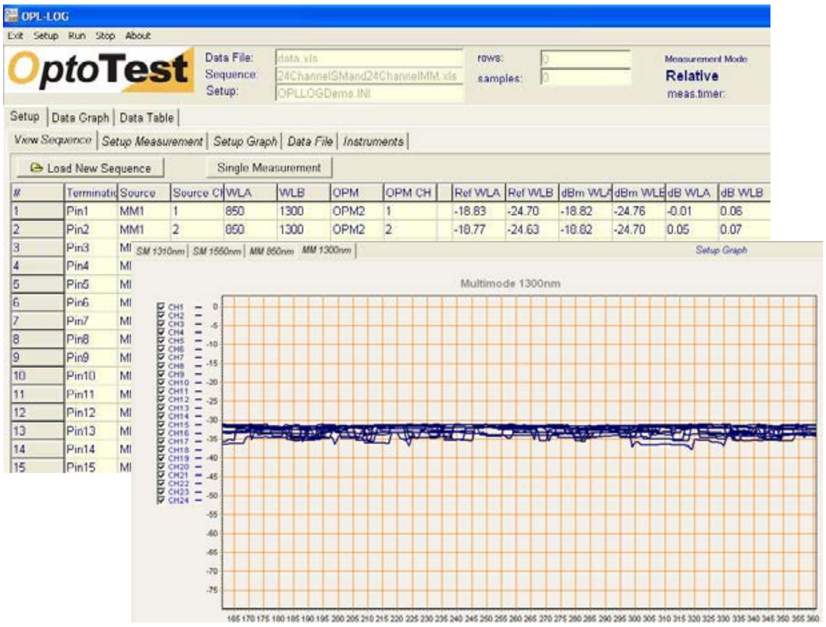
Measurement Devices

OptoTest Test Solutions for Fiber Optics

LASER COMPONENTS®

# OPL-LOG
# Instruction Manual




10/22 / V02 / AHIF / manuals/optotest/opl-log-datalogging-software



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

OPL-LOG Instruction Manual

## Table of Contents





Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

OPL-LOG Instruction Manual





MnOPL-LOG-RevA13

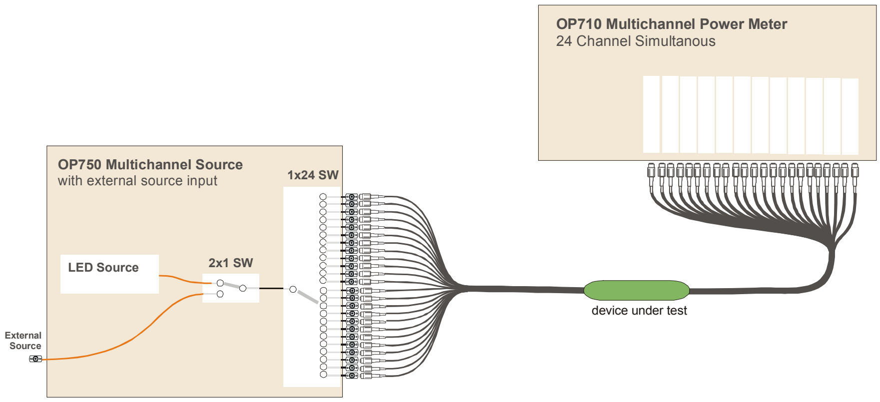


Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

# Overview

The OPL-LOG is a customized application software for a combination of OP750 Sources and OP710 Optical Power Meters offering data logging features and functions:

- Measures absolute and relative power (dB/dBm)
- Configure measurement sequences in an EXCEL spreadsheet
- Correlate any available source channel with any available power meter channel.
- Manual or automatic use of the External Source port
- User configurable time interval for measurements
- Integrated temperature measurements with up to 4 thermocouples
- External trigger to start acquisition






Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

## System Requirements

**Operating System:** Windows 2000 SP4
Windows XP Professional 2002 SP2
Windows XP Home Edition 2002 SP2

**Operational Requirements:**

For long term testing disable all power saving features that affect any of the following:

- Turn off external ports and peripherals, the USB ports are being accessed frequently and should remain powered on.
- Turn off hard disks: the test data is frequently written to the harddisk
- Administrator access to c:\program files\optotest\...
- Date/time clock are properly set: the measurement timing is based on the computers real-time clock.

Other recommendations:

- Operating computer should be on an uninterruptible power supply or surge protector to avoid power interruption to the computer.

**Support Instrumentation:**

- OptoTest OP710 Multichannel Optical Power Meter [OPM1, OPM2]
- OptoTest OP750 Multichannel Optical Laser Source [SM1, SM2]
- OptoTest OP750 Multichannel Optical LED Source [MM1, MM2]
- OptoTest OP930 Series return loss meters [RL1,RL2]
- TC Module with up to 4 thermocouples [TC0… TC3]



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864-0
Fax: +49 8142 2864-11
info@lasercomponents.com
www.lasercomponents.com

# Quick Start

## Load the Sequence File

At startup most of the settings of the last session are being restored this includes the last used sequence file. The currently loaded measurement sequence is shown at startup.


To select a difference sequence file use this or **Setup | Load Sequence.**

There are already a few sequences included sequences with the installation. To establish a new sequence find an EXCEL file that has a sequence that is similar and modify it.

### *Change Sequence Header*

Change the number of sequences to reflect the setup to be run:

Configuration File of OPL-LOG

Identification

| | |
|---|---|
| Partnumber | new part |
| SerialNumber | new serial |
| Data File | insert later |
| Number of Sequences | **12** |

### *Change Sequence*

The example shows a 12 channel measurement where each multimode (MM1) channel corresponds with the power meter channel (OPM1).

| Seq | Termination | Source | Source Channel | Wavelength A | Wavelength B | OPM Rack | OPM Channel |
|---|---|---|---|---|---|---|---|
| <num> | <string> | <num> | <num> | <num> | <num> | <num> | <num> |
| 1 | Pin1 | MM1 | 1 | 850 | 1300 | OPM1 | 1 |
| 2 | Pin2 | MM1 | 2 | 850 | 1300 | OPM1 | 2 |
| 3 | Pin3 | MM1 | 3 | 850 | 1300 | OPM1 | 3 |
| 4 | Pin4 | MM1 | 4 | 850 | 1300 | OPM1 | 4 |
| 5 | Pin5 | MM1 | 5 | 850 | 1300 | OPM1 | 5 |
| 6 | Pin6 | MM1 | 6 | 850 | 1300 | OPM1 | 6 |
| 7 | Pin7 | MM1 | 7 | 850 | 1300 | OPM1 | 7 |
| 8 | Pin8 | MM1 | 8 | 850 | 1300 | OPM1 | 8 |
| 9 | Pin9 | MM1 | 9 | 850 | 1300 | OPM1 | 9 |
| 10 | Pin10 | MM1 | 10 | 850 | 1300 | OPM1 | 10 |
| 11 | Pin11 | MM1 | 11 | 850 | 1300 | OPM1 | 11 |
| 12 | Pin12 | MM1 | 12 | 850 | 1300 | OPM1 | 12 |



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864 – 0
Fax: +49 8142 2864 – 11
info@lasercomponents.com
www.lasercomponents.com

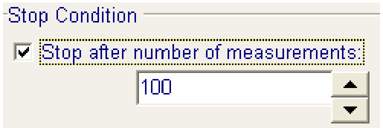
LASER COMPONENTS®

NOTE: To avoid errors during the load of the sequence maintain the row and column allocation of the sample files. For details of the sequence structure please refer to the chapter “Sequence File” in this manual.

**Set Measurement Parameters**


Select the measurement time interval.

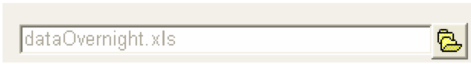
This is the time the system waits between the executions of two sequences.




Set the stop condition if needed.

This is the number of samples that are being taken, the approximate total test time can be reviewed by pressing the “update” button.

**Select the Data File**





Use the file dialog button to select the data file and directory for the measurement data.
If the data file already exists it will prompt to either append or overwrite the data.

NOTE: Data will be lost if “No” is chosen.

**Test the Sequence**


Press the “Single Measurement” button. It will exercise each sequence step and insert the measured power readings into the grid.

**Start the Measurement**

Select either the “Run” command from the menu or press the run button.



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

## Measurement Data

The measurement data is displayed in three ways:

- The measurements of the current sequence are filled in to the sequence view
- All the measurements are inserted into the Data Table, organized by wavelength
- The measurements are graphed in a Data Graph

All those representations of measurements are available with the corresponding page tabs.

In addition to displaying the data for review each measurement is written to the assigned data file.

NOTE: Do not open and view the data file with EXCEL while running a test. A LOCK VIOLATION will occur since the program cannot access the data file while another application is viewing it. The best method for viewing the data file while a test is running is to make a copy of the file and then view the copy.



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

LASER COMPONENTS®

## Installation

OPL-LOG is shipped or downloaded as a self-extracting executable OPLLOG.EXE.

Upon execution the software is extracted and installed into C:\program files\OptoTest\OPLLOG.
Included in the installation are sample configuration files.

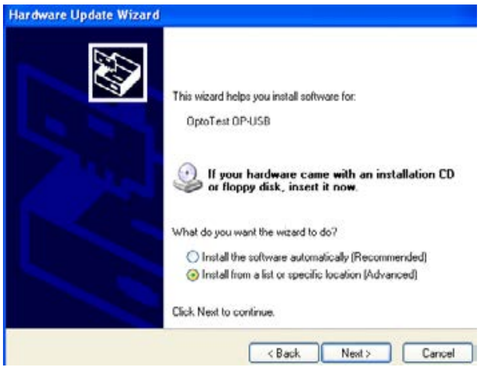
### USB Driver Installation

To operate the OP831 from the computers' USB bus, the USB driver needs to be installed. By executing the DRIVER.EXE the necessary files are being copied to C:\OptoTest\Driver.

When the OP750 or OP710 is first connected to the computer via the USB cable, the operating system will inform you that a new USB device has been connected and eventually starts the wizard.

Follow these steps:

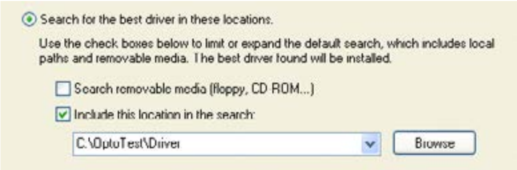
Use the option "Install from a list or specific location" that allows you to select the location of the driver yourself.




Use the browse button to locate the directory **C:\OptoTest\Driver** and proceed with the installation.



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com




**Windows XP**
Some installations of Windows XP will prompt with an incompatibility warning, select “Install Anyway”.

The wizard will recognize the “OptoTest OP-USB” extract the driver files into the windows system directory.





Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864-0
Fax: +49 8142 2864-11
info@lasercomponents.com
www.lasercomponents.com

LASER COMPONENTS®

## Startup

At startup OPL-LOG checks for and lists all available OptoTest USB devices, the available instruments will be listed on the **Setup | Instruments** page:

Instruments

| USB Device | NR | ID | SerialNumber | Description | Status |
|---|---|---|---|---|---|
| 0 | 0 | SM1 | Demo 10101 | OP750 | Status: 1 |
| 1 | 1 | MM1 | Demo 10112 | OP750 | Status: 1 |
| 2 | 0 | OPM1 | Demo 10132 | OP710 | Status: 1 |

Each connected OP710 is sequentially numbered with OPM1, OPM2, and so on which correlate with the assignment of the power meter in the sequence.

Similarly each OP750 is sequentially numerated with SM1, SM2 and so on if it is a singlemode (laser) source or MM1, MM2 and so on if it is a multimode (LED) source.

