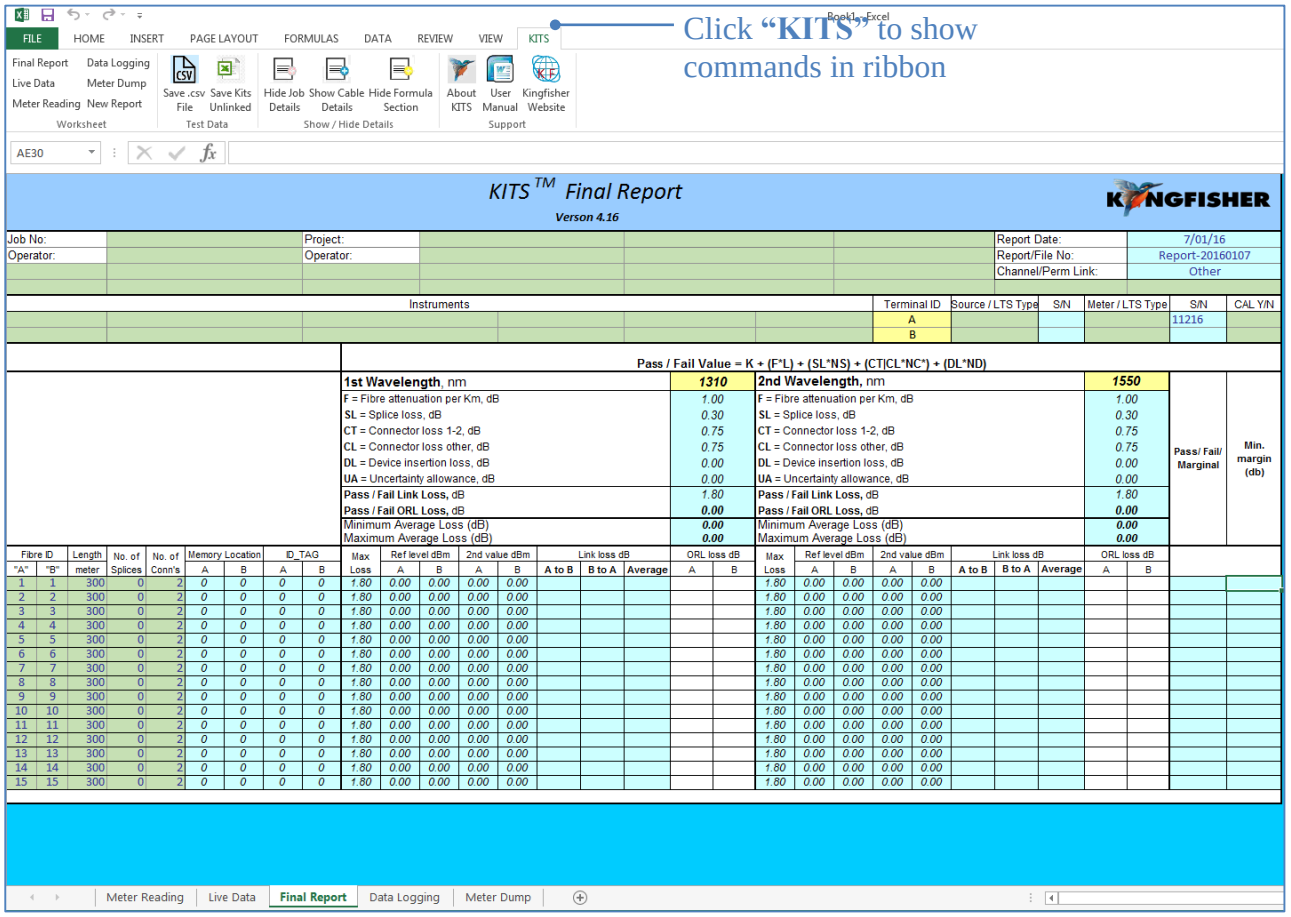
### 10.4.17 *[Kingfisher Web site]*

Links to the Kingfisher International web site.

# 11. FINAL REPORT WORKSHEET




## 11.1 Final Report Worksheet

The **"Final Report"** worksheet is used when the test data is required to be presented in an alternate format to that of the **"Live Data"** worksheet.

- The Loss testing worksheet is 'receive' only.
- All data is imported from the **"Live Data"** worksheet.
- To open the worksheet, click on **"Final Report"** worksheet and "KITS please wait" will pop up.



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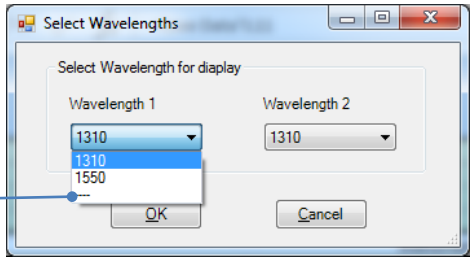
- The Loss testing worksheet can be configured to display one or maximum two wavelengths.

  To configure:
  Click on the yellow **1st** or **2nd wavelength** cells to specify the wavelength(s) displayed as below;

Wavelength not selected




## 11.2 Associated KITS™ Commands of Final Report Worksheet

Click on KITS Menu Tab to display all available KITS™ command on the worksheet's ribbon. If only some of these commands are displayed, click on any other worksheet tab followed by switching back to this worksheet, to refresh the ribbon with the full commands.

### 11.2.1 *[Save .csv File]*

See Section 10.4.10.

### 11.2.2 *[Save Kits Unlinked]*

See Section 10.4.13.

### 11.2.3 Show / Hide Details: *[Show/Hide Job Details], [Show/Hide Cable Details], [Show/Hide Formula Section]*

These commands are used to show or hide the subsections on the worksheet. Operation is self-explanatory.

### 11.2.4 *[User Manual]*

See Section 10.4.15.

### 11.2.5 *[About KITS]*

See Section 10.4.16.

### 11.2.6 *[Kingfisher Web site]*

See Section 10.4.17.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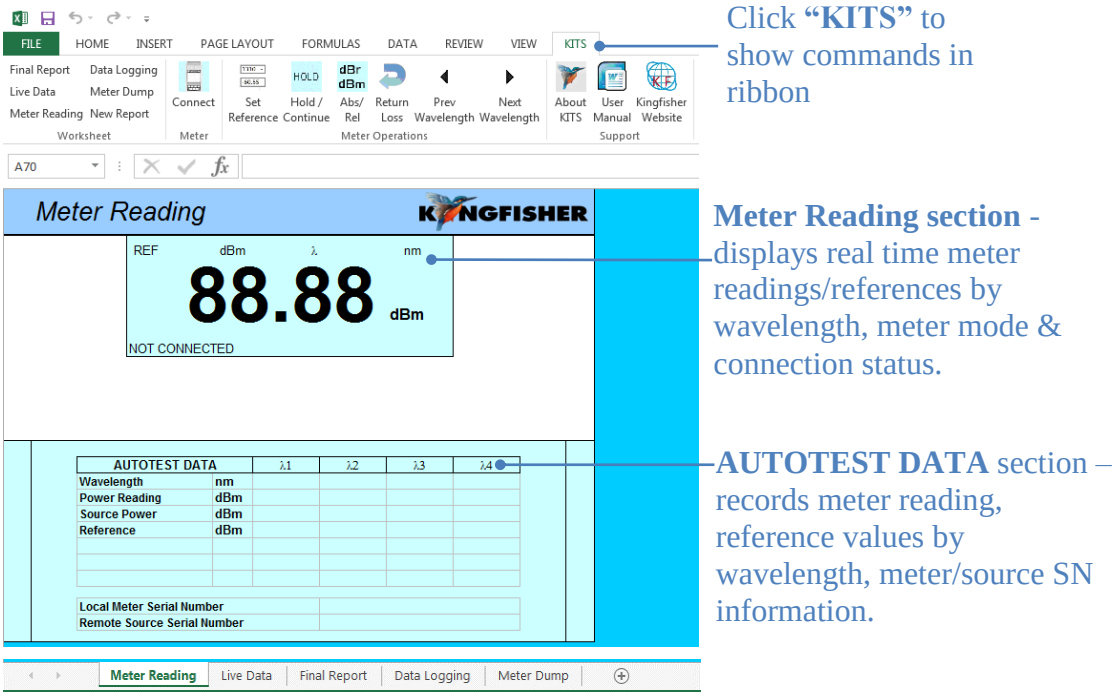
# 12. METER READING WORKSHEET

