Multiple Application Platform MAP-200

mORL-A1, mIL-A2 and PCT Application Framework

Installation and User Guide

22112369-260 R000
Standard
October 2016

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Chapter 1: Document History

Document Number / Revision	Date	Comment
22112369-260 R000	May 2016	Initial release with new number. Note that diagrams are not necessarily reflective of the company name change from JDSU to Viavi.
22026162 R001	November 2015	Complete rewrite of original JDSU manual. Applied Viavi branding.
22026162 R000	April 2013	First release.

Chapter 2: About this Guide

Notice

Every effort was made to ensure that the information in this manual was accurate at the time of printing. However, information is subject to change without notice, and Viavi reserves the right to provide an addendum to this manual with information not available at the time that this manual was created.

Purpose and Scope

The purpose of this guide is to help you successfully use the mORL, mIL-A2 and PCT application features and capabilities. This guide includes task-based instructions that describe how to install, configure, use, and troubleshoot the mORL, mIL-A2 and associated peripherals. Additionally, this guide provides a complete description of Viavi warranty, services, and repair information, including terms and conditions of the licensing agreement.

Assumptions

This guide is intended for novice and intermediate users who want to use the mORL or mIL-A2 effectively and efficiently. Viavi assumes that the user is familiar with basic telecommunication concepts and terminology.

Copyright

Copyright Release

Trademarks

Document Ordering Information

This guide is a product of Viavi's Technical Information Development Department, issued as part of the MAP-200 suite of documents. It is distributed on the MAP-200 USB drive, 21127440, shipped with MAP-200 chassis and cassettes.

Terms and conditions

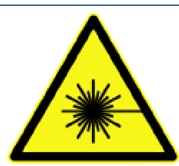
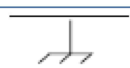
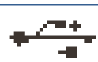
Specifications, terms, and conditions are subject to change without notice. The provision of hardware, services, and/or software are subject to Viavi’s standard terms and conditions, available at www.viavisolutions.com/terms.

Chapter 3: Safety and Compliance

Symbols used in this manual

The following symbols and messages can be marked on the unit. Observe all safety instructions that are associated with a symbol.

Table 1: Safety Symbols

Symbol	Description
	**CAUTION** See the user manual for instructions on handling and operating the unit safely. The procedure can result in serious damage to or destruction of the unit if not carried out following instructions for proper use.
	Electrostatic discharge (ESD). See the user manual for instructions on handling and operating the unit safely.
	Laser Safety. See section on laser safety for full instructions on safe handling and operating of source and amplifier modules.
	Frame or chassis terminal for electrical grounding within the unit.
	USB label.

	**WARNING** **The procedure can result in serious injury or loss of life if not carried out in proper compliance with all safety instructions. Ensure that all conditions necessary for safe handling and operation are met before proceeding.**
~	AC – Alternating current
V	Volts
VA	Volt amperes

General Safety

The MAP-200 system, including functional cassettes complies with CSA/UL/IEC 61010-1.

The following safety information must be observed whenever the unit is operated, serviced, or repaired. Failure to comply with any of these instructions or with any precaution or warning contained in this user manual is in direct violation of the standards of design, manufacture, and intended use of the unit. Viavi assumes no liability for the customer's failure to comply with any of these safety requirements.

	**WARNING** To avoid the risk of injury or death, always observe the following precautions before initializing the unit: • Never look into the end of an optical cable connected to an optical output device that is operating. Laser radiation is invisible, and direct exposure can severely injure the human eye. • Use only the type of power cord supplied with the unit. • Turning off the power to the device does not always block the externally supplied radiation to the connector at the output of the unit. • Do not use the unit outdoors. • To prevent potential fire or shock hazard, do not expose the unit to any source of excessive moisture. • Do not perform any operating or maintenance procedure that is not described in this user manual. All other repairs are to be carried out only buy a qualified Viavi professional. • Do not operate the unit when its covers or panels have been removed.

Laser Safety

MAP-200

Local Safety Interlock (MASTER ENABLE)

The safety interlock key found on the front panel of the MAP-200 must be inserted with the arrow pointed to the “ON” position for the interlock to be deactivated, and laser output to be enabled. An operator may place the key in the “OFF” position to disable all the source modules or remove the key when leaving the MAP-200 unsupervised to ensure that untrained or unprepared users do not unintentionally expose themselves to dangerous levels of optical energy.

Figure 1: Safety Interlock Key

CAUTION

The laser cannot be activated without the key inserted in the “ON” position.

Remote Safety Interlock

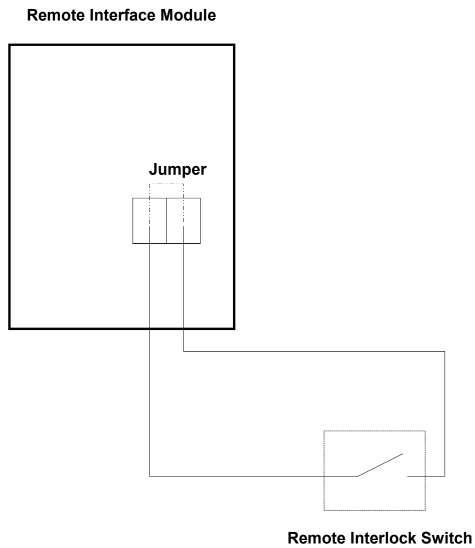
The system interlock line is a hardware safety line that controls the signal output of all laser sources within the MAP-200 system. The interlock line connects the MAP-200 chassis to each laser in the system. If the interlock circuit is broken, interlock is considered activated and all laser sources are immediately disabled removing all light at the output connectors. Upon deactivation of the interlock line, all laser sources are enabled after a three-second delay (assuming they were previously enabled). Operation and control of this line is hardware-based in order to make it fail-safe. Any failure of this interlock results in no power being supplied to the lasers.

The safety interlock connector is a 2-pin terminal block, which can be connected to a remote switch to enable an emergency shutdown. Pins 1 and 2 must be connected for laser sources in the MAP-200 chassis to be enabled.

Figure 2: Remote Interlock Terminal

A typical application would be an interruption circuit tied to a door switch that would activate the system interlock when a door is opened. Therefore, unprepared persons entering a room where a MAP-200 system is located are not exposed to hazardous levels of optical energy. The remote interlock mechanism is illustrated in Figure 3. The remote interlock switch should be closed, or a jumper inserted, to enable laser output. The MAP-200 ships with a jumper pre-installed.

Figure 3: Remote Interlock Operation



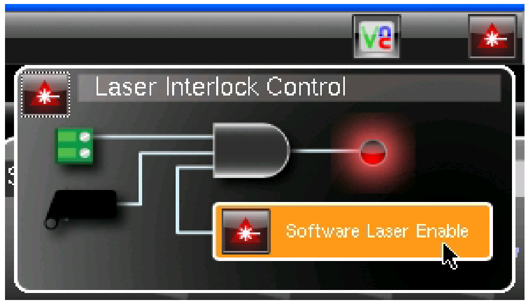
NOTE: For laser operation to be enabled, both the interlock key (Figure 1), and the remote interlock switch (Figure 2) should be configured such that laser output is enabled. A third level of protection is the Software Interlock Flag, which must be enabled from the MAP-200 GUI.

Software Interlock Flag

The software interlock flag is the third level of safety control for sources and amplifiers. This flag can be activated through automation software or through the MAP-200 GUI. Figure 4 shows the icon that brings up the safety interlock state pop-up window. This icon can be found near the top right corner of the GUI. The Software Laser Enable button must be clicked for it to be enabled, and if all other interlocks are in place, the LED lights up red, as shown in Figure 4, indicating that the sources can now be operated. For controlling the Software Interlock Flag state through automation software, please refer to the programming guide section of the manual.

Figure 4: Interlock Control and Status Icon for Pop-up

Figure 5: Laser Interlock Control Pop-up



The interlock line deactivates all laser sources regardless of their settings. However, other factors such as beam block and laser activation have to be considered when enabling a source output. Table 2 shows the relationship of the system interlock line, the source activation circuit, and the signal beam block.

Table 2: Laser Source Output Truth Table

Laser State	Interlock	Beam Block*	Signal Out
Inactive	X	X	No
X	Active	X	No
X	X	Active	No
Active	Inactive	Inactive	Yes

X means any status (don't care).
* Beam block is an optional feature on some cards. Not all cards having a beam block utilize the interlock line.

WARNING

Interlock does not control a remote chassis.

Laser Safety Labeling

The MAP-200 mIL-A2 (Optical Multimode Insertion Loss Meter) is classified Laser Class 1. The typical output power of the mIL-A2 is -22 dBm for 62.5 μm fiber type and -23 dBm for 50μm fiber type at wavelength of 850nm and 1300nm. The maximum power of source is less than – 14.3 dBm.

The MAP-200 mORL-A1 (Optical Return Loss Meter, singlemode and multimode) are classified Laser Class 1. The typical output power of mORL depends on fiber type and configuration (bi-directional or standard).

On all three cassettes a warning label, as shown in Figure 6, indicating the IEC Class of laser and applicable standard is located on the cassette(s) as shown in Figure 12.

Figure 6: Laser Warning Label

On all three cassettes a warning label, as shown in Figure 7, indicating a laser beam and wavelength of lasers is located on the cassette(s) as shown in Figure 13.

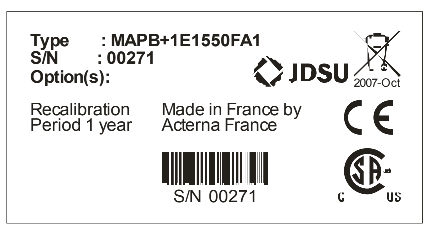
Figure 7: Laser Beam warning and Wavelength ID label

MAP-200 Chassis Safety Labeling

Controller Labels

As required by the FDA standard 21 CFR 1040.10, a label as shown in Figure 8 identifying the manufacturer, manufacturing location, marketing part number, serial number, date of manufacture, as well as CE and CSA markings (certifying testing and compliance to CE and CSA) is included on all mainframes, controllers, display and cassettes. An example is shown in Figure 8.

Figure 8: Product Identifier Label

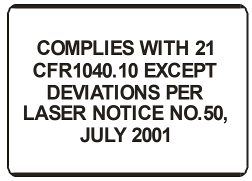


A RoHS compliant as shown in Figure 9 (Green label for no lead) or non-compliant (Red label for lead) is included on all mainframes, controllers, display and cassettes.

Figure 9: RoHS Label

An FDA label as shown in Figure 10 is included on all chassis and source cassettes.

Figure 10: FDA label



Cassette Labels

A calibration label as shown in Figure 11 is supplied to the customer as part of the Calibration Certificate and can be applied by the customer if they choose to do so. It is shown in the figures for reference only to identify the recessed area set aside for this label. See Figure 12.

Figure 11: Calibration Label

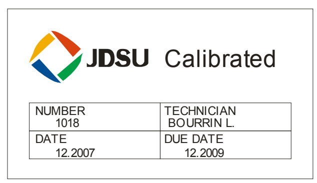


Figure 12: MAP-200 Cassette Labels, clockwise from left: Identifier label, RoHS label, Calibration label, FDA label and Laser Classification label

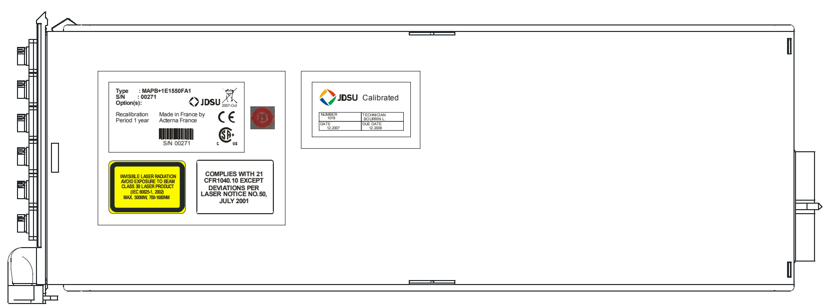


Figure 13: MAP-200 mORL Cassette Labels: Faceplate Overlay, Laser Beam Warning and Wavelength ID label on handle

Regulatory Compliance

- EMC Requirements: The MAP-200 system complies with EN61326-1, EN55022 and EN55024.
- The MAP-200, including functional cassettes complies to CE requirement EN61010-1:2001, plus UL61010-1 and CAN/CSA-C22.2 No.61010-1-04 (see CE certificate of compliance).
- The MAP-200 is in Installation Category (Over voltage Category) II under IEC 664. The unit is in the Pollution Degree 2 category under IEC61010-1 (Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use) and CAN/CSA-C22.2 No. 61010-1-04(Safety Requirements for Electrical Equipment for Measurement Control, and Laboratory Use, Part I: General Requirements)
- The MAP-200 system has been tested and certified to an altitude of 2,000 meters.

EHSR Compliance

Noise emitted by the unit during operation does not exceed the recommended level for the health and safety (80dB) specified by the European Essential Health and Safety Requirement (EHSR) Standards, section 1.7.4.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

WARNING

Use of any instrument with no optical energy source in conjunction with sources must be conducted with care and recognition of the safety required according to the classification of the source.

WEEE Directive Compliance

Viavi has established processes in compliance with the Waste Electrical and Electronic Equipment (WEEE) Directive, 2002/96/EC, and the Battery Directive, 2006/66/EC.

This product, and the batteries used to power the product, should not be disposed of as unsorted municipal waste and should be collected separately and disposed of according to your national regulations. In the European Union, all equipment and batteries purchased from Viavi after 2005-08-13 can be returned for disposal at the end of its useful life. Viavi will ensure that all waste equipment and batteries returned are reused, recycled, or disposed of in an environmentally friendly manner, and in compliance with all applicable national and international waste legislation.

It is the responsibility of the equipment owner to return the equipment to Viavi for appropriate disposal. If the equipment was imported by a reseller whose name or logo is marked on the equipment, then the owner should return the equipment directly to the reseller. Instructions for returning waste equipment to Viavi can be found in the Environmental section of Viavi's web site at http://www.viavisolutions.com/en-us/corporate/about-us/policies-and-standards .If you have questions concerning disposal of your equipment, contact Viavi's WEEE Program Management team at weee.emea@viaisolutions.com .

WARNING

The MAP-200 Controller contains a Lithium Coin Battery which contains Perchlorate Material - special handling may apply

CE Certificate mORL-A13xxx

JDSU France SAS
34, rue Necker
F - 42000 Saint-Etienne

Tel 33 4 77 47 89 00
Fax 33 4 77 47 89 70
www.jdsu.com

CE

EC - Declaration of Conformity

Type of instruments :	**MULTIPLE APPLICATION PLATFORM (MAP)**
Product name :	**MAP 200 MORL-A1**
Order number :	**MORL-A13500-MSTD ; MORL-A13456-MSTD ; MORL-A13500-MBID ; MORL-A13456-MBID**
For used in :	**MAP Series Chassis**
Manufactured by :	JDSU France SAS - 34 rue Necker - 42000 Saint Etienne - France

Sample of these instruments types have been tested and found to conform with the Council Directive 2004/108/EC relating to **electromagnetic compatibility** using the following standards

EN 61326:-1:2006	Electrical equipment for measurement, control and laboratory use - EMC requirements.
EN 61000-3-2:2006	Electromagnetic compatibility (EMC) - Part 3-2 : Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).
EN 61000-3-3:2008	Electromagnetic compatibility (EMC) - Part 3 : Limits - Section 3 : Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current up to and including 16 A

In addition the instruments comply with the safety objective of the Council Directive 2006/95/EC concerning **electrical operating equipment for use within certain voltage limits** (low voltage directive).

To test the compliance, the following standards were used

EN 61010-1:2001	Safety requirements for electrical equipment for measuring, control and laboratory use ; Part 1 : General requirements
EN 60825-1:2007	Safety of laser products - Part 1 : Equipment classification, requirements and user's guide

Instruments of this type comply with all the requirements for affixing the

CE-Mark

This EU Declaration of Conformity is prepared in accordance with and for the sole propose of the Manufacturer's declaration requirements of the above mentioned Council Directives.

The signatory is empowered to sign for the manufacturer.

Date : March 1st, 2010

Signature :

Name : **MICHEL BOUQUAIN**

Department : Quality Management
JDSU France SAS
34 Rue Necker
42000 Saint Etienne
France

S.A.S. au capital de 22.096.760 Euros - SIRET : 402 261 234 00049 - R.C.S. : Saint-Etienne - A.P.E. : 332B - TVA : FR 21 402 261 234

CE Certificate mORL-A11308

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CE

EC - Declaration of Conformity

Type of instruments :	**MULTIPLE APPLICATION PLATFORM (MAP)**
Product name :	**MAP 200 MORL-CASSETTE**
Order number :	**MORL-A11308-MSTD-M101 ; MORL-A11308-MSTD-M112 ; MORL-A11308-MBID-M101 ; MORL-A11308-MBID-M112**
For used in :	**MAP Series Chassis**
Manufactured by :	JDSU France SAS - 34 rue Necker - 42000 Saint Etienne - France

Sample of these instruments types have been tested and found to conform with the Council Directive 2004/108/EC relating to **electromagnetic compatibility** using the following standards

EN 61326-1:2006	Electrical equipment for measurement, control and laboratory use - EMC requirements.
EN 61000-3-2:2006	Electromagnetic compatibility (EMC) - Part 3-2 : Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).
EN 61000-3-3:2008	Electromagnetic compatibility (EMC) - Part 3 : Limits - Section 3 : Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current up to and including 16 A

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To test the compliance, the following standards were used

EN 61010-1:2001	Safety requirements for electrical equipment for measuring, control and laboratory use ; Part 1 : General requirements
EN 60825-1:2007	Safety of laser products - Part 1 : Equipment classification, requirements and user's guide

Instruments of this type comply with all the requirements for affixing the

CE-Mark

This EU Declaration of Conformity is prepared in accordance with and for the sole propose of the Manufacturer's declaration requirements of the above mentioned Council Directives.

The signatory is empowered to sign for the manufacturer.

Date : August 24th, 2012

Signature :

Name : **MICHEL BOUQUAIN**

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CE Certificate mIL-A1

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www.jdsu.com

CE

EC - Declaration of Conformity

Type of instruments :	**MULTIPLE APPLICATION PLATFORM (MAP)**
Product name :	**MAP 200 IL Multimode Insertion Cassette**
Order number :	**mIL A21308**
For used in :	**MAP Series Chassis**
Manufactured by :	JDSU France SAS - 34 rue Necker - 42000 Saint Etienne - France

Sample of these instruments types have been tested and found to conform with the Council Directive 2004/108/EC relating to **electromagnetic compatibility** using the following standards

EN 61326:-1:2006	Electrical equipment for measurement, control and laboratory use - EMC requirements.
EN 61000-3-2:2006	Electromagnetic compatibility (EMC) - Part 3-2 : Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).
EN 61000-3-3:2008	Electromagnetic compatibility (EMC) - Part 3 : Limits - Section 3 : Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current up to and including 16 A

In addition the instruments comply with the safety objective of the Council Directive 2006/95/EC concerning **electrical operating equipment for use within certain voltage limits** (low voltage directive).

To test the compliance, the following standards were used

EN 61010-1:2001	Safety requirements for electrical equipment for measuring, control and laboratory use ; Part 1 : General requirements
EN 60825-1:2007	Safety of laser products - Part 1 : Equipment classification, requirements and user's guide

Instruments of this type comply with all the requirements for affixing the

CE- Mark

This EU Declaration of Conformity is prepared in accordance with and for the sole propose of the Manufacturer's declaration requirements of the above mentioned Council Directives.

The signatory is empowered to sign for the manufacturer.

Date : January 17th, 2012

Signature :

Name : **MICHEL BOUQUAIN**

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China RoHS Addendum

JDSU

21107462 Rev 000

“中国 RoHS”

《电子信息产品污染控制管理办法》（信息产业部，第 39 号）

附录 (Additional Information required for the Chinese Market only)

本附录按照“中国 RoHS”的要求说明了有关电子信息产品环保使用期限的情况，并列出了产品中含有的有毒、有害物质的种类和所在部件。本附录适用于产品主体和所有配件。

产品系列: MAP MODULAR APPLICATION PLATFORM - CHASSIS AND CASSETTES
(Product Family)

环保使用期限：

本标识标注于产品主体之上，表明该产品或其配件含有有毒、有害物质（详情见下表）。

其中的数字代表在正常操作条件下至少在产品生产日期之后数年内该产品或其配件内含有的有毒、有害物质不会变异或泄漏。该期限不适用于诸如电池等易耗品。

有关正常操作条件，请参见产品用户手册。

产品生产日期请参见产品的原始校准证书。

有毒、有害物质的类型和所在部件

	有毒、有害物质和元素					
元器件 (Component)	铅(Pb)	汞 (Hg)	镉(Cd)	六价铬(CR^{6+})	多溴联苯(PBB)	多溴二苯醚 (PBDE)
产品主体 MAP (Main Product)						
印刷电路板组件 (PCB Assemblies)	X	O	X	O	X	X
内部配线 (Internal wiring)	X	O	X	O	X	X
显示器 (Display)	X	X	O	O	O	O
电源 (Power Supply)	X	O	X	O	X	X
电工零件 (Electro-mechanical parts)	X	O	X	X	X	X
光模块 / 辅助模块 (Optical modules) / (Auxiliary modules)	X	O	X	X	X	X
金属外壳零件和紧扣件 (Metal case parts and fixings)	X	O	X	X	O	O
塑料外壳零件 (Plastic case parts)	O	O	O	O	X	X
配件 (Accessories)						
外接电缆和适配器 (External cables and adapters)	X	O	X	O	X	X

O：代表该部分中所有均质材料含有的该有毒、有害物质含量低于 SJ/T11363-2006 标准的限值。
X：代表该部分中所有均质材料含有的该有毒、有害物质含量高于 SJ/T11363-2006 标准的限值。

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Chapter 4: General Information

PCT Super Application

The Viavi Passive Component/Connector Test solution (PCT) consists of a powerful family of modules, software, and peripherals for testing IL, RL, physical length, and polarity of optical connectivity products.

Leveraging the modularity and connectivity of the Viavi MAP-200 platform, the PCT can be configured for R&D, production, or qualification test environments and can address all key fiber types from single-mode through OM1 and OM4.

PCT allows for two basic modes of operation:

- Instrument mode for doing one-off or short run insertion loss and optical return loss measurements, and
- Test script mode for doing guided testing by an operator.

Instrument Mode

“Instrument Mode” lets users quickly and easily access all the key setup parameters in a simple easy-to-use intuitive GUI, which is ideal for R&D and qualification labs. This feature gives users maximum control in a rapidly changing environment. Users have constant access to interactive windows showing current connections and measurement setups. Quick-save features let users save test results to text files and window settings to simplify recall.

Test Script Mode

“Test Script Mode” fully automates tests with user-programmed test sequences and provides an SQL-light database to store results in a password-protected environment.

Test script mode is ideal for manufacturing quality control testing. It allows a supervisor to design, or script, a testing sequence along with step-by-step instructions, save the script and then have operators execute the script at the their workstations. Serial numbers may be generated locally or entered using a USB keyboard or barcode reader. User defined scripts ensure that production procedures are followed strictly while a full HTML editor can be used to embed instructions and photos for operators to follow.

Test script mode does more than give the supervisor writing the script access to all the features of the mIL-A2 and mORL-A1. It allows the supervisor to assemble a complete set-up, including other elements such as switches, and treat the setup as a single instrument for the purposes of testing. This ability to treat the complete setup as a single instrument means that the device under test (DUT) becomes the only unknown variable. This ensures reliable and repeatable measurements.

Test script mode also provides a reporting feature for capturing test data from a series of tests, extracting that data from the database and producing a formatted report or CSV file. Users can print reports and labels or export data from the database for analysis. A database query engine lets users extract results based on criteria such as device type, connector type, or customer.

Remote Commands

Integrating the PCT application with external automation environments, such as LabView and Visual Basic, leverages the full power of the MAP-200 platform.

Its full set of standard commands for programmable instruments (SCPI)-based commands are accessible through the local area network (LAN) or over the legacy general-purpose interface bus (GPIB) interface. The simple, robust, remote interface is a core requirement of the application. The MAP-200 Linux-based operating system eliminates the maintenance requirements of legacy Windows based platforms and IT department efforts on viruses and network access. A simple Excel-based example is available and may be all that is required for programmers to get started.

For debugging purposes, users can remotely login to the unit over VNC, which is extremely useful when interacting with remote manufacturing locations.

Port-Mapping Application

Port mapping is an additional software application (mSUP-PCTMAPPING) that unlocks the power of two optical switches inside the PCT framework to let users pre-program connectivity or polarity templates and to quickly verify whether the DUT complies before executing IL or IL/RL tests.

Leveraging the speed and unique capabilities of Viavi optical switches, this testing can be accomplished in less than a quarter of the time it takes to fully characterize the assembly. The port-mapping application also has a discover mode that is particularly powerful for breakout cable assemblies. Using the discover mode eliminates the need to pre-select outputs or match DUT outputs to switch outputs. Users can simply connect it as quickly as possible and allow the application to find the ports prior to test. Field trials indicate that this can cut connection times in half. Once the port maps are established, the information seamlessly feeds back into the instrument and test script modes.

mIL-A2 General Information

mIL-A2 Multimode IL

The multimode insertion loss meter (mIL-A2) is a powerful, stable, and compact IL-only solution. One single-slot module contains two LED sources (850 nm and 1300 nm), and an integrated power meter for manual or automated testing. It is an ideal lower-cost option for applications that do not require RL measurements.

Its excellent source stability and launch monitoring minimizes reference frequency requirements. The mIL-A2 uses the same lower-power, incoherent, and depolarized LED sources as the mORL described earlier. It also meets the latest IEC launch-condition standard and is available in either an OM1 (62.5 µm) or OM3 (50 µm) version.

Like the mORL modules, the mIL-A2 module works within the standard MAP-200-based PCT application framework and shares the same graphical user interface (GUI) and features, simplifying training and reducing operator transition time.

Figure 14: mIL-A2 Optical Multimode Insertion Loss Meter

Standard Accessories

- AC power cord
- Dual LED sources
- 3 mm InGaAs detector
- FC/PC-FC/PC measurement jumper
- FC/PC-type detector adapter
- Detector cap

- User's manual
- PCT application software and user's manual
- Certificate of Compliance (NIST Traceability Report available on request)

Optional Accessories

- Variety of detector adapters
- Measurement jumpers with various user-selected connectors.

mORL-A1 General Information

mORL-A1 Single-Mode IL and RL

One compact single-slot module contains up to four sources (1310, 1490, 1550, 1625 nm), and integrated power meter, and an optional 2x2 optical switch for automated bidirectional testing.

RL measurements are based on time-domain technology and are often referred to as "mandrel-free." Mandrel-free technology dramatically reduces test time by eliminating the need to make slow, difficult, manual terminations during both setup and execution of RL measurements. It also measures length further eliminating the need for extra steps to verify quality. Leveraging decades of OTDR technology, the Viavi mORL-A1 delivers 80 dB of RL dynamic range and can measure jumpers as short as 70 cm in as quickly as 3 seconds for two wavelengths.

IL is measured using the power meter method. Precise launch power monitoring and depolarization technology provides true 0.001 dB resolution. IL measurements are completed in parallel using the same optical stimulus, requiring less time overall.

mORL-A1 Multimode IL and RL

Multimode modules are based on the same basic technology and architecture as the single-mode module described above. A standard dual-wavelength version is available (850, 1300 nm) for multimode applications with an integrated power meter and optional 2x2 optical switches for automated bidirectional testing.

The multimode module requires the selection of fiber type. After years of fighting to balance test capacity investments between 50 µm (OM2, 3, 4) and 62.5 µm (OM1), Viavi released a first-of-its-kind module that tests both fiber types. The dual-fiber option can test 50 µm or 62.5 µm from the same module. Similar to the single-mode version, an optional bidirectional test is available which can also test hybrid assemblies.

Measurements for RL from 15 to 60 dB are possible and can be achieved during concurrent IL measurements in less than 2 s per wavelength.

IL performance meets IEC 61280-4-1 recommendations for mode fill. For high-throughput testing, the mORL module uses the same laser sources for IL and RL. The multimode module includes a standard set of low-power LED sources from which to select for extra precision. The low-power LED sources offer lower coherence without polarization, removing instability from speckle effects on the power meter surface. Like the single-mode module, launch powers are monitored to achieve an IL stability of ±0.02 dB.

Figure 15: mORL Optical Return Loss Meter

Standard Accessories

- AC power cord
- IL/RL Meter
- FC/APC type measurement jumper
- FC detector adapter
- Detector cap
- User's manual
- PCT application software and user's manual
- Certificate of Compliance (NIST Traceability Report available on request)

Optional Accessories

- Variety of detector adapters,
- Measurement jumpers with various user-selected connectors,
- Integrating sphere.

MPO and Multifiber Test Accessories

Multiple-fiber push-on/pull-off (MPO) connectors are one of the fastest growing segments in the connectivity market. The MAP-200 PCT can be flexibly adapted to create high-throughput solutions for cables, breakouts, and modules. As volumes change, users can adapt the MAP-200 on site to convert single-fiber test solutions to multifiber. Manufacturers are future-proofed against changing requirements and markets. The PCT MPO solutions set consists of three key components.

Optical Switches

Pairing the mORL or mIL-A2 with the industry-leading MAP Optical Switch Count (mOSW-C1) switch family can expand a single fiber output to 8, 12, or 24 outputs.

Switches are used to speed workflow and to connect multiple master test jumpers (MTJ) to the system simultaneously. If 24 channels are insufficient, external Viavi switches can be used and controlled via USB to sequentially test up to 96 fibers hands-free.

The Viavi mOSW-C1 and external optical switches are the industry leaders in loss and repeatability and provide more than 100 M+ switch cycles without specification degradation. The repeatability and stability of the switch directly impacts the measurement repeatability for IL. Up to two switches can be associated with the application at any one time, but unique architectures can be implemented where switches are selected based on the fiber type required.

Integrating Sphere

An optional integrating sphere attachment is available to measure ribbon connectors and bare fiber. The integrating sphere scatters the input light for uniform illumination of its inner surface. A small opening at the photodiode allows for integrated power level measurements. The innovative Viavi design allows for removal of the integrating sphere for simplex connector work or maintenance when not in use. The input aperture is large enough to accommodate 72-fiber MT ferrules when used with the correct detector adaptor.

Ordering Information

mORL-A1 Single-Mode Insertion Loss and Return Loss Module

Product Code	Description
MORL-A13500-MSTD	IL/RL meter, standard dual wavelength (1310, 1550 nm)
MORL-A13500-MBID	IL/RL meter, integrated bidirectional, dual wavelength (1310, 1550 nm)
MORL-A13456-MSTD	IL/RL meter, standard quad wavelength (1310, 1490, 1550, 1625 nm)
MORL-A13456-MBID	IL/RL meter, integrated bidirectional, quad wavelength (1310, 1490, 1550, 1625 nm)

Fiber Type Options (required)

Product Code	Description
M100	9/125 fiber type

Connector Options (required)

Product Code	Description
MFA	FC/APC connector type

mORL-A1 Multimode Insertion Loss and Return Loss Module

Fiber type codes are embedded directly in these codes; -M101, etc. .

Product Code	Description
MORL-A11308-MSTD-M101	IL/RL meter, standard dual wavelength (850, 1300 nm), 50 µm (OM3) fiber
MORL-A11308-MBID-M101	IL/RL meter, integrated bidirectional, dual wavelength (850, 1300 nm), 50 µm (OM3) fiber
MORL-A11308-MSTD-M112	IL/RL meter, standard dual wavelength (850, 1300 nm), 50 µm (OM3) and 62.5 µm (OM1) fiber
MORL-A11308-MBID-M112	IL/RL meter, integrated bidirectional, dual wavelength (850, 1300 nm), 50 µm (OM3) and 62.5 (OM1) fiber

Connector Options (required)

Product Code	Description
MFA	FC/APC connector type

mIL-A2 Multimode Insertion Loss Module

Product Code	Description
mIL-A21308	IL meter, dual wavelength 850, 1300, LED based

Fiber Type Options (1 selection required)

Product Code	Description
M101	50/125 fiber
M102	62.5/125 fiber

Connector Options (required)

Product Code	Description
MFP	FC/PC
Popular optical switches	Additional versions available, consult separate switch data sheets

MAP-200-Based Switch Modules

Product Code	Description
MOSW-C111C004B(S)(M)*	Single 1 x 4 switch, bulkheads
MOSW-C111C008B(S)(M)*	Single 1 x 8 switch, bulkheads
MOSW-C111CO12B(S)(M)*	Single 1 x 12 switch, bulkheads (dual width)
MOSW-C111CO24B(S)(M)*	Single 1 x 24 switch, bulkheads (dual width)

Fiber type Options (required)`

Product Code	Description
M100	9/125 fiber type
M101	50/125 fiber (OM3)
M102	62.5/125 fiber (OM1)

Connector Options (required)

Product Code	Description
MFA	FC/APC connector type
MFP	FC/PC

100 µm Fiber Receive Switch

These are for use in front of power meter only.