NOTE: To verify which instrument is assigned to which ID (SM1, SM2, ..) highlight the particular instrument in the instruments list and turn ON and OFF the backlight of that particular instrument with the backlight check box.

### Configuration Files

At startup the following configuration files are required:

| | |
|---|---|
| c:\program files\optotest\OPLLOG\INI\OPLLOG.INI | Structured text file that stores the overall settings of the OPL-LOG application. |
| c:\program files\optotest\OPLLOG\License\ | Licensing files |
| c:\program files\optotest\ OPLLOG \Config\defaultParameters.xls | EXCEL spreadsheet file that stores a basic set of measurement sequences. |
| Other files required for proper operation of the application c:\program files\optotest\ OPLLOG \images\ | Bitmaps for buttons and logos used in application |

All those files are copied during the installation.



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

## Measurement Setup

The OPL-LOG application is configured two ways:

1. Basic settings that control the appearance and overall function of the application and the instruments connected.
2. Measurement sequence, an EXCEL parameter file that defines what source channel is connected to what channel of the optical power meter.

### Basic Settings

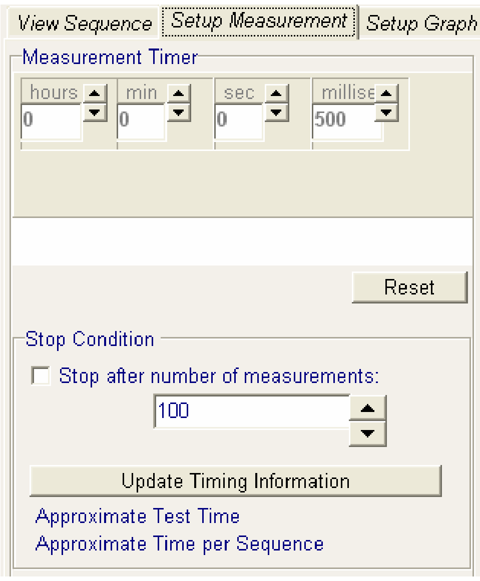
The “Setup” page organizes the basic settings into settings for:

- Loading of sequence files
- Settings for the measurement, mainly the measurement mode (absolute, relative) and the acquisition timing.
- Settings for the graph
- Assignments of the data files
- Instrument settings




Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864-0
Fax: +49 8142 2864-11
info@lasercomponents.com
www.lasercomponents.com

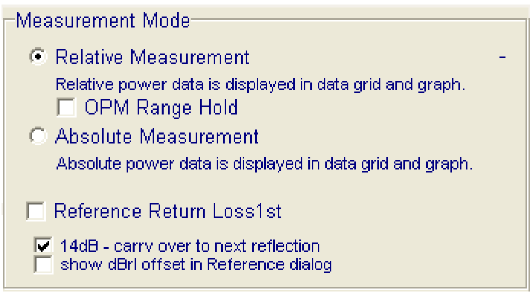
*Setup Measurement – Measurement Timer*




The **Measurement Timer** is set for the time interval a new sequence is started. This timer is started *after* a sequence has been executed, therefore the overall time interval is the sum of Measurement Timer *and* the time required to execute a sequence.

Once started the sequences are automatically executed indefinitely or until manually stopped or if the **Stop Condition** is enabled and the number of sequences have been executed.

Some minimal statistics are calculated by pressing the **Update Timing Information** button.




**Measurement Mode**
The user can choose if the measurement process will be absolute or relative.

In absolute mode the power is measured and stored in dBm.

In relative mode the power is measured absolute as well and the data is stored and displayed relative to the reference measurement taken earlier. The **Reference** measurement is executed manually by pressing the 

button. However if a sequence is started and the reference has not been taken, the user is prompted for a reference measurement.

There is a small “+” or “-“ sign located to the right of the “relative measurement” label. This denotes the sign convention for the graphing and reporting of data. With a “-“

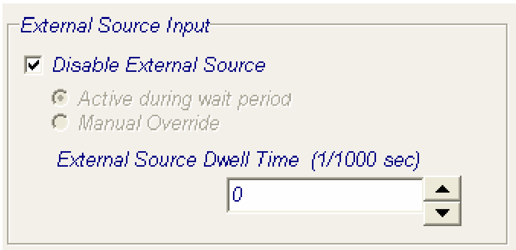


Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864-0
Fax: +49 8142 2864-11
info@lasercomponents.com
www.lasercomponents.com

displayed it means that a loss of power will be displayed as a loss, while a “+” will display loss as a positive value.  Clicking on the symbol will toggle the sign convention.

The user can choose to put the power meter into a range hold mode.  This is only advised if power measurements need to be quick.  In range hold mode the power meter has a limited dynamic range (<20dB).

Checking the “Reference Return Loss 1$^{st}$” box allows the user to reference the RL before the IL.  This is more convenient in some instances.




**External Source Input**
If the OP750 is equipped with an External Source Input it can be activated by un checking the **Disable** check box.

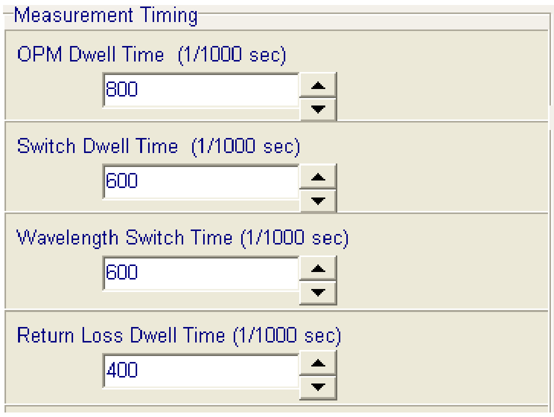
**Active during wait period** switches the external source input port to current selected optical output port.

**Manual Override** allows the user to manually route the external source input port to the currently selected optical output port. *NOTE: The manual override could affect the measurement sequence that is currently executed.*

**External Source Dwell Time** sets the time the applications allows hardware to settle after the external source is switched, this value is usually set to 0.8 seconds (800).



Germany and Other Countries
Laser Components Germany GmbH
Tel:   +49 8142 2864–0
Fax:  +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com



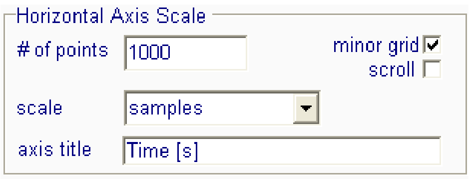

**Measurement Timing**
After switching the optical switch or source, the switch and power meters need some time to settle. The **OPM Dwell Time** is the time the software allows for the power meter to wait before taking a measurement after the source has been selected and the switch has been switched. The **Switch Dwell Time,** usually set to 0.8 seconds, is the time the application allows the hardware to settle after a source channel has been switched. Similarly the **Wavelength Switch Time**, set to 0.8 seconds, is the resting time for a wavelength change of a dual wavelength source. The **Return Loss Dwell Time** should be set to 0.8 seconds to allow for a stable return loss measurement.



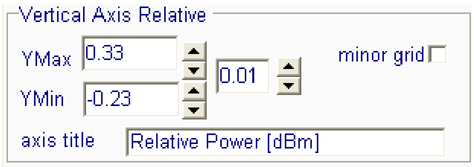
Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

*Setup Measurement – Setup Graph*

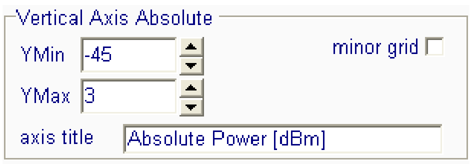

The **Setup Graph** page controls the setting of the scaling of the graphs in absolute or relative mode, it also allows for changing of the colors of the individual lines.
The graphing feature can be turned off by un-checking the **Graph the Data**.



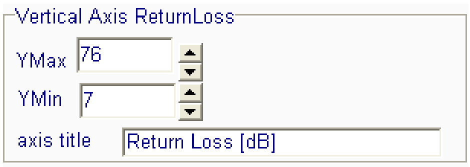

The horizontal axis or time axis, can scroll like a strip chart and shows the # of points, if unchecked it automatically scales this axis. In the dropdown menu one can select the axis scaling: samples, seconds, minutes, etc. In the space labeled “axis title” the user can enter an axis title to customize the output graph.



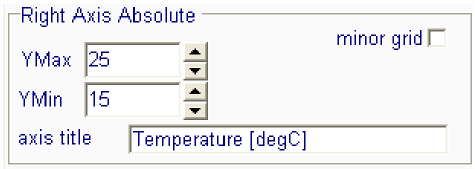

The scale of vertical axis in relative mode is adjusted here. Clicking on the corresponding up/down arrows will increase or decrease the value by 0.1dB. The up/down arrows corresponding to the third box will simultaneously increase/decrease both YMax and YMin by the value in the box. The axis title can be edited in the given edit box.




The scale of vertical axis in absolute mode is adjusted here. This is the same as for relative mode only there is no simultaneous increase/decrease option.




If a return loss measurement is to be performed the vertical axis of the graph can be configured here. Return loss is graphed as a positive value. The axis title can be customized using the given edit box.




The scale for the right axis can be adjusted here. If auxiliary measurements are to be graphed on the same graph as IL or RL graphs, then they will be graphed according to the right axis of the graph.



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

LASER COMPONENTS®

## Sequence File

The configuration file is in EXCEL format and can be modified easily using any version of EXCEL or compatible applications. Each row in the configuration file defines a measurement sequence for one particular cable type.

For each measurement interval a complete sequence of steps is executed in exactly the order as listed in the configuration file. For each sequence a source channel is related to a power meter channel.

Connection Examples

Straight connection between corresponding channels:

| Source | | Channel | Power Meter Channel | | Channel |
|---|---|---|---|---|---|
| Singlemode Source 1 | SM1 | 1 | Optical Power Meter 1 | OPM1 | 1 |
| | | 2 | | | 2 |
| | | 3 | | | 3 |
| | | 4 | | | 4 |

Mixed singlemode and multimode connections:

| Source | | Channel | Power Meter Channel | | Channel |
|---|---|---|---|---|---|
| Singlemode Source 1 | SM1 | 1 | Optical Power Meter 1 | OPM1 | 1 |
| | | 2 | | | 2 |
| | | 3 | | | 3 |
| | | 4 | | | 4 |
| Multimode Source 1 | MM1 | 1 | Optical Power Meter 1 | OPM1 | 5 |
| | | 2 | | | 6 |
| | | 3 | | | 7 |
| | | 4 | | | 8 |

A typical EXCEL representation for 12 channel singlemode one-on-one is shown below.