## 12.1 Meter Reading Worksheet




The "**Meter Reading"** work sheet provides basic meter functions and is useful for confirming instrument connection, and where a large display is required. This worksheet is opened by default when KITS™ completes start-up.

When ***[connect]*** to a meter, the meter reading will be displayed on Meter Reading section and or AUTOTEST DATA section, depending on whether the meter is operating in AutoTest or non-AutoTest mode, see Step 6 of Section 9 for more detail.

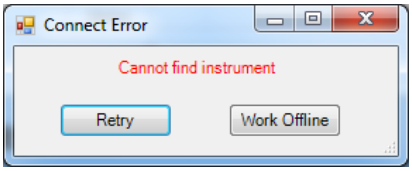
Click "**KITS"** on Menu Bar to show commands in ribbon.

## 12.2 Associated KITS™ Commands of Meter Reading Worksheet

Click on KITS Menu Tab to display all available KITS™ command on the worksheet's ribbon. If only some of these commands are displayed, click on any other worksheet tab followed by switching back to this worksheet, to refresh the ribbon with the full commands.

### 12.2.1 *[Disconnect /Connect]*

Click to connect or disconnect the meter from KITS™ software. When connected, **"CONNECTED"** will be shown on the display. If the error below pops up after a connect command, make sure that the meter is turned on, unplug and re-plug USB connection between meter and computer, select the ***[Retry]*** or connect command again.





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If the above does not solve the problem, see section B.5.1 of Appendix B for manual installation of device driver.

### 12.2.2 *[Set Reference]*

See Section 10.4.6.

### 12.2.3 *[Hold / Continue]*

Click to hold meter display or to continue with real time display. When in hold-mode, "**HOLD**" will show on the display.

### 12.2.4 *[Abs / Rel]*

Click to toggle between absolute / relative meter measurements modes.

### 12.2.5 *[Previous Wavelength] & [Next Wavelength]*

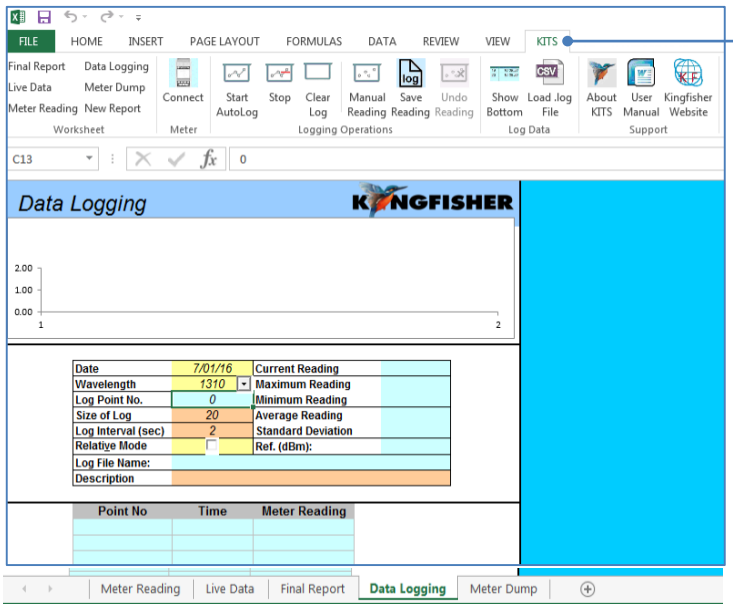
To change the current test wavelength displayed in the Meter Reading section.

Note:

i. This feature is not available when source is in AutoTest mode.

ii. In AutoTest mode, the display shows live data.

## 13. DATA LOGGING WORKSHEET




Click **"KITS"** to show command ribbon

The Data Logging sheet supports data logging whether the meter is in Power Meter, one-way or two-way Autotest mode.

The following statistical information is recorded: -



Copyright

- max,
- min,
- mean,
- standard deviation and
- current reading.

## 13.1 Data Logging

Data Logging can be performed automatically or manually. User is allowed to specify: -

- the meter wavelength,
- the size of the log,
- the log time interval and
- Absolute or Relative mode

During data logging, each data point is automatically written to the specified log file, minimising data loss in case of a process interruption.

**Caution:** The source should be in CW mode; however, data logging may be possible in AutoTest mode. Depending upon sample interval and computer speed, the reading may become unreliable if the instrument is in AutoTest mode. AutoTest samples intervals greater than 5 seconds are generally OK.

If sampling with the source in AutoTest mode is required, trial test parameters before committing to the test.

### 13.1.1 Automatic Data logging

| Step | Automatic Data Logging Procedure |
|---|---|
| 1 | Select the **"Data Logging"** worksheet. |
| 2 | To select the wavelength, use the arrow buttons next to **"Wavelength"**.<br>**Note:** Meter must be connected for this function. |
| 3 | Define **"Size of log"**. |
| 4 | Define **"Log Interval (sec)"**. |
| 5 | If required, select **"Relative Mode"**. |
| 6 | If required, add a **"Description"**. |
| 7 | To clear existing data, select KITS™ command, ***[Clear Log]***. |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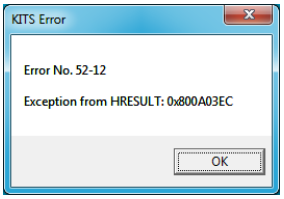
| Step | Automatic Data Logging Procedure |
|---|---|
| 8 | To start logging, click KITS™ command, ***[Start Autolog]*** and enter file name in the dialog box, and select a directory to save data.<br>If Excel is in cell input mode (e.g. the cursor is placed inside the **"Size of log"** cell), clicking ***[Start Autolog]*** will trigger the error message below. Exit input mode by clicking on any cell outside the tables, amd click ***[Start Autolog]*** to restart auto data logging.<br>  <br>• Consider using the **"Description"** from Step 6 above for the file name. |
| 9 | To hold data logging before it is completed, click KITS™ command, ***[Stop].*** To resume data logging, click KITS™ command ***[Continue AutoLog].***<br>Click ***[Stop]*** twice to abort a data logging session. |

### 13.1.2 Manual Data Logging

Data is stored upon user command.