Product Code	Description
MOSW-C11RX012BX	Single 1x12 switch, 100 µm fiber, FC/APC connector
MOSW-C11RX024BX	Single 1x24 switch, 100 µm fiber, FC/APC connector

Software Options

Product Code	Description
MSUP-FIT	Visual inspection application license
MSUP-PCTMAPPING	PCT mapping applications license

MSUP-SBSC	SB/SC series external optical switches driver license (requires MAP-200A15)

Blanking and Dark-Current Caps

Product Code	Description
AC100	Protective dust cap (Comes with one, standard, with each module)
AC900	Magnetic quick-attach adaptor for dark level measurements
AC990P	72-Fiber integrating sphere, locking style

Common Connector Adaptors

All adaptors accommodate PC, UPC, and APC interfaces.

Product	Code Description
AC901	FC adaptor, locking style (also available in AC101 non-locking)
AC102	ST adaptor
AC903	SC adaptor, locking style (also available in AC103 non-locking)
AC912P	MT ferrule holder
AC114	MU adaptor
AC917P	MPO adaptor, locking style (requires AC990P)
AC918	LC adaptor, locking style
AC918D	LC duplex adaptor, locking style

Ferrule Adaptors

Product Code	Description
AC116	Universal 2.5 mm ferrule holder
AC123	Universal 1.25 mm ferrule holder

Bare-Fiber Holder

Product Code	Description
AC120	Barrel adaptor for bare-fiber holder
AC121	Single-fiber bare-fiber adaptor (requires AC120)
AC113	Ribbon fiber bare fiber adapter (requires AC120)

Fiber Connector Inspection Probes

Connector interfaces options are available on request.

Product Code	Description
FBP-P5000i	P5000 digital probe microscope
FVD-2200	200X digital bench-top microscope
FVD-2400	400X digital bench-top microscope
FVD-2400-L	400X digital bench-top microscope — long working distance (recommended for MPO or connector with guide pins)

Third-Party Supported Accessories

Control and Data-Entry Devices

- Standard USB HID-compliant single-function keyboard, English.
- Standard USB HID-compliant mouse.
- USB barcode reader with HID/keyboard emulation.

Direct-Connect Printers

Part numbers change frequently. Please check with Viavi for the current list.

- Brother QL-1060N. (USB or Ethernet)

Network Printer Support

PostScript®-compatible network printer.

Common Power Meter Interfaces

Consult with Viavi for additional options, if required.

FIT Accessories

FIT accessories are also supported. Please contact Viavi for more information.

Chapter 5: Configuration Setup

Before making your first measurement in Instrument Mode, you must calibrate / integrate the PCT and measure the reference level of the jumpers you will use in the test. These procedures are also necessary before running a script.   Normally this is done once and not redone until the setup is changed.

Setup your System

Before calibrating your setup you should have it configured with the equipment that will be used in testing.

To capture the setup for the PCT follow this procedure.

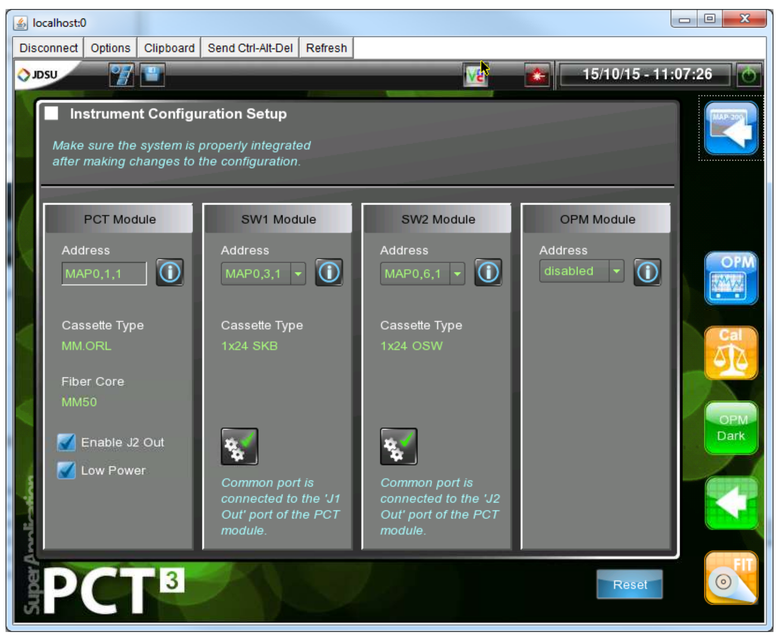
This procedure assumes you have a single-mode mORL cassette installed in the MAP-200. A multi-mode version of the mORL cassette is also available.

Setup Procedure

1. Click on "Configuration Setup" on the PCT home screen.

For a single-mode cassette a screen similar to the following appears.

For a multi-mode cassette a screen similar to the following appears.



Note: This chapter assumes that you have selected “Enable J2 Out” in the lower left of the screen.

2. If switch modules or an OPM are part of your setup, enable them by using the pull-down menu beside the “i” (information) icon.

Calibration / Integration

“Calibration / Integration” involves making a series of measurements that capture the optical behaviour of your test setup, excluding the device under test (DUT). In this way the PCT application can adjust various readings and record only the values for the DUT, discounting the values of the test setup itself.

The following procedure is for a unidirectional test setup involving only jumper cables to and from the DUT.

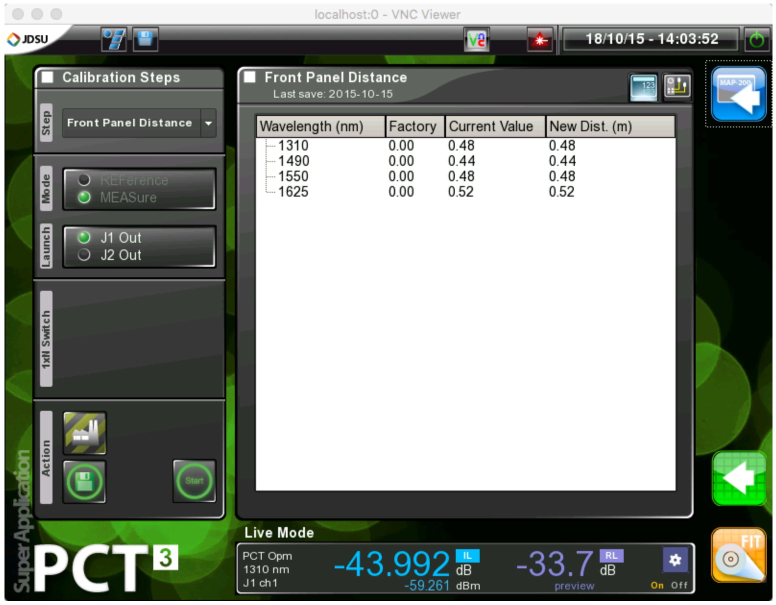
Prerequisites

Disconnect all jumpers and other equipment from the PCT setup.

Procedure

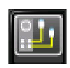
1. Click on "Cal" on the “Instrument Configuration Setup” screen.

   A screen similar to the following appears.



2. Select "J1 Out" beside “Launch” on the left-hand side of the screen.

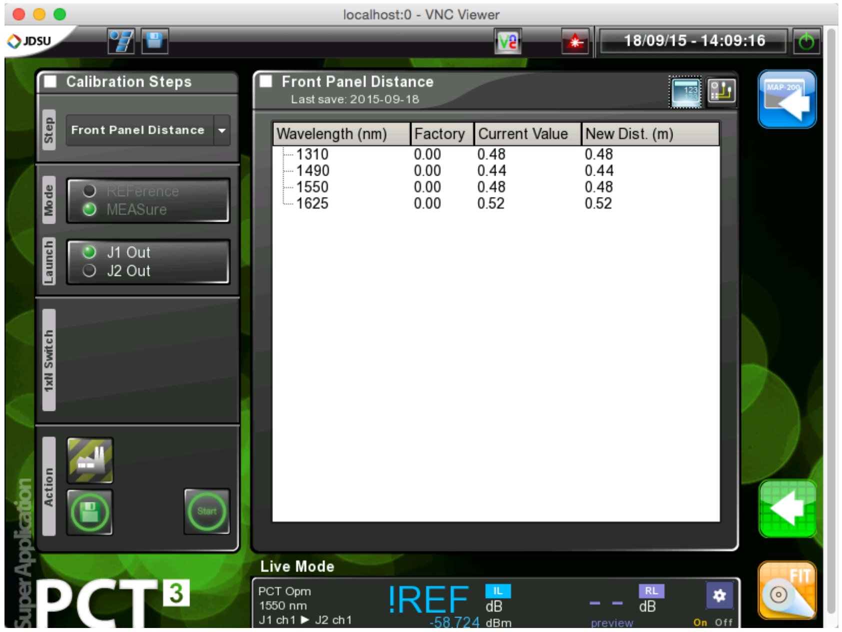
3. Click on the connection diagram icon in the upper right-hand side of the screen to show the connection diagram, with instructions.



4. Configure your equipment as specified in the instructions.

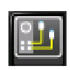
5. Click the “Start” button.

A screen similar to the following appears.



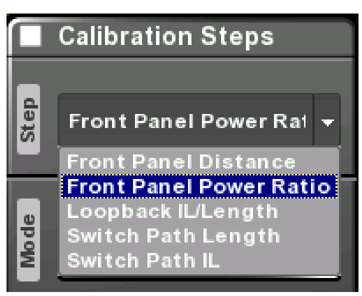
6. Click the “Save” icon.

7. Click on the connection diagram icon in the upper right-hand side of the screen to show the connection diagram, with instructions.



8. Repeat steps 4 to 7 after selecting “J2 Out” beside “Launch” on the left-hand side of the screen.

9. Click on the pull-down menu beside “Step” in the upper-left corner of the screen and select the next step.



Note: The number and kind of step will vary depending on your setup.

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10. For each step follow the instructions that appear in the connection diagram on the right-hand side of the screen.

11. Repeat steps 9 and 10 until all of the steps have been completed.

Reference Levels for the Master Test Jumpers (MTJs)

Measuring the reference level is done through the “Instrument Mode” button on the PCT home screen. After your setup has been configured / integrated measure the MTJ1 and MTJ2 reference levels in “Instrument Mode”.

Note: A reference level measurement must be made whenever a master test jumper, MTJ, is disconnected and reconnected to the J1 or J2 port on an mORL-A1 or mIL-A2 cassette.

Disconnection and reconnection will change the optical characteristics of the jumper cable enough to make subsequent measurements inaccurate unless the reference level is reestablished.

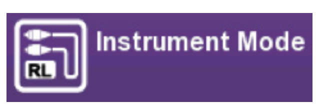
Prerequisites

1. Complete the previous section in this chapter “Calibration / Integration”.

   This procedure assumes you have selected “Enable J2 Out” in the configuration setup. Screens shown in this procedure will be different if J2 Out has been disabled.

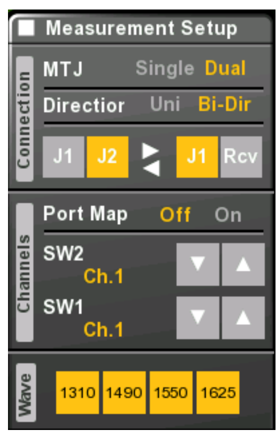
Procedure

1. Click on "Instrument Mode" on the PCT home screen.

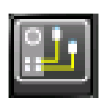


   A screen similar to the following will appear.

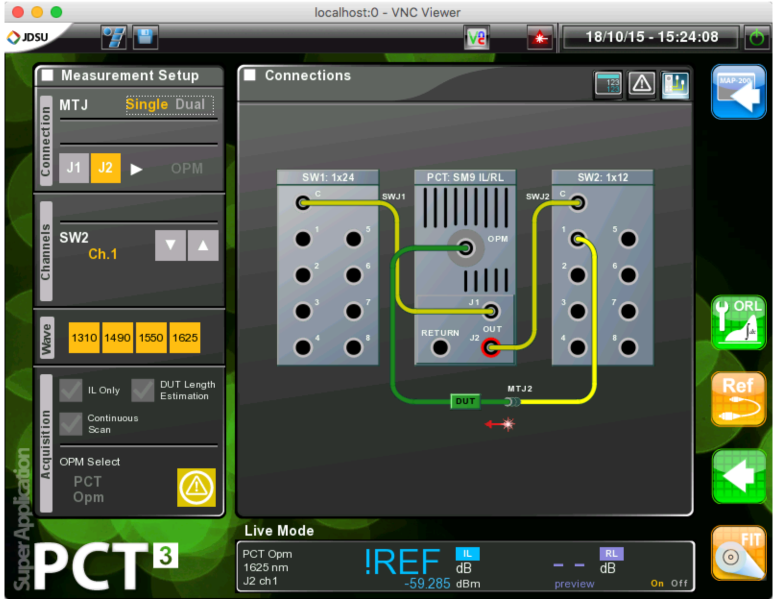
What is displayed on the screen depends on the selections you have made on the left-hand side of the screen

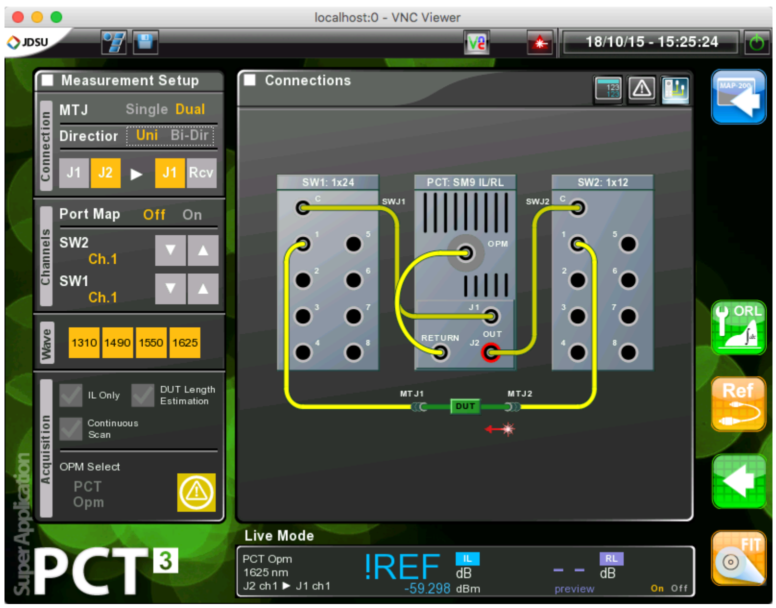


2. Click on the connection diagram icon to see how your equipment is connected.

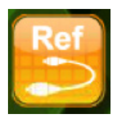


A screen similar to one of the following appears, depending on the selections you have made on the left-hand corner of the screen.

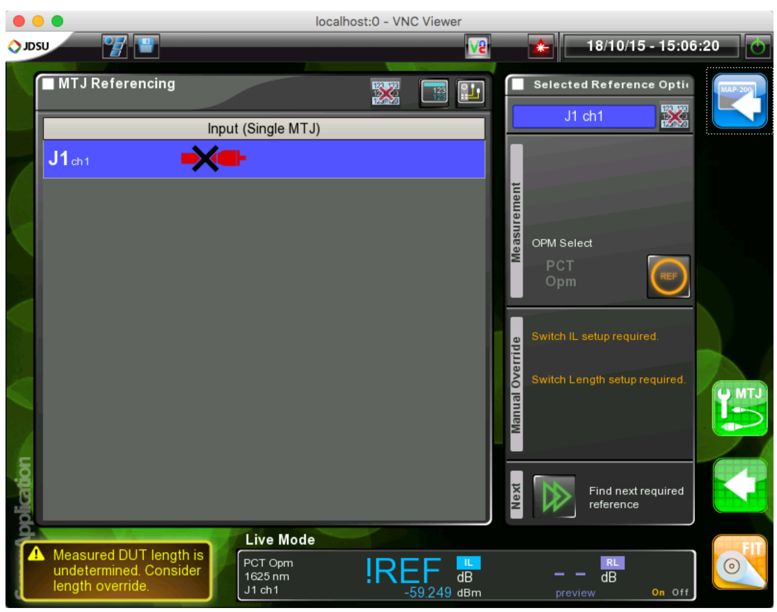

localhost:0 - VNC Viewer
JDSU
18/10/15 - 15:24:08
Measurement Setup
Connection
MTJ
Single
Dual
J1
J2
OPM
Channels
SW2
Ch.1
Wave
1310
1490
1550
1625
Acquisition
IL Only
DUT Length Estimation
Continuous Scan
OPM Select
PCT
Opm
Connections
SW1: 1x24
PCT: SM9 IL/RL
SW2: 1x12
SWJ1
SWJ2
OPM
J1
RETURN
J2
OUT
DUT
MTJ2
ORL
Ref
FIT
Live Mode
PCT Opm
1625 nm
J2 ch1
!REF
IL
dB
-59.285 dBm
RL
dB
preview
On Off
Super Application
PCT3

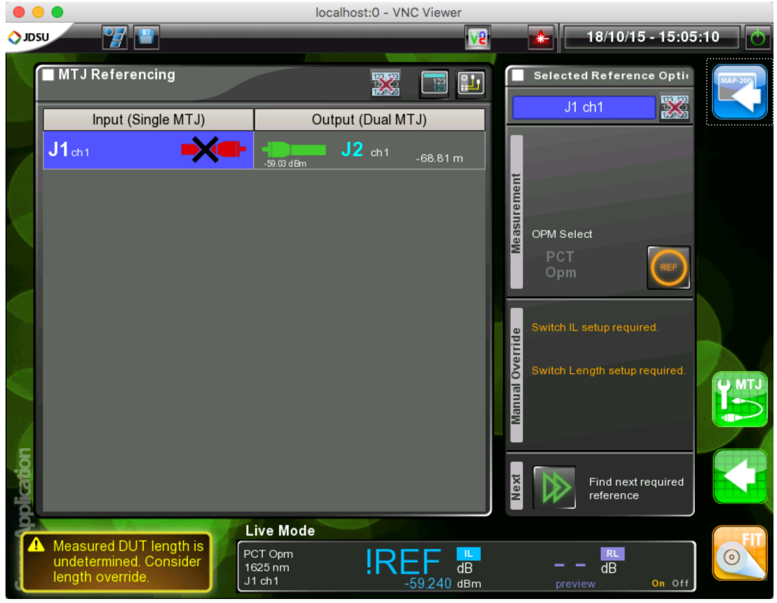

localhost:0 - VNC Viewer
JDSU
18/10/15 - 15:25:24
Measurement Setup
Connection
MTJ
Single
Dual
Direction
Uni
Bi-Dir
J1
J2
J1
Rcv
Port Map
Off
On
Channels
SW2
Ch.1
SW1
Ch.1
Wave
1310
1490
1550
1625
Acquisition
IL Only
DUT Length Estimation
Continuous Scan
OPM Select
PCT
Opm
Connections
SW1: 1x24
PCT: SM9 IL/RL
SW2: 1x12
SWJ1
SWJ2
OPM
J1
RETURN
J2
OUT
MTJ1
DUT
MTJ2
ORL
Ref
FIT
Live Mode
PCT Opm
1625 nm
J2 ch1 ▶ J1 ch1
!REF
IL
dB
-59.298 dBm
RL
dB
preview
On Off
Super Application
PCT3

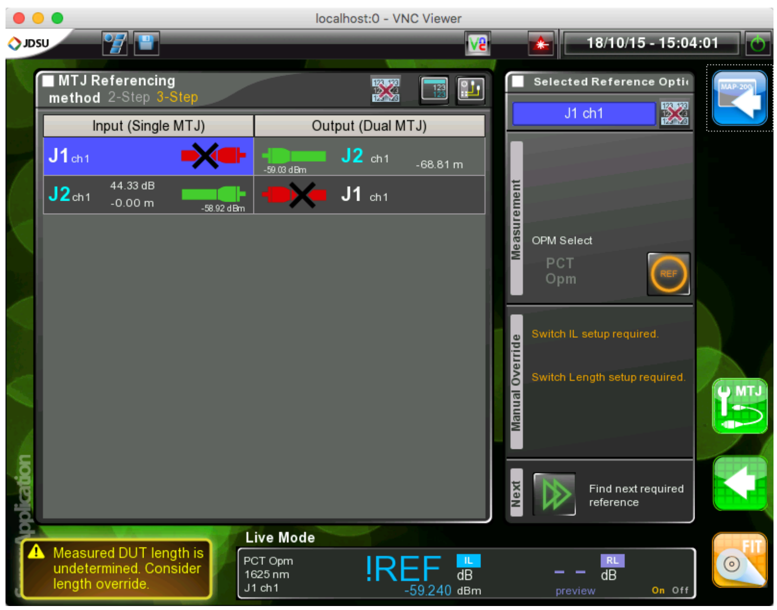
3. Click on the "Reference" icon on the right-hand side of the screen.



A screen similar to one of the following appears, depending on the selections you have made on the left-hand corner of the screen.







4. Select one of the red jumpers with an “X” though it, in this case the one on the upper left. .

5. Click on the "Ref” button to take a reference measurement.

A screen similar to one of the following will appear. Note the MTJ2 jumper on the upper left is now green.

6. Repeat steps 4 and 5 for every jumper that has not been referenced.

Chapter 6: Instrument Mode Quick Start

This section has two worked examples of making Optical Return Loss (ORL) measurements using the mORL cassette. Although the examples are simple, all measurements follow the same basic procedure.

Unidirectional ORL Measurements: Single Master Test Jumper (MTJ)

Prerequisites

The following will be required to follow this worked example.

1. A mORL cassette in Slot 1, 2, or 3 of MAP-200 Chassis.

   Note: The mORL cassette is not hot swappable. The MAP-200 chassis must be powered down before inserting the cassette.

   ---

2. One Master Test Jumper (MTJ).

   Note: When one jumper is used it is referred to as the MTJ. When two jumpers are used they are referred to as MTJ1 and MTJ2 in these instructions and in the PCT graphical user interface.

   ---

3. A user interface:

   a. MAP-200 Keypad/Display, or;

   b. A DVI-D monitor, mouse and English keyboard connected directly to the MAP-200 or through a remote VNC.

4. A fiber inspection device and connector cleaning materials.

   Note: It is critical to clean and inspect the fiber facets every time you mate a DUT or MTJ Reference jumper. Compromised junctions are the leading cause of problems when making PCT measurements with the mIL and mORL.

5. A device to be tested, for example a fiber patch cord.

Note: The device being tested will be referred to as the Device Under Test (DUT) in these instructions and in the PCT graphical user interface.

Procedure: Setup the Test

Note: A reference level measurement must be made whenever a master test jumper, MTJ1 or MTJ2, is disconnected and reconnected to the J1 or J2 port on an mORL-A1 or mIL-A2 cassette.

Disconnection and reconnection will change the optical characteristics of the jumper cable enough to make subsequent measurements inaccurate unless the reference level is reestablished.

1. Confirm that the “Setup your System” on page “39” has been done. If it has not been done, go back and do it.

   For this procedure ensure that “Enable J2 Out” is unchecked.

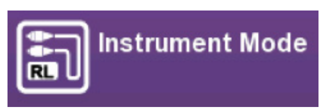
2. Confirm that the referencing procedure for MTJ1 and MTJ2 on page 44 has been done. If it has not been done, go back and do it. Reference levels for Master Test Jumpers do not have to be redone unless the equipment setup has changed or the jumpers have been disconnected and reconnected.

3. Setup your measurement by selecting the correct values on the “Instrument Mode” home screen, including the wavelengths you want to use in the test.

4. Click the “ORL” icon on the right-hand side of the “Instrument Mode” home screen. Setup your ORL zones as described here: “Setting and Using the ORL Zone” on page 83.

Procedure: Do the Test

1. Click "Instrument Mode" on the PCT home screen.



A screen similar to the one below appears on screen. The table is empty because no measurements have been taken.

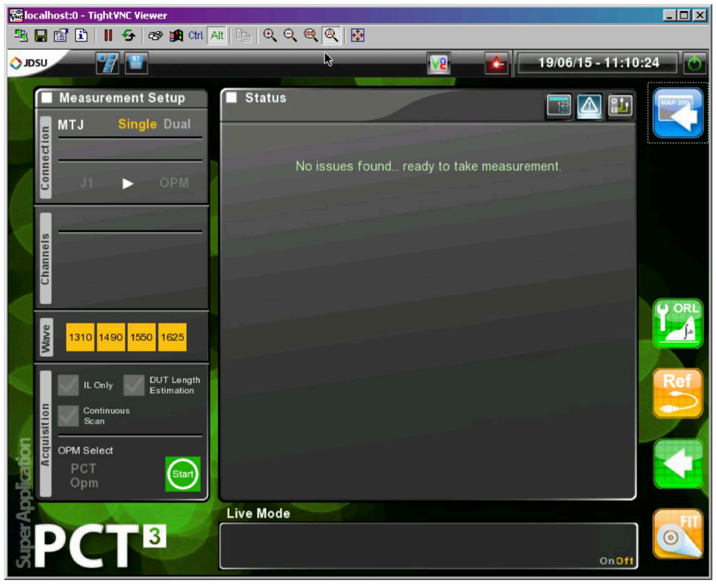
2. Click the "Graphic View" icon in the upper right-hand portion of the screen to see a graphical view of the setup.

A screen similar to the following will appear.

3. Confirm that the setup diagram is as you expected.

4. Click on the "Warnings/Status" icon.

A screen similar to the following will appear.



5. If there is a problem found you most likely will have to repeat the reference procedure under “

   Reference Levels for the Master Test Jumpers (MTJs)” on page 44 to capture the reference levels for new wavelengths to be tested.

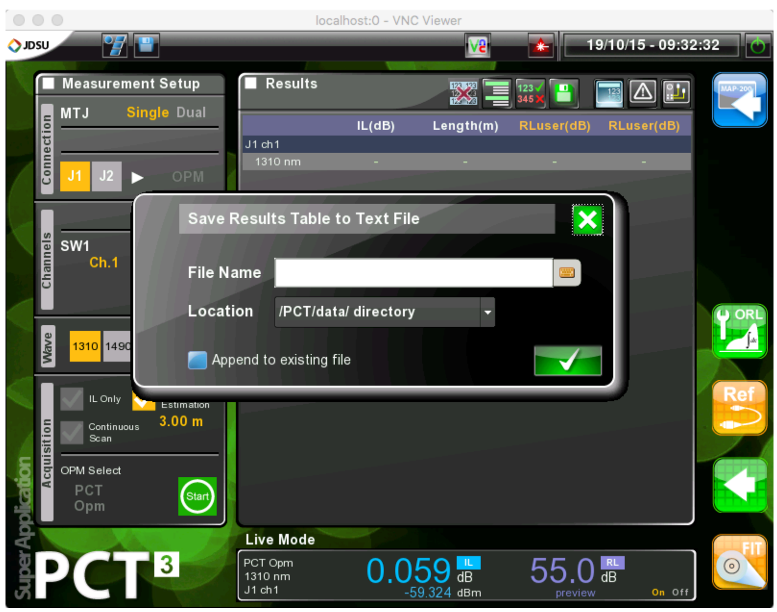
   If there is a problem the “Start” icon will be replaced by a “Warning/Status” icon.

6. Connect your DUT.

7. Click on the "Start" icon.

   A screen similar to the one below will appear.

8. Click on the “Save” icon at the top of the “Results” pane to save the results for this DUT to a file.



Unidirectional ORL Measurements: Dual Master Test Jumper (MTJ)

Prerequisites

The following will be required to follow this worked example.

1. An mORL Cassette in Slot 1, 2, or 3 of MAP-200 Chassis.

   Note: The mORL cassette is not hot swappable. The MAP-200 chassis must be powered down before inserting the cassette.

2. Two Master Test Jumpers (MTJ).

   Note: When one jumper is used it is referred to as the MTJ. When two jumpers are used they are referred to as MTJ1 and MTJ2 in these instructions and in the PCT graphical user interface.

3. A user interface:

   a. MAP-200 Keypad/Display, or;

   b. A DVI-D monitor, mouse and English keyboard connected directly to the MAP-200 or through a remote VNC.

4. A fiber inspection device and connector cleaning materials.

   Note: It is critical to clean and inspect the fiber facets every time you mate a DUT or MTJ Reference jumper. Compromised junctions are the leading cause of problems when making PCT measurements with the mIL and mORL.

5. A device to be tested, for example a fiber patch cord.

   Note: The device being tested will be referred to as the Device Under Test (DUT) in these instructions and in the PCT graphical user interface.

Procedure: Setup the Test

Note: A reference level measurement must be made whenever a master test jumper, MTJ, is disconnected and reconnected to the J1 or J2 port on an mORL-A1 or mIL-A2 cassette.

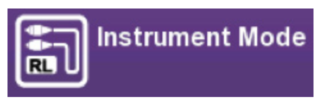
Disconnection and reconnection will change the optical characteristics of the jumper cable enough to make subsequent measurements inaccurate unless the reference level is reestablished.

1. Confirm that the general “Setup your System” on page “39” has been done. If it has not been done, go back and do it.

   For this procedure ensure that “Enable J2 Out” is checked.

2. Confirm that the referencing procedure for MTJs on page 44 has been done. If it has not been done, go back and do it. Reference levels for Master Test Jumpers do not have to be redone unless the equipment setup has changed or the jumpers have been disconnected and reconnected.

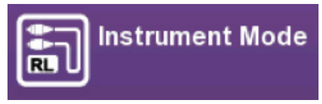
3. Setup your measurement by selecting the correct values on the “Instrument Mode” home screen, including the wavelengths you want to use in the test.



4. Click the “ORL” icon on the right-hand side of the “Instrument Mode” home screen. Setup your ORL zones as described here: “Setting and Using the ORL Zone” on page 83.

Procedure: Do the Test

1. Click "Instrument Mode" on the PCT home screen.



A screen similar to the one below appears on screen. The table is empty because no measurements have been taken.

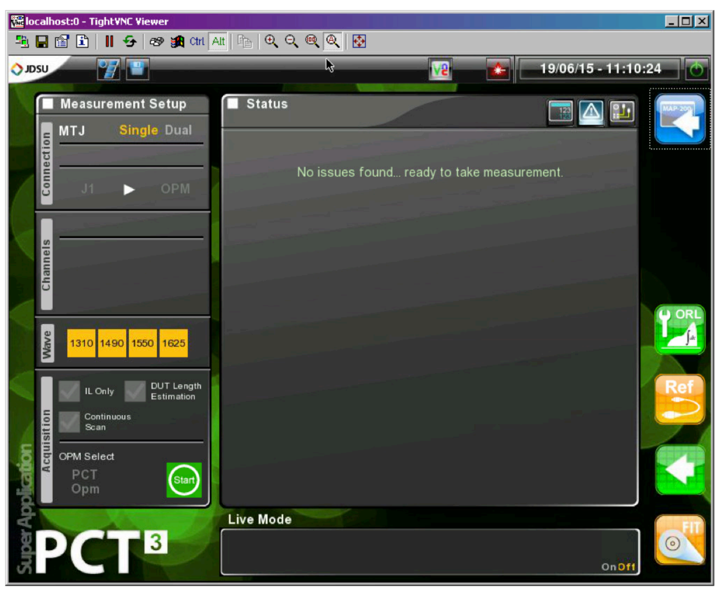
2. Click the "Graphic View" icon in the upper right-hand portion of the screen to see a graphical view of the setup.

A screen similar to the one below appears on screen.

3. Confirm that the setup diagram is as you expected.

4. Click on the "Warnings/Status" icon.

A screen similar to the following will appear.



If there is a problem found you most likely will have to repeat the reference procedure under “Reference Levels for the Master Test Jumpers (MTJs)” on page 44 to capture the reference levels for new wavelengths to be tested.