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | **Identification** | | | | | | | | | | | |
| 3 | Partnumber | | | | | | | | | | | |
| 4 | SerialNumber | | 0 | | | | | | | | | |
| 5 | Data File | | | | | | | | | | | |
| 6 | Number of Sequences | 6 | | | | | | | | IL=0 | | |
| 7 | Lotnumber | LotNumber | | | | | | | | IL&RL=1 | | |
| 8 | Customer | Customer | | | | | | | | RL=2 | | |
| 9 | Sales Order | SalesOrder | | | | | | | | | | |
| 10 | | CableSpec | | | | | | | | | | |
| 11 | | **Description** | **Source Instrument** | | | | **OPM** | | | | | |
| 12 | Seq | Value8 | Source Instrument | Source Channel | WavelengthA | WavelengthB | OPM Rack | OPM Channel | Termination for Pass/Fail | Measurement Type | Delay | Comment |
| 13 | <num> | <string> | <num> | <num> | <num> | <num> | <num> | <num> | | | | |
| 14 | 1 | Pin1 | SM1 | 1 | 1310 | 1550 | OPM1 | 1 | 2 | 0 | 0 | |
| 15 | 2 | Pin2 | SM1 | 2 | 1310 | 1550 | OPM1 | 2 | 2 | 0 | 0 | |
| 16 | 3 | Pin3 | SM1 | 3 | 1310 | 1550 | OPM1 | 3 | 2 | 0 | 0 | |
| 17 | 4 | Pin4 | SM1 | 4 | 1310 | 1550 | OPM1 | 4 | 2 | 0 | 0 | |
| 18 | 5 | Pin5 | SM1 | 5 | 1310 | 1550 | OPM1 | 5 | 2 | 0 | 0 | |
| 19 | 6 | Pin6 | SM1 | 6 | 1310 | 1550 | OPM1 | 6 | 2 | 0 | 0 | |



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

### Header Description

None except the “Number of Sequences” field of the header section is essential for the operation or execution of the sequence. Enter the total number of sequence steps into the “Number of Sequences” field.

| | A | B |
|---|---|---|
| 1 | Configuration File of OPL7-OCC | |
| 2 | Identification | |
| 3 | Partnumber | |
| 4 | SerialNumber | |
| 5 | Data File | |
| 6 | Number of Sequences | 24 |

The Partnumber, SerialNumber and Data File fields can be used for internal processing as desired.

### Sequence Instructions

The start row of the sequence instructions is **ROW 14**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 11 | | | Instrument Control | | | | | |
| 12 | Seq | Termination | Source | Source Channel | WavelengthA | WavelengthB | OPM Rack | OPM Channel |
| 13 | <num> | <string> | <num> | <num> | <num> | <num> | <num> | <num> |
| 14 | 1 | Pin1 | MM | 1 | 850 | 1300 | OPM1 | 1 |

### Field Description

| Column | Header | Description |
|---|---|---|
| A | Seq | Consecutive number. This field is for information only. |
| B | Termination | Text to indicate the sequence step or channel this can be used to guide the operator.<br><br>NOTE: A minimum of one character needs to be entered into this filed. A blank field will flag to ignore this sequence step. |
| C | Source | Indicate which source rack is to be used, choices are:<br>SM1, SM2, … SM8 – single mode sources<br>MM1, MM2, … MM8 – multimode sources |
| D | Source Channel | Indicate which channel of the source is being used, choices are 1, 2, …. 24 |
| E | Wavelength A | Wavelength in [nm] of the first wavelength to be used to measure the insertion loss.<br><br>NOTE: If the wavelength is other than 0 the available first wavelength of the particular OP750 will be used. |
| F | Wavelength B | Wavelength in [nm] of the second wavelength to be used to measure the insertion loss, a 0 indicates no measurement.<br><br>NOTE: If the wavelength is other than 0 the available second wavelength |



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

| | | |
|---|---|---|
| | | of the particular OP750 will be used. |
| H | OPM Rack | Indicate which OPM rack is to be used, choices are:<br>OPM1, OPM2, … OPM8 |
| I | OPM Channel | Indicate which channel of the optical power meter is being used, choices are 1, 2, … 24 |
| J | Measurement Type or Pause/Delay | The type of measurement is defined in this column, options are:<br>IL only = 0<br>IL and RL = 1<br>RL =2<br>Bidirectional IL = 3 (if supported by the instrument)<br>If 100 is entered into this column it indicates that the measurement taking process will be paused until the user wishes to proceed (see below). If 110 is put into this field then a delay will be implemented for a certain interval defined by a value in column K. |
| K | Delay Duration | If a 110 is entered into column J then this cell is designated as the length of the delay in milliseconds. |

(Note that the selected wavelength needs to be supported by the instrument in use.)

Return Loss / Alternate Reference Configurations: The return loss configurations are in the same sequence file as the other configurations. The RL configurations are in columns M-Q of the Excel sequence file.

| M | N | O | P | Q |
|---|---|---|---|---|
| Return Loss | | Alternate Reference | | Force 14dB |
| Reflection Number | Reference Channel | Reference Module | Reference Channel | 1 = Yes, 0 = No |
| 1 | 1 | OPM1 | 1 | 1 |
| 1 | -1 | OPM1 | 2 | 1 |
| 1 | -1 | OPM1 | 3 | 1 |
| 1 | -1 | OPM1 | 4 | 1 |
| 1 | -1 | OPM1 | 5 | 1 |
| 1 | -1 | OPM1 | 6 | 1 |
| 1 | -1 | OPM1 | 7 | 1 |
| 1 | -1 | OPM1 | 8 | 1 |
| 1 | -1 | OPM1 | 9 | 1 |
| 1 | -1 | OPM1 | 10 | 1 |
| 1 | -1 | OPM1 | 11 | 1 |
| 1 | -1 | OPM1 | 12 | 1 |

| | | |
|---|---|---|
| M | Reflection # | The reflection number corresponds to the location of the reflection on the cable assembly to be tested. The first reflection to be measured should be the closest to the front panel and the 2nd reflection to be measured should be the next reflection out from the front panel and so on. In most cases this number should be set to 1. |
| N | Reference Channel | This designates which channel will be referenced for this particular sequence step. A positive value means that the channel will actually be referenced, while a negative number means that the reference position will be copied from another channel. |
| O | Reference Module | The alternate reference module is specified here. If there is to be no alternate reference module then this module should be the same as in |



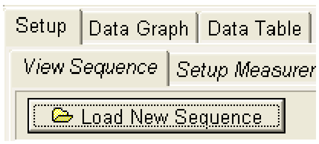
Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

| | | |
|---|---|---|
| | | column G. If one would like to reference to a different channel than where the actual IL measurement will take place then the alternate module should be listed here. (Note: Many times an alternate reference is used when measuring fanouts.) |
| P | Reference Channel | The reference channel corresponds to the channel on the alternate reference module where the IL reference is to take place. |
| Q | Force 14dB | The force 14dB column tells the software whether or not the user would like for a return loss reference to be forced to 14dB. Many times insertion loss can be added to a system and this can affect the return loss reading. An open PC reflection could read 16dB, rather than 14dB. Calling the software to force the reference to 14dB will add an offset to all RL measurements that is equal to the difference between the measured open PC reflection and 14dB. |

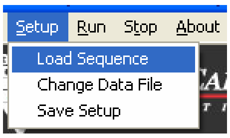
### Loading the Sequence File

At startup the sequence file that was last used will be loaded. The filename is stored into the OPLLOG.INI file in c:\program files\optotest\INI.

The sample sequence files installed with OPL-LOG are placed in c:\program_files\optotest\OPLLOG\Config subdirectory.




To load a new sequence file use the "Load New Sequence" button in Setup | View Sequence




Or the menu selection.

While loading the sequence file is double checked for consistency and available hardware. Error or warning messages are displayed accordingly.

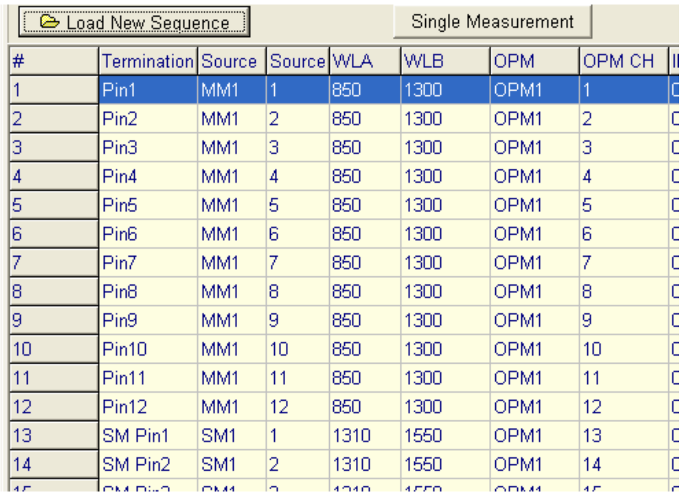


Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864-0
Fax: +49 8142 2864-11
info@lasercomponents.com
www.lasercomponents.com

LASER COMPONENTS®

### Testing the Sequence

Once the sequence is loaded, double check the individual steps in the “View Sequence” page.

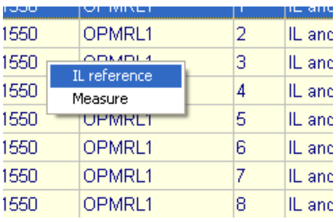



| # | Termination | Source | Source | WLA | WLB | OPM | OPM CH |
|---|---|---|---|---|---|---|---|
| 1 | Pin1 | MM1 | 1 | 850 | 1300 | OPM1 | 1 |
| 2 | Pin2 | MM1 | 2 | 850 | 1300 | OPM1 | 2 |
| 3 | Pin3 | MM1 | 3 | 850 | 1300 | OPM1 | 3 |
| 4 | Pin4 | MM1 | 4 | 850 | 1300 | OPM1 | 4 |
| 5 | Pin5 | MM1 | 5 | 850 | 1300 | OPM1 | 5 |
| 6 | Pin6 | MM1 | 6 | 850 | 1300 | OPM1 | 6 |
| 7 | Pin7 | MM1 | 7 | 850 | 1300 | OPM1 | 7 |
| 8 | Pin8 | MM1 | 8 | 850 | 1300 | OPM1 | 8 |
| 9 | Pin9 | MM1 | 9 | 850 | 1300 | OPM1 | 9 |
| 10 | Pin10 | MM1 | 10 | 850 | 1300 | OPM1 | 10 |
| 11 | Pin11 | MM1 | 11 | 850 | 1300 | OPM1 | 11 |
| 12 | Pin12 | MM1 | 12 | 850 | 1300 | OPM1 | 12 |
| 13 | SM Pin1 | SM1 | 1 | 1310 | 1550 | OPM1 | 13 |
| 14 | SM Pin2 | SM1 | 2 | 1310 | 1550 | OPM1 | 14 |

Execute a “Single Measurement” this will run through the sequence step by step once and insert the measured power levels accordingly. In relative mode the reference measurements are taken and filled in as well.

### Executing a single sequence step measurement/reference

To execute a single reference or to perform a single measurement of a sequence step without having to cycle through the entire sequence one can simply right click the sequence step to be measured/referenced. The right click will pull up a dialog box.




Selecting **IL Reference** or **Measure** will perform the desired function.

10/22 / V02 / AHIF / manuals/optotest/opt-log-datalogging-software

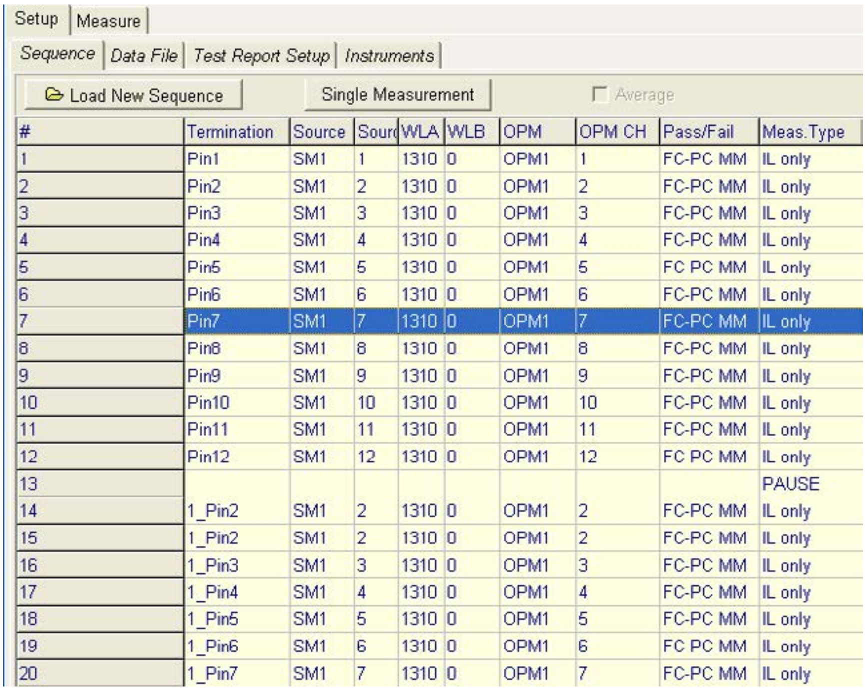


Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864-0
Fax: +49 8142 2864-11
info@lasercomponents.com
www.lasercomponents.com

LASER COMPONENTS®

*Editing the Sequence in OPLLog*

By double-clicking on a step (termination) in the **Sequence Tab** one can edit the attributes of that step.