| Step | Manual Data Logging Procedure |
|---|---|
| 1 | Select the **"Data Logging"** worksheet. |
| 2 | To clear existing data, select KITS™ command, ***[Clear Log].*** |
| 3 | To set the wavelength, use the arrow buttons next to **"Wavelength"**.<br>**Note:** Meter must be connected for this function. |
| 4 | If required, select **"Relative Mode"**. |
| 5 | If required add a **"Description"**. |
| 6 | On each click of KITS™ command, ***[Manual Reading]*** a data point is logged.<br>The data point index and the size of the log is automatically incremented. |
| 7 | To undo the last reading, select KITS™ command, ***[Undo Reading]***. This decreases the data point index, but not the size of log value. |
| 8 | To save the data log, click KITS™ command, ***[Save Reading]*** and enter file name and select directory to save data in the dialog box. |

## 13.2 Viewing data whilst logging

Whilst the data is being logged, the default is to show the earliest (top of the spreadsheet) readings. If required, the user can display the current readings (at the bottom of the spreadsheet).

| Step | View data options whilst logging |
|---|---|
| 1. | To show current data readings, select KITS™ command, ***[Show Log Data Bottom].*** |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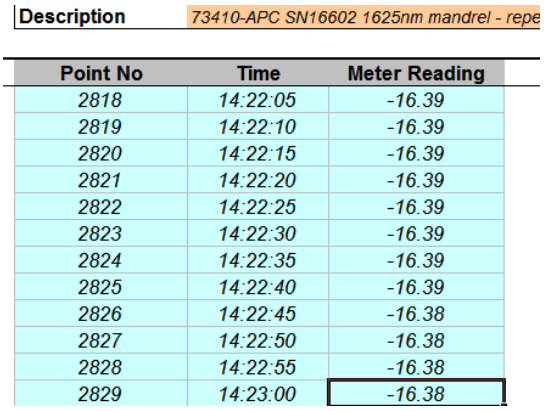
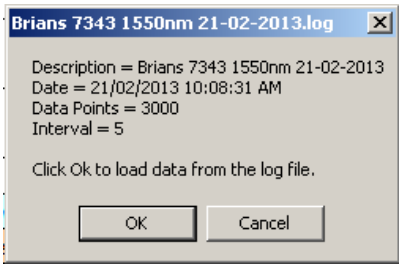
| Step | View data options whilst logging |
|---|---|
| . |  |
| 2. | To revert to the top of the data readings, select KITS™ command, ***[Show Log Data Top].*** |



## 13.3 Loading saved log files

A saved log file can be loaded into this spreadsheet.

| Step | Loading saved Log file |
|---|---|
| 1. | Ensure no instrument is connected to KITS™. |
| 2. | Select KITS™ command, ***[Load .log File]***. |
| 3. | A pop up dialogue box provides information about the selected Log file. Select ***[OK]*** to load or ***[Cancel]*** to back out.<br>  <br>**Note:** very large Log files may take a while to load. Load completion is easily confirmed by the presence of the graph. |



## 13.4 Printing log files

Use Windows print options to print hardcopy of the logged data.

## 13.5 Associated KITS™ Commands of Data Logging Worksheet

Click on KITS Menu Tab to display all available KITS™ command on the worksheet's ribbon. If only some of these commands are displayed, click on any other worksheet tab followed by switching back to this worksheet, to refresh the ribbon with the full commands.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### 13.5.1 *[Disconnect /Connect]*

See Section10.4.2.

### 13.5.2 *[Start AutoLog]*

To start Automatic Data logging, see application in Section 13.1.1.

### 13.5.3 *[Stop / Continue AutoLog]*

***[Stop]:*** One click to halt existing automatic data logging process. Click twice will abort the exiting existing automatic data logging process. ***[Continue AutoLog]:*** To resume a halt data logging process. See application in Section 13.1.1.

### 13.5.4 *[Clear Log]*

To clear the exiting logged data on the display, see application in Section 13.1.1.

### 13.5.5 *[Manual reading]*

To manually enter log data. A data point will be entered on each click of this command, see application in Section 13.1.2.

### 13.5.6 *[Save Reading]*

To save the existing logged data on the display in the specified file see application in Section 13.1.2.

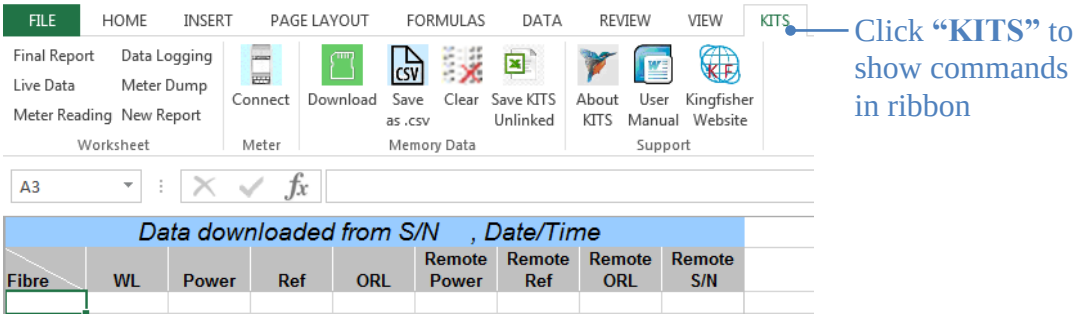
### 13.5.7 *[Show Log Data Bottom] & [Show Log Data Top]*

To move the cursor to the bottom or to the top of the display to view the 1st or the last data point, see application in Section 13.2.

### 13.5.8 *[Load .log File]*

Load a log files saved in a directory onto the worksheet see application in Section 13.3.

## 14. METER DUMP WORKSHEET



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## 14.1 Meter Dump Worksheet

The **"Meter Dump"** worksheet provides a simple and convenient way to download and view the loss test data stored in a meter/instrument.

Unlike the **"Live Data"** worksheet where only the memory readings that match the selected wavelengths are downloaded, the **"Meter Dump"** sheet downloads all data from meter memory. No analysis is performed.

| Step | Meter Dump Operations |
|---|---|
| 1. | Select command, ***[Connect]*** to connect meter to KITS™ software. |
| 2 | Select command, ***[Download]***. |
| 3 | All memory cells of meter will be downloaded to the worksheet. |
| 4 | To Clear the data on worksheet, select ***[Clear]***. |
| 5 | To save the data on worksheet to a CSV file, select ***[Save as .csv]*** followed by specify a file name and directory to save. |
| 6 | Alternatively, select ***[Save KITS Unlink]*** to save the workbook (inclusive of the downloaded data in the Meter Dump worksheet in a normal Excel format (not linked to KITS™). |

*Data downloaded from S/N 25018, Date/Time 3/12/15 16:09:05*

| Fibre | Date | Time | Type | ID Tag | Remote S/N | WL | Power | Ref | Nom |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 10/12/13 | 9:25 | 2WIAuto | ABCD013 | 11216 | 1310 nm | -7.74 | -7.69 | -7.00 |
| 1 | 10/12/13 | 9:25 | 2WIAuto | ABCD013 | 11216 | 1550 nm | -7.74 | -7.76 | -7.00 |
| 2 | 10/12/13 | 9:25 | 2WIAuto | ABCD014 | 11216 | 1310 nm | -7.75 | -7.69 | -7.00 |
| 2 | 10/12/13 | 9:25 | 2WIAuto | ABCD014 | 11216 | 1550 nm | -7.73 | -7.76 | -7.00 |
| 3 | 10/12/13 | 9:25 | 2WIAuto | ABCD015 | 11216 | 1310 nm | -7.76 | -7.69 | -7.00 |
| 3 | 10/12/13 | 9:25 | 2WIAuto | ABCD015 | 11216 | 1550 nm | -7.75 | -7.76 | -7.00 |

## 14.2 Associated KITS™ Commands of Meter Dump Worksheet

Click on KITS Menu Tab to display all available KITS™ command on the worksheet's ribbon. If only some of these commands are displayed, click on any other worksheet tab followed by switching back to this worksheet, to refresh the ribbon with the full commands.