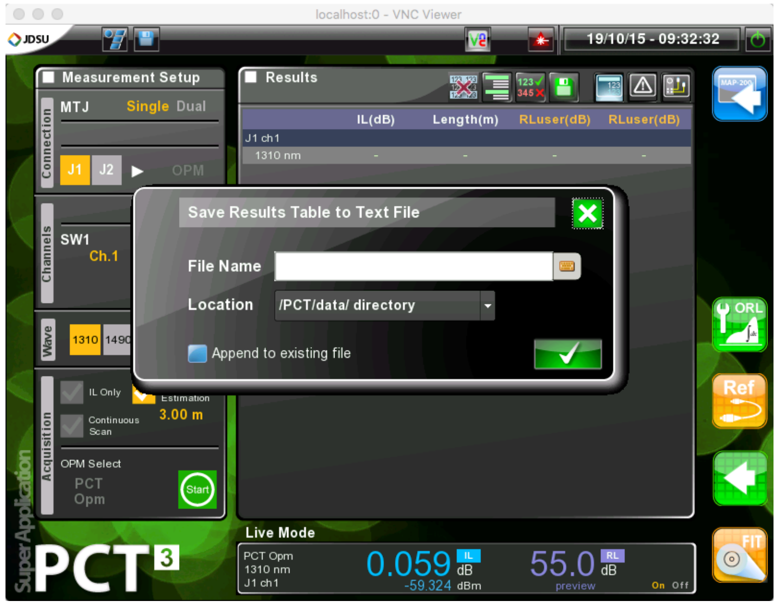
If there is a problem the “Start” icon will be replaced by a “Warning/Status” icon.

5. Connect your DUT.

6. Click on the "Start" icon.

A screen similar to the one below will appear.

7. Click on the “Save” icon at the top of the “Results” pane to save the results for this DUT to a file.


localhost:0 - VNC Viewer
19/10/15 - 09:32:32
Measurement Setup
MTJ
Single
Dual
J1
J2
OPM
SW1
Ch.1
1310
Results
IL(dB)
Length(m)
RLuser(dB)
RLuser(dB)
J1 ch1
1310 nm
Save Results Table to Text File
File Name
Location
/PCT/data/ directory
Append to existing file
IL Only
Continuous Scan
Estimation
3.00 m
OPM Select
PCT Opm
Start
Live Mode
PCT Opm
1310 nm
J1 ch1
0.059
dB
-59.324 dBm
55.0
dB
preview
On
Off
ORL
Ref
FIT
PCT3

Chapter 7: Script Mode Configuration

Configuration or integration of your setup is not strictly necessary for writing a script but it is necessary before running a script and making measurements.

Please follow the procedures described under “Configuration Setup” on page 39 before running a script.

Chapter 8: Script Mode Quick Start

This section has one worked example of writing a script for making Optical Return Loss (ORL) measurements on a patch cord. Although the example is simple, all script writing follows the same basic procedure.

It also explains how to deploy a script to another workstation and how to run it at that workstation.

Enable "Supervisor" Mode

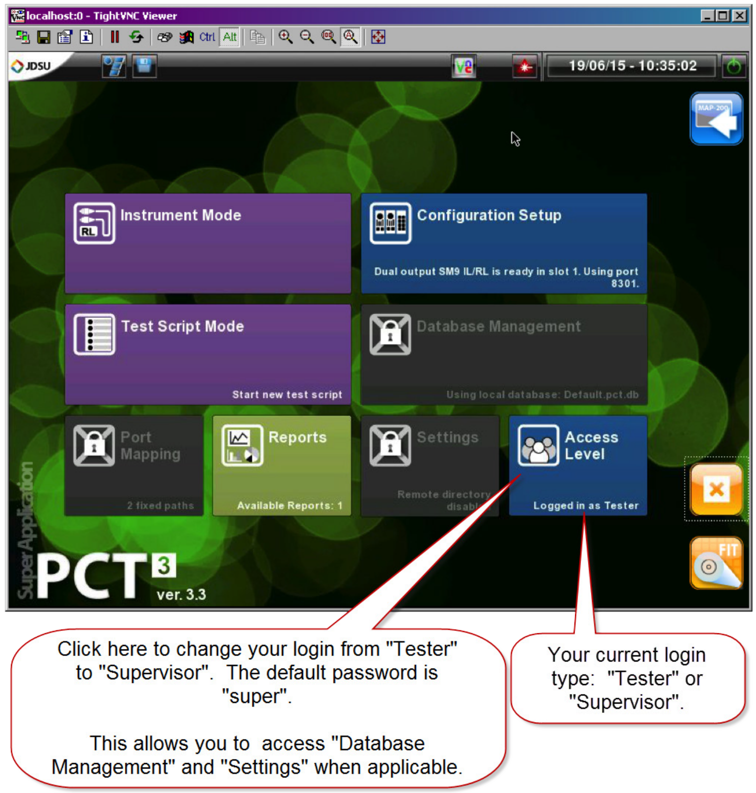
Before writing a testing script you may want to create a new database to capture the results of the testing. This requires login in as a supervisor to make the “Database Management” button active.

Procedure: Enable Supervisor Mode

1. Select one of the PCT Super Application icons on the MAP-200 home screen

Selecting the green PCT icon

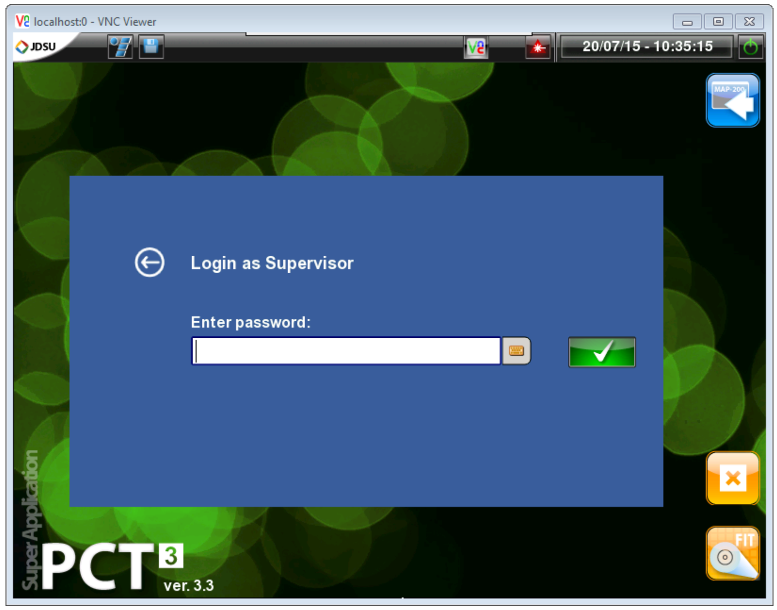
on the left will display this PCT home screen:



2. On the PCT home screen, select "Access Level".

3. You will be asked to login.

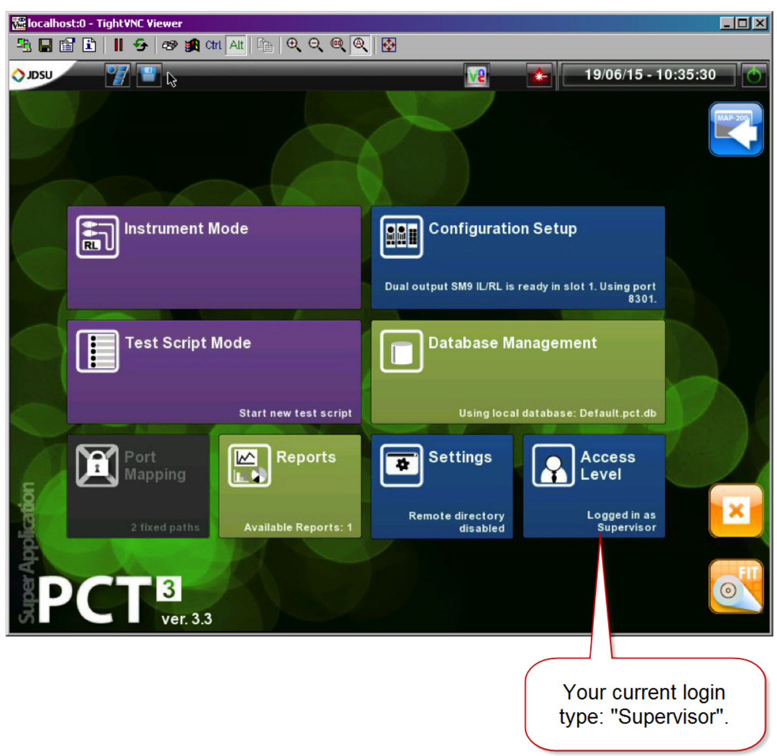
   The following screen appears. The default password is "super".



Once you have entered the password click the green checkmark button.

You are taken back to the home screen that now shows that you are logged in as "Supervisor" and you have access to "Settings" and "Database Management".

The “Port Mapping” button is active if there are two switches in the MAP-200.



Create a Database

Creating a database is not strictly required. However, may want to create a database for a script or a collection of scripts.

The default database will be used if a new one is not created and selected.

About Tabs ...

The tabs displayed in the “Database Management” screen are used to create records in a database.

Each record must have a unique and meaningful name: unique because this will be a record in a database and meaningful because people have to be able to understand what the record is about and what exactly it refers to in real life.

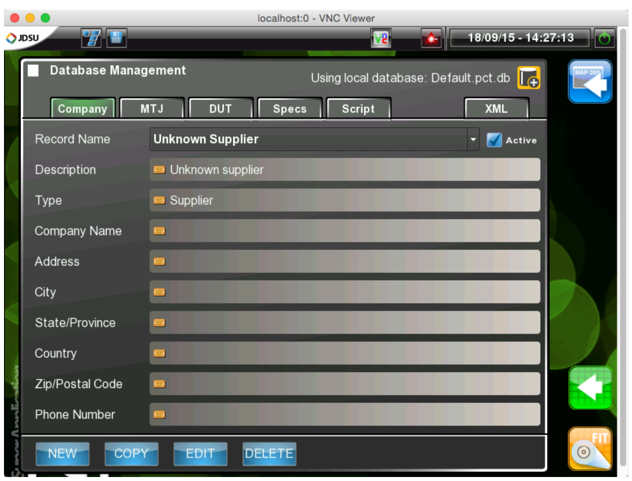
Records are not entered into the database until the update button is clicked on the bottom of the screen.

Scripts are only able to refer to things (companies, DUTs, jumpers, etc.) that have been recorded in the database and made available to the script by having their status made “Active”.

Procedure: Create a Database

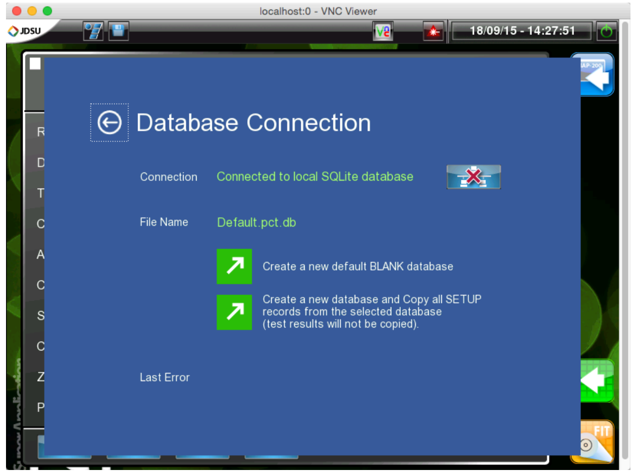
1. Click on the “Database Management” button on the PCT home screen.

   A screen similar to the following will appear.



2. Click on the “Database” icon in the upper right-hand corner of the screen.

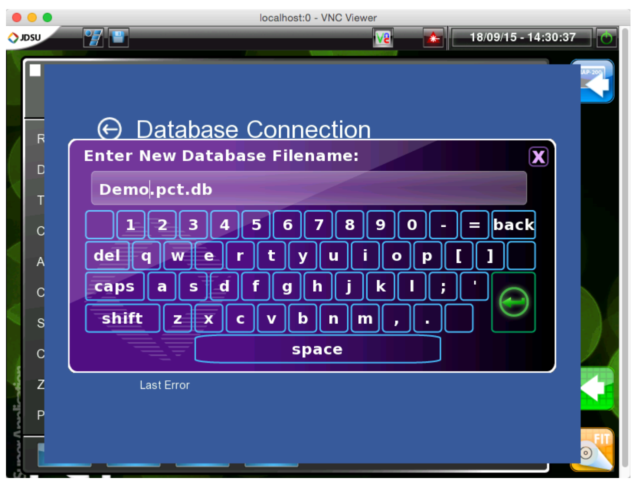
   A screen similar to the following will appear:



3. Click on “Create a new default BLANK database”.

   You can also copy or edit an existing database if you like.

   A screen similar to the following will appear:

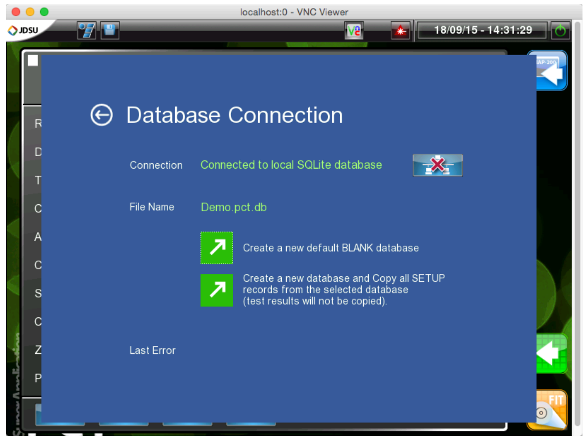


4. Fill in the name of your new database and press the green “Return” button on the keyboard.

   In this example we have typed “Demo.pct.db”.

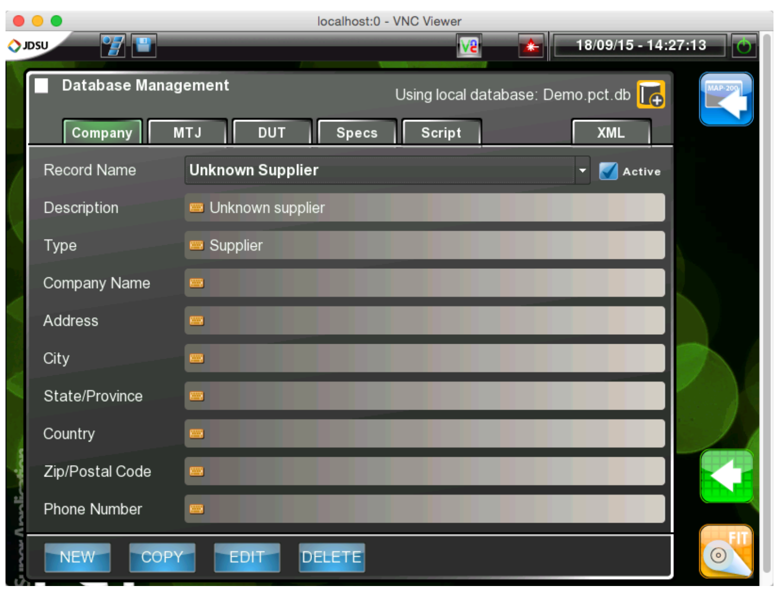
Note: The filename extension ".pct.db" will be automatically appended to the name you type.

A screen similar to the following will appear showing the name of your new database, ready to use from your script.



5. Click on the return arrow in the upper left of the screen to return to the database home page.

A screen similar to the following will appear.



Notice that the name of your database appears in the upper right-hand corner of the screen.

6. Confirm that the "Company" tab is displayed.

7. Click on the “New”, “Copy”, or “Edit” button at the bottom of the screen.

Because this is a new database only the “New” button will work as expected. After some records have been made “Copy” and “Edit” will be functional.

- “New” will present a blank form ready to create a new record.
- “Copy” will copy a selected record, if available, ready for changes and creating a new record.
- “Edit” will display the selected record, if available, ready for editing and changing the record in the database.

8. Fill in the information fields under the “Company” tab.

   This is the basic company information required to identify customers or suppliers.

   The “Active” checkmark on the right-hand side makes the record available to the script.

9. ‘Click on the “Update” button to load the information to your database.

Note: After clicking the update button you can repeat steps 6 to 9 to create another record for the same tab in the database. Create a new record for each of the customers and suppliers you want to make available when writing your script.

---

10. Click the “MTJ” tab and follow the same steps as you did for the company tab.

    The MTJ tab is a convenient to way to manage your Master Test Jumpers (MTJs) and make them available in your script.

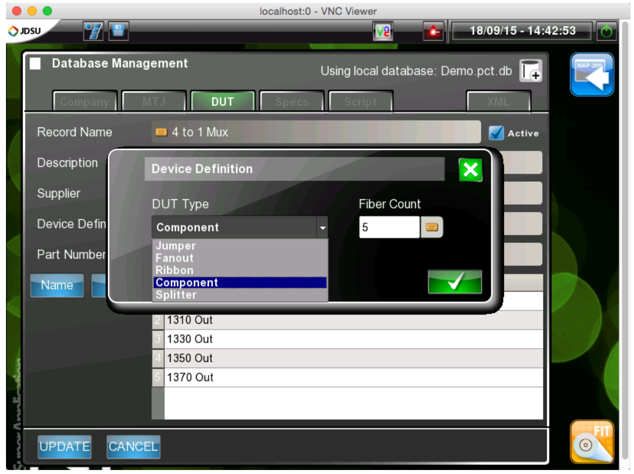
    When you click on the “Supplier” field you will get a list of suppliers that have been entered using the “Company” tab.

    The “Active” checkmark on the right-hand side makes the record available to the script.

11. Click the “DUT” tab and follow the same steps as you did for the company tab.

    When you click on the “Supplier” field you will get a list of suppliers that have been entered using the “Company” tab.

    When you click in the “Device Definition” field device definition dialog will appear. Select the appropriate definition and fiber count.



Once you have selected a device definition, the port fields will be automatically populated. You can type in your own names for these ports.

The “Active” checkmark on the right-hand side makes the record available to the script.

12. Click the “Specs” tab and follow the same steps as you did for the company tab.

    The “Specs” tab defines the tests that will be available to the script.

    The “Active” checkmark on the right-hand side makes the record available to the script.

13. Click the “Script” tab.

    You are ready to write your first script. Please refer to the next section.

Writing a Script

Prerequisites

1. Before you write a script you should have populated the database with information under the “Company”, “DUT”. You must have added records to the “Specs” tabs.

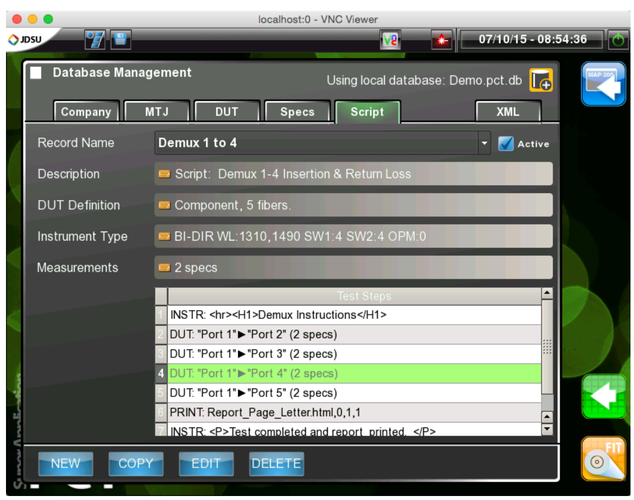
Procedure: Write the Script

1. On the PCT home screen select “Database Management”.

   You may have to login as a supervisor to activate the “Database Management” button. To enable the “Database Management” button follow the procedure under “Enable "Supervisor" Mode” on page 63.

2. Click on the “Script” tab.

   A screen similar to the following appears.

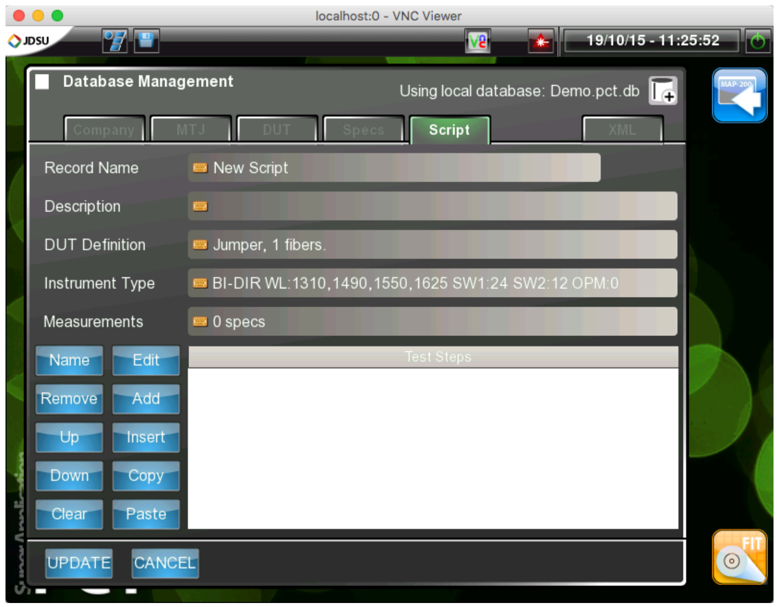


   If the correct database is already selected (the name is shown in the upper right side of the screen) proceed to the next step. If it is not selected, click on the orange “Database” icon and select the correct database.

3. Click on “New” to begin a new script.

A keyboard interface appears asking you to fill in a name for your script. Enter a unique name for the script and click the green return on the keyboard.

A screen similar to the following appears.

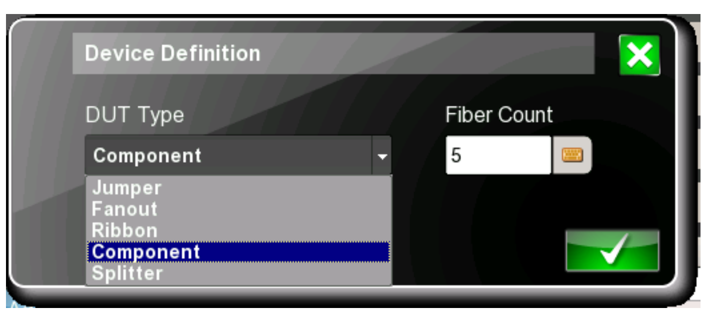


4. Click in the Description field and fill in the description of your script.

5. Click in the "DUT Definition".

Note: DUT definitions entered here will become available to operators running a script when they are asked to choose a DUT part number.

A dialog similar to the following appears.

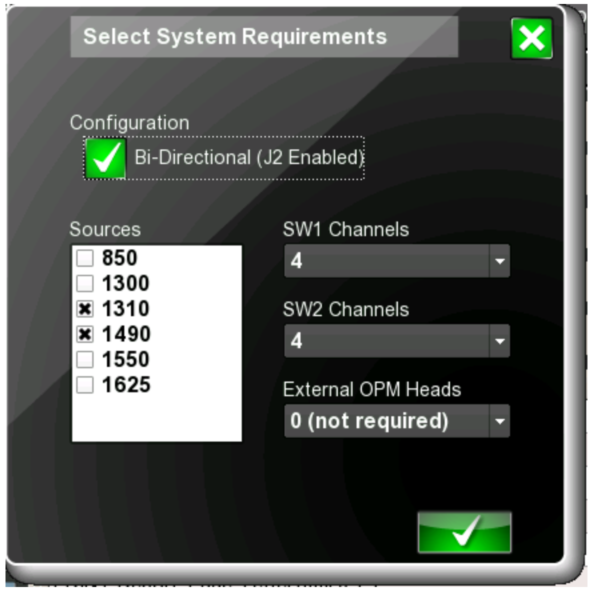


6. Select the type of component and fiber count.

   Click the checkmark to save your device definition.

7. Click in the “Instrument Type” field.

   A dialog similar to the following appears.



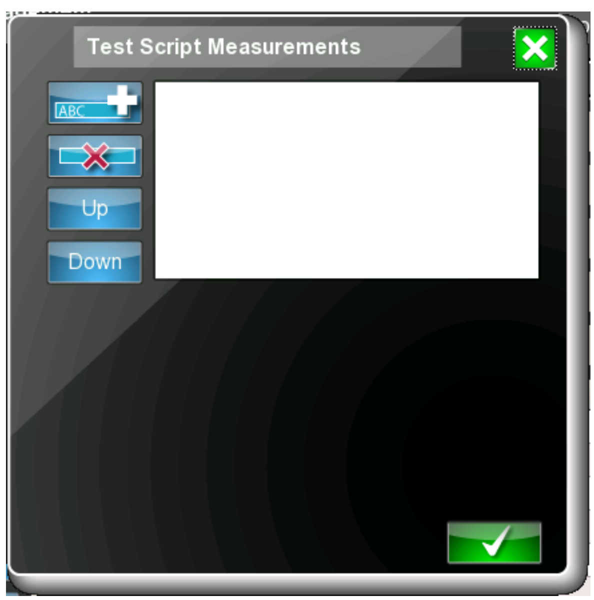
8. Select the configuration, sources, switch channels (SW1 and SW2) and external OPM heads required.

   Change the selections to match your setup and test.

   Click the checkmark to save your system requirements.

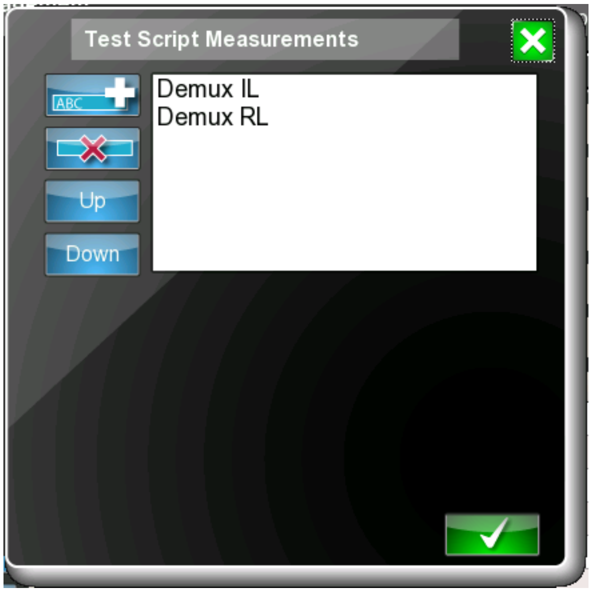
9. Click in the “Measurements” field.

   A dialog similar to the following appears.



a. Click the “+”icon to select measurements that will be available in your script steps. These measurements options are created under the “Specs” tab.

When you are finished your selections the dialog will be similar to the following.



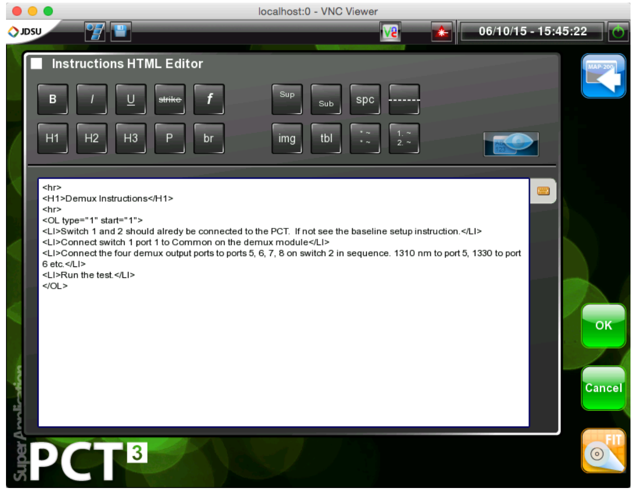
b. Click the checkmark to save your selections.

10. Click the “Add” to a step in your script.

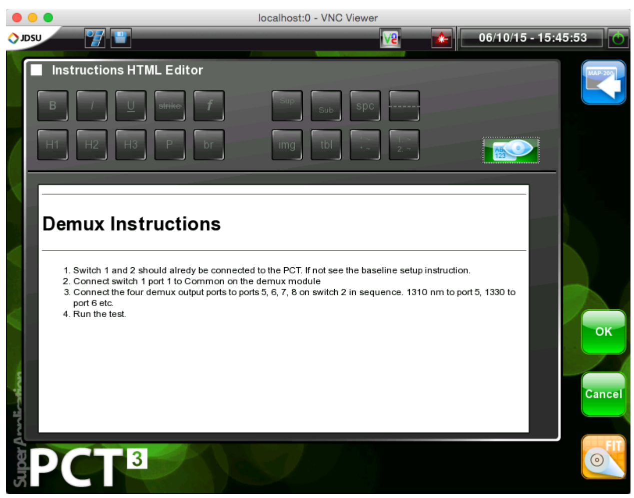
A dialog will appear asking you to choose what kind of step you want to add: “Instruction”, “Measurement” or “Report”.

11. Select “Instruction” in the dialog.

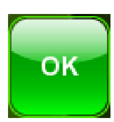
A screen similar to the following appears.



HTML entered in this dialog will appear on screen, at this position in the script sequence, when an operator runs your script. Use the preview button to see the final formatted text as an operator will see it.



12. Click “OK” when you are done.

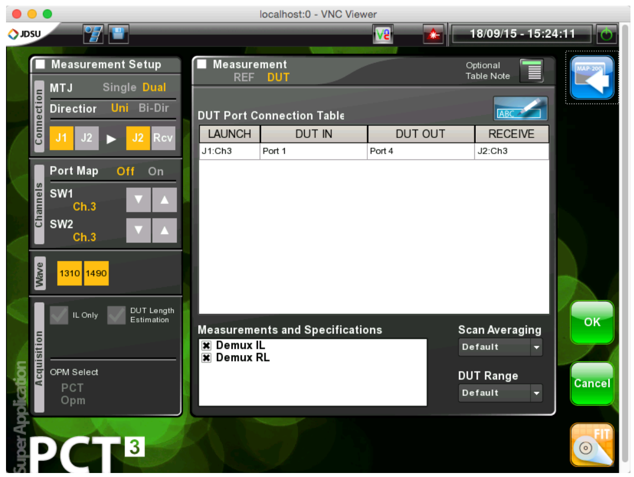


13. Click the “Add” to a step in your script.

A dialog will appear asking you to choose what kind of step you want to add: “Instruction”, “Measurement” or “Report”.

14. Select “Measurement” in the dialog.

    A screen similar to the following appears that allows you to setup your measurement for this step in your script..



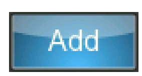
This is the same measurement setup interface already explained here: “Setup your System” on page “39” and “Instrument Mode Quick Start” on page 50.

15. Highlight a line in the table and click the “ABC” button to specify ports.

16. Select the tests to be performed in the box at the bottom of the screen.

17. Repeat step 14 to 16 for each measurement you want to make in your script.

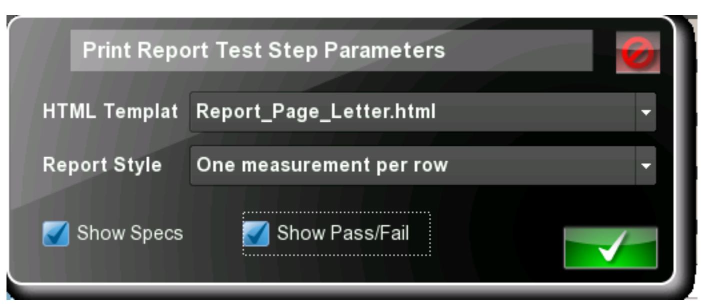
18. Click the “Add” to a step in your script.



    A dialog will appear asking you to choose what kind of step you want to add: “Instruction”, “Measurement” or “Report”.

19. Select “Report” in the dialog.

    A report dialog will appear allowing you to select and specify a report format.



20. When you have completed your script click the “Update” button to save the script to your database.

Running a Script: New test

Test scripts are normally created by a supervisor and run by operators at their workstation.

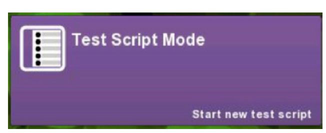
Operators can run a script loaded onto their MAP-200 on specific devices under test (DUTs) by following this procedure.