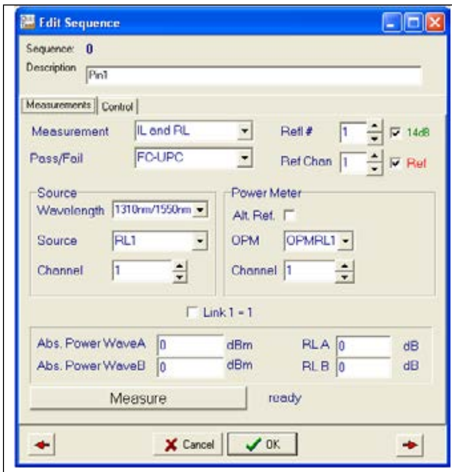



| # | Termination | Source | Sour | WLA | WLB | OPM | OPM CH | Pass/Fail | Meas.Type |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Pin1 | SM1 | 1 | 1310 | 0 | OPM1 | 1 | FC-PC MM | IL only |
| 2 | Pin2 | SM1 | 2 | 1310 | 0 | OPM1 | 2 | FC-PC MM | IL only |
| 3 | Pin3 | SM1 | 3 | 1310 | 0 | OPM1 | 3 | FC-PC MM | IL only |
| 4 | Pin4 | SM1 | 4 | 1310 | 0 | OPM1 | 4 | FC-PC MM | IL only |
| 5 | Pin5 | SM1 | 5 | 1310 | 0 | OPM1 | 5 | FC PC MM | IL only |
| 6 | Pin6 | SM1 | 6 | 1310 | 0 | OPM1 | 6 | FC-PC MM | IL only |
| 7 | Pin7 | SM1 | 7 | 1310 | 0 | OPM1 | 7 | FC-PC MM | IL only |
| 8 | Pin8 | SM1 | 8 | 1310 | 0 | OPM1 | 8 | FC-PC MM | IL only |
| 9 | Pin9 | SM1 | 9 | 1310 | 0 | OPM1 | 9 | FC-PC MM | IL only |
| 10 | Pin10 | SM1 | 10 | 1310 | 0 | OPM1 | 10 | FC-PC MM | IL only |
| 11 | Pin11 | SM1 | 11 | 1310 | 0 | OPM1 | 11 | FC-PC MM | IL only |
| 12 | Pin12 | SM1 | 12 | 1310 | 0 | OPM1 | 12 | FC PC MM | IL only |
| 13 | | | | | | | | | PAUSE |
| 14 | 1_Pin2 | SM1 | 2 | 1310 | 0 | OPM1 | 2 | FC-PC MM | IL only |
| 15 | 1_Pin2 | SM1 | 2 | 1310 | 0 | OPM1 | 2 | FC-PC MM | IL only |
| 16 | 1_Pin3 | SM1 | 3 | 1310 | 0 | OPM1 | 3 | FC-PC MM | IL only |
| 17 | 1_Pin4 | SM1 | 4 | 1310 | 0 | OPM1 | 4 | FC-PC MM | IL only |
| 18 | 1_Pin5 | SM1 | 5 | 1310 | 0 | OPM1 | 5 | FC-PC MM | IL only |
| 19 | 1_Pin6 | SM1 | 6 | 1310 | 0 | OPM1 | 6 | FC PC MM | IL only |
| 20 | 1_Pin7 | SM1 | 7 | 1310 | 0 | OPM1 | 7 | FC-PC MM | IL only |



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

*Sequence Editor*




### *Measurement Tab*

Description: Allows user to change the description of the sequence step.

Measurement: One can designate the type of measurement for this sequence. If a return loss measurement is taken during this step then the *Refl#* and *Ref Chan* boxes will pop up. These are to setup the reference positions for the RL measurements.

14dB Checkbox: Checking this will force the software to force an Open PC reflection to 14dB. This will take into account loss in the system between the source and the open PC reflection to be referenced.

Source: Allows user to change wavelength, source module, and the source channel.

Power Meter: The user may choose which Optical Power Meter module should take the measurement and which channel to take that measurement at.

The Alt.Ref. checkbox allows the user to reference to one channel specified in the two selection boxes to the right of a power meter and apply that reference power to another power meter specified in the boxes to the left.

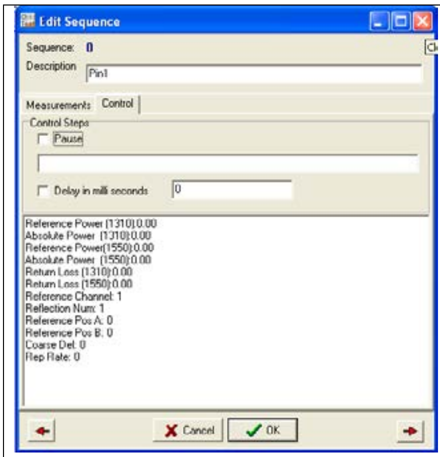
Note: If Link 1 = 1 is checked that means the source channel will match the OPM channel.

Measure Button: Clicking this will quickly take a single measurement for this particular step of the sequence.



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

LASER COMPONENTS®




*Control Tab*

Pause: Checking the pause setting will initiate a pause step during the measurement process, which allows the user to change cables, review data, etc. During the measurement process the user can exit out of the Pause step at any time by clicking the Continue button. A command to be displayed during the pause step can be entered into the space below the pause check box. Note: If one does not want to see the pause step in the test reports then make sure the Description entry is left blank.

Delay: Checking this box allows the user to insert a delay. The length of the delay can be specified in the space provided.
Status Box: This status box will display various information about the current step in the sequence.



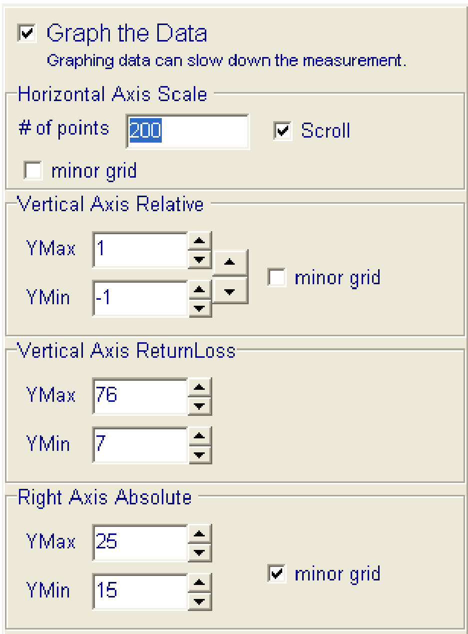
Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

## Configuring Graph Settings

To alter the graph settings for a test select the [Setup Graph] tab. Under this tab one can configure the axes max and mins for the IL or RL graphs and assign colors for the different data series to be monitored. To have the software create graphs the [Graph the Data] check box should be checked. If this box is not checked then the software will just output data to an excel file without producing a graph in OPLLog. This can save time because the software does not have to save the data points into memory.

### Editing axis maximum and minimums

To change the various axis maximums and minimums edit the corresponding values under the appropriate headings.




*Horizontal Axis Scale*

The number of points defined under the “Horizontal Axis Scale” heading defines how many data points will be displayed for the graph. If the check box next to “Scroll” is selected then the graph will display the last amount of points defined by the value next to the “# of points” label. The data previous to these points is still accessible. One just needs to scroll in the graph using a left mouse click and dragging in the direction to scroll.



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

*Vertical Axis Relative*

One can edit the maximum and minimum left axis values for the IL measurements here.

*Vertical Axis Returnloss*

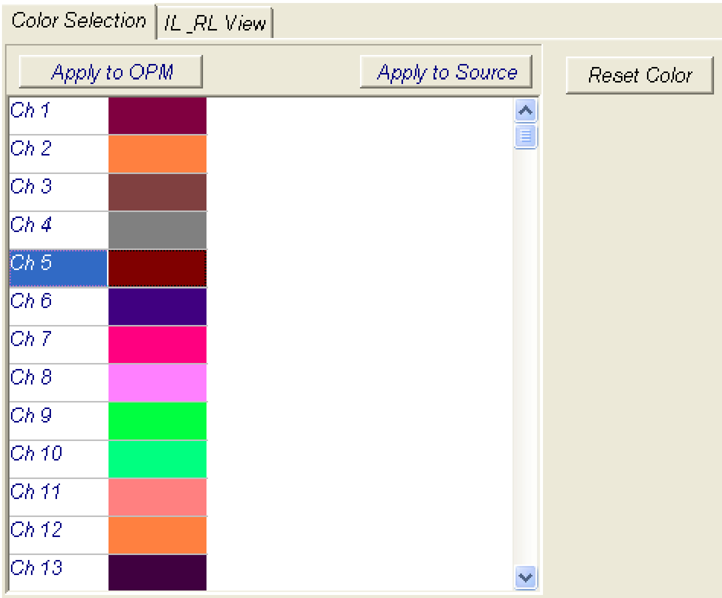
One can edit the graph maximum and minimum for the return loss graphs.  (Note: these values are displayed as a positive, even though return loss is technically a negative measurement.)

*Right Axis Absolute*

Here the user can define the maximum and minimum for the right axis of the graph.  This is used if the user would like to also include a temperature graph or some other Auxiliary measurement to be overlayed on the insertion or return loss graphs.

**Configuring Graph Series Colors and Auxiliary measurements**

The user can edit the colors which will be assigned to each measurement channel.  There are a few ways to change the colors of a data set in OPLLog.  The most efficient way of doing this is to select the [Color Selection] tab under the [Setup Graph] tab.




Under this tab the user can specify a color for each channel and then choose to either apply the colors to the OPM channels or to the Source channels.  The channels for the source do not always match



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864-0
Fax: +49 8142 2864-11
info@lasercomponents.com
www.lasercomponents.com

those of the power meter, so here the user can choose to group the channels by power meter or source. This only affects how the colors will be displayed.

To change the color of a channel simply double click the channel and a color selection box will pop up. After configuring all the colors for the channels click either [Apply to OPM] or [Apply to Source]. This will copy these color configurations for all data series so that one does not need to do a color scheme for each wavelength, but rather copy the color scheme to all other wavelengths.

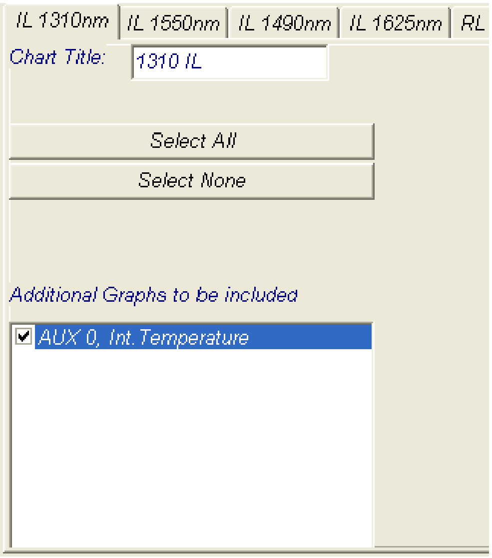
Another way to change the data series colors is by right-clicking on the data series under the [Data Graph] tab, or under the [IL_RL view] tab under the [Setup Graph] tab.