### 14.2.1 *[Disconnect /Connect]*

To connect or disconnect meter with the software, see application note in Section 14.1.

### 14.2.2 *[Download]*

To download meter's memory onto the worksheet, see application note in Section 14.1.

### 14.2.3 *[Save as .csv]*



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See Section 10.4.10.

### 14.2.4 *[Clear]*

To clear data on the worksheet, see application note in Section 14.1.

### 14.2.5 *[Save Kits Unlink]*

To save data the whole workbook in a normal Excel file, see application note in Section 14.1.

# 15. EXTRACT MEMORY OF A METER DIRECTLY

## Save Csv

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

This feature is independent of Microsoft Office.

Note: If the full KITS™ software is installed, it is recommended to close KITS™ first before executing this function.

| Step | Extract to CSV |
|---|---|
| 1. | Connect the instrument to the RS232 or USB port of the PC. |
| 2. | Click ***[Start] -> [Programs] -> [Kingfisher Kits] -> [Save Csv]*** |
| 3. | In the Open box specify a filename and choose the location to save the file. The open box may take a little while to show up depending on the data size in instrument memory. |
| 4. | Click ***[Save]*** and the data will be saved to this text file in CSV format.<br>• The exact CSV file format depends upon the instrument type. E.g. KI7000 series differs to that of KI2000 series. See below for samples files.<br>• The file includes a checksum. |

**Memory extract KI2600 via 'Save Csv':**

| Save csv output from KI2X00. SN: 25018 Time in 24h format. Wavelengths in nm. Optical Power values in dBm. | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mem** | **Date** | **Time** | **Type** | **ID_Tag** | **RemSN** | **Wl1** | **Pwr1** | **Ref1** | **Nom1** | **Wl2** | **Pwr2** | **Ref2** | **Nom2** | **Wl3** |
| 1 | 26/05/2014 | 10:09 | 2WlAuto | THUR001 | 11216 | 1310 | -8.9 | -0.7 | -7 | 1550 | -8.57 | -0.77 | -7 | |
| 2 | 26/05/2014 | 10:09 | 2WlAuto | THUR002 | 11216 | 1310 | -9.31 | -0.7 | -7 | 1550 | -8.59 | -0.77 | -7 | |
| 3 | 26/05/2014 | 10:09 | 2WlAuto | THUR003 | 11216 | 1310 | -9.42 | -0.7 | -7 | 1550 | -8.61 | -0.77 | -7 | |
| 4 | 26/05/2014 | 10:09 | 2WlAuto | THUR004 | 11216 | 1310 | -8.91 | -8.93 | -7 | 1550 | -8.63 | -8.28 | -7 | |
| 5 | 26/05/2014 | 10:09 | 2WlAuto | THUR005 | 11216 | 1310 | -8.95 | -8.85 | -7 | 1550 | -8.28 | -8.34 | -7 | |

**Memory extract KI7343 via 'Save Csv':**

| Save csv output from KI Meter. SN: 11216 Time in 24h format. Wavelengths in nm. Optical Power values in dBm. | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mem** | **Date** | **Time** | **ID_Tag** | **RemSN** | **Length** | **Wl1** | **Pwr1** | **Ref1** | **Orl1** | **RemPwr1** | **RemRef1** | **RemOrl1** | **Wl2** | **Pwr2** | **Ref2** | **Orl2** |
| 1 | | | | 24919 | | 1310 | -0.34 | -99.99 | 1.44 | -99.99 | -99.99 | -99.99 | 1310 | -0.43 | -99.99 | 99.98 |
| 2 | | | | 24919 | | 1310 | -0.1 | -0.1 | | | | | 1550 | -0.25 | -0.25 | |
| 3 | | | | 24919 | | 1310 | -0.09 | -0.1 | | | | | 1550 | -0.25 | -0.25 | |
| 4 | | | | 24919 | | 1310 | -8.33 | -0.1 | | | | | 1550 | -19.31 | -0.25 | |
| {xcheck: 00a1a199e0} | | | | | | | | | | | | | | | | |

# 16. CUSTOMISATION



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Being Excel based, KITS™ offers a number of modification options.

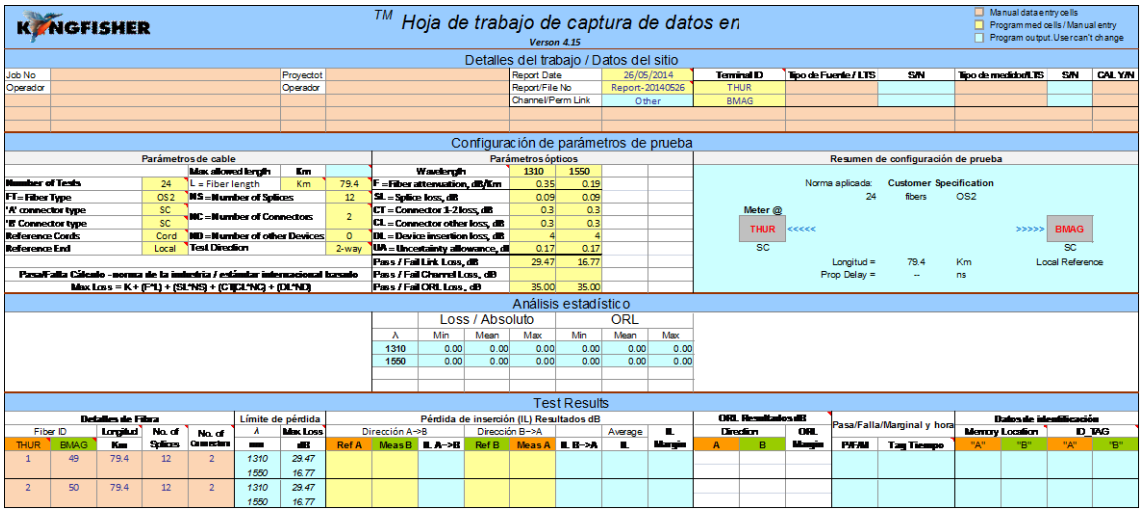
## 16.1 Renaming worksheets

This is as standard Windows function. A worksheet name can be changed to any other text accepted by Excel. KITS™ remembers the new sheet name when the workbook is saved.

## 16.2 Modifying the Live Data & Loss Testing worksheets

Many fields in the Live Data & Loss Testing worksheets can be modified. There are two options for performing this being:

1. Modifying the Master Layout template or
2. Modifying an open or existing KITS™ workbook.




**Modifications to the Master Layout template** will affect all new KITS™ workbooks. However, it will be overridden should KITS™ be upgraded or reloaded at a later date.

The Master Layout template, KitsXls 4.16.xlsx is typically installed under ***<Drive>:\Documents and Settings\All Users\Application Data\Kingfisher\ KITS4.***

**Modifying an existing or open KITS™ workbook**, and saving it with a specific name, is preferred by many users as it permits them to create several customised worksheets.