Prerequisites

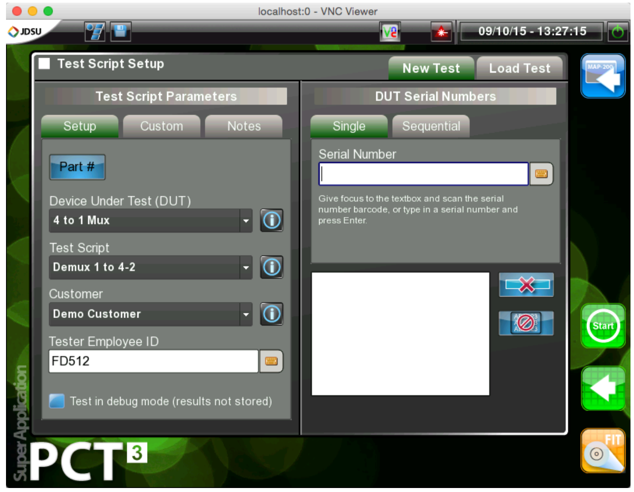
1. You must have the expected equipment setup at the workstation.
2. You must have the appropriate database and script loaded on the MAP-200.
3. You must have completed the configuration / setup steps detailed in “Configuration Setup” on page 39.
4. You should be logged into the PCT as a “Tester“.

Procedure: Running a script

1. Click on “Test Script Mode” on the PCT home screen.



A screen similar to the following appears.



2. Click on the “Part #” icon and enter a part number, or scan the barcode.

   The fields under “Part #” fill in automatically.

   You can also use the pull-down menus to select the appropriate values for the following.

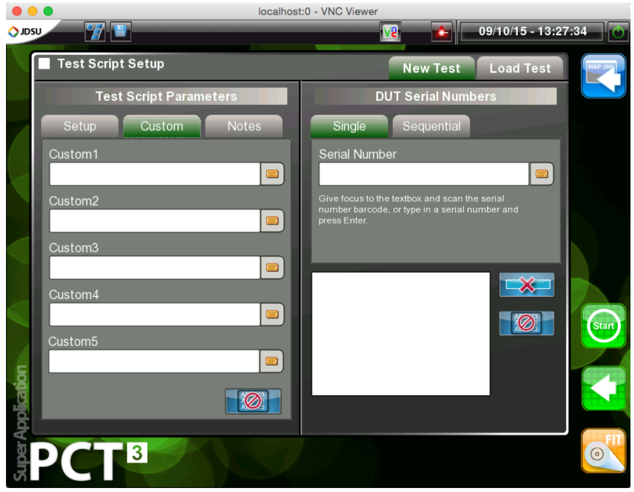
   - Device Under Test (DUT). These DUTs are defined in the “DUT” tab of “Database Management”.
   - Test Script:
     This allows you to select a previously written script and specify certain parameters such as the serial numbers under test, the part number being tested, the customer and the employee ID.
   - Customer

3. Fill in your “Tester Employee ID”

4. Click on the “Custom” tab.

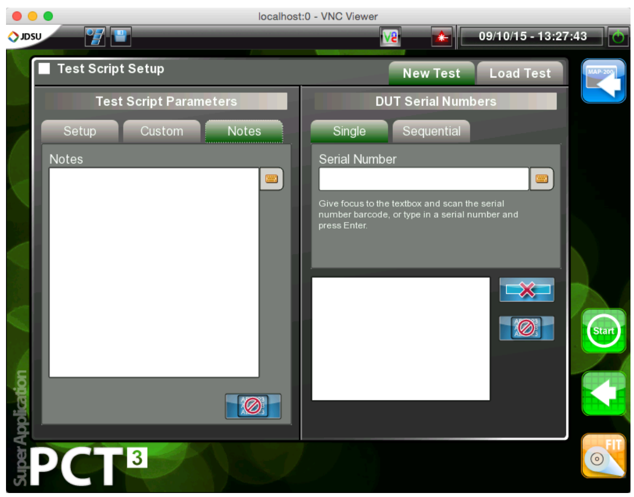
   A screen similar to the following appears. It allows you to fill in custom script parameters that can be printed on reports.

Note: Because these items are separate records in the database they are more flexible in how you use them than content entered under the note tab, a single record in the database.



5. Click on the “Notes” tab.

   A screen similar to the following appears. It allows you to add a note to the report that will be produced by the test.

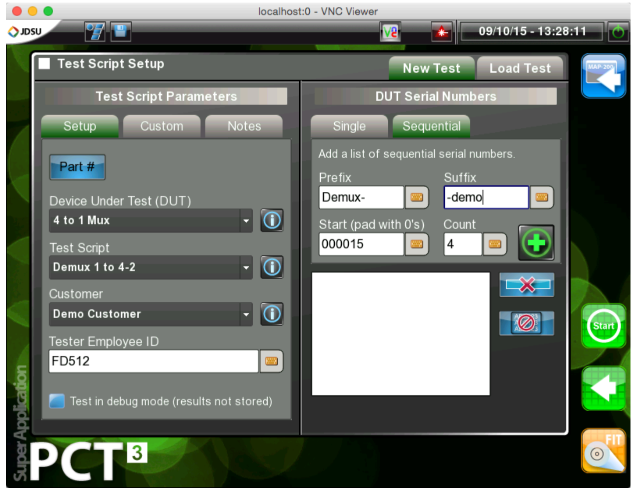


6. Enter the serial numbers of the DUT.

   a. The “Single” tab allows you to enter the serial numbers of the DUTs one at a time by typing them in or scanning the bar code. .

   b. The “Sequential” tab allows you to enter many sequential serial numbers in one step.

      Fill in the appropriate values as show below



and click the “+” icon.

The dialog fills in the serial numbers as shown below.

7. Click “Start” to start the test.

Running a Script: Load Test

Rather than creating a new test you may want to load a previously created test complete with all the selections you might make using “New test”.

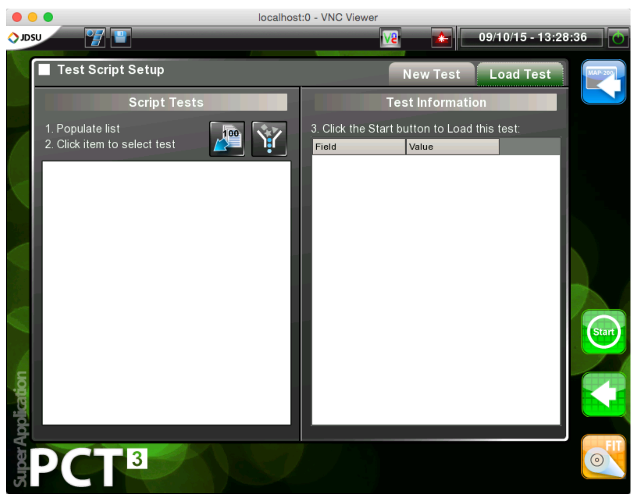
Prerequisites

1. You must have the expected equipment setup at the workstation.
2. You must have the appropriate database loaded on the MAP-200.
3. You must have completed the configuration / setup steps detailed in “Configuration Setup” on page 39.
4. PCT should be in “Tester “ mode.

Procedure: Loading a Test Including it’s Script

1. Click on the “Test Script Mode” icon on the PCT home screen.
2. Click on the “Load Test” icon on the “Test Script Mode” home screen.

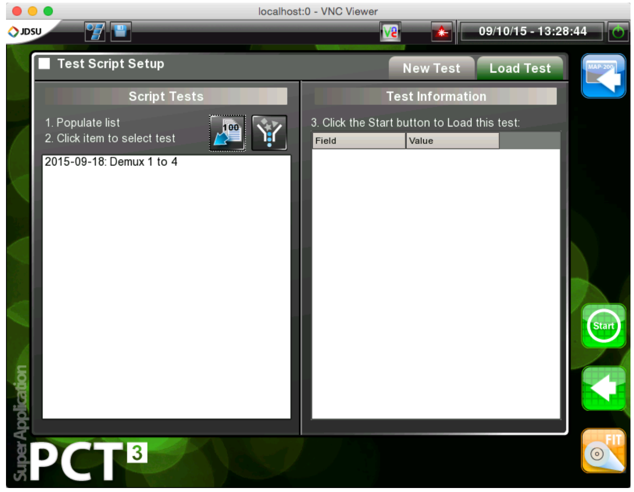
A screen similar to the following appears.



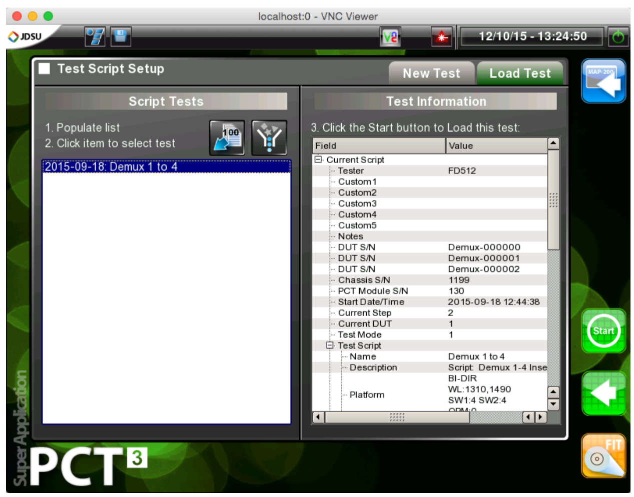
3. Click on the load scripts icon.

If necessary you can filter the results by clicking on the filter icon.

A screen similar to the following appears.



4. Select the test you want to run.



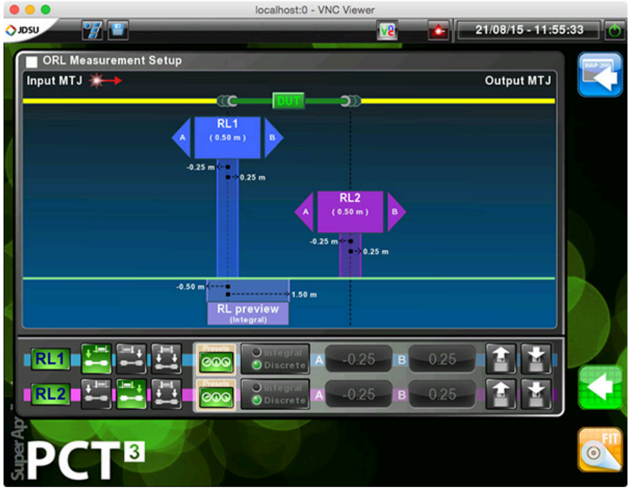
5. Click “Start” to start the test.

Chapter 9: Setting and Using the ORL Zone

ORL Zones Setup Window

In this window, the user can define how the return loss (RL) measurements will be calculated.

This window always displays settings based on the last DUT measurement taken. The diagram displays the DUT connection at the top, and the zones underneath, and the RL events line (in light green) at the bottom. The RL zones are always based on either the DUT input connection or the DUT output connection, because these two distances are known.



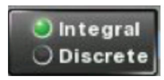
The window displays up to two different RL measurements, depending on whether you have specified one or two jumpers, each shown in a separate color (RL1=blue, RL2=violet). The zone box displays the zone width in brackets, and the RL value in the zone if available.

You can move this zone by clicking and dragging it left/right. You can change the zone limits by clicking and dragging the triangles (A and B). By looking at the two colored bars at the bottom of the window, you can set up the zone parameters. Click on the RL1/RL2 buttons to enable/disable the zones. Click on the preset button beside RL1 or RL2 reset the zone offsets to a default value that was defined in the Application settings dialog. Each zone is defined by the following parameters:

- Presets:

If the preset is selected, the offset and method are optimized for best results as defined by Viavi in the specified region of the current measurement setup. When selected the method and offset controls are grayed out and cannot be updated manually.

- Method : Integral or Discrete

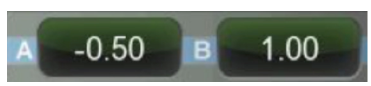


  - Integral uses the ORL method of integrating the backscatter trace.
  - Discrete uses the discrete RL values defined by the individual events that were detected.

- Marker Origin: Input, Output, Both

  - Input – anchor both zone offsets (A and B) to the DUT input connection.
  - Output – anchor both zone offsets (A and B) to the DUT output connection.
  - Both – anchor offset A to the DUT input connection, and offset B to the DUT output connection.

- Offset A and B:



  - These define the zone limit markers, which are offsets from the selected marker origin. These values are updated when the zone is dragged in the diagram.

- Save or use a previously defined ORL setup (preset)
  - Save the current ORL Setup. When you click the button a keyboard dialog appears allowing to specify a name for the setup. The setup is saved under that name in the database.

  - Use a previously defined RL setup or “Preset”. When you click this button a dialog similar to the following appears.


ORL Zone Presets
ORL Setup 1
ORL Setup 2

Chapter 10: Port Mapping

PCT includes a Port Mapping (PM) tool, which is available for any two-switch configuration. The use of two switches requires a specific “PCT Dual Switch” license to be installed on the chassis.

This tool is used to validate the known paths through a DUT, or to discover the paths if they are unknown. Once a PM table is generated, it can be enabled in the Instrument mode to cycle through all the DUT paths and make measurements.

Changing or Creating a Port Mapping Table

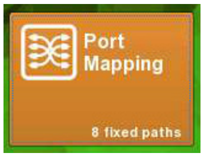
Prerequisites

1. You must have two switches in your system, enabled in the “Configuration Setup” interface.

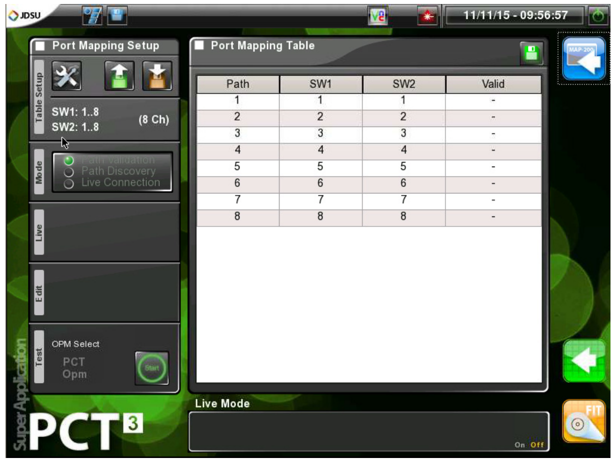
2. The dual switch license (MSUP-PCTMAPPING) must be installed on the chassis

Procedure: Changing or Creating a Port Mapping Table

1. Click on the “Port Mapping” Button on the PCT start screen.



A screen similar to the following will appear:



2. Click on the tools icon.

The Switch Port Mapping Setup dialog will appear:

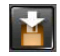
In this dialog, you will set up the range of channels that is to be used on both switches for the port mapping function. Click on the Channel selection buttons for each switch to make the selections. The channels do not have to be in a continuous range, but the channel count must be the same for both switches.

The table can be set up as a “fixed” table, if the paths through the DUT are known ahead of time. Alternatively, one of the two switches can be designed as the “Unknown order” side. This will set up the PM table as “discoverable”, where the DUT is connected in order on the known side, and the paths can be discovered on the other side.

Click on the

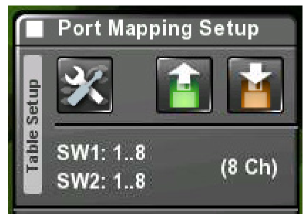
button to complete the setup.

3. Back on the main Port Mapping page, on the left setup panel, a summary of the port mapping table is shown with the total number of port map paths, and the channel ranges for each switch.
The current table can be saved to the database by clicking on the



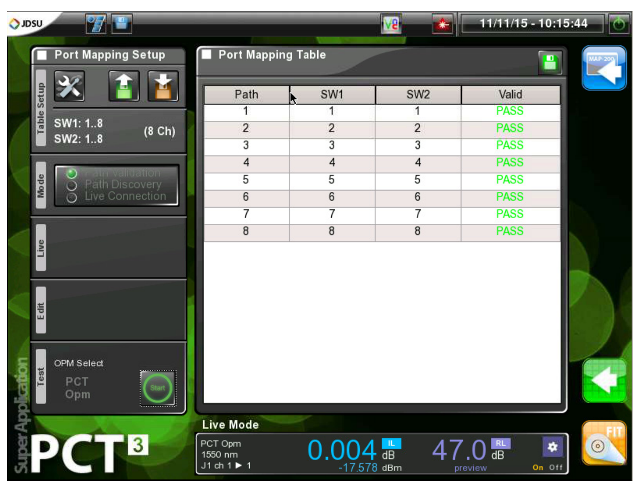
button, or a table can be retrieved from the database with the

button.



Procedure: Testing DUT path continuity

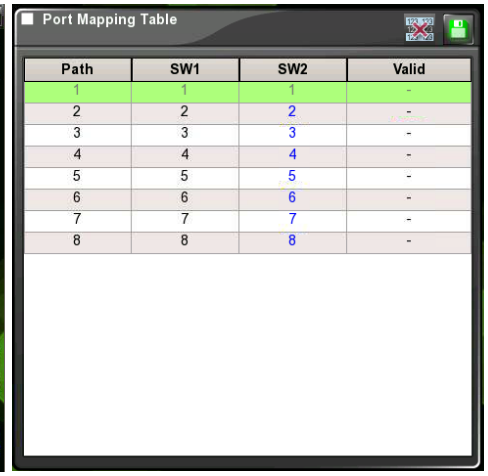
For a fixed or “known” path table, the channels of both switches for a particular path are shown in each row. In this mode, the only operation available to the user is the “Path Validation”. In this feature, all of the switch paths are tested for continuity, and will give a PASS/FAIL status on each row. Click the Start button to begin the operation.



Note: Port Mapping uses the PCT “Live Mode” to make measurements.

Procedure: Discovering paths through a DUT

For an “unknown” path table, the user connects the labeled (or “known”) DUT ports to the switch with the known channels, and will connect the unlabeled (or “unknown”) DUT ports to the switch with the unknown channels, that is shown with the “???” in the port mapping table. Make sure the “Path Discovery” mode is selected in the left panel.

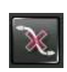


Click the Start button to begin the Path Discovery operation. This option will proceed to discover the path continuity through the DUT and sets the “discovered” channels in the “unknown” switch column.

Note: The “Live Connection” mode can be used to discover one path at a time, which can be useful for very large tables. After cleaning and connecting the “unknown” side of the DUT to the switch, you can initiate a discovery on the selected “Live Channel” (ie. the channel that was just connected to the unknown switch side). This path will be discovered while you are free to start cleaning and connecting the next DUT port.

Procedure: Editing the Port Mapping table

In some cases, a fixed PM can be more complex (for example a “cross-connect”). Setting up a fixed table only allows for ascending channel ranges on both switches. A solution for this case is to set up an “unknown” table and manually set the channels instead of “discovering” them. While in “Path Discovery” mode, you can highlight any row in the table by clicking on it. In the Setup panel on the left, in the “Edit” section, you can click on the



button to clear the assigned channel in the row, or click on the

button to specify a channel for this row.

Once the table is complete, you may wish to “lock” the table from further changes by clicking on the

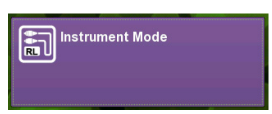
button. The buttons above the table provide more functionality. The

button will clear all channel assignments in a non-fixed table, while the

button allows you to save the PM table to a text file.

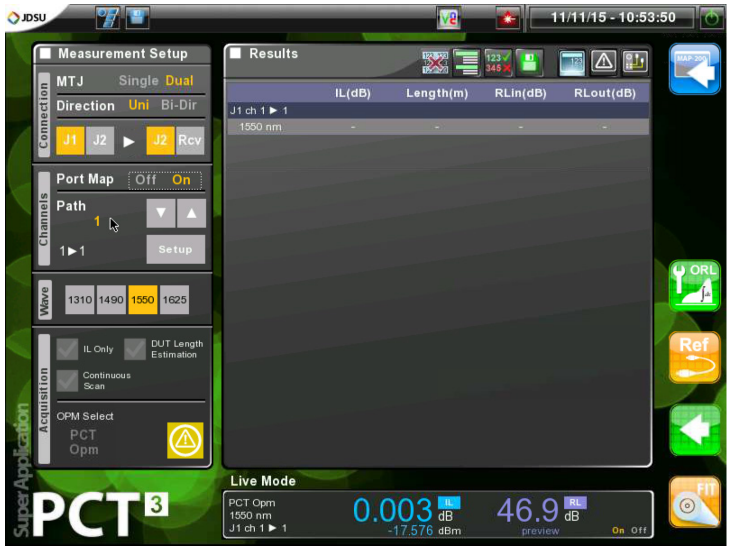
Procedure: Making measurements with the Port Mapping table

1. Click the “Instrument Mode” button on the PCT start screen.



2. In the Measurement Setup tab, in the Connection section, select “Dual” MTJ with J1 to J2 selected. In the Channels section, select “On” for the Port Map option. Underneath this, you are able to select the paths from the PM table. The screenshot below shows that Path 1 is selected, with the channel selection shown below it

.



3. Cycle through the paths with the Up/Down button, or click on the path selection to select one or multiple paths from a selection dialog.

Note: You can enter the Port Mapping table setup dialog from here as well by clicking the “Setup” button.

---

4. When you take a measurement with the Start button, or enter the Reference dialog, the selected Port Mapping paths will be used.

Chapter 11: PCT mORL with Integrating Sphere Adapter

Calibration – Front Panel Power Ratio

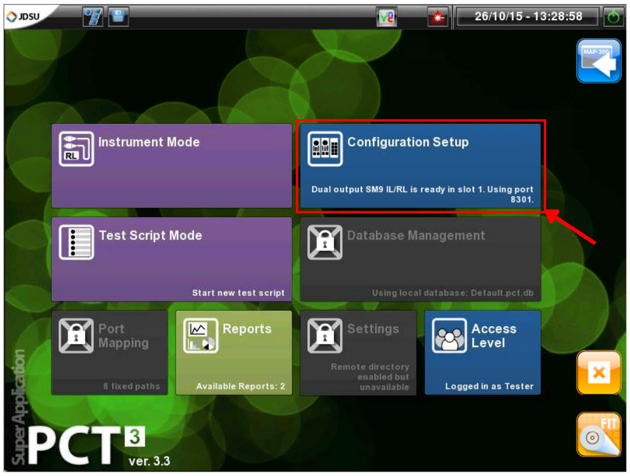
Calibration of the Front Panel Power Ratio must be performed when changing from a regular fiber adapter (i.e. AC101, etc.) to an integrating sphere installed on the OPM detector, or vice versa. If this procedure is not done, measurement accuracy will be impacted, and a warning message will be displayed when a reference is taken.

Front Panel Power Ratio Calibration Procedure

Following is the procedure for performing the Front Panel IL/Power calibration after changing from a regular fiber adapter to an integrating sphere installed on the OPM detector, or vice versa.

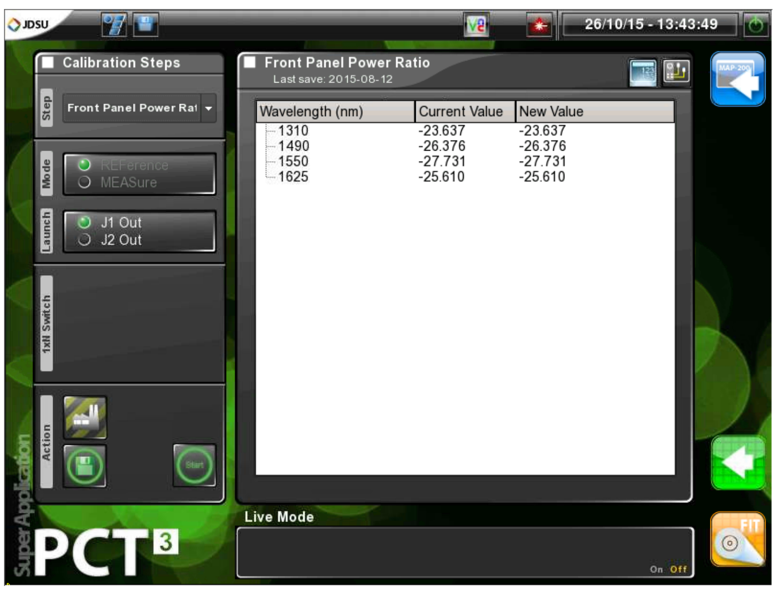
1. Connect the integrating sphere directly to the mORL OPM detector, and connect the fiber adapter that you will be using to the integrating sphere. If you are using a regular fiber adapter only, then connect it directly to the mORL OPM detector.

2. At the main PCT application screen, click Configuration Setup.

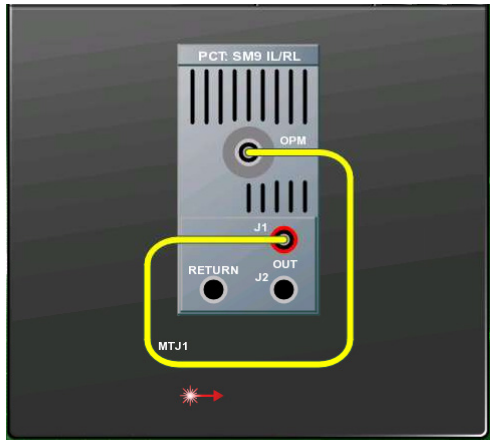


3. If your mORL has the bidirectional option, check the box next to “Enable J2 Out” and then click the Cal button on right to enter the Calibration page

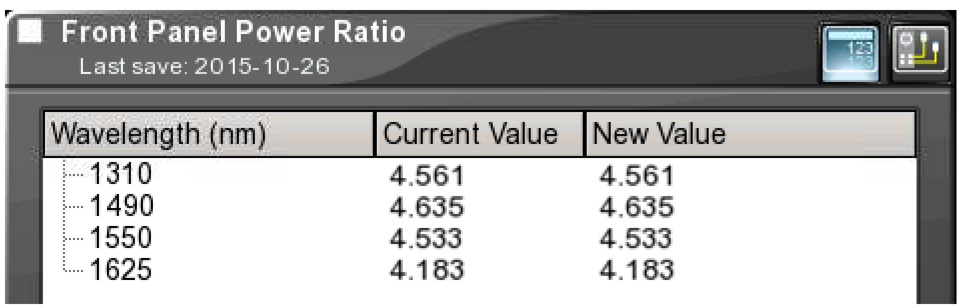
4. Under Calibration Steps, select “Front Panel Power Ratio” for the Step, “Reference” for the Mode, and “J1 Out” for the Launch path.



5. Connect MTJ1 between the J1 port and OPM.



6. In the Action section, click the “Start” button and when the measurement is completed, click the “Save” button to save the new front panel power ratio values.


Front Panel Power Ratio
Last save: 2015-10-26

Wavelength (nm)	Current Value	New Value
1310	4.561	4.561
1490	4.635	4.635
1550	4.533	4.533
1625	4.183	4.183

7. Repeat steps 4 to 6 for J2 out if applicable.

8. When the calibration has been completed, click the return button at the lower right of the screen to button to go back to the Configuration Setup screen, and click it again to go back to the main PCT application screen.

Chapter 12: PCT Database Management

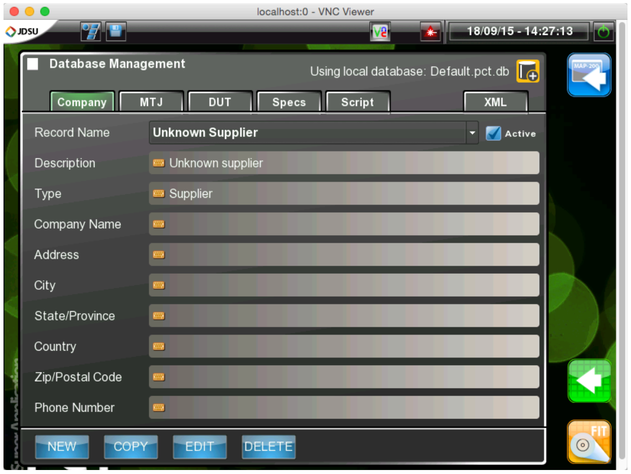
A default database is included with every MAP-200. This may be sufficient for your needs. However, over time you may want to create a new empty database, copy parts of a database to a new smaller database, or export data to other tools.

This chapter describes how to create a new database, how to copy an existing database, and how to export or import data to or from a MAP-200 PCT database.

Create a New Empty Database

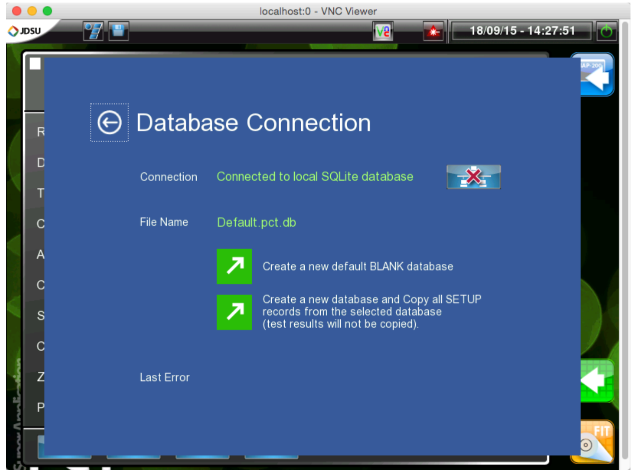
1. Click on the “Database Management” button on the PCT home screen.

   A screen similar to the following will appear.



2. Click on the “Database” icon in the upper right-hand corner of the screen.

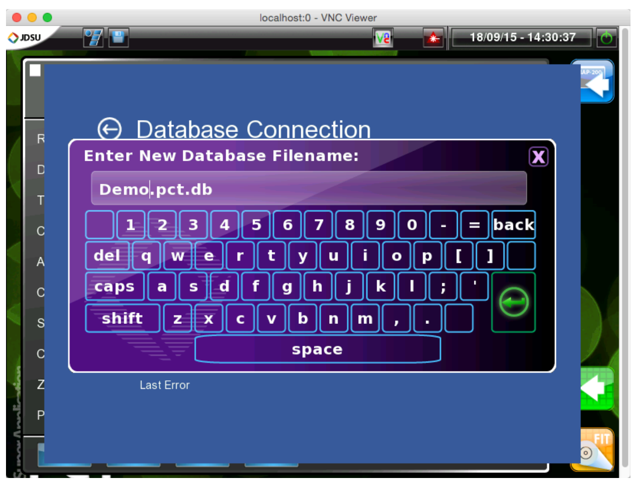
   A screen similar to the following will appear:



3. Click on “Create a new default BLANK database”.

   You can also copy or edit an existing database if you like.

   A screen similar to the following will appear:

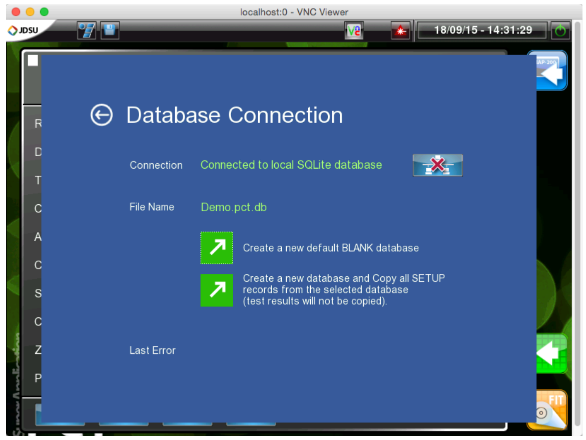


4. Fill in the name of your new database and press the green “Return” button on the keyboard.

   In this example we have typed “Demo.pct.db”.

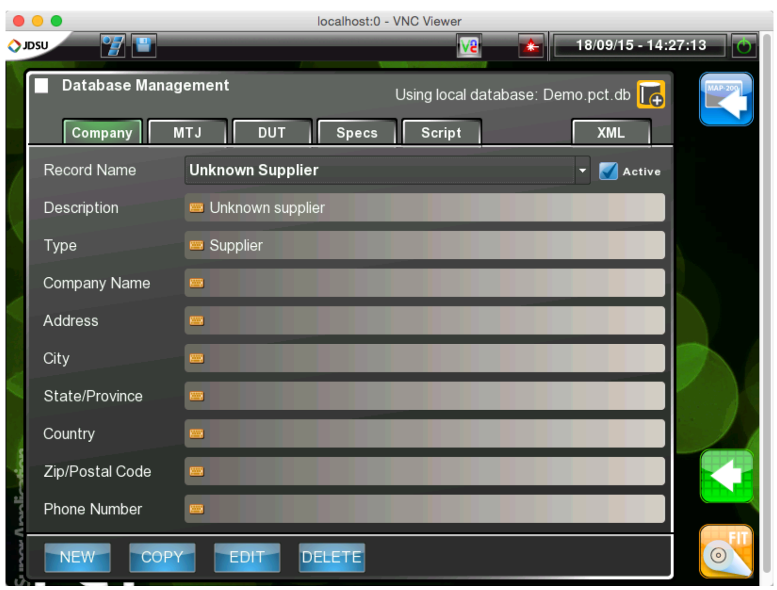
Note: The filename extension ".pct.db" will be automatically appended to the name you type.