### *IL_RL View tab*

This tab is located under the [Setup Graph] tab and one can configure colors for data series, titles of graphs, and Auxiliary measurements.

To graph Auxiliary data from a unit such as temperature, pressure sensors, etc., one can do this under the [AUX Measure] tab. The data series can be selected to be included/excluded in the graph by checking or unchecking the corresponding checkbox next to the data series. All units have the ability to graph the temperature read from the OptoTest unit, whether it be an OP750, 930, 710, etc.

To graph an Auxiliary input onto an insertion loss or return loss graph one needs to select that Auxiliary series from the “Additional graphs to be included” under the wavelength for which that measurement will be graphed. For instance if it is desired to graph temperature on the same graph as the insertion loss for 1310nm, then select the [1310nm] tab and check the box under the “Additional graphs to be included” corresponding to the Auxiliary temperature.








Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864-0
Fax: +49 8142 2864-11
info@lasercomponents.com
www.lasercomponents.com

### *Configuring AUX Measure Graph*

OPLLog allows the user to connect auxiliary measurement devices such as the Fluke Hydra and Keithley 2000. To configure these one must alter the OPLLOG.INI file located in the INI directory of the working OPLLog directory. Configuring these is described the Analog Measurements section of this manual. OPLLog allows the user to include the data acquired from these devices to be graphed as well. To configure these graphs select the [AUX Measure] tab under the [Setup Graph]|[IL_RL View] tabs.

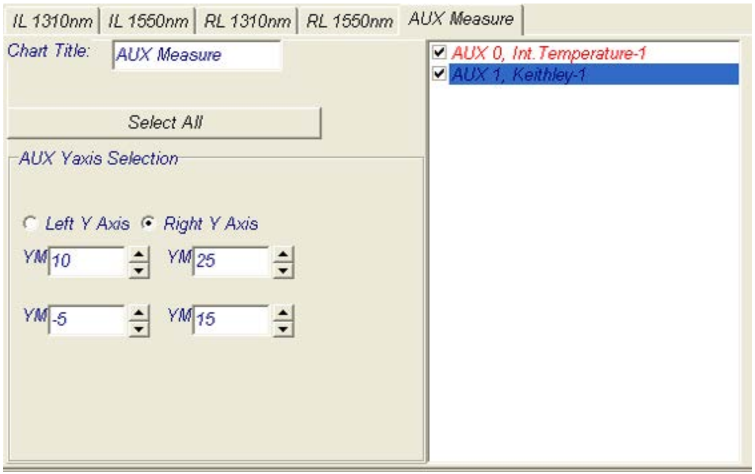



**Figure 1: AUX measure graph configuration**

Since multiple signals can be monitored at once, the user can assign different axis ranges for the left and right axes. In Figure 1, if the user wants to graph AUX 0, Int. Temperature -1 and use the left axis range, then the user would select the AUX 0 data series at the right of the screen and then select the radio button. “AUX 0” will then be graphed with respect to the left axis range. Then if the user wanted to apply the Right axis range to “AUX 1” then the user would select the “AUX 1” data series at the right of the screen and then select the “Right Y Axis” radio button. This will apply the range associated with the Right Y Axis to all “AUX 1” measurements.

### *Changing Graph Title and Axis Label Fonts*

The user has the ability to completely customize the graphs created by OPL-LOG. One of those options is to change the title and axis label fonts. To do this one just needs to select the **Setup|Setup Graph|Font Selection** tab. Under this tab the user can specify the font style, type, and size.



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

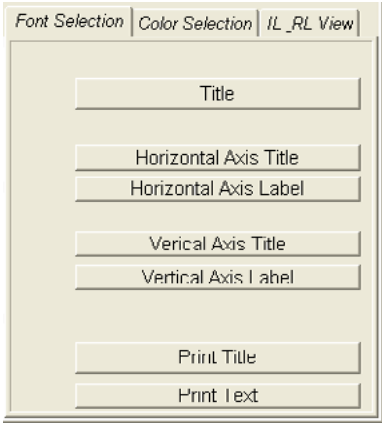



**Figure 2. Font Selection tab.**

To change the font simply click on the button corresponding to the axis/title to be edited. Once clicked the font selector will pop up.

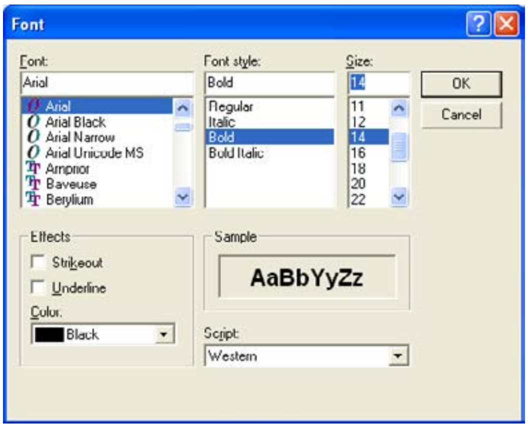



**Figure 3. Font style editor.**



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

Select the proper changes and then click [OK].  The changes will be displayed on the corresponding axis button.

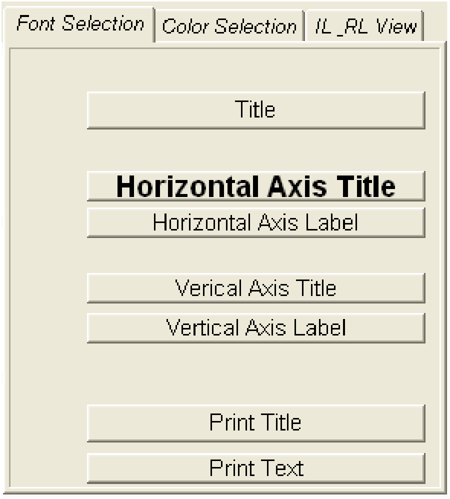


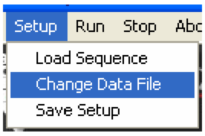

**Figure 4. Font is displayed on the corresponding button.**



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

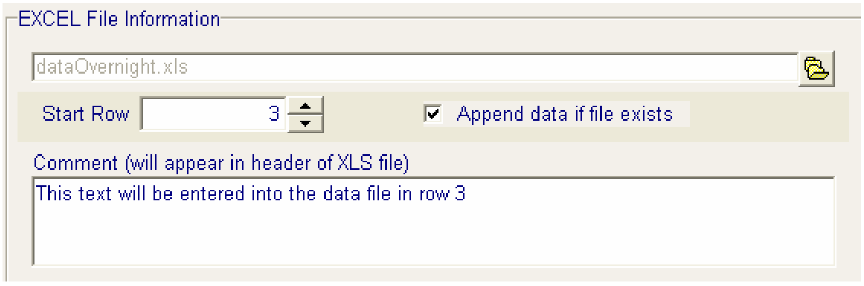
## Data File

All data files are stored in EXCEL (filename.XLS) format.




To assign the data file or create a new data file use the Setup | Change Data File menu.

or select the Setup | Data File page.




If the data file already exists, the option is presented to append the data to the existing data file or to overwrite the content of the existing data file.

NOTE: If “No” is selected at this point, there will be no further prompting.



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

LASER COMPONENTS®

## Data Display

The measured data is displayed in data grids, organized by wavelength and active channels.

Setup | Data Graph | Data Table

SM 1310nm | SM1550nm | MM 850nm | MM 1300nm

| | CH1 | CH2 | CH3 | CH4 | CH5 | CH6 | CH7 | CH8 | CH9 | CH10 | CH11 | CH12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wl | 850 | 850 | 850 | 850 | 850 | 850 | 850 | 850 | 850 | 850 | 850 | 850 |
| ref | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| min | -34.46 | -31.35 | -35.48 | -33.14 | -33.58 | -33.50 | -31.38 | -32.45 | -32.67 | -33.33 | -31.51 | -34.65 |
| ave | -33.16 | -31.28 | -31.56 | -31.48 | -33.50 | -32.41 | -31.38 | -31.88 | -31.79 | -33.25 | -31.46 | -34.62 |
| max | -33.09 | -31.14 | -31.56 | -31.48 | -32.28 | -32.09 | -31.11 | -31.88 | -31.79 | -31.88 | -31.34 | -34.46 |
| 2:50:36 PM | -34.46 | -31.14 | -33.23 | -33.14 | -32.28 | -33.50 | -31.11 | -32.39 | -32.63 | -31.88 | -31.51 | -34.46 |
| 2:50:37 PM | -34.36 | -31.23 | -33.25 | -31.72 | -32.31 | -32.14 | -31.19 | -32.45 | -32.61 | -31.93 | -31.41 | -34.55 |
| 2:50:37 PM | -34.39 | -31.32 | -33.35 | -31.69 | -33.52 | -32.09 | -31.20 | -32.35 | -32.67 | -31.96 | -31.34 | -34.62 |
| 2:50:38 PM | -33.09 | -31.35 | -33.30 | -31.59 | -33.52 | -32.14 | -31.29 | -32.29 | -31.84 | -32.02 | -31.41 | -34.62 |
| 2:50:39 PM | -33.16 | -31.31 | -35.48 | -31.51 | -33.58 | -32.24 | -31.23 | -32.33 | -31.93 | -31.95 | -31.49 | -34.55 |
| 2:50:39 PM | -33.23 | -31.35 | -35.44 | -31.54 | -33.58 | -32.31 | -31.32 | -31.96 | -31.86 | -33.33 | -31.43 | -34.65 |
| 2:50:40 PM | -33.16 | -31.28 | -31.56 | -31.48 | -33.50 | -32.41 | -31.38 | -31.88 | -31.79 | -33.25 | -31.46 | -34.62 |

The data grid also maintains some minimal statistics such as minimum, average and maximum of the current run.

NOTE: Each start of a new run does reset these statistics.

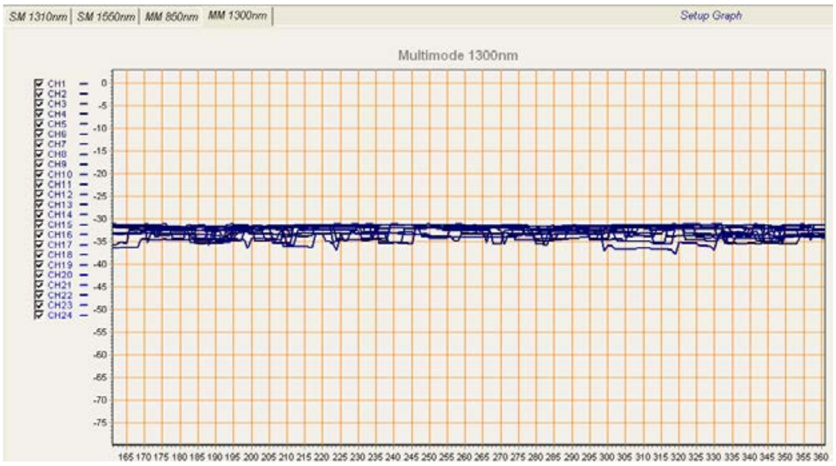




Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

## Graph Display

The measured data is displayed in graphs, organized by wavelength and active channels.




### Setup Graph

This menu allows full featured access to the control of the graphics component used in this application; it should be used with caution.