- Once modified the changes should be protected. The two methods of protecting the changes are covered in Section **16.3** below.

### 16.2.1 Modification Rules

**Live Data**

The text in cells with a blank or light blue background may be changed.

**Final Report**

The text in cells with a blank background may be changed.

## 16.3 Protecting a worksheet design



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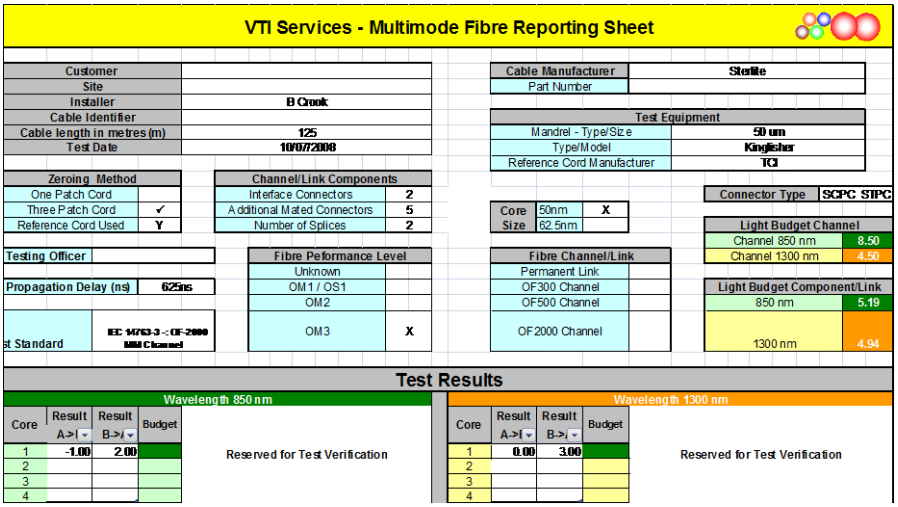
This is very handy for working on assorted jobs, changing languages, terminology, and so on. Windows offers two methods for creating a protected worksheet. These are:

1. Write Protecting a file or
2. Creating a Template.

As these are standard Windows functions, instructions are not given within this manual.

## 16.4 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 worksheet and automatically populate the test data to the custom designed report worksheet.




| Step | Designing a Customized Report Sheet |
|---|---|
| 1 | It is suggested that the design of the new report sheet be performed or obtained before starting. Alternatively, you can design the layout of the sheet as you work. |
| 2 | Create a new or open a saved KITS™ workbook, set up all parameters for the Live Data sheet. |
| 3 | Select command, ***[New Report]***. A **"New Report Sheet"** form will pop up. |
| 4 | Enter a sheet name. |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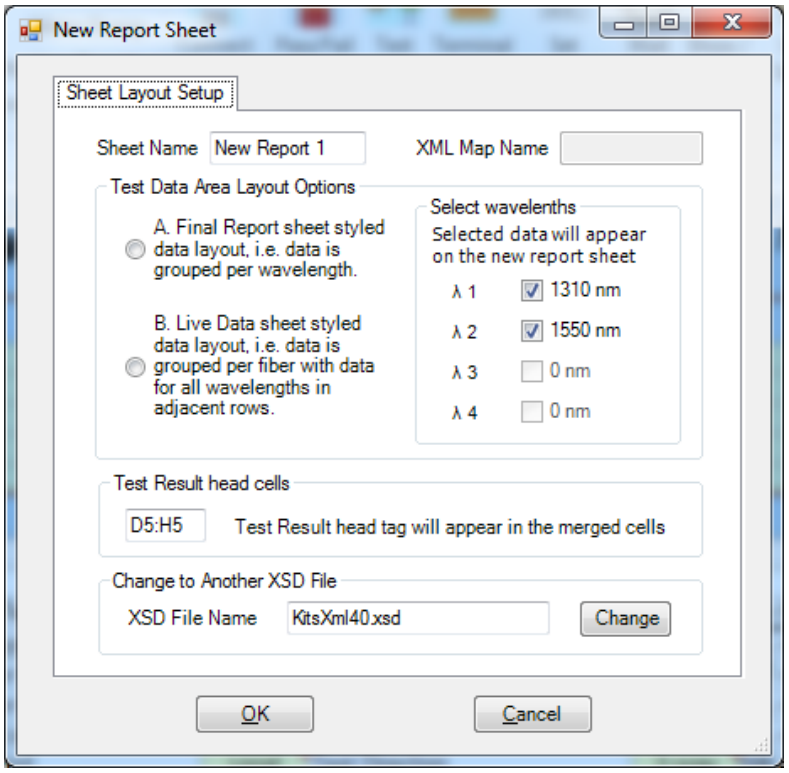
| Step | Designing a Customized Report Sheet |
|---|---|
| 5 | Choose data layout option A or B<br>• **A** is the layout of the **"Final Report"** worksheet, where one Excel row has data for all wavelengths of one fiber.<br>• **B** is the layout of the **"Live Data"** worksheet, where one Excel row has data for one wavelength and data for one fiber is grouped in consecutive rows).<br>For option B, you can tick check boxes to decide which wavelengths to include in the report.<br>By default, the new report worksheet 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.<br>  <br><br>XML Map Name shows the name of the XML map for this sheet. It is empty before the sheet is created. |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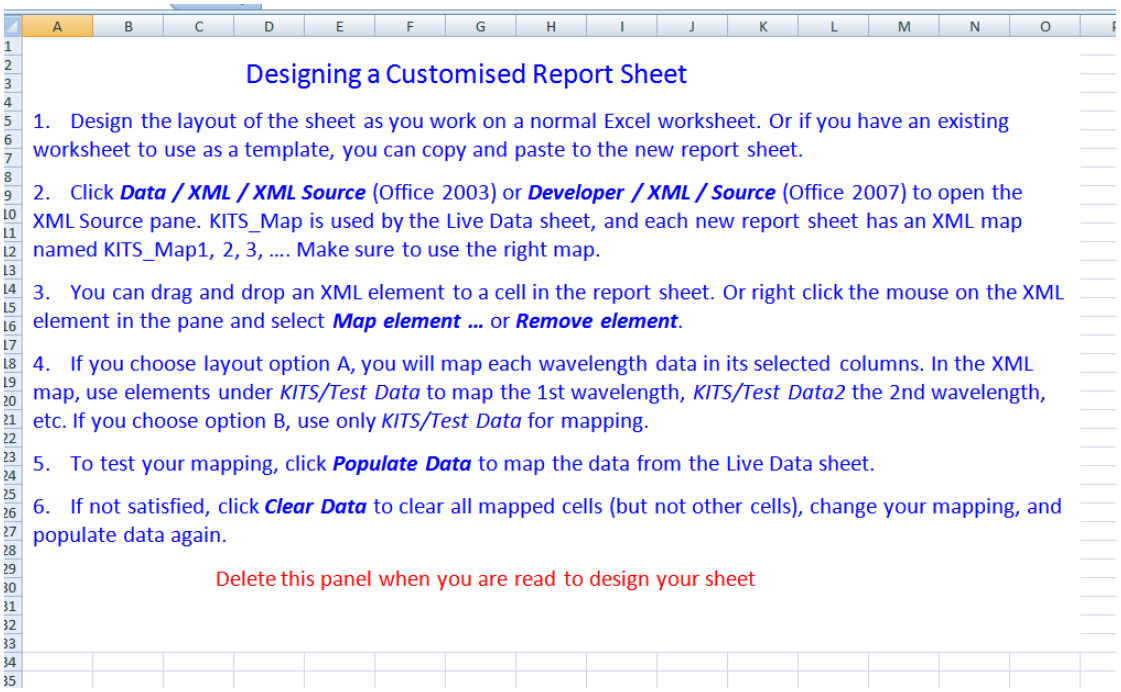
| Step | Designing a Customized Report Sheet |
|---|---|
| 6 | Click ***[Ok]*** to complete.<br>A new sheet is created which contains a picture frame with instructions to customise a report sheet.<br>  <br>Read and delete this frame before you start designing the sheet (or copy it somewhere else, if you may need to refer to it later). |
| 7 | If you have an existing worksheet to use as a template, you can copy part or the whole sheet and paste it into the new report worksheet.<br>Alternatively, you can design the layout of the sheet as you work. |