A screen similar to the following will appear showing the name of your new database, ready to use from your script.



5. Click on the return arrow in the upper left of the screen to return to the database home page.

A screen similar to the following will appear.



Notice that the name of your database appears in the upper right-hand corner of the screen.

Copy a Database into a New Database

1. Click Database Management on the main PCT3 application screen to access the Database Management screen.

NOTE: You must be logged in as Supervisor to access Database Management

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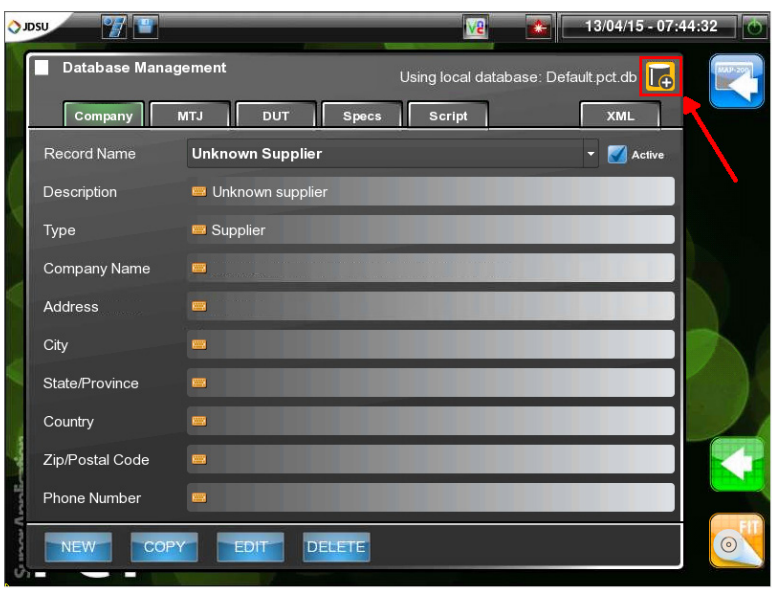
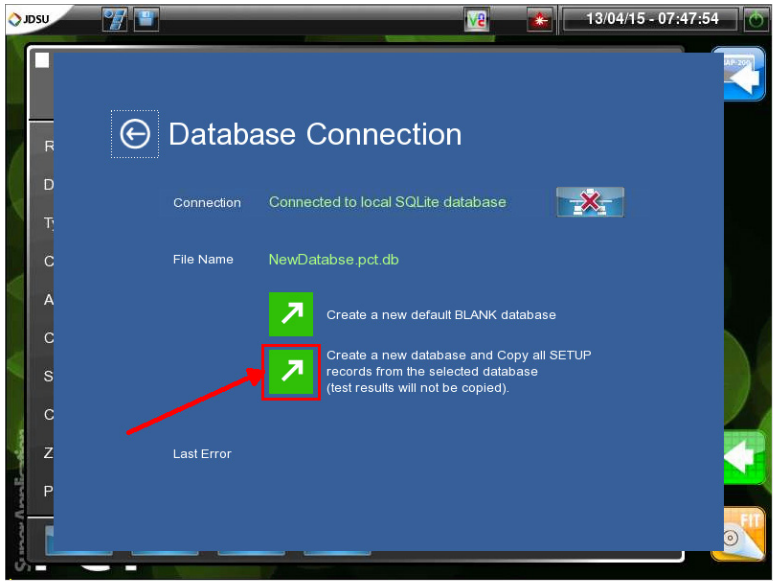
2. Click the database icon in the top right corner of the Database Management screen

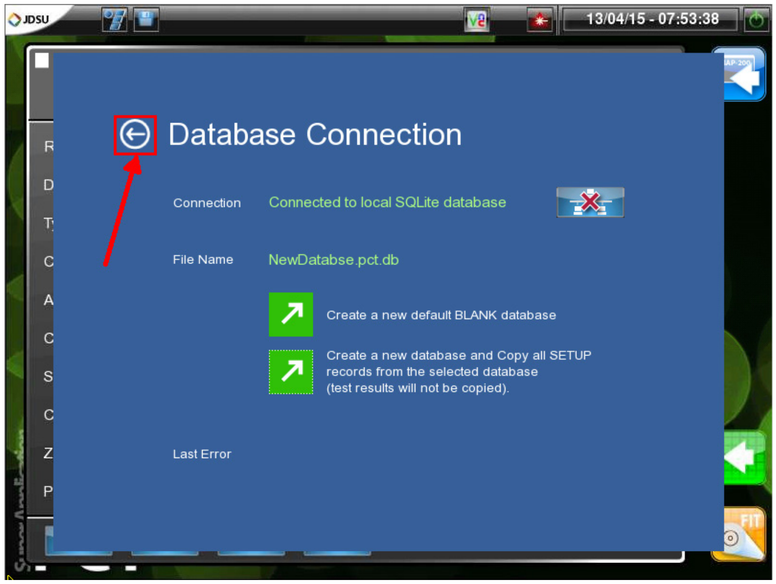


3. Click the button for “Create a new database and Copy all SETUP records…”

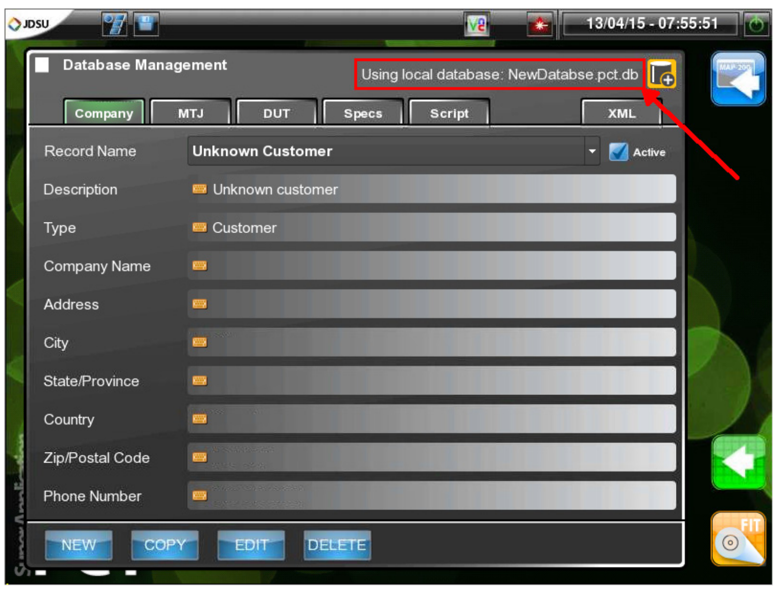


4. Enter a name for the new database and press the green “Return” key

5. Click the left arrow next to Database Connection to return to the Database Management screen

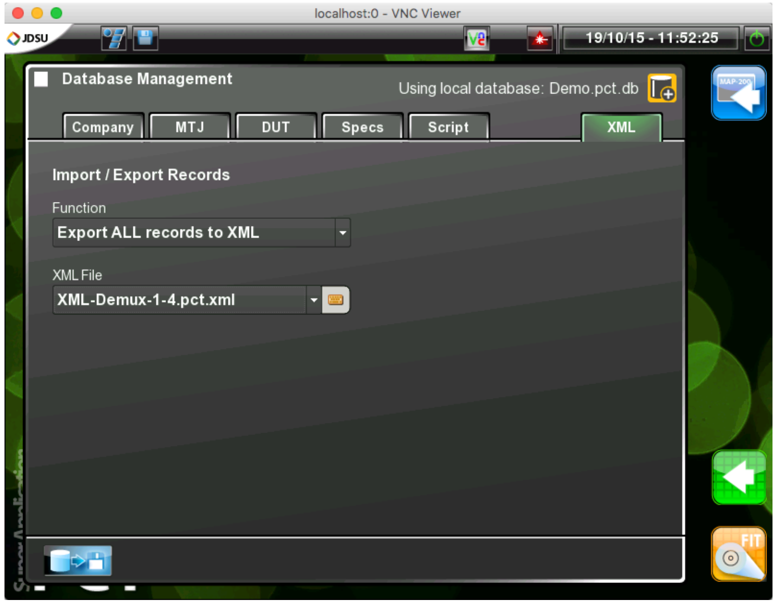


The newly created database will now be the current one used, and includes all of the SETUP records (i.e. Company, MTJ, DUT, Specs and Script) from the old database. Scripts can be edited and/or deleted at this point if desired.



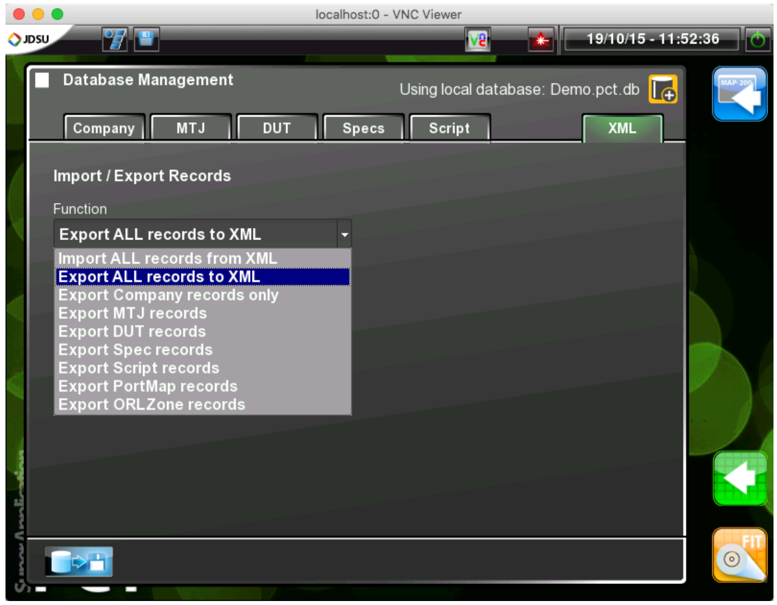
Exporting Data using the XML Tab

The “XML” tab in the database management interface can be used to export all or selected database records to an XML file or import records from an XML file generated by another database.



XML import/export options are:

- Import all records from XML – imports all records from XML generated by another database. If the XML file only contains records for, say, DUTs, only the DUT records are imported.
- Export all records to XML – exports all records to an XML file.
- Export Company records only – exports only the Company records.
- Export MTJ records – exports only the MTJ records.
- Export DUT records – exports only the DUT records.
- Export Spec records – export only the Spec records.
- Export Script records – exports only Script records.
- Export PortMap record – export only the PortMap records.
- Export ORLZone record – this application is only used for mORL cassette.

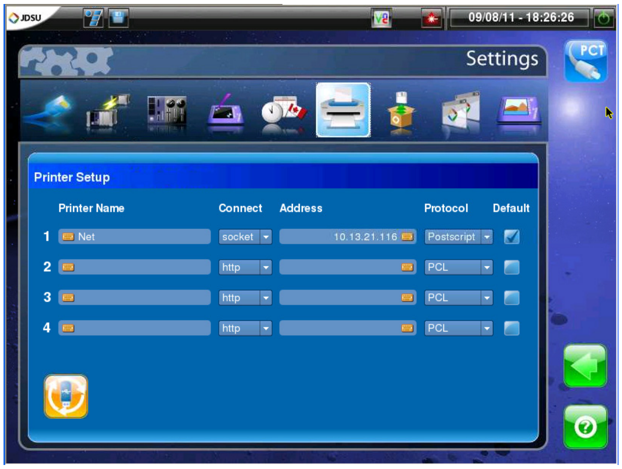

localhost:0 - VNC Viewer
19/10/15 - 11:52:36
Database Management
Using local database: Demo.pct.db
Company
MTJ
DUT
Specs
Script
XML
Import / Export Records
Function
Export ALL records to XML
Import ALL records from XML
Export ALL records to XML
Export Company records only
Export MTJ records
Export DUT records
Export Spec records
Export Script records
Export PortMap records
Export ORLZone records

Chapter 13: Printers and Printing (Optional)

Procedure: Printer Setup

1. Go to the MAP-200 Settings page, select printers and enter the information similar to the below screen capture for the printers intended to use.

Note: The Brother printer needs to be purchased separately.



Procedure: Printing Reports and Labels (Optional)

1. Under “Application Tools” select “Reports and Labels”

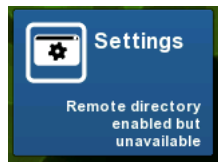
2. This will take you to the “Report and Labels” page. On the “Filters”  tab, the user can filter which scripts to print by script name, DUT name, customer, or tester based on all dates or a specific start and end date.

3. Once an item has been filtered, press the “Update” button to refresh the “Script test” list box. Then select one of the tests to update the DUT list. Check all the DUT’s for which you want to print a report. The Report/Label template combo-box is populated with any print steps that were defined in the test script – but you can edit any of these to print different reports by clicking the “keyboard” icon.

4. Choose the Report or Label Template for the report or printer to be used.
5. Choose the print functionality from the printer icon pull down menu.

Chapter 14: PCT Settings and Factory Defaults

The “Settings” button on the PCT home screen gives you access to control the basic operation of the PCT application.

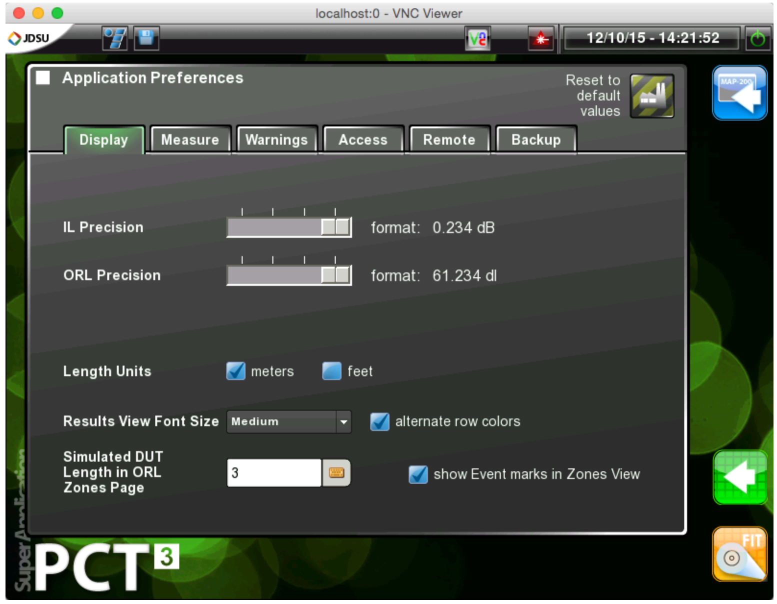


To reset everything to the default factory settings, click this icon after clicking “Settings”

Display Preferences

Display preferences control

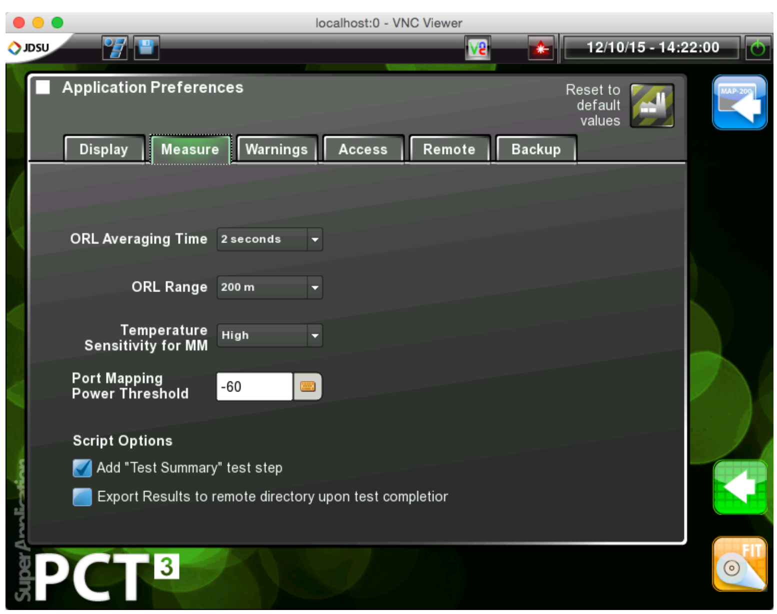
- fonts and units displayed
- the precision displayed on various screens and
- some characteristics of the ORL Zones interface.



Measure Preferences

Measurement preferences control

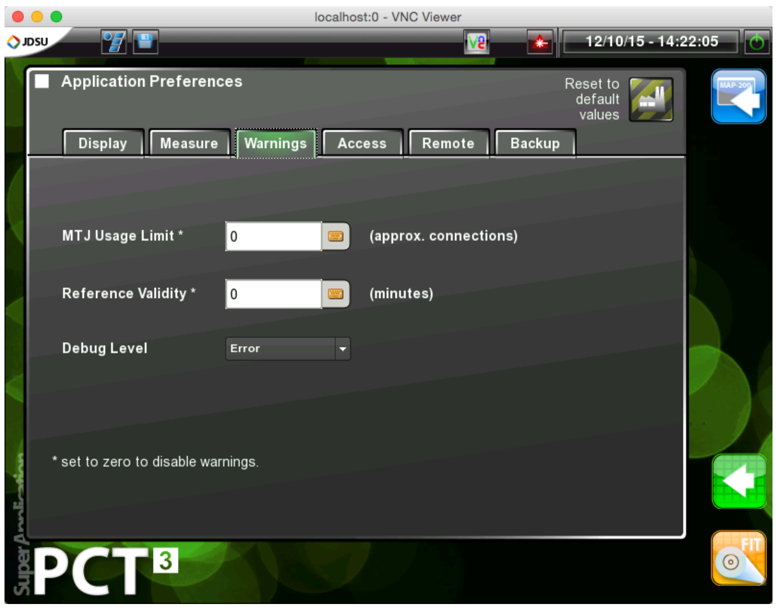
- ORL averaging time
- ORL range
- Temperature sensitivity
- Port mapping power threshold
- And some script options such as adding a test summary to reports.



Warning Preferences

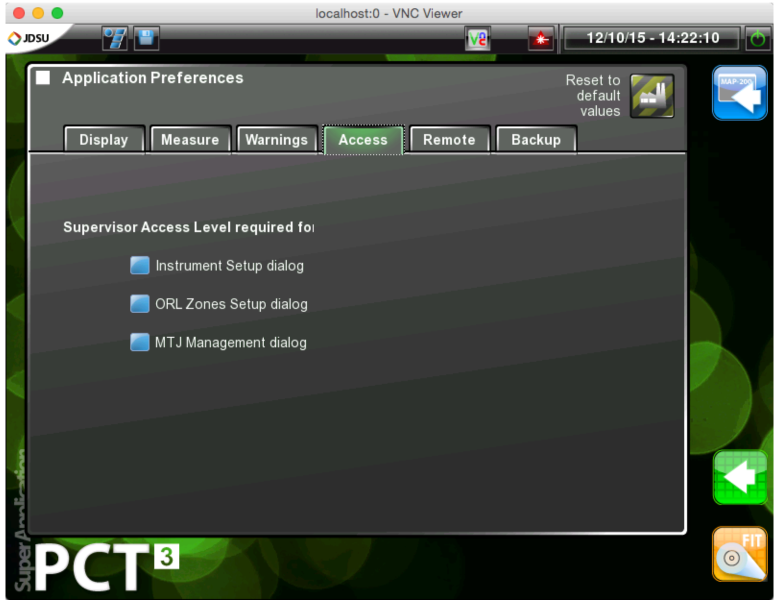
Warning preferences allow you to set

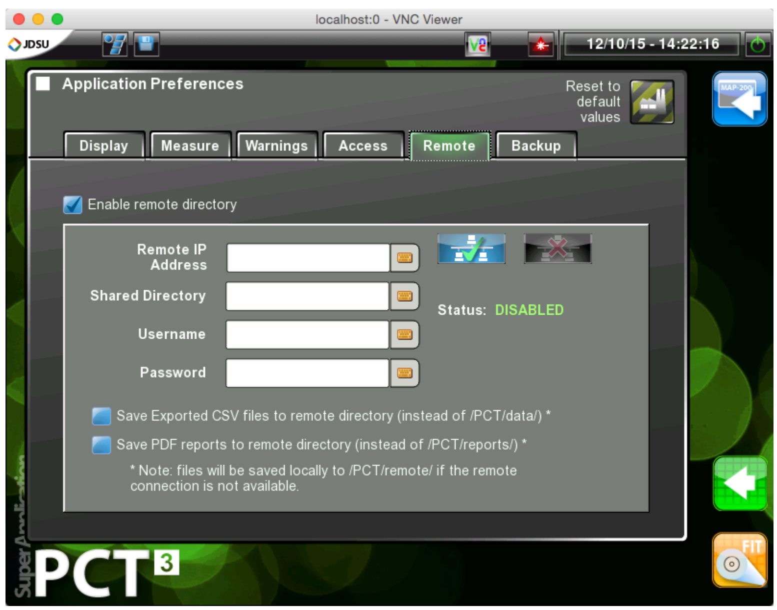
- an MTJ usage limit (never use an MTJ for more than XX measurements) – zero indicates no limit,
- a time in minutes for reference validity – zero indicates no limit, and
- a debug level.



Access Preferences

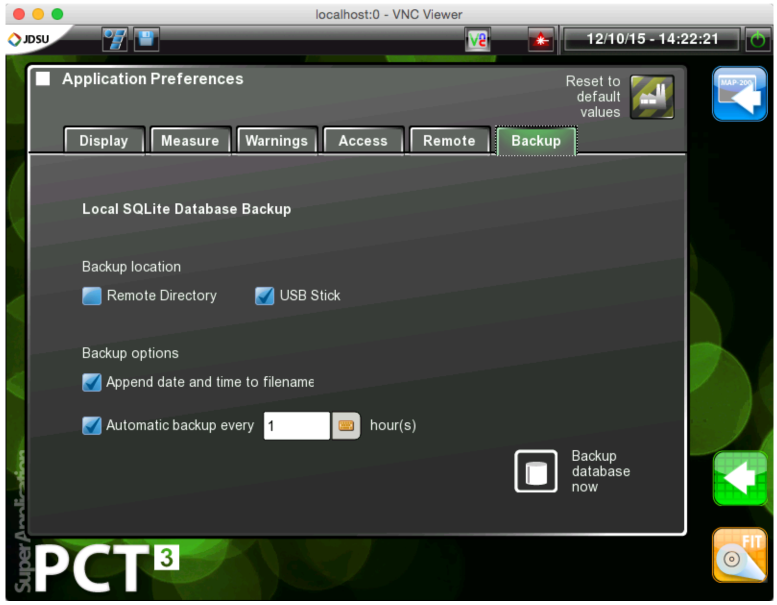
This defines which interfaces require supervisor access.





Backup Preferences

Backup preferences specify various options for backing up the database(s).


localhost:0 - VNC Viewer
JDSU
12/10/15 - 14:22:21
Application Preferences
Reset to default values
Display
Measure
Warnings
Access
Remote
Backup
Local SQLite Database Backup
Backup location
Remote Directory
USB Stick
Backup options
Append date and time to filename
Automatic backup every
1
hour(s)
Backup database now
PCT 3

Chapter 15: Firmware Update

General Requirements

The procedures in this chapter have these general requirements:

1. Empty/blank USB flash drive (memory stick) formatted for FAT32 file system.
2. MAP-200 firmware (Zip) file if updating a MAP-230 and/or MAP-280 chassis. For instructions a getting the ZIP file please contact Viavi Technical Support.
3. MAP-220 firmware (Zip) file if updating a MAP-202, MAP-204 and/or MAP-220 chassis. For instructions a getting the ZIP file please contact Viavi Technical Support.
4. Access to the GUI of the MAP-230/280 chassis (i.e. through local display and mouse control, or remote VNC) if updating that chassis model.
5. Physical access to MAP-202/204/220 chassis touchscreen, or remote VNC access to its GUI, if updating that chassis model.
6. Physical access to a free USB port on the MAP-202/204/220 and/or MAP-230/280 chassis that will be updated.

Updating the MAP-230/280 Firmware

This section describes the procedure for updating firmware on a MAP-230 or MAP-280 chassis. It assumes

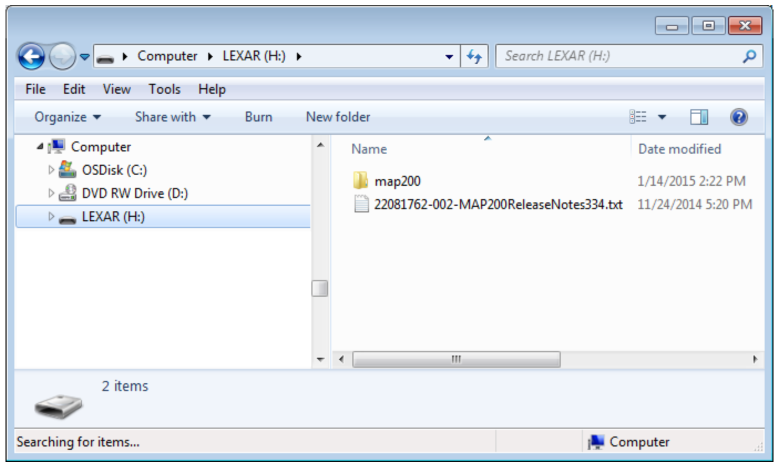
- the firmware update ZIP file is located on your PC.
- you have basic disk, folder and file management skills, and
- you have access to the GUI of the MAP-230/280 you will update.

1. Insert the USB flash drive into your PC.

   Ensure the USB flash drive is blank/empty and formatted for FAT32. If unsure, format its file system for FAT32 at this time (see Formatting a USB Flash Drive for FAT32 (Windows OS)" on page 115.

2. Navigate to where you stored the MAP-200 firmware (Zip) file and unzip its contents to the root of the USB flash drive. When done, the USB flash drive view of the root folder in Windows File Explorer (right pane) should be as in the figure below.

Figure 16: USB flash drive folder view after extracting MAP-200 firmware Zip file contents



3. Remove the USB flash drive from your PC.

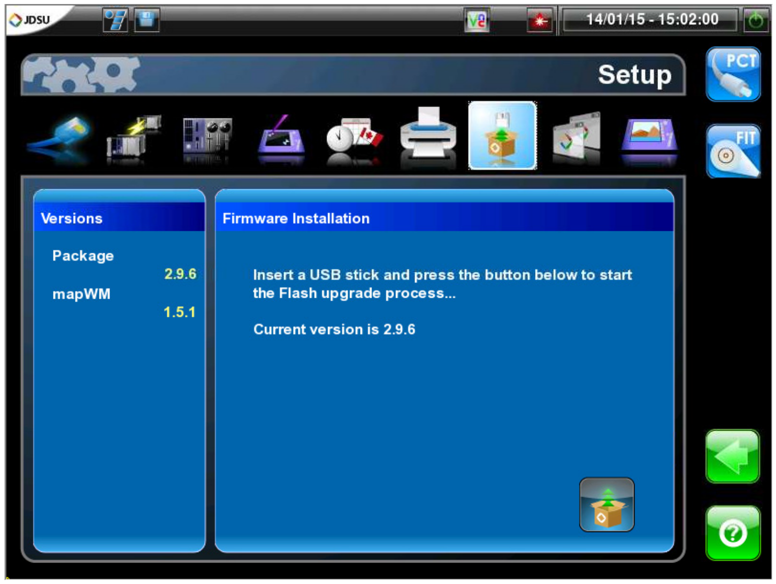
4. Insert the USB flash drive into a free USB port on the MAP-230/280 chassis.

5. Click the Settings icon on the MAP-200 main GUI page.

Figure 17: MAP-200 main GUI page (before update)

6. Select the “Firmware Installation” page.

Figure 18: MAP-230/280 Firmware Installation page



7. Click the firmware installation button in the lower right corner of the page. A dialog window will open and software will check for USB media containing an available flash upgrade.

   If software does not find a valid flash upgrade, a message is displayed indicating the query failed and the USB media does not have a valid upgrade package.

Figure 19: MAP-230/280 checking for flash upgrade window (query failed)

Note: Possible reasons for the upgrade query to fail:
- — USB flash drive not plugged into chassis or not detected
- — USB flash drive file system not formatted as FAT32
- — USB flash drive does not contain the MAP-220 firmware file(s)
- — Contents of the MAP-220 firmware (Zip) file were not extracted to the root of the USB flash drive, that is the files reside in a subfolder instead of the root.

If software detects a valid flash upgrade, you will be prompted with an upgrade message that includes the version found.

Figure 20: MAP-230/280 checking for flash upgrade screen (query successful)

8. Confirm the version is correct and click the green checkmark button to start the update.

   A status bar will appear in the dialog window displaying the elapsed time to indicate the update has started and is progressing.

Figure 21: MAP-230/280 flash upgrade in progress screen

NOTE: The firmware update may take up to 25 minutes to complete, or possibly longer depending on the current software version installed on the chassis.

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9. When the "Upgrade Successful" message appears in the dialog window, remove the USB flash drive from the MAP-230/280 chassis and click the green power button to shut down the chassis.

Figure 22: MAP-230/280 flash upgrade successful window

10. Press the silver power button on the front of the controller to restart the chassis. Once it has booted, the upgrade is complete.

11. Verify the firmware was updated by confirming the new software version is displayed under System Info on the MAP-200 main page of the GUI.

Figure 23: MAP-200 main GUI screen (after update)

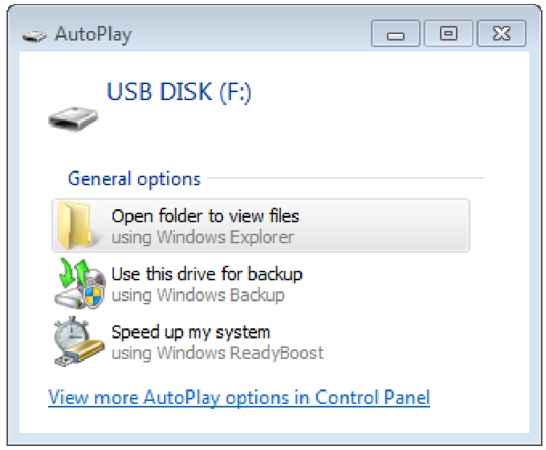
Formatting a USB Flash Drive for FAT32 (Windows OS)

This section describes the general procedure for formatting a USB flash drive for FAT32 within the Windows operating system environment to prepare it for the MAP-2xx firmware update.