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

LASER COMPONENTS®

## Measurement Control


Executes a reference cycle. This button is only visible in relative measurement mode.

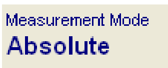
Starts the execution of a measurement sequence, the same as the menu command **Run.**

Stops a running measurement, it does finish a started sequence. This is the same as the **Stop** command from the menu.

## Status


Show the current data file and the sequence that has been loaded.

**Rows:** row number in the EXCEL data file that currently is being or has been written.
**Samples:** Number of samples taken in this run.




Reflects the current measurement mode.

## Saving/Loading Reference values

OPLLog allows the user to save reference values for both IL and RL for specific sequences. Once the reference sequence has been completed simply click on **Store Reference ALL** under the **Options** menu. This will bring a pop up screen which will allow the user to specify a file where all the data will be saved.

To load a reference sequence from past stored values one needs to have the same sequence file loaded for which the references were stored. Click on **Load Reference ALL** or **Load RL Reference only** under the Options menu depending on if the user would like to load simply the RL reference values and re-reference the IL, or select **Load Reference ALL** to load the IL reference values and RL reference values. If the current sequence is only monitoring IL then, the user can select **Load Reference ALL**, and the software will ignore any RL reference data.



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

OP1302 power meter control
The OP1302 is a linear encoder driven power meter that moves two detectors behind the fiber optic adapters. Each adapter position on the front panel corresponds to a linear encoder position. This position is a value between 1 and 33000. Position 1 refers to the position furthest to the left and position 33000 refers to the position furthest to the right. The two scanning detectors are positioned one on top of the other, so when one detector is aligned on the top row of adapters the bottom detector is aligned on the bottom row of adapters.

### Loading Channel Positions for OP1302

The OP1302 can be preset with detector "channels." These channels are loaded in through an excel spreadsheet that designates these detector positions. The excel spreadsheet is laid out as the following:

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | | 1 | 12212 | 0 | |
| 2 | | 2 | 12212 | 1 | |
| 3 | | 3 | 14637 | 0 | |
| 4 | | 4 | 14637 | 1 | |
| 5 | | 5 | 16454 | 0 | |
| 6 | | 6 | 16454 | 1 | |
| 7 | | 7 | 17953 | 0 | |
| 8 | | 8 | 17953 | 1 | |

Sheet1 Sheet2 Sheet3

**Figure 5: Spreadsheet for OP1302 Positions. In the above screen capture Ch 1 corresponds to a linear encoder position of 12212 and uses the top detector for the power readings. Ch 6 corresponds to position 16454 and the bottom detector for power readings.**

| Column | Function |
|---|---|
| B | This column designates the Channel number for the 1302. |
| C | This column designates the linear encoder position that corresponds to the channels designated in column B |
| D | This column designates which detector will be used for the channel assignment. A "0" corresponds to the detector for the top row of the OP1302 and a "1" corresponds to the bottom row of the OP1302. |

This spreadsheet is user alterable to define different channel selections for different setups and cable assemblies. The channel designations can be confirmed in the software by navigating to the "Instruments" tab and selecting the OP1302 in the spreadsheet under the "Instruments" heading. Once the OP1302 is selected, press the [Update Instruments] button and the channel designations will be listed in the memo box at the bottom left of the screen. (Note: this spreadsheet needs to be reloaded by restarting the software for any changes to take effect on software measurements.)



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

**Configuring Range Hold/Dwell Times for OP1302 Power meters**

The detectors of the OP1302 may, depending on the setup, have a slow response time (>800ms), when switching from a completely dark input to a lit up measurement. Symptoms of this would be measurements that appear to toggle between two values. This means that the detector isn't given enough time to complete its gain switching. One way to alleviate this problem is to increase the OPM Dwell time located under the *Setup Measurement* tab. A typical dwell time is 800ms, but there are some cases where this may need to be increased to about 1500ms.

Another way to achieve stable power meter readings is to force the detector into range hold. This can be done by checking the box labeled OPM range hold under the *Setup Measurement* tab.


This will force the power meter to stay in the same gain stage for all of the measurements. The gain stage the power meter is held in is the gain stage that the reference was taken in. If the power measurements are to have a wide range (>10dB), then it is not advisable to have this option checked, because the measurement could saturate the detector gain stage yielding poor results. For signals that are expected to have range of +/-2dB, with respect to the reference, then this setting is advisable.



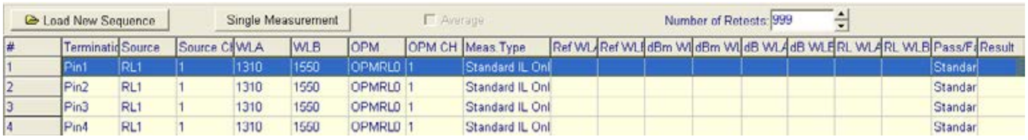
Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

## Configuring Return Loss Measurements

OPLLog allows for measurement of return loss if a supported instrument is connected to the computer (either the OP930SM or OP931MM).

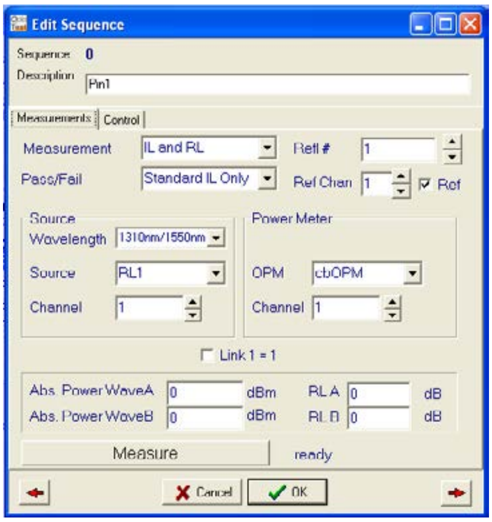
### Referencing Return Loss

The key to a good return loss measurement is to setup a correct referencing sequence. To setup the referencing one needs to edit the sequence to allow for RL measurements. Open a sequence file that corresponds to the testing setup. There are a few sample sequences that are included with the software. Once the correct sequence is loaded one can configure each step for return loss measurements. In this instance the first step is selected.




| # | Terminatio | Source | Source Cl | WLA | WLB | OPM | OPM CH | Meas Type | Ref WLA | Ref WLB | dBm Wl | dBm Wl | dB WLA | dB WLB | RL WLA | RL WLB | Pass/Fa | Result |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Pin1 | RL1 | 1 | 1310 | 1550 | OPMRL0 | 1 | Standard IL Onl | | | | | | | | | Standar | |
| 2 | Pin2 | RL1 | 1 | 1310 | 1550 | OPMRL0 | 1 | Standard IL Onl | | | | | | | | | Standar | |
| 3 | Pin3 | RL1 | 1 | 1310 | 1550 | OPMRL0 | 1 | Standard IL Onl | | | | | | | | | Standar | |
| 4 | Pin4 | RL1 | 1 | 1310 | 1550 | OPMRL0 | 1 | Standard IL Onl | | | | | | | | | Standar | |

To edit the sequence step double-click on the step and this will pull up the **Edit Sequence** dialog box.




For RL measurements to be measured the *Measurement* tab must either have [IL and RL] or [RL] only selected. Having one of these selected will cause the *Refl#* and *Ref Chan* boxes to be displayed.



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

The box corresponding to *Ref#* designates which reflection will be measured for this particular sequence step. Typically, a value of "1" in this box will correspond to the first reflection of a particular link and a "2" corresponds to the second, etc. It is advisable that if more than 1 reflection will be measured in a link (length of cables attached to each other) then the sequence steps should progress from the first reflection (closest) to the last reflection (furthest from the front panel).

The *Ref Chan* corresponds to the channel that the reflection reference position will correspond to. This function is used if the user has multiple links that are the same length and would only like to reference to one of the links and use that measurement position for all of the links. This eliminates a lot of time in the referencing process, but this is only advisable if the link lengths are known to be within +/- 0.2m of each other.

The check box next to the *Ref Chan* that is labeled *"Ref"* if checked will notify the software to actually reference to this position when going through the referencing process.

### The Return Loss Reference Screen

Return loss is referenced under this dialog box. There are 7 columns in this spreadsheet and each column conveys important information to the user.

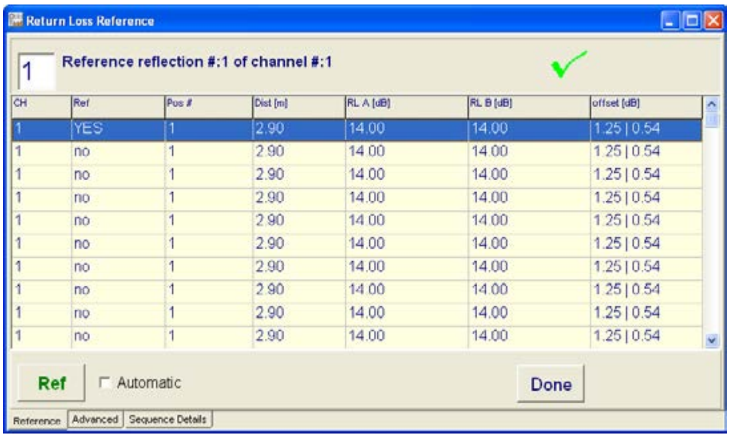



**Figure 6**

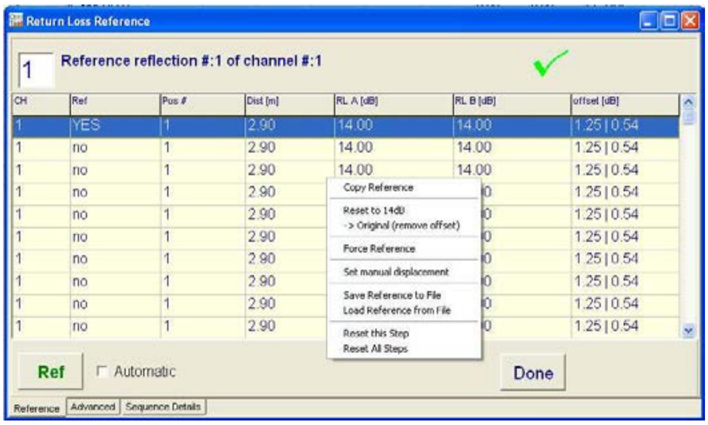
| | |
|---|---|
| CH | This corresponds to the channel where the return loss will be referenced on. |
| Ref | This columns notifies the user that this sequence step is to be referenced. In the above reference sequence only sequence step 1 is referenced and that reference is copied down for the other sequence steps. |
| Pos# | This corresponds to the reflection number that is to be referenced. |
| Dist(m) | This shows the distance to the reflection. |
| RL A, RL B | This shows the return loss measurement of the referenced position. For an open PC reflection this should be close to 14dB. |
| Offset (dB) | This column will display the offset that will be applied to each channel for the return |



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864-0
Fax: +49 8142 2864-11
info@lasercomponents.com
www.lasercomponents.com

| | |
|---|---|
| | loss measurement. In the above reference sequence the offset is 1.25dB for 1310nm and 0.54dB for 1550nm. This means that for each RL measurement 1.25dB and 0.54dB will be **subtracted** from each measurement. |

By right clicking anywhere on the spreadsheet in the return loss reference screen a small dialog box will pop up:




| | |
|---|---|
| Copy Reference | Clicking on this option will copy all references that are to be applied from one channel to another. |
| Reset to 14dB | If the user does not have the software automatically force the open PC reflection to 14dB then the user can manually reset the selected sequence step to 14dB. |
| Original (Remove Offset) | This allows the user to remove the 14dB offset that had already been applied. |
| Force Reference | If the user would like to set a reference position without actually referencing the return loss and knows the length to the reflection the clicking on Force reflection will allow the user to set the distance to the reflection. The following buttons will appear when “Force Reference” is selected.   The user can choose to force the reflection at a distance from the front panel or after the previous reflection. |
| Set Manual Displacement | No functionality as of yet. |
| Save Reference | No functionality as of yet. |
| Load Reference | No functionality as of yet. |
| Reset this | This allows the user to clear the reference data for this step. It is advisable to |



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864-0
Fax: +49 8142 2864-11
info@lasercomponents.com
www.lasercomponents.com

| | |
|---|---|
| step | perform this step prior to re-referencing return loss. This will clear reference position and reference offset. |
| Reset all steps | Allows the user to clear all steps of the reference data. |

### Handling the 14dB Offset for systems with noticeable loss

An OP930 is calibrated to a system with negligible insertion loss between the front panel and a reflection. If insertion loss is added to a system between the front panel and the reflection to be measured, such as a switch, coupler, or lossy connectors, then it is advisable to add an offset to all RL measurements. This offset will take into account the loss in the system. In the case where the user references to an open PC connector, the software will measure the return loss at that connector. It will most likely show some number higher than 14dB. For example if the RL measurement on an open PC connector is 15.5dB then all RL measurements should be corrected by subtracting out 1.5dB.