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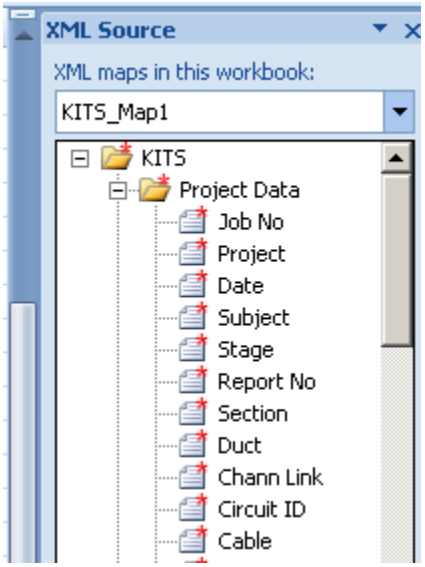
| Step | Designing a Customized Report Sheet |
|---|---|
| 8 | In KITS™, click the Excel menu item, ***Developer / XML / Source*** (Office 2007) to open the XML Source pane.<br>  <br>**Figure 1, XML source pane**<br>A dropdown list on the top of the pane shows the XML maps in the workbook.<br>• KITS_Map is used by the Live Data sheet,<br>• The new report sheet has an XML map named KITS_Map1. Any subsequent report sheets will be named with the suffix 2, 3, etc.<br>**Note:** You must use the correct XML map, otherwise the data cannot be populated correctly.<br>The KITS_Map and subsequent XML maps, are divided into 13 sections, being:<br>Project Data, A Terminal, B Terminal, Cable Details, Pass Formula1, Pass Formula2, Pass Formula3, Pass Formula4, Stat Analysis, Test Data, Test Data2, Test Data3 and Test Data4. |
| 9 | You can drag and drop an XML element to a cell in the report sheet. Alternatively, right click the mouse on the XML element in the pane and select ***Map element*** ⋯ or ***Remove element***. |
| 10 | **If you choose layout option A:**<br>You will need to map each wavelength data in its selected column.<br>• Use elements under **KITS/Test Data** to map the first wavelength,<br>• Use elements under **KITS/Test Data2** to map the second wavelength, etc.<br>**If you choose layout option B:**<br>Use only **KITS/Test Data** for mapping. |
| 11 | To test your mapping, click ***[Populate Data]*** to map the data from the Live Data sheet. |
| 12 | If not satisfied, click ***Clear Data*** to clear all mapped cells (but not other cells), change your mapping, and then re-populate the data. |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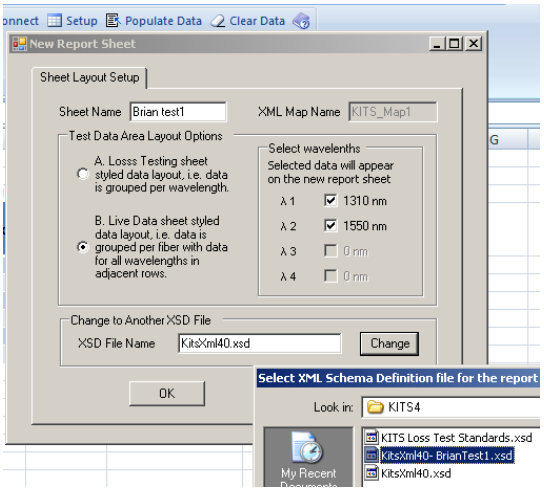
### 16.4.1 XML Mapping Tips:

- 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.
- An XML element which maps with a blue background and a pull down arrow (

) 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, rename it with your own heading or hide the title element.
- A repeating element, such as the fibre number cannot auto size. If you do want to change the number fibres, you can manually edit the new XML work book
- 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***. Alternatively, depending upon your design, you can insert a column in between two XML mapped lists and set its width to 0 (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.
  Then, from within the customised KITS™ worksheet, run ***[Setup]*** to change to the new XSD file name.





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# 17. TECHNICAL TIPS

## 17.1 Running an additional KITS™ Workbooks

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

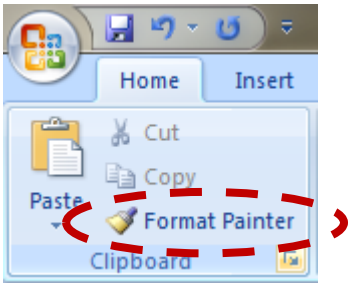
The two KITS™ workbooks each run in their own workspace without interfering with another.

## 17.2 Opening an Old format 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.

If the old workbook does not open correctly in KITS™, 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. The special windows 'Clipboard' function, which permits copying and pasting of multiple items is ideal for this. Below shows its location in Office 2007.




**Note:** This can only be done in 'Non Secure Mode'.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# APPENDIX A
# SUPPORT

A comprehensive range of FAQs is available on our web site at:-
http://www.kingfisherfiber.com/Fiber-Optic-Test-Equipment/Kits-Software/FAQ/Index.htm
or via www.kingfisherfiber.com and select ***Support.***

For advanced technical support, let us know:

- The KITS™ version and build date. This can be found located in KITS™, under Kingfisher / about KITS,
- Your instrument model number, firmware version and serial number.
  - KI7000 instrument firmware version is displayed during instrument start-up,
  - KI2000 series instruments require holding down [F4] during turn on
  - and the instrument serial number is usually on the rear label.
- Your Windows and Office versions, including any non-English language options.

If you have any suggestions for improvement to this document or to the software, please contact sales@kingfisher.com.au


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# APPENDIX B
# RS232 / USB DRIVER CONFIGURATION & INSTALLATION

Early instruments used a RS232 interface, later instruments use an USB interface.

## B.1 RS232

Prior to version 4.15, KITS™ required that Com port assignment be in the range of 1~4. Version 4.15 removed this restriction.

If a new RS232 lead is needed for a legacy instrument, the connection details are as follows.

| | **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) |

**Table 1, RS232 pinout**

**Note 1:** ** Some (out of spec) serial ports need a 10 K resistor in the D connector across wires 1 & 2.

**Note 2:** If your instrument has an RS232 interface and your computer does not, then you will need to install a suitable USB to RS232 adaptor/driver.

These can be purchased from most computer supply shops.

**Note 3**: With some versions of Windows the USB to RS232 driver is only installed on one USB port! In this situation, either note the correct USB port or also install the driver on the other USB ports.

## B.2 USB Power

Some computers, particularly laptops, may be configured to shut off power to the USB port.

If KITS™ seems to hang for no reason this may be due to the power management settings.

KITS™ is a real-time data acquisition program, and computer power management settings may need to be modified or disabled.