1. Insert the USB flash drive into your PC.

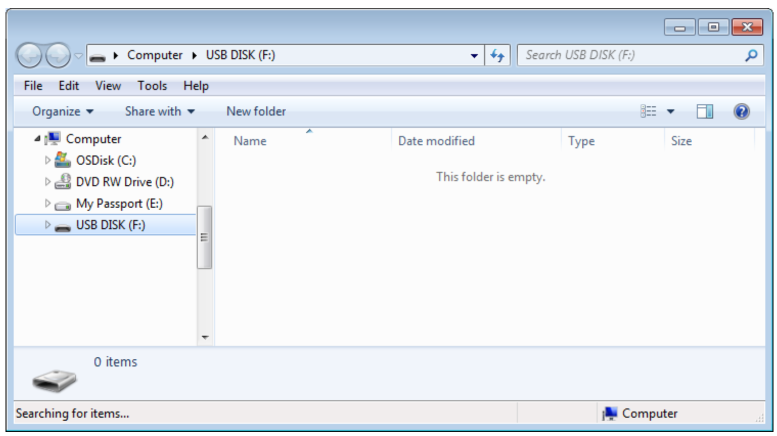
2. If an AutoPlay dialog window appears, select “Open folder to view files” to open Windows Explorer to the flash drive location

Figure 24: Windows AutoPlay window (after USB flash drive inserted into PC)



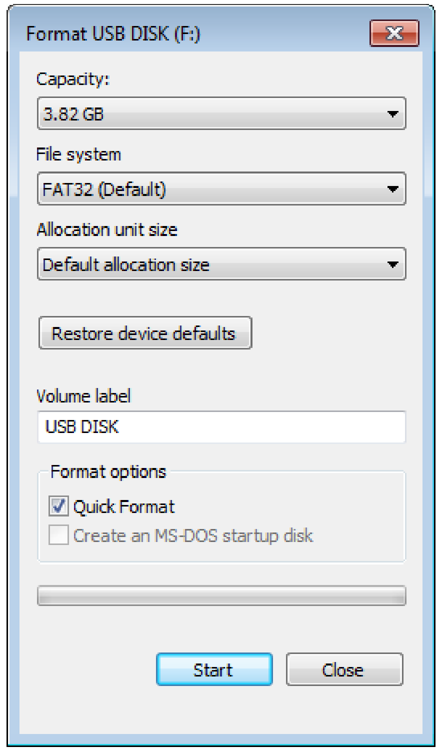
Otherwise, open Windows Explorer and navigate to the USB flash drive

Figure 25: Windows Explorer window (open to USB flash drive location)



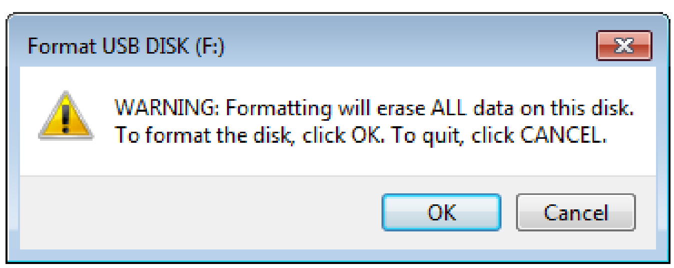
3. Right-click on the USB flash drive name in the left pane (USB DISK (F:) in the above example), select “Format…” from the menu to open the Format dialog window, set the File System to “FAT32”, set the Allocation unit size to “Default allocation size”, and select Quick Format under Format options.

Figure 26: Windows Format dialog window (formatting USB flash drive)



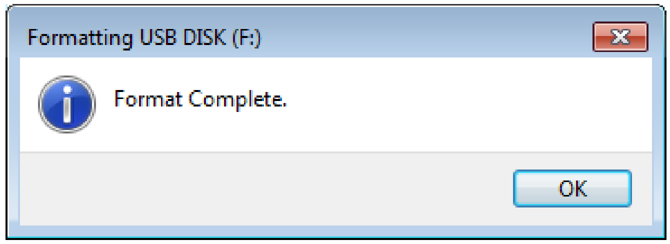
4. Click the Start button to initiate the format
5. Click the OK button in the warning dialog that is displayed

Figure 27: Windows Format Warning dialog window



6. Click the OK button in the format complete dialog displayed when the format has finished

Figure 28: Windows Format Complete dialog window



7. Click the Close button in the format dialog window

   The USB flash drive is now ready to accept the MAP-2xx firmware.

Chapter 16: Maintenance

Changing the Controller/Power Module

If the controller and power supply module assembly is believed to be defective, it will be replaced as one assembly.

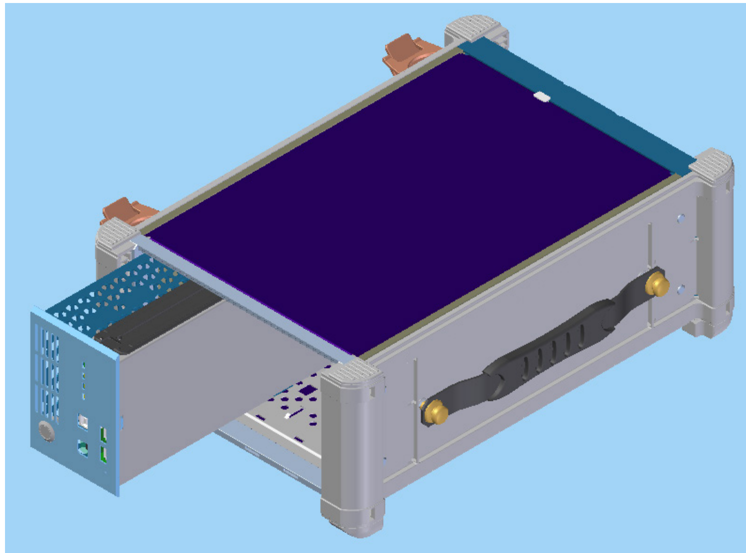
WARNING

Disconnect electrical power to the chassis at least 30 seconds prior to removing the power supply. Failure to do so may result in electrical shock.

Perform the following steps to remove/install a controller module:

1. Turn the power to the unit to the ‘OFF’ (0) position.
2. Disconnect all cables.
3. Use a screwdriver to unscrew the jack screw at the rear of the unit that holds the controller in place. Unscrewing this screw will eject the controller/power module.
4. Remove the controller module, as shown in Figure 46.
5. Insert the replacement controller module. Re-tighten jack screw.
6. Turn the power to the ‘ON’ (I) position.

Figure 29: Changing the Main Controller Module



Chapter 17: Remote Commands

Definitions

Term	Definition
Card	Refers to a removable component of the MAP shelf providing a specific functionality related to optical testing and/or measurement. The term card and cassette may be used interchangeably.
Chassis	Refers to the MAP enclosure that houses cards.
CI	Cassette Interface. This is a common component of all MAP cassettes.
Device	The part of a card that is individually addressed and controlled to perform a particular action based on card type.
MAP200	Multiple Application Platform 200. Refers to one or more shelves which house and control modular cards to form a system.
Module	Refers to an element, usually addressable, on a card.
SCPI	Standard Commands for Programmable Instruments.
Slot	One of eight physical areas where a card may be inserted within a MAP chassis.
PCT	Passive Component Tester – refers to the MAP-200 module that performs IL and ORL measurements using OTDR technology (also known as the mORL module). This also refers to the super-application that runs this module.
OTDR	Optical Time Domain Reflectometer
IL	Insertion Loss (dB)
ORL	Optical Return Loss (dB)

SCPI Commands

All the SCPI commands listed below can be performed through TCP/IP or through GPIB via the MAP-200 controller (with extra parameter used to specify slot number) or through LXI.

This section lists a summary of the PCT commands. For more detailed descriptions, refer to the appendices.

IEEE 488.2 Common Commands

Command	Parameter	Response	Minimum	Maximum
*CLS	N/A	N/A	N/A	N/A
*ESE	NRf	N/A	0	255
*ESE?	N/A	NRf	0	255
*ESR?	N/A	NRf	0	255
*IDN?	N/A	String	N/A	N/A
*OPC	N/A	N/A	N/A	N/A
*OPC?	N/A	NRf	1	1
*OPT?	N/A	String	N/A	N/A
*RST	N/A	N/A	N/A	N/A
*SRE	NRf	N/A	0	255
*SRE?	N/A	NRf	0	255
*STB?	N/A	NRf	0	255
*TST?	N/A	NRf	0	1
*WAI	N/A	N/A	N/A	N/A

MAP-200 Cassette Common Commands

Command	Parameter	Description
:BUSY?		Query card busy state
:CONFig?		Query configuration information of all devices on the card
:INFOrmation?		Query card information
:RESet		Reset all devices on the card to their default states
:TEST?		Performs a self-test of all devices on the card
:FAULt		
:SLOT?		Query the Slot Fault Register
:DEVice?	<D>	Query the Device Fault Register
:STATus		
:DEVice?	<D>	Query the Device Status Register
:RESet	<D>	Clear specific bits in the Device Status Register
:DEVice		
:INFOrmation?	<D>	Query the device information

Command	Parameter	Description
:SYSTem		
:ERRor?		Query the error queue
:WARNing?		Query the warning queue

OPM Commands

The PCT supports the following subset of the MAP-200 OPM cassette commands.

Command	Parameter	Description
:FETCh		
:POWer?		Query the last power measurement in OPM mode.
:LOSS?		Query the last IL measurement in OPM mode.
:ORL?		Query the last ORL measurement in OPM mode
:SENSe		
:POWer		
:DARK		Perform a dark power measurement.
:FACTory		Reset to factory dark level.
:DARK?		Query if dark measurement was performed since last reset.
:MODE	<Mode>	Set power meter mode.
:MODE?		Query power meter mode.

PCT Commands

Command	Parameter	Description
*REM		Initiate communication with this device.
*ACTIVE?		Query if the PCT cassette is the active one.
:SENSe		
:FUNCtion	<Mode>	Set the measurement mode.
:FUNCtion?		Query the measurement mode.
:ATIMe	<Secs>	Set the averaging time in seconds.
:AVAilable?		Query the available averaging times.
:ATIMe?		Query the averaging time.
:RANGe	<Range>	Set the DUT range (200m, 500m, 1km, 2km, 5km,

Command	Parameter	Description
		10km).
:RANGe?		Query the DUT range.
:ILONly	<State>	Sets the “IL Only” measurement option.
:ILONly?		Queries the “IL Only” measurement option.
:TEMPerature	<Sens>	Sets the temperature sensitivity setting.
:TEMPerature?		Queries the temperature sensitivity setting.
:OPM	<index>	Sets the OPM to use for IL measurements.
:OPM?		Queries the OPM used to make IL measurements.
:SOURce		
:WAVelength	<Wave>	Set the wavelength to use for measurement.
:AVAilable?		Query the available wavelengths.
:WAVelength?		Query the wavelength to use for measurement.
:WARMup	<Wave>	Set the wavelength to warm up for next measurement.
:WARMup?		Query the wavelength to warm up for next measurement.
:CONTinuous	<State>	Set the continuous scanning mode option.
:CONTinuous?		Query the continuous scanning mode option.
:PATH		
:LAUNch	<Port>	Set the source launch port.
:AVAilable?		Query the number of available launch ports.
:LAUNch?		Query the source launch port.
:CHANnel	<SW>,<Ch>	Set the channel for the specified 1xn switch.
:AVAilable?	<SW>	Query the channel count for the specified 1xn switch.
:CHANnel?	<SW>	Query the channel for the specified 1xn switch.
:CONNection	<MTJ>	Set the MTJ connection mode.
:CONNection?		Query the MTJ connection mode.
:RECeive	<State>	Set the “receive” jumper usage.
:RECeive?		Query the “receive” jumper usage.
:DUT		
:LENG	<Length>	Set the “DUT Length Estimation” value.
:LENG?		Query the “DUT Length Estimation” value.
:LENG:AUTO	<State>	Set the “DUT Length Estimation” usage.
:LENG:AUTO?		Query the “DUT Length Estimation” usage.

Command	Parameter	Description
:JUMPer		
:IL	<Group>,<Channel>,<IL>	Set the MTJ IL override value.
:AUTO	<Group>,<Channel>,<State>	Set the MTJ Auto IL setting.
:AUTO?	<Group>,<Channel>	Query the MTJ Auto IL setting.
:IL?	<Group>,<Channel>	Query the MTJ override IL value.
:LENGth	<Group>,<Channel>,<Length>	Set the MTJ override length value.
:AUTO	<Group>,<Channel>,<State>	Set the MTJ Auto length setting.
:AUTO?	<Group>,<Channel>	Query the MTJ Auto length setting.
:LENGth?	<Group>,<Channel>	Query the MTJ override length value.
:RESet	<Group>,<Channel>	Resets the MTJ to default settings.
:MEASure	<Group>,<Channel>	Resets the MTJ measured values.
:PMAP		Port Mapping commands branch.
:ENABle	<State>	Turn on the Port Mapped channel selection.
:ENABle?		Query if Port Mapped channels are enabled.
:PATH		
:SIZE?		Query the number of paths in the port map table.
:LINK?	<Path>	Query the channel link for a path in the port map table.
:SELect	<Path>	Select a path from the port map table.
:SELect?		Query the currently selected path in the port map table.
:SETUP		
:INIT		
:RANGe	<Start1>,<Start2>,<Size>, <Mode>	Initialize the port map table based on channel ranges.
:LIST	<List1>,<List2>,<Mode>	Initialize the port map table based on channel lists.
:LINK	<FixedCh>,<VariableCh>	Create a channel link in the port map table.
:LOCK		Lock a variable table.
:LOCK?		Query the lock status of a table.
:RESet		Reset all channel links in the port map table.
:SIZE?		Query the number of rows (paths) in the port map

Command	Parameter	Description
		table.
:MODE?		Query the port map table mode.
:FIRSt?	<SW>	Query the first defined channel of a switch.
:LAST?	<SW>	Query the last defined channel of a switch.
:LIST?	<SW>	Query the list of defined channels of a switch.
:MEASure		
:ALL		Discover all channel links in the port map table.
:LIVE	<Ch>	Discover the channel link for a specified live channel.
:LIVE?	<Ch>	Query the channel link for the specified live channel.
:VALid		Validate all channel links in the port map table.
:VALid?		Query if the port map table is valid.
:MEASure		
:RESet		Resets all DUT and Reference measurement values.
:POWer?		Query the power in dBm for the current measurement setup.
:DISTance?		Query the distance to end of fiber in meters for the current measurement setup.
:LENGth?		Query the MTJ length or the DUT length in meters for the current measurement setup.
:IL?		Query the DUT Insertion Loss, or REF mode Insertion Loss in dB for the current measurement setup.
:ORL?	<Method>,<Origin>, <A>,<B>	Query the DUT Optical Return Loss in dB for the last measurement setup.
:ORL:PRESET?	<Origin>	Query the preset DUT Optical Return Loss in dB for the last measurement setup.
:ORL:ZONE?	<zone>	Query the ORL value of the defined zones 1 or 2 for any measurement setup.
:STARt		Initiate a measurement cycle.
:STOP		Abort current measurement cycle.
:STATe?		Query the measurement state.
:REF2step	<State>	Set the 2-step bi-directional referencing option state.
:REF2step?		Query the 2-step bi-directional referencing option state.

Factory Commands

Command	Parameter	Description
:FACTory		
:RESet	<Step>	Reset the calibration step values to factory defaults.
:COMMit	<Step>	Commit the calibration step new measurement values.
:ARTifact		
:LOSS	<List>	Set the artifact insertion losses for each wavelength.
:LOSS?		Query the artifact insertion losses.
:ORL	<List>	Set the artifact return losses for each wavelength.
:ORL?		Query the artefact return losses.
:MEASure		
:STARt	<Step>	Start the calibration step measurement.
:FPDistance?	<ILF>	Query the Front Panel distances.
:FPLoss?	<ILF>	Query the Front Panel insertion losses.
:FPRatio?	<ILF>	Query the Front Panel Power Ratio.
:LOOP?	<ILF>	Query the Loopback Length/IL.
:ARTLoss?	<ILF>	Query the Artifact connector losses.
:CALK?	<ILF>	Query the K calibration values.
:CALT?	<ILF>	Query the DeltaT calibration values.
:SWDistance?	<Ch>,<ILF>	Query the 1xn Switch channel distances.
:SWLoss?	<Ch>,<ILF>	Query the 1xn Switch channel insertion losses.
:OPMP?	<index>	Query the Remote OPM Pairing offsets.
:SETup		
:SWITch	<SW>	Sets the Switch to calibrate.
:SIZE	<SW>,<Size>	Sets the channel count for an external Switch.
:SWITch?		Query the current calibrated switch.
:CONFIG		
:SWITch	<SW>,<Address>	Set the MAP or USB address of the SW1 or SW2 switch.
:SWITch?	<SW>	Query the MAP or USB address of the SW1 or SW2 switch.
:BIDir	<State>	Set the Bi-Directional option.
:BIDir?		Query the Bi-Directional option.
:CORE	<Core>	Select the Core (Dual Core modules only).

Command	Parameter	Description
:CORE?		Query the Core selection.
:LPOW	<State>	Set the Low Power option.
:LPOW?		Query the Low Power option.
:OPM	<Address>	Set the MAP address of the remote OPM cassette.
:OPM?		Query the MAP address of the remote OPM cassette.
:CALibration?		Query if the PCT module is calibrated
:DATe?		Query the calibration date of the PCT module.

Chapter 18: Common Commands

*CLS

Description

This command will clear the following queues and registers.

1. SCPI command error queue
2. Standard event status register (ESR)
3. Status byte register (STB) except MAV bit

If this command is issued to the CMR (chassis controller, TCP port number 8100 or GPIB), only the chassis-level error queue and registers will be affected: if it is issued to an application, the error queue and registers for the application will be affected.

Input Format

```
*CLS
```

Output Format

None.

Errors

Standard error messages.

Example

The following example illustrates the syntax of the CLS command.

Terminal input:

```
*CLS
```

*ESE

Description

Sets the bits in the Standard Event Status Enable register that will determine which events are reflected in the event summary bit (ESB) of the standard status register. The numeric value is converted to a binary number. The bits of the register are set to match the bit values of the binary number.

If bits are set TRUE in the standard event status enable register and a corresponding bit is set TRUE is the standard event status register, the ESB bit (bit 5) of the status byte register will be set TRUE.

Input Format

```
*ESE <Register Value>
```

Parameter	Type	Value
Register	Numeric	0 <= value <= 255

Standard Event Status Enable Register							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Power on (PON)	User request (URQ)	Command error (CME)	Execution error (EXE)	Device dependent error (DDE)	Query error (QYE)	Request control (RQC)	Operation complete (OPC)

Bit 0: operation complete
Bit 1: request control – not supported
Bit 2: query error. It is set when a query error occurs, for example, an attempt is made to read the output queue when the output queue is empty or when the data in the output queue is lost
Bit 3: device dependent error – not supported
Bit 4: execution error
Bit 5: command error. it is set when a command error is detected by the system, for example, if a syntax error is detected in a program message, an incorrect command header is received, or an IEEE GET message is received in the middle of a program message.
Bit 6: user request – not supported
Bit 7: power on

Output Format

None.

DEFAULT

0 on power cycle.

Errors

Standard error messages.

Example

The following example sets the CMR standard event status enable register bits to 00100000, indicating that the COMMAND ERROR (CME) byte of the event status register

Terminal input:

```
*ESE 32
```

*ESE?

Description

Returns the contents of the Standard Event Status Enable register as an Integer that, when converted to a binary number, represents the bit values of the register.

Input Format

```
*ESE?
```

Output Format

```
<Register Value> (see the details in command *ESE)
```

Parameter	Type	Value
Register	Numeric	0 <= value <= 255

DEFAULT

0 on power cycle.

Errors

Standard error messages.

Example

The following example queries the CMR (chassis controller, TCP port number 8100 or GPIB), standard event status enable register.

Terminal input:

```
*ESE?
```

Terminal response:

```
32
```

The following example queries standard event status enable register of application on slot 4.

Terminal input:

```
*ESE? 4
```

Terminal response:

```
32
```

*ESR?

Description

Returns the contents of the Standard Event Status register as an Integer that, when converted to a binary number, represents the bit values of the register.

Reading the ESR clears it.

Input Format

```
*ESR?
```

Output Format

```
<Register Value>
```

Parameter	Type	Value
Register	Numeric	0 <= value <= 255

Standard Event Status Register							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Power on (PON)	User request (URQ)	Command error (CME)	Execution error (EXE)	Device dependent error (DDE)	Query error (QYE)	Request control (RQC)	Operation complete (OPC)

Bit 0: operation complete
Bit 1: request control
Bit 2: query error. is set when a query error occurs, for example, an attempt is made to read the output queue when the output queue is empty or when the data in the output queue is lost.
Bit 3: device dependent error. It is set by the system to always indicate 0.
Bit 4: execution error
Bit 5: command error. it is set when a command error is detected by the system, for example, if a syntax error is detected in a program message, an incorrect command header is received, or an IEEE GET message is received in the middle of a program message.
Bit 6: user request
Bit 7: power on

DEFAULT

0 on *CLS, *ESR? and power cycle.

Errors

Standard error messages.

Example

The following example illustrates a default value of the ESR.

Terminal input:

```
*ESR?
```

Terminal response:

```
1
```

*IDN?

Description

Queries for the identification.

Input Format

```
*IDN?
```

Output Format

```
Manufacturer,Model,ID,FW
```

Parameter	Type	Value
Manufacturer	String	Viavi
Model	String	<model name>
ID*	String	<ID number>
FW	String	<maj.min.rev>

*ID: for super-applications, this is the application name.

Note: SCPI standard states that the overall length of the IDN? Response shall be less than or equal to 72 characters.

Errors

Standard error messages.

Example

The following example queries the PCT identification String:

Terminal input:

```
*IDN?
```

Terminal response:

```
JDSU,PCT,123456,1.0.0
```

*OPC

Description

This command starts to monitor pending operations, and sets/clears the Operation Complete (OPC) bit in the Standard Event Register as follows:

1. if there is no pending operation, sets the OPC bit to 1;
2. if there are any pending operations, sets the OPC bit to 0. The bit will be set to 1 again when all pending operations are complete;

So, *OPC command is required to enable the OPC bit. To stop monitoring pending operations (disable OPC bit), execute the *CLS command.

Input Format

```
*OPC
```

Output Format

None.

Errors

Standard error messages.

Example

```
*OPC
```

Terminal input:

```
*OPC
```

*OPC?

Description

This command will not return until all of the pending operations are complete. Once it returns, the return value will always be “1”.

For MAP-200, it is important to note that the CMR (chassis controller, TCP port number 8100 or GPIB) does NOT combine the other levels of OPC (tool-box app. or super app.)

Input Format

```
*OPC?
```

Output Format

```
<Status>
```

Parameter	Type	Value
Status	Numeric	1 = Operation Complete

Errors

Standard error messages.

Example

The following example queries the state of the operation.

Terminal input:

```
*OPC?
```

Terminal response:

```
1
```

The response will always indicate a 1.

*RST

Description

Reset the instrument unit(s) in the MAP-200 system. The behaviors are different upon the level of this command is issued:

1. If the command is sent to CMR or GPIB
    - The System (CMR) subsequently issues an individual *RST to each tool-box application running on the MAP-200 except those are locked. Only the owner of the locked applications can send this command to the locked applications;
    - The CMR subsequently issues an individual *RST to each super application and the super applications will subsequently issues an individual *RST to each tool-box application it locked. If the super applications are locked, only the lock owner can issue this command to them;
    - All the software (processes) running on the chassis controller will not be restarted
    - All the TCP/IP connections, socket servers and clients, will be maintained
    - The System (CMR) IEEE488 Standard Event Status Register (ESR), Service Register (ESE), Event Status Enable Register (SRE), STB settings and error queue settings for the system will NOT be effected
    - All the other registers, and variables will be reset to their default values
    - Application Locking status will be maintained
    - If the command is sent to a tool-box application,
    - Toolbox applications will reset their respective cassettes via a hard reset for existing MAP cassettes.
    - Toolbox applications default their data (power, wavelength, states, etc) and re-establish communication with the Cassette.
    - The Toolbox application will not be restarted
    - The Toolbox IEEE488 Standard Event Status Register (ESR), Service Register (ESE), Event Status Enable Register (SRE), STB settings and error queue settings for the application will NOT be affected.
    - All the other registers, and variables will be reset to their default values
    - All TCP/IP Connections will be maintained.
    - Application Locking will be maintained

2. SuperApp Item Reset

    A Super Application reset can be initiated by the following mechanisms:

    - Remotely via LXI system level connection, GPIB or System (CMR) Socket connection when a ***RST** is received
    - Locally the SuperApp GUI will have a **Reset Button**

    A SuperApp reset will have the following effects:

    - The SuperApp subsequently issues an individual ***RST** to each Toolbox application currently locked by the Super Application
    - SuperApps default their data (power, wavelength, states, etc.) and wait for the ToolBox Applications to indicate they are ready.
    - The SuperApps will <u>not</u> be restarted

- The SuperApps IEEE488 Standard Event Status Register (ESR), Service Register (ESE), Event Status Enable Register (SRE), STB settings and error queue for the system will NOT be effected
- All TCP/IP Connections will be maintained.
- LXI or Application Locking will be maintained

Input Format

```
*RST
```

Output Format

None.

Errors

Standard error messages.

Example

```
*RST
```

Terminal input:

```
*RST
```

*SRE

Description

Sets the bits in the Service Request Enable register. The numeric value is converted to a binary number. The bits of the register are set to match the bit values of the binary number.

The Service Request Enable register determines which bits of the Status Byte Register are enabled. Enabled bits are ORed together, and the result is reported to the Master Summary Status.

Input Format

```
*SRE <Register Value>
```

Parameter	Type	Value
Register	Numeric	0 <= value <= 255

Service Request Enable Register							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Power on (PON)	User request (URQ)	Command error (CME)	Execution error (EXE)	Device dependent error (DDE)	Query error (QYE)	Request control (RQC)	Operation complete (OPC)

Bit 0: operation complete
Bit 1: request control
Bit 2: query error. it is set when a query error occurs, for example, an attempt is made to read the output queue when the output queue is empty or when the data in the output queue is lost.
Bit 3: device dependent error
Bit 4: execution error
Bit 5: command error. it is set when a command error is detected by the system, for example, if a syntax error is detected in a program message, an incorrect command header is received, or an IEEE GET message is received in the middle of a program message.
Bit 6: user request
Bit 7: power on

Output Format

None.

DEFAULT

0 on *CLS and power cycle.

Errors

Standard error messages.

Example

The following example sets the service request enable register bits for slot 3 application to 11011000.

Terminal input:

```
*SRE 3,216
```

The following example enables command error event for slot 2 application. Whenever a command error occurs, this event will be sent to the event destination, which will be LXI (by default) or the application's lock owner.

Terminal input:

```
*SRE 2,32
```

Terminal input:

```
*ESE 2,32
```

*SRE?

Description

Returns the contents of the service request enable register as an Integer that, when converted to a binary number, represents the bit values of the register.

Input Format

```
*SRE?
```

Output Format

```
<Register Value> (see command *SRE for details)
```

Parameter	Type	Value
Register	Numeric	0 <= 63 | 128 <= 191

DEFAULT

00000001 on *CLS, and power cycle.

Errors

Standard error messages.

Example

The following example queries the service request enable register:

```
*SRE?
```

Terminal response:

```
216
```

*STB?

Description

Returns the contents of the SCPI status byte register as an Integer that, when converted to a binary number, represents the bit values of the register. The bit value for Bit 6 of the register is the MSB bit value, not the SRQ bit value.

Input Format

```
*STB?
```

Output Format

```
<Register Value>
```

Parameter	Type	Value
Register	Numeric	0 <= value <= 255

Status Byte Register							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Not used	Request for service (SRQ) or Master summary MSS)	Event summary (ESB)	Message available (MAV)	Not used	Not used	Not used	Not used

Bit 0 -- 3 is not used.
Bit 4: message available. it is set to 1 when a response message is available in the output queue.
Bit 5: event summary bit. it is the summary bit for the standard event status structure. The ESB summary message bit is set if any bit in the standard event status register is set while its corresponding bit in the standard event status enable register is set.
Bit 6: SRQ. as the service request bit, is set to 1 if a service request has been generated. The SRQ bit is set internally and is not visible to the user.
Bit 6, as the master summary bit (MSS), is set when there is at least one reason for the MAP-200 unit to request service from the controller. That is, the master summary bit is set if any summary bit in the status byte register is set and if the corresponding bit in the service request enable register is also set. The MSS is returned as bit 6 when the status register is queried or the MAP-200 unit is serial polled.
Bit 7 is not used.

Errors

Standard error messages.

DEFAULT

00000000 on *CLS, and power cycle.

Example

The following example queries the status byte register value.

Terminal input:

```
*STB?
```

Terminal response:

```
80
```

This response 01010000 indicates that the MSB (master summary) and the MAV (message available) bits are set.

*TST?

Description

If this command is issued through CMR or GPIB, the return value is always PASS.

If this command is sent to a toolbox application, it will trigger card self test. If it is sent to a super application, the super application will subsequently issue *TST to each toolbox that it locked and also do self test to the super application itself. The return value is the test result. It is equivalent to sending the :TEST? command.

Input Format

```
*TST?
```

Output Format

```
<Result>
```

Parameter	Type	Value
Result	Boolean	0 = PASS, 1 = FAIL

Errors

Standard error messages.

Example

The following example initiates a complete self-test through CMR of the MAP-200 system.

Terminal input:

```
*TST?
```

Terminal response:

```
0
```

This response indicates that the self-test operation passed on all cards.

*WAI

INTERFACE

TCP/IP, LXI, GPIB

Description

The *WAI command stops execution of any commands until the Operation Complete (OPC) bit is set to 1, which means there is no pending operation.

Input Format

```
*WAI
```

Output Format

None.

Errors

Standard error messages.

Example

```
*WAI
```

Terminal input:

```
*WAI
```

:SYSTem:ERRor?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Extracts the first error code written to the error queue. The error queue is used exclusively to indicate SCPI command errors. Command’s error from multiple interfaces will be written to the same error queue.

If no errors are present in the error queue, the value 0 will be returned. The error queue size is 128 bytes. If the system writes more than 128 errors to the error queue then the last error queue number is –350 and all subsequent errors are discarded until –350 is read.

Input Format

```
:SYSTem:ERRor?
```

Output Format

```
<Error>,”Description”
```

Parameter	Type	Value
Error	Numeric	-16384 to 16384
Description	String	8 – 50 chars

Errors

Standard error messages.

Example

The following example queries the first error in the error queue.

Terminal input:

```
:SYST:ERR?
```

Terminal response:

```
-100,”Command error”
```

:SYSTem:WARNing?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Extracts the first error code written to the warning queue. This warning queue is cleared before each new measurement or when a different PCT module is selected.

If no errors are present in the error queue, the value “No Warning” will be returned.

Input Format

```
:SYSTem:WARNing?
```

Output Format

```
"Description"
```

Parameter	Type	Value
Description	String	8 – 50 chars

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the first warning in the warning queue.

Terminal input:

```
:SYST:WARN?
```

Terminal response:

```
"No Warning"
```

:BUSY?

Busy Status

N/A

Description

Queries the selected card to determine if any devices are busy. Response is determined by the busy state.

Input Format

```
:BUSY?
```

Output Format

```
<State>
```

Parameter	Type	Value
State	Integer	1 = Busy, 0 = Available

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-227	Invalid address or no card inserted.

Example

The following example quarries the BUSY state of a specific to determine when the operation is complete so another command may be sent.

Terminal input:

```
:BUSY?
```

Terminal response:

```
1
```

The response indicates that the device queried is busy (i.e. still performing a system operation). Currently the command returns a busy state when the OPM is performing a dark power measurement or is performing an OPM upgrade.

Continuous queries of the card, will eventually indicate a non-BUSY condition, whereby further operations can be performed.

:RESet

Busy Status

☐ Busy Test Required? ☒ Causes Card Busy?

Description

Reset all devices on the selected card to their default state. Perform the same reset as *RST issued to a card.

Card reset commands simulates a hot-swap or card power-up event. The card may briefly appear to have disappeared from the system. This is normal until the system acquires and configures the card.

Input Format

```
:RESet
```

Output Format

None.

Errors

Standard error messages.

Example

The following example resets all devices on the specific card.

Terminal input:

```
:RES
```

:TEST?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Performs a self-test of all devices on the selected card.

Input Format

```
:TEST?
```

Output Format

```
<Result>
```

Parameter	Type	Value
Result	Integer	0 = PASS 1 = FAIL

Errors

Standard error messages.

Example

The following example returns result of the self-test performed on the selected card.

Terminal input:

```
:TEST?
```

Terminal response:

```
0
```

The above response indicates a successful test.

:CONFig?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query configuration of all devices for the selected card.

Input Format

```
:CONFig?
```

Output Format

```
<Device 1> <Parameters>,<Device 2> <Parameters>,…. *
```

*The parameters are different upon different cards. A separator "," is used to separate different devices if there are multiple devices. For PCT card, the parameters are listed below:
<Device> <Type> <Fiber> <Outputs> <SW1 Channels> <SW2 Channels> <Wave1> <Wave2> <Wave 3> <Wave 4> <Wave 5> <Wave 6> <DualCore> <OPM>

Note: Information items are separated by spaces, fields separated by commas. The PCT will always have only one device, so there should be no commas in the response.

Parameter	Type	Value
Device	Integer	1
Type	String	PCT
Fiber	String	Fiber Type (SM9, MM50, MM62.5)
Outputs	Integer	1 = 1 output (NO 2x2 switch option) 2 = 2 outputs with bi-directional ENABLED 3 = 2 outputs with bi-directional DISABLED
SW1 Channels	Integer	SW1 channel count (1 = NO 1xn switch)
SW2 Channels	Integer	SW2 channel count (1 = NO 1xn switch)
Wave	String	wavelength (nm) (0 = Not installed)
DualCore	Integer	0=Single Core, 1=Dual Core
OPM	Integer	Remote OPM Head count

Errors

Standard error messages.