One can force the software to calculate this offset by checking the 14dB box under the sequence editor for each RL measurement. This offset will also be applied to all RL references that correspond to a particular reference. So if a reference position is to be applied to another channel the offset can also be applied to the other channel (See Example: Referencing RL for a 12 fiber MTP UPC terminated cable.)

If a user would like to measure return loss on multiple connectors on a single fiber optic link the 14dB offset can be applied to all connectors on a link. To do this the 14dB checkbox needs to be checked for each sequence in the sequence editor and the checkbox under Measurement Mode in the **Setup | Setup Measurement** tab labeled *14dB – carry over to next reflection* needs to be checked. This checkbox is pictured below.


Checking this box will cause the offset for the first reflection of a link to be copied over to the second link, third link, and so on.

*Example: Referencing RL for a 12 fiber MTP UPC terminated cable*
Load a 12 fiber sequence that corresponds to the measurement process. Edit the first step of the sequence and set the *Refl#* to “1,” set the *Ref Chan* to “1,” and make sure the box next to ”Ref” is checked. Check the box next to “14dB” so that the open PC reflection is forced to 14dB. The sequence editor should look like this:



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com


**Figure 7**

If the fiber links are known to all have the same length then edit the last 11 steps of the sequence so that the *Refl#* is set to "1," *Ref Chan* is set to "1," and the box next to "Ref" is **unchecked**. (Note: Leaving these unchecked will mean that during the referencing process these will not be referenced.) The remaining 11 steps would look like the following figure, except the OPM1 channel would correspond to the channel measured for IL reference.

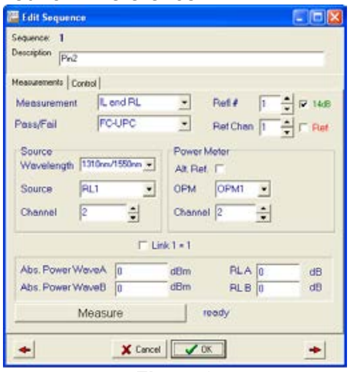



**Figure 8**

Notice that the "Ref" box is not checked. Also, notice that the source and power meter channel corresponds to the channel where IL will be measured.

If the fiber links do not have the same length, then edit the last 11 steps so that the *Refl#* is "1," the *Ref Chan* corresponds to the channel the fiber is connected to, and that the box next to "Ref" is **checked**. The first sequence step would look the same as in Figure 7, but the second sequence step would look like this:



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

LASER COMPONENTS®

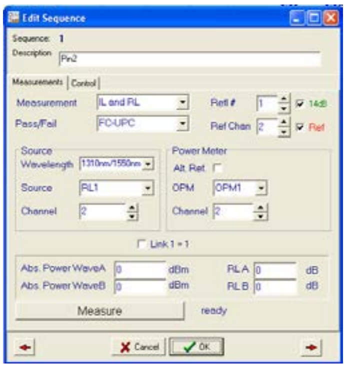



**Figure 9**

Once the sequence steps are correctly set up click on the [Ref] button. A prompt asking if the user would like to reference return loss will pop up. Select [Yes] in this screen.

For the first case where the cable lengths are expect to be the same the reference screen will look like this:

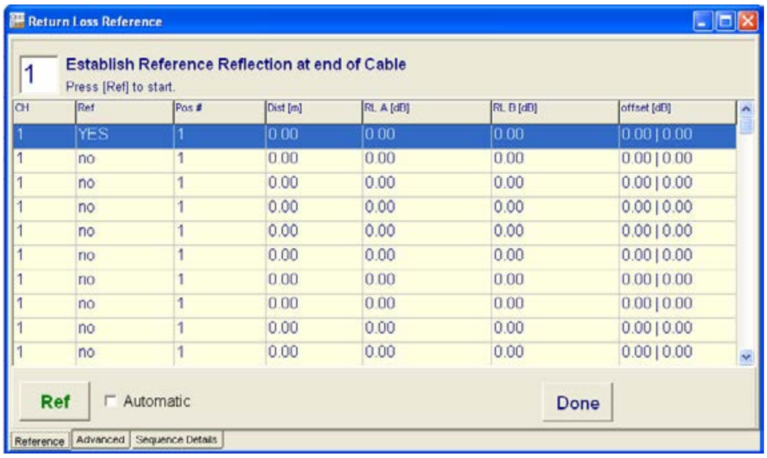
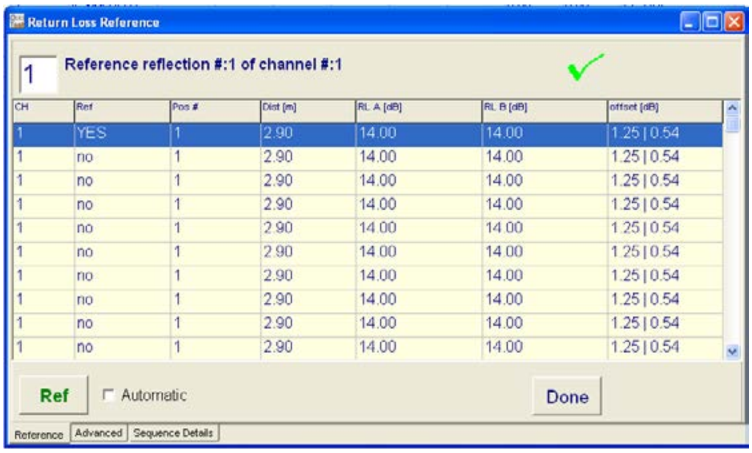



**Figure 10**

Figure 10 shows that only channel 1 needs to be referenced. The position and offset will be copied down for all 12 channels. The following screenshot shows after the first reflection is referenced and then copied down.



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com




| CH | Ref | Pos # | Dist [m] | RL A [dB] | RL B [dB] | offset [dB] |
|---|---|---|---|---|---|---|
| 1 | YES | 1 | 2.90 | 14.00 | 14.00 | 1.25 \| 0.54 |
| 1 | no | 1 | 2.90 | 14.00 | 14.00 | 1.25 \| 0.54 |
| 1 | no | 1 | 2.90 | 14.00 | 14.00 | 1.25 \| 0.54 |
| 1 | no | 1 | 2.90 | 14.00 | 14.00 | 1.25 \| 0.54 |
| 1 | no | 1 | 2.90 | 14.00 | 14.00 | 1.25 \| 0.54 |
| 1 | no | 1 | 2.90 | 14.00 | 14.00 | 1.25 \| 0.54 |
| 1 | no | 1 | 2.90 | 14.00 | 14.00 | 1.25 \| 0.54 |
| 1 | no | 1 | 2.90 | 14.00 | 14.00 | 1.25 \| 0.54 |
| 1 | no | 1 | 2.90 | 14.00 | 14.00 | 1.25 \| 0.54 |
| 1 | no | 1 | 2.90 | 14.00 | 14.00 | 1.25 \| 0.54 |

**Figure 11**

The distance (2.90m in this case) is copied down for all 12 channels and the offset (1.25 for 1310nm and 0.54dB for 1550nm) is also copied down.

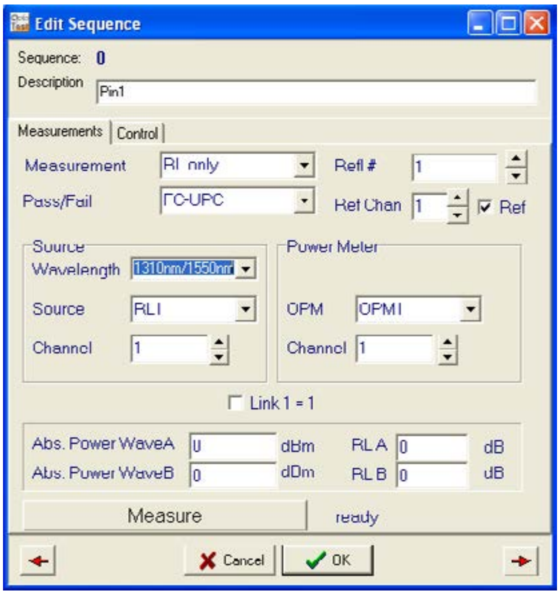
For case where the distance to the reflection is not the same for each channel each reflection needs to be done manually. By checking the "Automatic" checkbox under the "Return Loss Reference" screen and pressing the [Ref] button the software will go through each sequence step and reference each channel for the user.

*Example: Making two return loss measurements on one fiber optic link. (Supported OP930s only)*

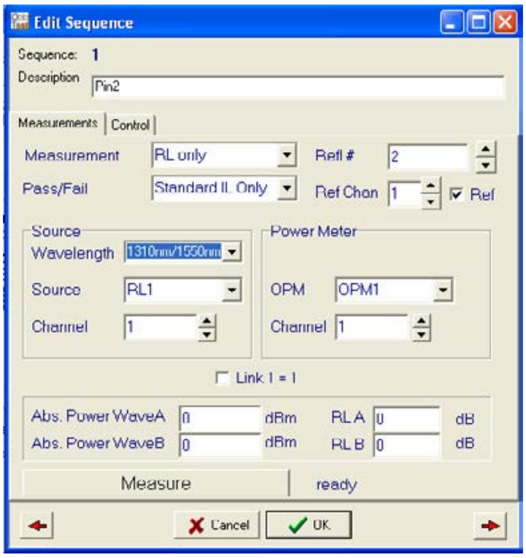
Open a two step sequence and edit them so that the first step in the sequence has the source channel set to one and measurement type as "RL only." The *Refl#* for the first step should be set to "1," the *Ref Chan* set to "1," and the "Ref" box should be checked. The sequence step should look like this after done editing.



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com




After the first step is complete the second step needs to be edited as follows:

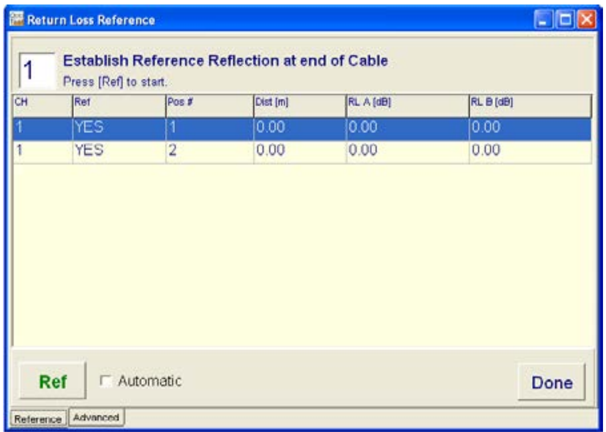





Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

The step should be set up similar to the first step. The *Ref Chan* should be set to “1,” the “Ref” box should be checked, the Measurement should be set to “RL only,” the source channel should be set to “1,” but the only difference is that the *Refl#* should be set “2.” This designates it as the second reflection to be measured on the fiber optic link.