## B.3 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™.

## B.4 USB KI7000 series

The KI7000 series USB instruments use a HID interface that is built into Windows.



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## B.5 USB KI2000 series

Beginning with a KITS 4.15 build, the KI2000 device driver is installed along with the KITS™ software.

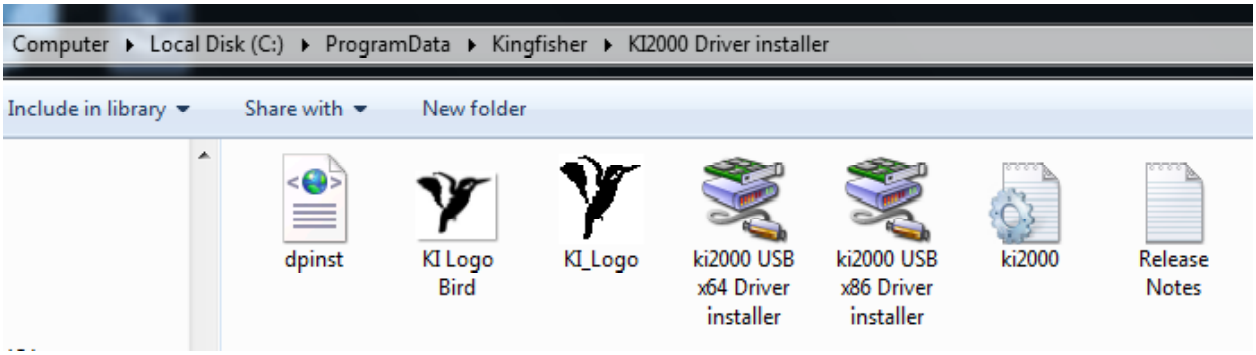
Typically: -

C:\Documents and Settings\<User>\Application Data\Kingfisher\KI2000 Driver installer

or

C:\ProgramData\Kingfisher\KI2000 Driver installer.

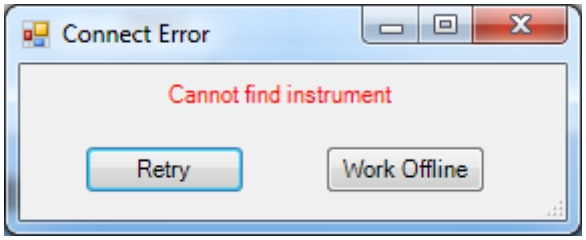
The default KI2000 device driver directory sometimes is hidden. The exact location depends upon which version of the Windows operating system is being used or computer system configuration.



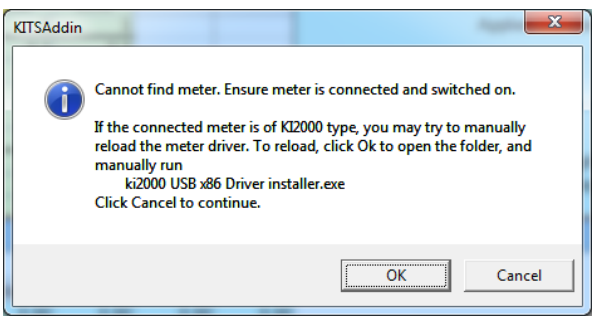

### B.5.1 Install KI2600 series device driver manually

If manual installation is required, you can run the .exe (x86 or x64) program located in this folder. X86 for 32 bit and x64 for 64 bit machines.

Alternatively, when the pop-up below is displayed after KITS™ command, ***[Connect]*** was selected, click ***[Retry]***.




Read the instructions in the next pop-up below and click ***[OK]***, select and double-click to execute the suitable installer file (.exe) listed on the Window Explorer window.



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### B.5.2 Add/edit register, ‘IgnoreHWSerNum’ on a computer

‘IgnoreHWSerNum’ registry setting is helpful for production and testing of USB devices:

Each MCP2200 (i.e. KI2x00 USB interface) has a unique serial number.

Windows adds a new device instance triad for each unique serial number.

A COM port number is also assigned incrementally to each serial number.

‘IgnoreHWSerNum’ registry setting makes Windows ignore the difference of serial number.

Instead, Windows sees USB port 'location'. With this setting, all MCP2200s are assigned to the same COM port number, as long as they are plugged into the same USB port.

Using a registry editor (regedit etc.),

Add IgnoreHWSerNum binary value under this key,

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\UsbFlags\

The entry name should have VID/PID of KI2x00 (18BE/2000) like, IgnoreHWSerNum18BE2000
Set its value to 0x01 (REG_BINARY, length must be exactly one byte)



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# APPENDIX C
# 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 defined parameters for Pass/Fail assessment.

Four parameter based pass/fail options are provided: -

1. International Standard
2. Other Standard
3. Custom Specification
4. Simple Limit

The Standards can be modified, deleted or added to. The default file location is

C:\Documents and Settings\All Users\Application Data\Kingfisher\KITS4

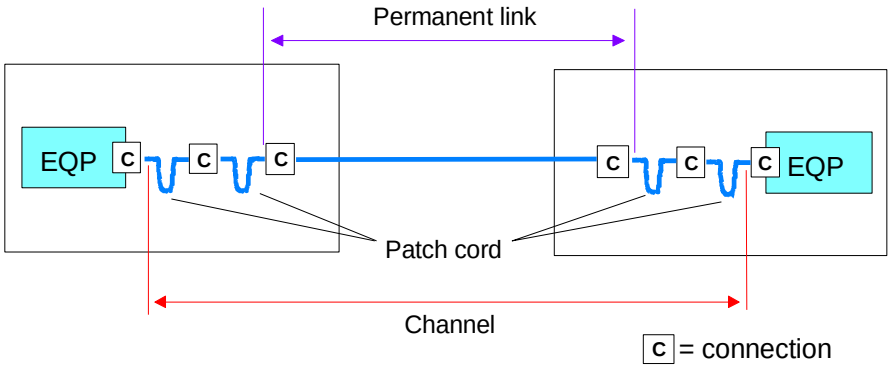
**Note:** Any changes will be overridden, should a KITS™ update be applied or the program be re-installed.

## C.1 International Standards

As installed, this workbook is preconfigured for ISO/IEC and TIA insertion loss Standards. The data is stored in the file **Int-LossTest-Standards.XLS**. The file is Write Protected to prevent accidental changes.

Note that the pass/fail parameters for the ISO/IEC standards involve a formula complexity not seen in the TIA standards.

Should other International Standards be required to be referenced, contact your nearest KI distributor or Kingfisher International directly.



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## C.2 Other Standards

As installed, this workbook is preconfigured for 3 Telstra Corporation insertion loss standards and MIL-STD-2042. The data is stored in the file **User-LossTest-Standards.XLS.** This file is Write Protected to prevent accidental changes.