ExampleS

The following examples illustrate typical responses for the CONFig? on a selected card.

Terminal input:

```
:CONF?
```

Terminal response:

```
1 PCT SM9 1 12 1 1310 1550 0 0 0 0 0 1
```

:INFOrmation?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query card information.

Input Format

```
:INFOrmation?
```

Output Format

```
<Serial Number>,<Part Number>,<Card Firmware Rev>,<Module1
Firmware Rev>,<Module2 firmware Rev>,…,<HW Rev>,<Assembly
Date>,<Description>
```

Parameter	Type	Value
Serial Number	String	(8 characters)
Part Number	String	(23 characters)
Card Firmware Rev (super-app)	String	(4 characters)
Module1 Firmware Rev (ORL)	String	(4 characters)
Module2 Firmware Rev (OPM)	String	(4 characters)
HW Rev (ORL)	String	(4 characters)
Assembly Date (ORL)	String	(8 characters)
Description	String	(30 characters)

Errors

Standard error messages.

Example

The following example illustrates typical response for a PCT.

Terminal Input :

```
:INFO?
```

Terminal response:

```
29374743, mORL-A13456-MBID-M100 MFA, 1.00, 1.00, 2.00, 011,
20090815, Passive Component Tester
```

:DEVice :INFOrmation?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the device description.

Input Format

```
:DEVice:INFOrmation? <D>
```

Output Format

```
<Description>
```

Parameter	Type	Value
D	Integer	device number
DESCRIPTION	String	0-25 ASCII chars

Errors

Standard error messages.

Example

The following example illustrates typical response for a PCT.

Terminal Input :

```
:DEV:INFO? 1
```

Terminal response:

```
Passive Component Tester
```

:FAULt:SLOT?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Returns an Integer which, when translated to binary, indicates the state of all bits in the slot fault register for the card. A bit set as 1 indicates a TRUE condition. The Slot fault register contains a bit for all lower-level device fault register.

If slot fault register bits are TRUE, the associated chassis fault register bit for that slot will have corresponding bit set TRUE.

Reserved (unused) bits are returned with value 0.

Input Format

```
:FAULt:SLOT?
```

Output Format

```
<Register>
```

Parameter	Type	Value
Register	Integer	0 <= value <= 255

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
RSVD	RSVD	RSVD	RSVD	TBD	TBD	TDD	TBD

DEFAULT

0

Errors

Standard error messages.

ExampleS

The following examples illustrate typical responses for the slot fault register query for the card.

Terminal input:

```
:FAULt:SLOT?
```

Terminal response:

2

The binary pattern for Integer response 2 is 00000010 which indicates the card has a device fault. The device fault register should be queried to determine exact fault.

:FAULt:DEVice?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Returns an Integer which, when translated to binary, indicates the state of all bits in the device fault register for the device specified. A bit set as 1 indicates a TRUE condition.

If a bit of any device fault register is TRUE, the device fault bit of associated Slot fault register will have corresponding bit set TRUE.

Important:

- Reserved (unused) bits are returned with value 0.
- Device without a fault register will return a value 0.

Input Format

```
:FAULt:DEVice? <D>
```

Output Format

```
<Register>
```

Parameter	Type	Value
Register	Integer	0 <= value <= 255

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
RSVD	RSVD	RSVD	RSVD	TBD	TBD	TDD	TBD

DEFAULT

0

Errors

Standard error messages.

Example

The following examples illustrate typical responses for the device fault register query for device 2.

Terminal input:

```
:FAULt:DEV? 1
```

Terminal response:

```
1
```

The binary pattern for Integer response 2 is 00000001 which indicates the laser source has an TEC over temperature error.

:STATus:DEVice?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Returns an Integer which, when translated to binary, indicates the state of all bits in the Device Status Register for the selected card and device specified. A bit set as 1 indicates a TRUE condition.

Important:

- Reserved (unused) bits are returned with value 0.
- Device without a fault register will return a value 0.

Input Format

```
:STATus:DEVice? <D>
```

Output Format

```
<Register>
```

Parameter	Type	Value
Register	Integer	0 <= value <= 255

PCT Status Register							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
RSVD	RSVD	RSVD	TBD	TBD	TBD	TBD	TBD

Note: Value 0 indicates the device is in normal operation condition.

DEFAULT

0

Errors

Standard error messages.

Example

The following examples illustrate typical responses for the device status register query for device 1.

Terminal input:

```
:STAT:DEV? 1
```

TLS Example

Terminal response:

```
1
```

The binary pattern for Integer response 3 is 00000001 which indicates the temperature not in the valid range.

:STATus:RESet

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Clears specific bits in the Device Status Register.

Input Format

```
:STATus:RESet <D>
```

Output Format

None.

PCT							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
n/c	n/c	n/c	n/c	n/c	n/c	n/c	n/c

Bit 0 to Bit 7 – no change.

DEFAULT

Not applicable.

Errors

Standard error messages.

Chapter 19: OPM Commands

:FETCh:POWer?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the optical power value in dBm when Live mode is enabled.

Input Format

```
:FETch:POWer?
```

Output Format

```
<Power>
```

Parameter	Type	Value
Power	Float	Pmin <= Power < Pmax - - - - - - - *(TOO LITTLE LIGHT)* +++++++ *(TOO MUCH LIGHT)*

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example queries the last power reading in dBm of the external head when Live mode is enabled.

Terminal input:

```
:FETCh:POWer?
```

Terminal output:

```
-15.348
```

:FETCh:LOSS?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the insertion loss value in dB when Live mode is enabled. The calculation will use the reference value that was made for the current measurement setup.

Input Format

```
:FETCh:LOSS?
```

Output Format

```
<Loss>
```

Parameter	Type	Value
Loss	Float	IL value - - - - - - - (for invalid reference or measurement)

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the Insertion Loss for the current measurement setup when Live mode is enabled.

Terminal input:

```
:FETCh:LOSS?
```

Terminal response:

```
5.027
```

:FETCh:ORL?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the Optical Return Loss value in dB when Live mode is enabled. The calculation will use the reference value that was made for the current measurement setup.

Input Format

```
:FETCh:ORL?
```

Output Format

```
<ORL>
```

Parameter	Type	Value
ORL	Float	ORL value - - - - - - - (for invalid reference or measurement)

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the Optical Return Loss for the current measurement setup when Live mode is enabled.

Terminal input:

```
:FETCh:ORL?
```

Terminal response:

```
65.40
```

:SENSe:POWer:DARk

Busy Status

☐ Busy Test Required? ☒ Causes Card Busy?

Description

Perform a dark operation on the specified device, whereby the ambient optical level is measured (usually when the optical input aperture is sealed to prevent light penetration). The dark measurement value represents the optical “noise” and is removed from subsequent power samples. During this operation, the detector’s optical input should be tightly covered and the ambient light minimized.

Feature	OPM
Performing this operation will over-write the pre-configured (factory) DARK setting.	YES
A factory dark setting is programmed into each detector in the JDS factory, which cannot be modified (referred-to as the factory default).	Can be restored at any time.
If there is too much light for an accurate dark reading in any power range, the “TOO MUCH LIGHT” bit will be set in the device status register (see :SYSTem:STATus:DEVice description) will be set and the operation aborted. Previous dark values will be used instead.	YES
Dark measurements are preserved over reset / power-cycle.	YES
Executing this command will perform a dark reading for each power range.	YES

Input Format

```
:SENSe:POWer:DARk
```

Output Format

None

DEFAULT

Factory dark settings.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

-206	Command not valid during measurement

Example

The following example illustrates execution of a dark measurement.

Terminal input:

```
:SENSe:POWer:DARK
```

:SENSe:POWer:DARk?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query if a successful dark measurement has been performed since the last reset.

- FALSE – A valid dark measurement has not been performed since the last reset. Pre-configured (factory) or last valid user dark setting is being used.
- TRUE – A valid dark measurement has been performed since the last reset.

Input Format

```
:SENSe:POWer:DARK?
```

Output Format

```
<State>
```

Parameter	Type	Value
State	Integer	0 – FALSE, 1 -- TRUE

DEFAULT

0 (False).

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the dark setting.

Terminal input:

```
:SENSe:POWer:DARK?
```

Terminal Output:

```
0
```

The Terminal output indicates that a successful dark measurement has not been made since the last reset, thus the factory-programmed dark setting is currently being used.

:SENSe:POWer:DARK:FACTory

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Restore the factory dark settings.

This command may used after a user dark measurement is taken (see :SENSe:POWer:DARK description) to restore the factory defaults. The user dark measurement is discarded.

Following execution of this command, a dark query (see :SENSe:POWer:DARK? description) will return a FALSE response.

Input Format

```
:SENSe:POWer:DARK:FACTory
```

Output Format

None

DEFAULT

None

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-206	Command not valid during measurement

Example

The following example restores the factory dark settings.

Console Input:

```
:SENSe:POWer:DARK:FACTory
```

:SENSe:POWer:MODE

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Enable or disables the Live mode.

Input Format

```
:SENSe:POWer:MODE <Mode>
```

Parameter	Type	Value
Mode	Integer	0 = Disabled, 1 = Enabled

Output Format

None

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example enables the Live mode.

Terminal input:

```
:SENSe:POWer:MODE 1
```

:SENSe:POWer:MODE?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query if Live mode is enabled.

Input Format

```
:SENSe:POWer:MODE?
```

Output Format

```
<Mode>
```

Parameter	Type	Value
Mode	Integer	0 = Disabled 1 = Enable

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries if Live mode is enabled.

Terminal input:

```
:SENSe:POWer:MODE?
```

Terminal Output:

```
1
```

The Terminal output indicates that the Live mode is enabled.

Chapter 20: PCT Commands

*REM

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Instructs the PCT to accept remote commands from this connection, and to switch to the corresponding PCT cassette.

Note: The PCT super-application can manage up to three PCT cassettes, but it can only have one active cassette at a time. Each cassette will have its own remote interface (ie TCP servers listening at separate ports). Sending this command to a particular cassette will in effect switch the current PCT configuration to use that cassette and make it active. Sending some commands to an inactive cassette will generate an error in the system command error queue.

Input Format

```
*REM
```

Output Format

None

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-206	Command not valid during measurement

Example

The following example initiates remote commands for the cassette.

Terminal input:

`*REM`

*ACTive?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Queries if this card is the active one.

Note: The PCT super-application can manage up to three PCT cassettes, but it can only have one active cassette at a time. Each cassette will have its own remote interface (ie TCP servers listening at separate ports). Sending this command to a particular cassette will in effect switch the current PCT configuration to use that cassette and make it active. Sending some commands to an inactive cassette will generate an error in the system command error queue.

Input Format

```
*ACTive?
```

Output Format

```
<Status>
```

Parameter	Type	Value
Status	Integer	0 = Not active, 1 = Active

Errors

Standard error messages.

Command specific errors:

Example

The following example queries if the card is active in the PCT super-application.

Terminal input:

```
*ACTive?
```

Terminal Output:

```
1
```

The Terminal output indicates that the PCT card is active.

:SENSe:FUNCtion

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the PCT measurement function.

Input Format

```
:SENSe:FUNCtion <Mode>
```

Parameter	Type	Value
Mode	Integer	0 = Reference Measurement, 1 = DUT Measurement

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example sets the PCT measurement function for a DUT measurement. (ie. next scan will be a DUT measurement scan).

Terminal input:

```
:SENSe:FUNCtion 1
```

:SENSe:FUNCtion?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the PCT measurement function.

Input Format

```
:SENSe:FUNCtion?
```

Output Format

```
<Mode>
```

Parameter	Type	Value
Mode	Integer	0 = Reference Measurement, 1 = DUT Measurement

Errors

Standard error messages.

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the PCT measurement function.

Terminal input:

```
:SENSe:FUNCtion?
```

Terminal Output:

```
0
```

The Terminal output indicates that the current measurement function is set to “Reference measurement”.

:SENSe:ATIMe

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the measurement averaging time in seconds.

Input Format

```
:SENSe:ATIMe <Secs>
```

Parameter	Type	Value
Secs	Integer	{ 2, 5, 10, 30, 60 } seconds *

* Use the SENSe:ATIMe:AVAilable? Query to get the list of valid ATIMe values.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example sets the measurement averaging time to 5 seconds.

Terminal input:

```
:SENSe:ATIMe 5
```

:SENSe:ATIMe?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the measurement averaging time in seconds.

Input Format

```
:SENSe:ATIMe?
```

Output Format

```
<Secs>
```

Parameter	Type	Value
Secs	Integer	{ 2, 5, 10, 30, 60 } seconds

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the measurement averaging time.

Terminal input:

```
:SENSe:ATIMe?
```

Terminal Output:

```
10
```

The Terminal output indicates that the current measurement averaging time is 10 seconds.

:SENSe:ATIMe:AVAilable?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the available measurement averaging times in seconds.

Input Format

```
:SENSe:ATIMe:AVAilable?
```

Output Format

```
<Time 1>, … <Time n>
```

Parameter	Type	Value
Time	Integer	Number of seconds

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the available averaging times.

Terminal input:

```
:SENSe:ATIMe:AVAilable?
```

Terminal Output:

```
2,5,10,30,60
```

The Terminal output indicates that the current available measurement averaging times are 2, 5, 10, 30 and 60 seconds.

:SENSe:RANGe

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the DUT measurement range in meters.

Input Format

```
:SENSe:RANGe <Range>
```

Parameter	Type	Value
Range	Integer	0 = 200m, 1 = 500m 2 = 1km, 3 = 2km 4 = 5km, 5 = 10km

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example sets the DUT measurement range to 200m.

Terminal input:

```
:SENSe:RANGe 0
```

:SENSe:RANGe?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the DUT measurement range in meters.

Input Format

```
:SENSe:RANGe?
```

Output Format

```
<Range>
```

Parameter	Type	Value
Range	Integer	0 = 200 m, 1 = 500 m 2 = 1 km, 3 = 2 km 4 = 5 km, 5 = 10 km

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the DUT measurement range.

Terminal input:

```
:SENSe:RANGe?
```

Terminal Output:

```
0
```

The Terminal output indicates that the current DUT measurement range is 200m.

:SENSe:ILONly

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the “IL Only” DUT measurement option.

Input Format

```
:SENSe:ILONly <State>
```

Parameter	Type	Value
State	Integer	0 = Disabled 1 = Enabled

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example disables the “IL Only” DUT measurement option.

Terminal input:

```
:SENSe:ILONly 0
```

:SENSe:ILONly?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the “IL Only” DUT measurement option.

Input Format

```
:SENSe:ILONly?
```

Output Format

```
<State>
```

Parameter	Type	Value
State	Integer	0 = Disabled 1 = Enabled

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the DUT measurement range.

Terminal input:

```
:SENSe:ILONly?
```

Terminal Output:

```
0
```

The Terminal output indicates that the “IL Only” DUT measurement option is disabled.

:SENSe:TEMPerature

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the “Temperature Sensitivity” setting.

Input Format

```
:SENSe:TEMPerature <Sens>
```

Parameter	Type	Value
Sens	Integer	0 = Very Low, 1 = Low, 2 = Medium, 3 = High, 4 = Very High

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example sets the “temperature sensitivity” to Low.

Terminal input:

```
:SENSe:TEMP 1
```

:SENSe:TEMPerature?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the “Temperature Sensitivity” setting.

Input Format

```
:SENSe:TEMPerature?
```

Output Format

```
<Sens>
```

Parameter	Type	Value
Sens	Integer	0 = Very Low, 1 = Low, 2 = Medium, 3 = High, 4 = Very High

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the Temperature Sensitivity.

Terminal input:

```
:SENSe:TEMP?
```

Terminal Output:

```
0
```

The Terminal output indicates that the “Temperature Sensitivity” is set to Very Low.

:SENSe:OPM

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the index of the OPM to use for making IL measurements.

Input Format

```
:SENSe:OPM <Index>
```

Parameter	Type	Value
Index	Integer	0 = PCT OPM, 1-4 = Remote OPM

Note: The Remote OPM heads must be configured in advance. If the OPM cassette only has a single valid head, then just the value of 1 can be used to select this head.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example selects the first remote OPM head.

Terminal input:

```
:SENSe:OPM 1
```

:SENSe:OPM?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the index of the OPM to use for making IL measurements.

Input Format

```
:SENSe:OPM?
```

Output Format

```
<Index>
```

Parameter	Type	Value
Index	Integer	0 = PCT OPM, 1..4 = Remote OPM

Note: The Remote OPM heads must be configured in advance. If the OPM cassette only has a single valid head, then just the value of 1 can be used to select this head.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the OPM head used for IL measurements.

Terminal input:

```
:SENSe:OPM?
```

Terminal Output:

```
0
```

The Terminal output indicates that the PCT OPM is currently selected.

:SOURce:WAVelength

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the source wavelength to use in measurement (nm).

Input Format

```
:SOURce:WAVelength <Wave>
```

Parameter	Type	Value
Wave	String	4 characters (ie. 1310) *

* Use the SOURce:WAVelength:AVAilable? Query to get the list of available wavelengths.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example sets the source wavelength to use for measurements at 1310 nm.

Terminal input:

```
:SOURce:WAVelength 1310
```

:SOURce:WAVelength?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the selected source wavelength (nm).

Input Format

```
:SOURce:WAVelength?
```

Output Format

```
<Wave>
```

Parameter	Type	Value
Wave	String	4 characters (ie. 1310)

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the selected source wavelength.

Terminal input:

```
:SOURce:WAVelength?
```

Terminal Output:

```
1310
```

The Terminal output indicates that the current selected source wavelength is 1310 nm.

:SOURce:WAVelength:AVAilable?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the available source wavelengths (nm).

Input Format

```
:SOURce:WAVelength:AVAilable?
```

Output Format

```
<Wave 1>, … <Wave n>
```

Parameter	Type	Value
Wave	String	4 characters (ie. 1310)

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the available source wavelengths.

Terminal input:

```
:SOURce:WAVelength:AVAilable?
```

Terminal Output:

```
1310,1490,1550,1625
```

The Terminal output indicates that the available source wavelengths are 1310nm, 1490nm, 1550nm and 1625nm.

:SOURce:WARMup

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the source wavelength to warm up for next measurement (nm).

Input Format

```
:SOURce:WARMup <Wave>
```

Parameter	Type	Value
Wave	String	4 characters (ie. 1310) *

* Use the SOURce:WAVelength:AVAilable? Query to get the list of available wavelengths.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example sets the source wavelength to warm up for the next scan to 1550 nm.

Terminal input:

```
:SOURce:WARMup 1550
```

:SOURce:WARMup?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the selected source wavelength (nm).

Input Format

```
:SOURce:WARMup?
```

Output Format

```
<Wave>
```

Parameter	Type	Value
Wave	String	4 characters (ie. 1310)

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the warmed up source wavelength.

Terminal input:

```
:SOURce:WARMup?
```

Terminal Output:

```
1550
```

The Terminal output indicates that the current selected source for warmup is 1310 nm.

:SOURce:CONTinuous

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the continuous scanning mode option.

Input Format

```
:SOURce:CONTinuous <Enabled>
```

Parameter	Type	Value
Enabled	Integer	0 = disabled 1 = enabled

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example enabled the continuous scanning option.

Terminal input:

```
:SOURce:CONTinuous 1
```

:SOURce:CONTinuous?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the continuous scanning mode option.

Input Format

```
:SOURce:CONTinuous?
```

Output Format

```
<Enabled>
```

Parameter	Type	Value
Enabled	Integer	0 = disabled 1 = enabled

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the continuous scanning option.

Terminal input:

```
:SOURce:CONTinuous?
```

Terminal Output:

```
1
```

The Terminal output indicates that the continuous scanning option is enabled.

:PATH:LAUNch

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the source launch port for a module with 2 outputs.

Input Format

```
:PATH:LAUNch <Port>
```

Parameter	Type	Value
Port	Integer	1 = J1 Out, 2 = J2 Out

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example sets the source launch port to J2 Out.

Terminal input:

```
:PATH:LAUNch 2
```

:PATH:LAUNch?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the source launch port.

Input Format

```
:PATH:LAUNch?
```

Output Format

```
<Port>
```

Parameter	Type	Value
Port	Integer	1 = J1 Out, 2 = J2 Out

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the source launch port.

Terminal input:

```
:PATH:LAUNch?
```

Terminal Output:

```
2
```

The Terminal output indicates that the current source launch port is J2 Out.

:PATH:LAUNch:AVAilable?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the number of available source launch ports.

Input Format

```
:PATH:LAUNch:AVAilable?
```

Output Format

```
<Ports>
```

Parameter	Type	Value
Ports	Integer	1 = for module without 2x2 switch 2 = for module with 2x2 switch with ‘bi-directional’ option.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the available source launch ports.

Terminal input:

```
:PATH:LAUNch:AVAilable?
```

Terminal Output:

```
2
```

The Terminal output indicates that the number of source launch ports is 2.

:PATH:CHANNel

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the channel to use for the specified channel group.

Input Format

```
:PATH:CHANNel <Group>,<Ch>
```

Parameter	Type	Value
Group	Integer	1 = MTJ1 2 = MTJ2 3 = Receive
Ch	Integer	Channel number

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example sets the channel to use for measurements at Channel 2 on MTJ1.

Terminal input:

```
:PATH:CHANNel 1,2
```

:PATH:CHANnel?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the selected channel number for the specified channel group.

Input Format

```
:PATH:CHANnel? <Group>
```

Output Format

```
<Ch>
```

Parameter	Type	Value
Group	Integer	1 = MTJ1 2 = MTJ2 3 = Receive
Ch	Integer	Channel number

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example queries the current channel number setting for MTJ1.

Terminal input:

```
:PATH:CHANnel? 1
```

Terminal Output:

```
2
```

The Terminal output indicates that the current channel setting is 2 for SW1.

:PATH:CHANNel:AVAilable?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the number of available channels for the specified channel group.

Input Format

```
:PATH:CHANNel:AVAilable? <Group>
```

Output Format

```
<Channels>
```

Parameter	Type	Value
Group	Integer	1 = MTJ1 2 = MTJ2 3 = Receive
Channels	Integer	Channel count

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example queries the available channels for MTJ1.

Terminal input:

```
:PATH:CHANNels:AVAilable? 1
```

Terminal Output:

```
24
```

The Terminal output indicates that the available channel count is 24 for SW1.

:PATH:CONNection

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the MTJ connection mode.

Input Format

```
:PATH:CONNection <MTJ>
```

Parameter	Type	Value
MTJ	Integer	1 = Single MTJ 2 = Dual MTJ

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example sets the connection mode to ‘Dual MTJ’.

Terminal input:

```
:PATH:CONNection 2
```

:PATH:CONNection?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the MTJ connection mode.

Input Format

```
:PATH:CONNection?
```

Output Format

```
<MTJ>
```

Parameter	Type	Value
MTJ	Integer	1 = Single MTJ 2 = Dual MTJ

* ‘Loop MTJ’ mode is only available for modules with 2x2 switch with the ‘Bi-directional’ option enabled.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the current connection mode.

Terminal input:

```
:PATH:CONNection?
```

Terminal Output:

```
2
```

The Terminal output indicates that the current connection mode is ‘Dual MTJ’ mode.

:PATH:RECeive

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the “receive” jumper usage.

This option is used when then MTJ connection mode is set to ‘Single MTJ’ and the measurement mode is set to ‘DUT’. The Receive jumper length must be set manually with the PATH:JUMP:LENG command.

Input Format

```
:PATH:RECeive <Use>
```

Parameter	Type	Value
Use	Integer	0 = Do not use 1 = Use receive jumper

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example sets the option to use the “receive” jumper.

Terminal input:

```
:PATH:RECeive 1
```

:PATH:RECeive?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the “receive” jumper usage.

This option is used when then MTJ connection mode is set to ‘Single MTJ’ and the measurement mode is set to ‘DUT’. The Receive jumper length must be set manually with the PATH:JUMP:LENG command.

Input Format

```
:PATH:RECeive?
```

Output Format

```
<Use>
```

Parameter	Type	Value
Use	Integer	0 = Do not use 1 = Use receive jumper

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries if the “receive” jumper is to be used.

Terminal input:

```
:PATH:RECeive?
```

Terminal Output:

```
1
```

The Terminal output indicates that the “receive” jumper is to be used.

:PATH:DUT:LENGth

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Sets the length value of the “DUT Length estimation”.

Input Format

```
:PATH:DUT:LENGth <Length>
```

Parameter	Type	Value
Length	float	DUT Length in meters

Errors

Standard Error Messages

Command Specific Errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example sets the DUT Length estimation to 3.5m.

Terminal Input:

```
:PATH:DUT:LENG 3.5
```

:PATH:DUT:LENGth?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the value of the “DUT Length Estimation” option.

Input Format

```
:PATH:DUT:LENGth?
```

Output Format

```
<Length>
```

Parameter	Type	Value
Length	float	DUT Length in meters

Errors

Standard Error Messages

Command Specific Errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the current connection mode.

Terminal Input:

```
:PATH:DUT:LENG?
```

Terminal Output:

```
5.25
```

The Terminal output indicates that the “DUT Length Estimation” value is set to 5.25m.

:PATH:DUT:LENGth:AUTO

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the “DUT Length Estimation” usage.

Input Format

```
:PATH:DUT:LENGth:AUTO <State>
```

Parameter	Type	Value
State	Integer	0 = Disable DUT Auto length (Use estimated Length) 1 = Enable DUT Auto Length

Errors

Standard Error Messages

Command Specific Errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example enables the “DUT Length Estimation” option.

Terminal Input:

```
:PATH:DUT:LENG:AUTO 0
```

:PATH:DUT:LENGth:AUTO?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the “DUT Length Estimation” usage.

Input Format

```
:PATH:DUT:LENGth:AUTO?
```

Output Format

```
<State>
```

Parameter	Type	Value
State	integer	0 = Disable DUT Auto length (Use estimated Length) 1 = Enable DUT Auto Length

Errors

Standard Error Messages

Command Specific Errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries if the “DUT Length Estimation” option is used.

Terminal Input:

```
:PATH:DUT:LENG:AUTO?
```

Terminal Output:

```
1
```

The Terminal output indicates that the “DUT Length Estimation” option is not used, and that the DUT auto length is used instead.

:PATH:JUMPer:IL

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the MTJ jumper IL override value.

Input Format

```
:PATH:JUMPer:IL <Group>,<Channel>,<IL>
```

Parameter	Type	Value
Group	Integer	1 = MTJ1 2 = MTJ2 3 = Receive MTJ
Channel	Integer	1…n*
IL	Float	IL in dB

* The channel number represents the 1xn switch channel, or the Receive Jumper channel.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example sets the MTJ1 IL override at channel 2 of the 1xn switch to 0.05 dB.

Terminal input:

```
:PATH:JUMP:IL 1,2,0.05
```

:PATH:JUMPer:IL?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the MTJ jumper IL override value.

Input Format

```
:PATH:JUMPer:IL? <Group>,<Channel>
```

Output Format

```
<IL>
```

Parameter	Type	Value
Group	Integer	1 = MTJ1 2 = MTJ2 3 = Receive MTJ
Channel	Integer	1…n*
IL	Float	IL in dB

* The channel number represents the 1xn switch channel , or the Receive Jumper channel.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the MTJ1 IL override value at channel 2 of the 1xn switch.

Terminal input:

```
:PATH:JUMP:IL? 1,2
```

Terminal Output:

```
0.05
```

The Terminal output indicates that the jumper IL override is 0.05 dB.

:PATH:JUMPer:IL:AUTO

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the MTJ jumper IL override option. If it is set to AUTO, then the overrides will be ignored and the measured value will be used.

Input Format

```
:PATH:JUMPer:IL:AUTO <Group>,<Channel>,<State>
```

Parameter	Type	Value
Group	Integer	1 = MTJ1 2 = MTJ2 3 = Receive MTJ
Channel	Integer	1…n*
State	Integer	0 = Use override value 1 = Use measured value

* The channel number represents the 1xn switch channel, or the Receive Jumper channel.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example sets the MTJ1 IL override option at channel 2 of the 1xn switch to “use override value”.

Terminal input:

```
:PATH:JUMP:IL:AUTO 1,2,0
```

:PATH:JUMPer:IL:AUTO?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the MTJ jumper IL override option. If it is set to AUTO, then the overrides will be ignored and the measured values will be used.

Input Format

```
:PATH:JUMPer:IL:AUTO? <Group>,<Channel>
```

Output Format

```
<State>
```

Parameter	Type	Value
Group	Integer	1 = MTJ1 2 = MTJ2 3 = Receive MTJ
Channel	Integer	1…n*
State	Integer	0 = Use override value 1 = Use measured value

* The channel number represents the 1xn switch channel , or the Receive Jumper channel.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the MTJ1 IL override option at channel 2 of the 1xn switch.

Terminal input:

```
:PATH:JUMP:IL:AUTO? 1,2
```

Terminal Output:

```
1
```

The Terminal output indicates that the jumper IL override value is not to be used.

:PATH:JUMPer:LENGth

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the MTJ jumper Length override value.

Input Format

```
:PATH:JUMPer:LENGth <Group>,<Channel>,<Length>
```

Parameter	Type	Value
Group	Integer	1 = MTJ1, 2 = MTJ2, 3 = Receive MTJ
Channel	Integer	1…n*
Length	Float	Length in meters

* The channel number represents the 1xn switch channel, or the Receive Jumper channel.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example sets the MTJ1 Length override at channel 2 of the 1xn switch to 3.0 meters.

Terminal input:

```
:PATH:JUMP:LENG 1,2,3.0
```

:PATH:JUMPer:LENGth?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the MTJ jumper Length override value.

Input Format

```
:PATH:JUMPer:LENGth? <Group>,<Channel>
```

Output Format

```
<Length>
```

Parameter	Type	Value
Group	Integer	1 = MTJ1 2 = MTJ2 3 = Receive MTJ
Channel	Integer	1…n*
Length	Float	Length in meters

* The channel number represents the 1xn switch channel , or the Receive Jumper channel.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the MTJ1 Length override at channel 2 of the 1xn switch.

Terminal input:

```
:PATH:JUMP:LENG? 1,2
```

Terminal Output:

```
2.25
```

The Terminal output indicates that the jumper Length override is 2.25m.

:PATH:JUMPer:LENGth:AUTO

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Set the MTJ jumper Length override option. If it is set to AUTO, then the overrides will be ignored and the measured value will be used.

Input Format

```
:PATH:JUMPer:LENGth:AUTO <Group>,<Channel>,<State>
```

Parameter	Type	Value
Group	Integer	1 = MTJ1 2 = MTJ2 3 = Receive MTJ
Channel	Integer	1…n*
State	Integer	0 = Use override value 1 = Use measured value

* The channel number represents the 1xn switch channel, or the Receive Jumper channel.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example sets the MTJ1 Length override option at channel 2 of the 1xn switch to “use measured value”.

Terminal input:

```
:PATH:JUMP:LENG:AUTO 1,2,1
```

:PATH:JUMPer:LENGth:AUTO?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the MTJ jumper Length override option. If it is set to AUTO, then the overrides will be ignored and the measured value will be used.

Input Format

```
:PATH:JUMPer:LENGth:AUTO? <Group>,<Channel>
```

Output Format

```
<State>
```

Parameter	Type	Value
Group	Integer	1 = MTJ1, 2 = MTJ2, 3 = Receive MTJ
Channel	Integer	1…n*
State	Integer	0 = Use override value, 1 = Use measured value

* The channel number represents the 1xn switch channel , or the Receive Jumper channel.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the MTJ1 AUTO Length override at channel 2 of the 1xn switch.

Terminal input:

```
:PATH:JUMP:LENG:AUTO? 1,2
```

Terminal Output:

```
0
```

The Terminal output indicates that the jumper Length override value is to be used.

:PATH:JUMPer:RESet

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Reset the MTJ jumper to default settings.

Input Format

```
:PATH:JUMPer:RESet <Group>,<Channel>
```

Parameter	Type	Value
Group**	Integer	0 = ALL MTJs, 1 = MTJ1, 2 = MTJ2, 3 = Receive MTJ
Channel**	Integer	0…n*

* The channel number represents the 1xn switch channel, or the Receive Jumper channel.
** These parameters are optional, a default of 0 is used if omitted. If Channel is set to 0 then all channels in that group are affected. If Group parameter is 0, then the Channel parameter is ignored.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example resets all the MTJ1 jumpers to default values.