After both steps are setup correctly, click on [Ref] at the bottom of the OPLLog screen. This will initiate the reference process. Click [Yes] on the pop up that asks if the user would like to reference for return loss. An RL reference screen will pop up:




Click on the first step that corresponds to the 1st reference position of channel one. Make sure that the first reference reflection is established at the position the return loss is to be measured. Press the [Ref] button on the lower left corner of the RL reference screen. This will attempt to find the first reflection. When the reflection is found the Distance RLA and RLB will be displayed.

| CH | Ref | Pos # | Dist [m] | RL A [dB] | RL B [dB] |
|---|---|---|---|---|---|
| 1 | YES | 1 | 12.50 | 14.03 | 14.56 |
| 1 | YES | 2 | 0.00 | 0.00 | 0.00 |

In the above reference the reflection will be measured at a distance 12.5m from the front panel and the return loss measured for wavelength A and B are 14.03dB and 14.56dB respectively. If the results are not satisfying this reference can be repeated by pressing the [Ref] button again.

Once the first reflection is established the second reflection can be established. Connect the next cable length to the position where the 1st reflection was found. Now establish a sufficiently large reflection at the 2nd position (4%,14dB). Highlight the second position of channel 1 and click the [Ref] button. This will cause the unit to scan the fiber beginning where the first reflection was found.

| CH | Ref | Pos # | Dist [m] | RL A [dB] | RL B [dB] |
|---|---|---|---|---|---|
| 1 | YES | 1 | 12.50 | 14.03 | 14.56 |
| 1 | YES | 2 | 19.40 | 14.52 | 14.81 |



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

LASER COMPONENTS®

In this example the 2nd reflection was found at a distance 19.4m from the front panel and the RL of the reflection is 14.52dB and 14.81dB for wavelength A and B respectively.

Once the referencing process is completed click on the [Single Measurement] button. (Note: If the magnitude of the two reflections are quite a bit different, like 20dB apart from each other, then the Return Loss Dwell time may need to be increased. A good value is 1000ms. If the unit is not given sufficient time to “settle” the return loss readings may be incorrect.)



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

## Using an External Switch (JDSU)

OPLLog has the ability to load up to two external JDSU switches. With this application the user can turn their single channel unit into a multichannel system.

### Setting the switch addresses

To notify the software that an external switch is to be used, the user must first edit the setup file, OPLLOG.INI, to set the GPIB addresses. To do this:

1) Navigate to the OPLLOG working directory, usually C:\Program Files\OptoTest\OPLLog.
2) Open the INI directory inside the main directory.
3) Prior to opening OPLLOG.INI make a backup of the file OPLLOG.INI.
4) Open OPLLOG.INI in a text editor, such as Notepad.
5) In OPLLOG.INI there are heading denoted by brackets [ ]. Scan the file and look for the headings [Switch] and [Switch2]. It will look something like this:

```
[Switch]
GPIB=-1
Idletime=800
[Switch2]
GPIB=-1
```

6) There are two switch headings the heading [Switch] corresponds to a switch, which will be associated with the source and [Switch2] corresponds with the power meter. The “-1” located after the “GPIB =” text instructs the software not to load a switch. To load the switch enter the address of the switch after the “GPIB=” text. (For example: If one wants to load a switch associated with the source that has a GPIB address of 7 then the line should look like “GPIB=7” and likewise for a switch associated with the power meter.
7) After making the proper changes, save the file under the same name, OPLLOG.INI.

### Verifying the switch is loaded properly

To verify that the switch is properly loaded, run the software with the switch properly connected to the computer and set to the designated GPIB address. Navigate to the **Setup|Instruments** tab. There will be two sections with the headings [Optical Switch] and [Optical Switch 2].


**Figure 12: The above configuration is for a single switch linked with the source.**



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

One can step through the channels using the [Up|Down] arrows associated with that switch.  The GPIB address should be the specified address, if a “-1” is shown for the address, then the software did not load a switch.

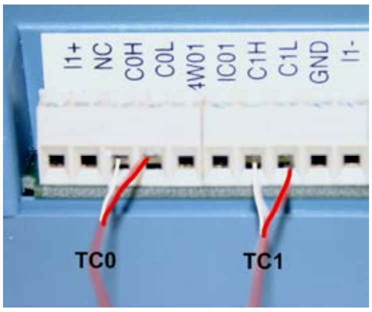


Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864 – 0
Fax: +49 8142 2864 – 11
info@lasercomponents.com
www.lasercomponents.com

## Thermocouple Measurements

### Connecting of thermocouples

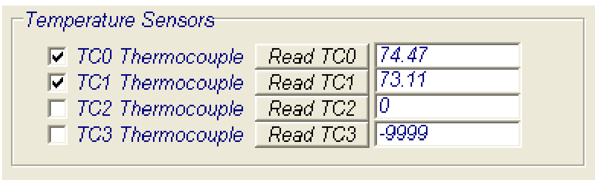
Connect one or more thermocouple(s) to the USB-TC module as shown:




**Thermocouples enumeration:**
The application software OPLLOG will recognize up to four (4) thermocouples as follows:

| USB-TC Module | OPLLOG Name |
|---|---|
| C0H (white) C0L(red) | TC0 |
| C1H (white) C1L(red) | TC1 |
| C2H (white) C2L(red) | TC2 |
| C3H (white) C3L(red) | TC3 |

**Activation of the TCs:**
After starting the application OPLLOG double checks the proper installation and operation of the TC Module. If OPLLOG is able to connect the module the additional panel for “Temperature Sensors” becomes visible in the “Instruments” window.




Press the [Read TCx] button of the corresponding channels where a thermocouple is connected, the

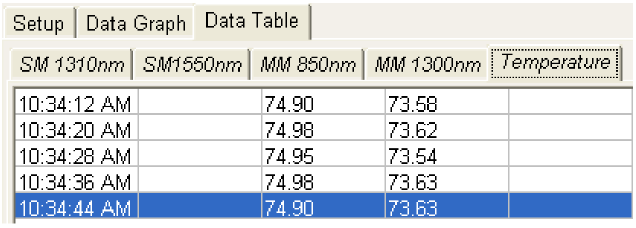


Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

temperature of the particular TC will be displayed. If there is no thermocouple connected, or if it is not connected properly (open) then “-9999” is displayed. If the thermocouple happens to be reversed the temperature reading will be wrong.

In order to log the temperature during the measurement check the appropriate TCx, the measurement data will be included into the data file together with the optical measurement data.

The temperature measurements are also recorded on the data table.



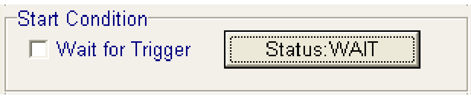


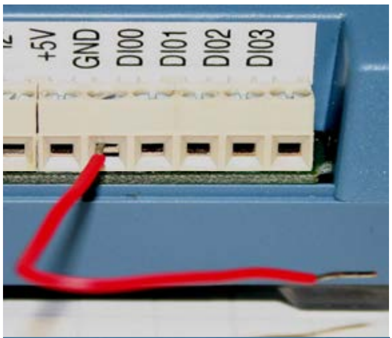

Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

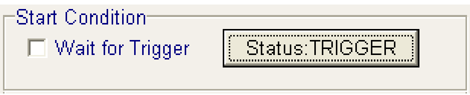
## Start Test with external trigger

The application OPLLOG has the option to trigger the measurement with an external digital signal.

To check the status of the external trigger press the [Status:xxx] button, it will reflect the current status (WAIT = open connection) or (TRIGGER = closed connection).





**Warning:** **Do not apply any external voltages beyond the limits of the TC Module to the DIxx inputs:**

**Input Low (Wait) = 0.5V to 0.8V**
**Input High (Trigger) = 2.0V to 5.5V**



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

LASER COMPONENTS®

## Analog Measurements

### Connecting of GPIB Instruments

Connect Analog Measurement Equipment such as Digital Voltmeters or Temperature Sensors that is GPIB controlled using a National Instrument GPIB-USB-H module. Make sure the appropriate drivers and utilities from NI are installed.

Currently following instruments are supported:

- Fluke HYDRA
- Keithley 2000 (or compatible)

### Configuration File

All configurations and setting for the Analog Measurement Instrument are done via the OPLLOG.INI file that needs to reside in the directory the program is executed from.

*GPIB Address, Number of Channels used*

The instrument is configured for GPIB operation and number of channels as follows:

Fluke configuration

```
[FLUKE]
GPIB=01
Channels=8
```

Keithley Configuration

```
[Keithley]
GPIB=01
```

To disable either unit simply set the GPIB address to “00.”

*Internal Temperature*

[Func0] is reserved for handling the internal temperature.

*Function Strings*

Each channel of the Instrument can be configured using a function string for each individual channel. This function string is sent prior to acquiring the data from the instrument. The function of those commands are explained in the corresponding manual of the instrument.

| | |
|---|---|
| [FuncN1] | Channel N |



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864-0
Fax: +49 8142 2864-11
info@lasercomponents.com
www.lasercomponents.com

| | |
|---|---|
| | N for channel number, starting with 1 |
| Func=VDC,AUTO | This is the string sent to setup the Fluke, it needs to be exactly from the fluke manual.<br>This example sets channel 1 to DC voltage (VDC) and auto range (AUTO) |
| Label=Fluke CH1 | This is how the channel is labeled in OPLLOG |
| Scale=0.5 | This is the scale. The measurement value returned by the instrument is scaled by this factor. In this example if the Fluke reports 1.0VDC OPLLOG reports 0.5*1.0=0.5V |
| Units=V | The units that are displayed in OPLLOG |
| Active=1 | Channel active or not – is also changed through OPLLOG |

*Channel Label, Scaling, Units*

For each channel a label can be assigned. This label will show up in OPLLOG and on the reports. The scale factor for each channel is set with the 'Scale' assignment. The unit label will be used in OPLLIOG and does show up on the reports accordingly.

Each channel can be set to active (=1) or inactive (=0). This is also controlled via OPLLOG

So for example, if a Fluke channel 3 is to be setup to measure N (Newtons) from a transducer that converts force (N) into voltage with 0.45 V/N.

```
[Func3]
Func=VDC,AUTO
Label=Fluke CH3
Units=N
Scale=0.45
Active=1
```



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com

## Warranty Information

OptoTest Corp. cannot be held responsible for any data loss due the use of this application nor can OptoTest be held liable for corruption of hard disks or any other program or data storing devices.

## Revisions

8/21/2008 Changes in release V1.10

- Added graphing functions for temperature and analog measurements
- Added support for Fluke HYDRA and Keithley 2000
- Fixed various issues with file handling

12/3/2008 Changes in release V1.08

- Save individual configuration settings
- Adjustment of the source(s).
- Fixed various defects

5/18/2005 Changes in release V1.10

- Support of TC Module with up to four thermocouples
- External start trigger to start test
- Configuration file as well as data files can be stored any place.
- Fixed various defects



Germany and Other Countries
Laser Components Germany GmbH
Tel: +49 8142 2864–0
Fax: +49 8142 2864–11
info@lasercomponents.com
www.lasercomponents.com