Version August 2013

User Defined Loss Test Standards

| | | | Con Ends | Reference | RR | CL | | SL | | UA | length/prop | | L | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No | Standard (protected) | Issue | Pass Fail Insertion Loss Average = A Worst Case = W | Allowed Reference Config. | Reference-Reference Loss | Reference against Random Connector 1-2 Loss dB | Embeded Connector Loss dB | Splice Loss dB | ORL | Uncertainty Allowance | Max Length m | Prop Delay nS/m | λ1 | λ1 Loss dB/km | Max Loss | λ2 | λ2 Loss dB/km | Max Loss2 |
| 1 | Telstra SMOF installed prior to Jan/06 | 9 | A | 1 | | 0.5 | 0.5 | 0.1 | 50 | 0.3 | | | 1310 | 0.37 | | 1550 | 0.22 | |
| 2 | Telstra SMOF installed after Jan/06 | 9 | A | 1 | | 0.3 | 0.3 | 0.1 | 50 | 0.3 | | | 1310 | 0.35 | | 1550 | 0.21 | |
| 3 | Telstra MMOF | | A | 1 | | 0.75 | 0.75 | 0.1 | 20 | 0.3 | | | 850 | 3.2 | | 1300 | 0.9 | |
| 4 | MIL-STD-2042-6B SMF | 5/07 | A | 1 | | 0.75 | 0.75 | 0.2 | 30 | | | | 1310 | 1.5 | | 1550 | 1.5 | |
| 5 | MIL-STD-2042-6B MMF | 5/07 | A | 1 | | 0.75 | 0.75 | 0.2 | | | | | 850 | 4.5 | | 1300 | 2.0 | |
| 6 | Location 06 (Spare) | | | | | | | | | | | | | | | | | |

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

**Column A: No:**

Numbers the standards. As installed, these are numbered 1 to 6. To provide for more than 6 standards, add additional numbering. e.g. 7

**Column B: Standards (Protected) / User Definable.**

Enter name of the standard or local specification here.

**Column C: Issue Number**

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 or a 'W' for Worst Case assessment.

**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, whilst for NBN Co work 2 is specified.

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.

**Note:** At time of this manual preparation, the IEC/ISO International Standards bodies were preparing to introduce an 'enhanced 3 cord reference method'.

His method involves validation of test cords as per the referencing procedure and is in effect a 1 test cord reference method.



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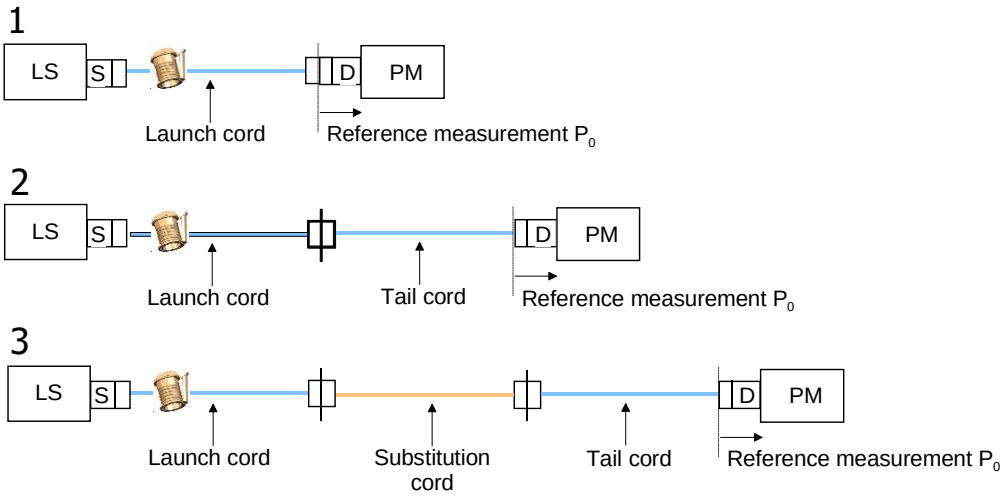
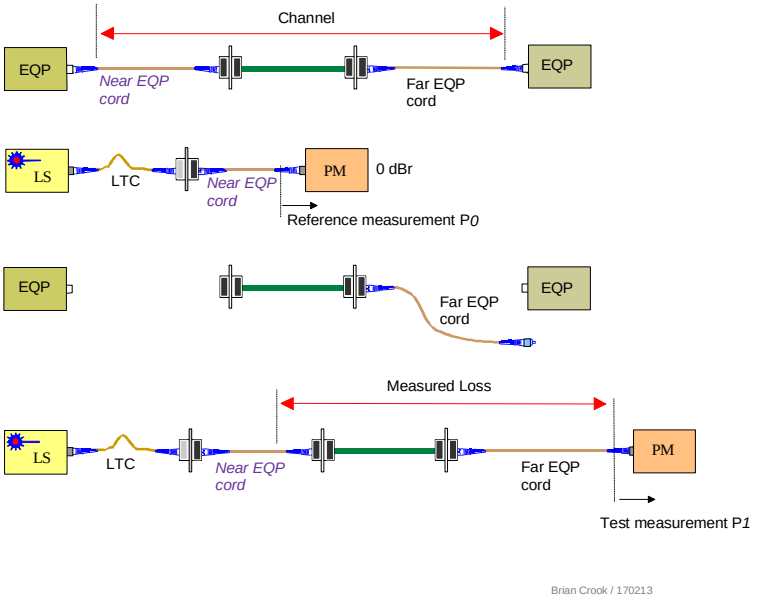



**Traditional 1~3 test cord referencing configurations**

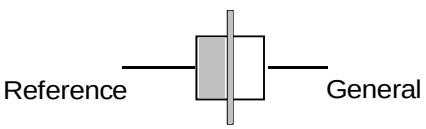



**Enhanced 3 cord reference method (e3) for a Channel**

## Column F: Connector 1-2 Loss dB

Some standards mandate that the mated DUT to test cord connections shall have a lower maximum allowable loss to any other mated connectors that may be in the DUT /installed cabling.

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' as detailed below. Typically, MMF= 0.1 dB and SMF = 0.2 dB.



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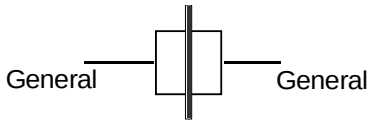
**Column G: Connector Other Loss dB**

Enter the Maximum Allowable loss in dB for any subsequent mated connectors here. Typically 0.75 or 0.3 dB




**Column H: Splice Loss dB**

Enter the Maximum Allowable splice loss in dB here. Typically, 0.1 dB

**Column I: ORL**

Enter the Maximum Allowable ORL in dB here. The entered ORL value can be $^{+}$Ve or $^{-}$Ve; the software will automatically convert the number to absolute.

**Column J: Uncertainty Allowance dB ****

If required, enter the allowance for measurement uncertainty in dB.

Depending upon the KITS$^{TM}$ build, the uncertainty value will be treated in one of two ways.

- **Early 4.15 Builds:** The uncertainty number is added to the calculated maximum link loss.
- **Later 4.15 builds:** Any insertion loss result falling within the specified uncertainty value of the calculated maximum link loss, will be reported in the Live Data Sheet as 'Marginal'. Refer to **Error! Reference source not found.** for definitions of Pass, Marginal and Fail.

Common values for measurement uncertainty are in the range of 0 to 0.3 dB.

Measurement uncertainty is also affected by the referencing method.

**Note:** ** The terms measurement 'Uncertainty' 'Repeatability' and 'Reproducibility' have different values as they are applicable to differing measurement conditions. For simplicity, this document uses the term 'measurement uncertainty'.

**Column K: Max Length m**

Enter any maximum allowable length in metres.

**Column L: Propagation Delay ns**

If propagation delay (PD) is required to be reported, enter the required delay parameter in Nano seconds/metre (ns/m), here.

The software will automatically calculate the propagation delay in ns.

PD = 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.

Parameters are:

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



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# APPENDIX D
# LICENSE & WARRANTY

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