Terminal input:

```
:PATH:JUMP:RESet 1
```

Default MTJ settings are as follows:

- IL = 0.05 dB
- L = 3.00 m
- Auto turned ON

:PATH:JUMPer:RESet:MEASure

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Resets the MTJ jumper measured IL/Length values (these are measured when DualMTJ reference measurement is made with a valid SingleMTJ reference measurement).

Input Format

```
:PATH:JUMPer:RESet:MEASure <Group>,<Channel>
```

Parameter	Type	Value
Group**	Integer	0 = ALL MTJs 1 = MTJ1 2 = MTJ2 3 = Receive MTJ
Channel**	Integer	0…n*

* The channel number represents the 1xn switch channel, or the Receive Jumper channel.
** These parameters are optional, a default of 0 is used if omitted. If Channel is set to 0 then all channels in that group are affected. If Group parameter is 0, then the Channel parameter is ignored.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example resets ALL MTJ measured values.

Terminal input:

```
:PATH:JUMP:RESet:MEAS
```

This will reset measured MTJ IL and Length.

:PMAP:ENABle

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Enables the port map channel selection option when taking measurements. Note that this command will also set the Connection Mode to DualMTJ and the UseReceive option to disabled.

Input Format

```
:PMAP:ENABle <State>
```

Parameter	Type	Value
State	Integer	0 = Disable port mapping 1 = Enable port mapping

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example enables the port mapping feature.

Terminal input:

```
:PMAP:ENAB 1
```

:PMAP:ENABle?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the port map channel selection option. Note that the Connection Mode must be set to DualMTJ and the UseReceive option bust be disabled for this option to work.

Input Format

```
:PMAP:ENABle?
```

Output Format

```
<State>
```

Parameter	Type	Value
State	Integer	0 = Port mapping disabled 1 = Port mapping enabled

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example queries if the port mapping option is enabled.

Terminal input:

```
:PMAP:ENAB?
```

Terminal Output:

```
0
```

The Terminal output indicates that the port mapping option is not enabled.

:PMAP:PATH:SIZE?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the available number of port map paths.

Input Format

```
:PMAP:PMAP:SIZE?
```

Output Format

```
<Size>
```

Parameter	Type	Value
Size	Integer	Number of Port Map paths.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example queries the number of available port map paths.

Terminal input:

```
:PMAP:PATH:SIZE?
```

Terminal Output:

```
4
```

The Terminal output indicates that there are 4 port map paths.

:PMAP:PATH:LINK?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the channel link for a given port map path.

Input Format

```
:PMAP:PATH:LINK? <Path>
```

Output Format

```
<SW1Ch>,<SW2Ch>
```

Parameter	Type	Value
Path	Integer	Port Map Path
SW1Ch	Integer	SW1 channel number
SW2Ch	Integer	SW2 channel number

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries if the channel link for port map path 3.

Terminal input:

```
:PMAP:PATH:LINK? 3
```

Terminal Output:

```
3,3
```

The Terminal output indicates that the channel selection for port map path 3 is SW1=3, SW2=3.

:PMAP:PATH:SELect

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Selects a path in the port map table.

Input Format

```
:PMAP:PATH:SELect <Path>
```

Parameter	Type	Value
Path	Integer	Port Map Path

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example selects Port Map path 4.

Terminal input:

```
:PMAP:PATH:SEL 4
```

:PMAP:PATH:SELect?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the current port map path selection.

Input Format

```
:PMAP:PATH:SELect?
```

Output Format

```
<Path>
```

Parameter	Type	Value
Path	Integer	Port Map Path

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example queries the current port map path.

Terminal input:

```
:PMAP:PATH:SEL?
```

Terminal Output:

```
3
```

The Terminal output indicates that the current port map path is set to 3.

:PMAP:SETup:INIT:RANGe

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Initializes the port map table when channel ranges are used.

Input Format

```
:PMAP:SETup:INIT:RANGe <Start1>,<Start2>,<Size>,<Mode>
```

Parameter	Type	Value
Start1	Integer	Start of Channel range on SW1.
Start2	Integer	Start of Channel range on SW2.
Size	Integer	Number of channels in each range.
Mode	Integer	0 = Fixed channels for both switches. 1 = SW1 channels variable. 2 = SW2 channels variable.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example initializes a fixed Port Map table using channels 1-4 for SW1 and 5-8 for SW2.

Terminal input:

```
:PMAP:SET:INIT:RANGE 1,5,4,0
```

:PMAP:SETup:INIT:LIST

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Initializes the port map table when channel lists are used.

Note: A hexadecimal representation of a bit-field is used so that larger arbitrary channel lists can be represented with much less characters.

Input Format

```
:PMAP:SETup:INIT:LIST <List1>,<List2>,<Mode>
```

Parameter	Type	Value
List1	String	Hex representation of SW1 channel selection.*
List2	String	Hex representation of SW2 channel selection.*
Mode	Integer	0 = Fixed channels for both switches. 1 = SW1 channels variable. 2 = SW2 channels variable.

* To specify an arbitrary channel list, using a bit-field specify with a 1 where a channel is to be selected. Then group every 4 bits and convert each to a hexadecimal number.
ie. Ch. 1,3,5,7 = 1010101 → 1010 1010 → AA.
Ch. 2,4,6,8 = 01010101 → 0101 0101 → 55

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example initializes a fixed Port Map table using channels 1,3,5,7 for SW1 and 2,4,6,8 for SW2.

Terminal input:

```
:PMAP:SET:INIT:LIST AA,55
```

:PMAP:SETup:LINK

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Creates a channel link path in the port map table. This is only valid for non-fixed tables (ie. mode 1 or 2).

Input Format

```
:PMAP:SETup:LINK <FixedCh>,<VariableCh>
```

Parameter	Type	Value
FixedCh	Integer	Fixed switch channel number.
VariableCh	Integer	Variable switch channel number.

Errors

Standard error messages.

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example creates a Port Map channel link path.

Terminal input:

```
:PMAP:SET:LINK 4,4
```

:PMAP:SETup:LOCK

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Locks a variable port map table.

Input Format

```
:PMAP:SETup:LOCK
```

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example locks a variable Port Map table.

Terminal input:

```
:PMAP:SET:LOCK
```

:PMAP:SETup:LOCK?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query if the variable port map table is locked.

Input Format

```
:PMAP:SETup:LOCK?
```

Output Format

```
<State>
```

Parameter	Type	Value
State	Integer	0 = NOT Locked 1 = Locked

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example queries if the port map table is locked.

Terminal input:

```
:PMAP:SET:LOCK?
```

Terminal Output:

```
0
```

The Terminal output indicates that the port map table is not locked.

:PMAP:SETup:RESet

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Resets all the variable channel assignments in the port map table.

Input Format

```
:PMAP:SETup:RESet
```

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example resets the variable port map table.

Terminal input:

```
:PMAP:SETup:RESet
```

:PMAP:SETup:SIZE?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the number of rows in the port map table.

Input Format

```
:PMAP:SETup:SIZE?
```

Output Format

```
<Size>
```

Parameter	Type	Value
Size	Integer	Number of Port Map paths.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example queries the number of paths in the port map table.

Terminal input:

```
:PMAP:SET:SIZE?
```

Terminal Output:

```
12
```

The Terminal output indicates that the port map table has 12 paths.

:PMAP:SETup:MODE?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the port map table table mode.

Input Format

```
:PMAP:SETup:MODE?
```

Output Format

```
<Mode>
```

Parameter	Type	Value
Mode	Integer	0 = Fixed channels for both switches. 1 = SW1 channels variable. 2 = SW2 channels variable.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example queries the port map table mode.

Terminal input:

```
:PMAP:SET:MODE?
```

Terminal Output:

```
0
```

The Terminal output indicates that the port map table is fixed.

:PMAP:SETup:FIRSt?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the first defined channel for the specified switch.

Input Format

```
:PMAP:SETup:FIRSt? <Switch>
```

Output Format

```
<Ch>
```

Parameter	Type	Value
Switch	Integer	1 = SW1 2 = SW2
Ch	Integer	First defined channel.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the first defined channel for the setup of SW2.

Terminal input:

```
:PMAP:SET:FIRSt? 2
```

Terminal Output:

```
4
```

The Terminal output indicates that the first defined channel when setting up SW2 is Channel 4.

:PMAP:SETup:LAST?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the last defined channel for the specified switch.

Input Format

```
:PMAP:SETup:LAST? <Switch>
```

Output Format

<Parameter	Type	Value
Switch	Integer	1 = SW1 2 = SW2
Ch	Integer	Last defined channel.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the last defined channel for the setup of SW2.

Terminal input:

```
:PMAP:SET:LAST? 2
```

Terminal Output:

```
12
```

The Terminal output indicates that the last defined channel when setting up SW2 is Channel 12.

:PMAP:SETup:LIST?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query if the channel list used to set up the port map table for the specified switch.

Input Format

```
:PMAP:SETup:LIST? <Switch>
```

Output Format

```
<Ch>,<Ch>,…,<Ch>
```

Parameter	Type	Value
Ch	Integer	Channel number

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the channel list for SW1.

Terminal input:

```
:PMAP:SETup:LIST?
```

Terminal Output:

```
4,5,6,7,8,9,10,11,12
```

:PMAP:MEASure:ALL

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Determines the port links for all unassigned paths in a variable port map table.

Input Format

```
:PMAP:MEASure:ALL
```

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example measures all unassigned paths in a variable port map table.

Terminal input:

```
:PMAP:MEAS:ALL
```

:PMAP:MEASure:LIVE

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Determines the port links for the specified Live Variable channel in a variable port map table.

Input Format

```
:PMAP:MEASure:LIVE <Ch>
```

Parameter	Type	Value
Ch	Integer	Live Channel number

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example measures the port link for live Channel 3 in a variable port map table.

Terminal input:

```
:PMAP:MEAS:LIVE 3
```

:PMAP:MEASure:LIVE?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the channel link for the specified Live channel in a variable port map table.

Input Format

```
:PMAP:MEASure:LIVE? <Ch>
```

Output Format

```
<Link>
```

Parameter	Type	Value
Ch	Integer	Live Variable Channel number
Link	Integer	Linked channel number

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the channel link for variable channel 2.

Terminal input:

```
:PMAP:MEAS:LIVE? 3
```

Terminal Output:

```
5
```

The Terminal output indicates that the live channel 3 is linked to the fixed channel 5.

:PMAP:MEASure:VALid

Busy Status

☐ Busy Test Required? ☐ Busy?

Description

Performs a validation measurement for all port map links in the port map table.

Input Format

```
:PMAP:MEASure:VALid
```

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example validates the port map table.

Terminal input:

```
:PMAP:MEAS:VALid
```

:PMAP:MEASure:VALid?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the results of a Port Map Validation measurement.

Input Format

```
:PMAP:MEASure:VALid?
```

Output Format

```
<Path>,<Path>,…<Path>
```

Parameter	Value
Path	0 = ALL paths are valid. 1..N = Path with invalid link

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example queries the results of the port map validation measurement.

Terminal input:

```
:PMAP:MEAS:VAL?
```

Terminal Output:

```
0
```

The Terminal output indicates that all defined paths are valid.

Terminal Output:

```
2,6
```

The Terminal output indicates that paths 2 and 6 are invalid.

:MEASure:STATe?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the PCT application state.

Input Format

```
:MEASure:STATe?
```

Output Format

```
<State>
```

Parameter	Type	Value
State	Integer	0 = INIT (initializing application) 1 = IDLE (ready but not measuring) 2 = BUSY (making a measurement) 3 = FAULT (in fault state) 4 = SYSTEM*

* Performing system functions – currently when an OPM dark measurement or upgrade is in progress.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected

Example

The following example queries the PCT busy state.

Terminal:

```
:MEAS:STATe?
```

Terminal Output:

```
1
```

The Terminal output indicates that the application state is IDLE, meaning that the PCT is ready and not currently scanning.

:MEASure:STARt

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Initiates a measurement cycle.

Input Format

```
:MEASure:STARt
```

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example starts a measurement cycle.

Terminal input:

```
:MEASure:STARt
```

:MEASure:STOP

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Aborts the current measurement cycle, or turns off the pulsed laser if it is enabled.

Input Format

```
:MEASure:STOP
```

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example stops the current measurement cycle.

Terminal input:

```
:MEASure:STOP
```

:MEASure:REF2step

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Enables the bi-directional 2-step referencing option.

Input Format

```
:MEASure:REF2step <State>
```

Parameter	Type	Value
State	Integer	0 = Disable 2-step referencing. 1 = Enable 2-step referencing

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example enables the bi-directional 2-step referencing.

Terminal input:

```
:MEAS:REF2 1
```

:MEASure:REF2step?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the bi-directional 2-step referencing option.

Input Format

```
:MEASure:REF2step?
```

Output Format

```
<State>
```

Parameter	Type	Value
State	Integer	0 = Disable 2-step referencing. 1 = Enable 2-step referencing

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example queries if the 2-step referencing option is enabled.

Terminal input:

```
:MEAS:REF2?
```

Terminal Output:

```
0
```

The Terminal output indicates that the bi-directional 2-step referencing option is not enabled.

:MEASure:RESet

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Resets all Reference and DUT measurements.

Input Format

```
:MEASure:RESet
```

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example resets all measurements.

Terminal input:

```
:MEASure:RESet
```

Chapter 21: Measurement Results Commands

The following commands will query the measurement result values for the current measurement setup as defined by these four parameters: Launch Port, MTJ Connection, Channel Number and Wavelength. The Channel and Wavelength setup in the PCT GUI allows for specifying multiple values to optimize measurement time. The SCPI command set allows setting only one wavelength and one channel at a time, and leaves the measurement optimization to the calling application. This greatly simplifies the command set for querying measurement results. Another benefit is that the ORL can be queried in different zones as many times as needed after each scan. The measurement results will always correspond to the last successful scan that was taken with these four parameters.

For example:

SENS:FUNC 0	Set to "Reference" mode
PATH:LAUN 1	Set to launch port 1
PATH:CONN 1	Set to ''Single MTJ" mode
PATH:CHAN 1,2	Set to channel 2 on J1 Output
SOUR:WAV 1550	Set to scan using 1550 source
MEAS:STARt	Start scan
MEAS:STATe?	Query state until measurement is complete
MEAS:POW?	Query measured power, ie. -1.75

Note: In **REF** measurement mode, only the **POW?**, **DIST?, LENG?** and **TABL?** commands are valid, as the other queries are DUT specific.

:MEASure:POWer?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the power measurement for the current measurement setup.

Input Format

```
:MEASure:POWer?
```

Output Format

```
<Power>
```

Parameter	Type	Value
Power	Float	Pmin <= Power < Pmax, - - - - - - - *(TOO LITTLE LIGHT),* +++++++ *(TOO MUCH LIGHT)*

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value

Example

The following example queries absolute power for the current measurement setup.

Terminal input:

```
:MEASure:POWer?
```

Terminal Output:

```
-12.55
```

The Terminal output indicates that the absolute power measured at the last scan was -12.55 dBm.

:MEASure:DISTance?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the distance to the end of fiber for the current measurement setup. This measurement is only valid for mORL modules.

Input Format

```
:MEASure:DISTance?
```

Output Format

```
<Dist>
```

Parameter	Type	Value
Dist	Float	Distance to end of fiber (m)

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example queries distance to the end of fiber for the current measurement setup.

Terminal input:

```
:MEASure:DISTance?
```

Terminal Output:

```
52.75
```

The Terminal output indicates that the measured distance to the end of fiber for the last scan was 52.75 m.

:MEASure:LENGth?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the DUT length for the current measurement setup when measurement type is DUT. Query the length of MTJ jumper for the MTJ single connection when measurement type is REFERENCE. Query the total length of both MTJ jumpers for the MTJ dual connection when measurement type is REFERENCE. This measurement is only valid for mORL modules.

Input Format

```
:MEASure:LENGth?
```

Output Format

```
<Length>
```

Parameter	Type	Value
Length	Float	length (m)

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example queries the length for the current measurement setup. Depending on the current measurement setup the length could be DUT length or MTJ1 jumper length or RECEIVER jumper length.

Terminal input:

```
:MEASure:LENGth?
```

Terminal Output:2.50

The Terminal output indicates that the measured length for the last scan was 2.50 m.

:MEASure:IL?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the DUT Insertion Loss, or the REF mode Insertion Loss for the current measurement setup. The REF mode IL is only available for mORL modules.

Input Format

```
:MEASure:IL?
```

Output Format

Parameter	Type	Value
IL	Float	Insertion Loss (dB)

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example queries the Insertion Loss for the current measurement setup.

Terminal input:

```
:MEASure:IL?
```

Terminal Output:

```
1.33
```

The Terminal output indicates that the measured Insertion Loss at for the last scan was 1.33 dB.

:MEASure:ORL?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the DUT ORL defined with the specified ORL zone setup for the current measurement setup. This measurement is only valid for mORL modules.

Input Format

```
:MEASure:ORL? <Method>,<Origin>,<AOff>,<BOff>
```

Output Format

```
<ORL>
```

Parameter	Type	Value
Method	Integer	1 = Integration method. 2 = Discrete method.
Origin	Integer	1 = both markers A and B anchored to DUT start. 2 = both markers A and B anchored to DUT end. 3 = marker A anchored to DUT start and marker B anchored to DUT end
AOff	Float	Marker A offset from origin (m).
BOff	Float	Marker B offset from origin (m).
ORL	Float	DUT ORL (dB)

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the DUT ORL for the current setup.

Terminal input:

```
:MEASure:ORL? 1,1,-0.5,1.5
```

Terminal Output:

```
72.65
```

The Terminal output indicates that the measured DUT ORL (integral mode) around the DUT input connector was 72.65 dB.

:MEASure:ORL:PRESet?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the DUT ORL preset in the specified origin for the current measurement setup. This measurement is only valid for mORL modules.

Input Format

```
:MEASure:ORL:PRESet? <Origin>
```

Output Format

```
<ORL>
```

Parameter	Type	Value
Origin	Integer	1 = preset for DUT start (input connector). 2 = preset for DUT end (output connector). 3 = preset for DUT without connectors
ORL	Float	DUT ORL (dB)

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the preset input connector ORL for the current measurement setup.

Terminal input:

```
:MEASure:ORL:PRESet? 1
```

Terminal Output:

```
72.65
```

The Terminal output indicates that the measured DUT ORL pre-set around the DUT input connector was 72.65 dB.

:MEASure:ORL:ZONe?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the DUT ORL measurement in the specified RL zone. This measurement is only valid for mORL modules.

Input Format

```
:MEASure:ORL:ZONe? <zone>
```

Output Format

Parameter	Type	Value
Zone	Integer	1 or 2 (RL zone defined in the GUI).
ORL	Float	DUT ORL (dB)

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the ORLvalue of RL zone 1 from the ORL setup dialog in the GUI.

Terminal input:

```
:MEASure:ORL:ZONe? 1
```

Terminal Output:

```
72.65
```

The Terminal output indicates that the measured DUT ORL value from Zone 1 is 72.65 dB.

Chapter 22: Factory Calibration Commands

The following commands are intended for setting up the PCT configurations, and for the factory calibration of the PCT module. The factory calibration can also be performed using the GUI of the PCT super-application – so the commands mirror the steps defined in the GUI as follows:

Step 1: Front Panel distances

Step 2: Front Panel IL/Power Ratio

Step 3: ORL artifact setup

Step 4: ORL artifact insertion losses

Step 5: K & DeltaT coefficients

Step 6: 1xn Switch distances

Step 7: 1xn Switch insertion losses

Step 8: Bi-Directional module Loopback IL/Lengths

The factory calibration commands are used in conjunction with the PCT commands found in 0. For instance, call `SENS:FUNC 1` and `PATH:LAUN 1` before calling `FACT:MEAS:START 2`.

Some measurement settings are hard-coded for the calibration steps – they will be set to the following values when the measurement starts:

Range – 200m

Averaging – 5 seconds

Connection – Single MTJ

Wavelength – All available

The queries will return a comma-separated list with values for each wavelength.

:FACTory:RESet

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Reset the calibration step values to factory defaults.

Note: the Step parameter is optional, and will reset to factory defaults for all steps if omitted.

Input Format

```
:FACTory:RESet [Step]
```

Parameter	Type	Value
Step (optional*)	Integer	1 = Front Panel distances, 2 = Front Panel IL/Ratio, 3 = Artifact Loss & ORL **, 4 = Artifact connector losses **, 5 = Artifact K & DeltaT coefficients, 6 = 1xn Switch distances, 7 = 1xn Switch connector losses, 8 = Loopback IL/Length, 9 = Remote OPM Pairing

* If the Step parameter is omitted, then all steps will be reset.

** Steps 3 and 4 cannot be reset and will produce error -224.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example resets the front panel losses to factory defaults.

Terminal input:

```
:FACT:RES 2
```

:FACTory:COMMit

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Commits the measured calibration step values to the EEPROM.

Input Format

```
:FACTory:COMMit <Step>
```

Parameter	Type	Value
Step (optional*)	Integer	1 = Front Panel distances, 2 = Front Panel IL/Ratio, 3 = Artifact Loss & ORL **, 4 = Artifact connector losses**, 5 = Artifact K & DeltaT coefficients, 6 = 1xn Switch distances, 7 = 1xn Switch connector losses, 8 = Loopback IL/Length, 9 = Remote OPM Pairing

* Step 4 cannot be commited and will produce error -224.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example commits the factory calibration measurement for the front panel connector losses to the EEPROM.

Terminal input:

```
:FACT:COMM 2
```

:FACTory:ARTifact:LOSS

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Sets the artifact insertion losses at each wavelength.

Input Format

```
:FACTory:ARTifact:LOSS <List>
```

Parameter	Type	Value
List	Comma-separated list of float.	Specify a value for each wavelength in ascending order.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-226	Lists not same length

Example

The following example sets the artifact insertion losses at wavelengths 1310,1550.

Terminal input:

```
:FACT:ART:LOSS 1.75,1.83
```

:FACTory:ARTifact:LOSS?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the artifact insertion losses at each wavelength.

Input Format

```
:FACTory:ARTifact:LOSS?
```

Output Format

```
<List>
```

Parameter	Type	Value
List	Comma-separated list of float.	Specifies a value for each wavelength in ascending order.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the artifact insertion losses at wavelengths 1310,1550.

Terminal input:

```
:FACT:ART:LOSS?
```

Terminal Output:

```
1.75,1.83
```

The Terminal output indicates that the artifact insertion losses are 1.75 dB at 1310 nm, and 1.83 at 1550 nm.

:FACTory:ARTifact:ORL

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Sets the artifact optical return losses at each wavelength.

Input Format

```
:FACTory:ARTifact:ORL <List>
```

Parameter	Type	Value
List	Comma-separated list of float.	Specify a value for each wavelength in ascending order.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-226	Lists not same length

Example

The following example sets the artifact optical return losses at wavelengths 1310,1550.

Terminal input:

```
:FACT:ART:ORL 40.5,42.8
```

:FACTory:ARTifact:ORL?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the artifact optical return losses at each wavelength.

Input Format

```
:FACTory:ARTifact:ORL?
```

Output Format

```
<List>
```

Parameter	Type	Value
List	Comma-separated list of float.	Specifies a value for each wavelength in ascending order.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries the artifact optical return losses at wavelengths 1310,1550.

Terminal input:

```
:FACT:ART:ORL?
```

Terminal Output:

```
40.5,42.8
```

The Terminal output indicates that the artifact optical return losses are 40.5 dB at 1310 nm, and 42.8 dB at 1550 nm.

:FACTory:MEASure:STARt

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Starts a factory calibration measurement for the specified step.

Input Format

```
:FACTory:MEASure:STARt <Step>
```

Parameter	Type	Value
Step (optional*)	Integer	1 = Front Panel distances 2 = Front Panel IL/Ratio 3 = Artifact Loss & ORL ** 4 = Artifact connector losses ** 5 = Artifact K & DeltaT coefficients 6 = 1xn Switch distances 7 = 1xn Switch connector losses 8 = Loopback IL/Length 9 = Remote OPM Pairing

* You can NOT make a measurement for step 3 – these values are specified manually with the `FACTory:ARTifact:LOSS` and `FACTory:ARTifact:ORL` commands.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example starts a Front Panel connector loss measurement.

Terminal input:

```
:FACT:MEAS:STARt 2
```

:FACTory:MEASure:FPDistance?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the Front Panel distances at each wavelength for the specified Internal Launch Fiber.

Input Format

```
:FACTory:MEASure:FPDistance? <ILF>
```

Output Format

```
<List>
```

Parameter	Type	Value
ILF		Internal Launch Fiber (1 or 2).
List	Comma-separated list of float.	Specifies values for each wavelength in ascending order as follows: <WL1>,<Default>,<Current>,<Measured>,…,<WLn>,<Default>,<Current>,<Measured>

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the front panel distances for ILF 1 at wavelengths 1310,1550.

Terminal input:

```
:FACT:MEAS:FPD? 1
```

Terminal Output:

```
1310,0.0,0.32,0.36,1550,30.0,30.4,30.36
```

:FACTory:MEASure:FPLoss?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the Front Panel insertion losses at each wavelength for the specified Internal Launch Fiber.

Input Format

```
:FACTory:MEASure:FPLoss? <ILF>
```

Output Format

```
<List>
```

Parameter	Type	Value
ILF		Internal Launch Fiber (1 or 2).
List	Comma-separated list of float.	Specifies values for each wavelength in ascending order as follows: <WL1>,<Ref.>,<Current>,<Measured>,…,<WLn>,<Ref.>, <Current>,<Measured>

* Note: the <Ref> parameter is the reference measurement value.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the front panel insertion losses for ILF 1 at wavelengths 1310,1550.

Terminal input:

```
:FACT:MEAS:FPL? 1
```

Terminal Output:

```
1310,-15.19,0.08,0.04,1550,-17.23,0.15,0.08
```

:FACTory:MEASure:FPRatio?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the Front Panel Power Ratio at each wavelength for the specified Internal Launch Fiber.

Input Format

```
:FACTory:MEASure:FPRatio? <ILF>
```

Output Format

```
<List>
```

Parameter	Type	Value
ILF		Internal Launch Fiber (1 or 2).
List	Comma-separated list of float.	Specifies values for each wavelength in ascending order as follows: <WL1>,<Current>,<Measured>,…,<WLn>,<Current>,<Measured>

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the front panel power ratios for ILF 1 at wavelengths 850,1300.

Terminal input:

```
:FACT:MEAS:FPR? 1
```

Terminal Output:

```
850,0.712,0.713,1300,0.723,0.725
```

:FACTory:MEASure:LOOP?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the Loopback Length/IL at each wavelength for the specified Internal Launch Fiber.

Input Format

```
:FACTory:MEASure:LOOP? <ILF>
```

Output Format

```
<List>
```

Parameter	Type	Value
ILF		Internal Launch Fiber (1 or 2).
List	Comma-separated list of float.	Specifies values for each wavelength in ascending order as follows: <WL1>,<Current Length>,<Measured Length>,<Current IL>,<Measured IL>, …

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the loopback values for ILF 1 at wavelengths 850,1300.

Terminal input:

```
:FACT:MEAS:LOOP? 1
```

Terminal Output:

```
850,35.50,35.34,0.25,0.24,1300,35.25,35.25,0.23,0.23
```

:FACTory:MEASure:ARTLoss?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the Artifact connector insertion losses at each wavelength for the specified Internal Launch Fiber.

Input Format

```
:FACTory:MEASure:ARTLoss? <ILF>
```

Output Format

```
<List>
```

Parameter	Type	Value
ILF		Internal Launch Fiber (1 or 2).
List	Comma-separated list of float.	Specifies values for each wavelength in ascending order as follows: <WL1>,<Ref>,<IL>,…,<WLn>,<Ref>,<IL>

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the artifact connector insertion losses for ILF 1 at wavelengths 1310,1550.

Terminal input:

```
:FACT:MEAS:ARTL? 1
```

Terminal Output:

```
1310,-15.19,0.08,1550,-17.23,0.15
```

:FACTory:MEASure:CALK?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the K coefficients at each wavelength for the specified Internal Launch Fiber.

Input Format

```
:FACTory:MEASure:CALK? <ILF>
```

Output Format

```
<List>
```

Parameter	Type	Value
ILF		Internal Launch Fiber (1 or 2).
List	Comma-separated list of float.	Specifies values for each wavelength in ascending order as follows: <WL1>,<Default>,<Current>,<Measured>,…,<WLn>,<Default>,<Current>,<Measured>

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the K coefficients for ILF 1 at wavelengths 1310,1550.

Terminal input:

```
:FACT:MEAS:CALK? 1
```

Terminal Output:

```
1310,-79.0,-80.3,-80.45,1550,-81.0,-81.8,-81.2
```

:FACTory:MEASure:CALT?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the DeltaT coefficients at each wavelength for the specified Internal Launch Fiber.

Input Format

```
:FACTory:MEASure:CALT? <ILF>
```

Output Format

```
<List>
```

Parameter	Type	Value
ILF		Internal Launch Fiber (1 or 2).
List	Comma-separated list of float.	Specifies values for each wavelength in ascending order as follows: <WL1>,<Default>,<Current>,<Measured>,…,<WLn>,<Default>,<Current>,<Measured>

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the DeltaT coefficients for ILF 1 at wavelengths 1310,1550.

Terminal input:

```
:FACT:MEAS:CALT? 1
```

Terminal Output:

```
1310,1.3326,1.4212,1.4924,1550,1.4223,1.4555,1.5234
```

:FACTory:MEASure:SWDistance?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the 1xn Switch distances at each wavelength for the specified switch channel number.

Input Format

```
:FACTory:MEASure:SWDistance? <Ch>,<Sw>
```

Output Format

```
<List>
```

Parameter	Type	Value
Ch	Switch channel number.	
Sw	Output	1 = SW1, 2 = SW2
List	Comma-separated list of float	Specifies values for each wavelength in ascending order as follows: <WL1>,<Default>,<Current>,<Measured>,…,<WLn>,<Default>,<Current>,<Measured>

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the 1xn switch distances for channel 2 on J1 Out at wavelengths 1310,1550.

Terminal input:

```
:FACT:MEAS:SWD? 2,1
```

Terminal Output:

```
1310,0.0,3.4,3.4,1550,0.0,3.44,3.4
```

:FACTory:MEASure:SWLoss?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the 1xn Switch insertion losses at each wavelength for the specified Internal channel number.

Input Format

```
:FACTory:MEASure:SWLoss? <Ch>,<Sw>
```

Output Format

```
<List>
```

Parameter	Type	Value
Ch	Switch channel number	Number
Sw	Switch number	1 = SW1, 2 = SW2
List	Comma-separated list of float	Specifies values for each wavelength in ascending order as follows: <WL1>,<Ref>,<Current>,<Measured>,…,<WLn>,<Re f>,<Current>,<Measured>

* Note: the <Ref> parameter is the reference measurement value.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the 1xn switch insertion losses for channel 2 on J1 Out at wavelengths 1310,1550

Terminal input:

```
:FACT:MEAS:SWL? 2,1
```

Terminal Output:

```
1310,-15.19,2.52,2.64,1550,-17.23,1.75,1.76
```

:FACTory:MEASure:OPMP?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the Remote OPM Pairing power offsets at each wavelength for the specified Remote OPM head.

Input Format

```
:FACTory:MEASure:OPMP? <Index>
```

Output Format

```
<List>
```

Parameter	Type	Value
ILF		Index of remote OPM head.
List	Comma-separated list of float.	Specifies values for each wavelength in ascending order as follows: <WL1>,<Ref.>,<Current>,<Measured>,…,<WLn>,<Ref.>,<Current>,<Measured>

* Note: the <Ref> parameter is the reference measurement value, taken using the PCT OPM head.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example queries the Remote OPM Pairing for Remote OPM head 1.

Terminal input:

```
:FACT:MEAS:OPMP? 1
```

Terminal Output:

```
1310,-15.19,0.08,0.04,1550,-17.23,0.15,0.08
```

:FACTory:SETup:SWITch

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Selects the switch to be calibrated.

Input Format

```
:FACTory:SETup:SWITch <Sw>
```

Parameter	Type	Value
Sw	Switch number	1 = SW1 2 = SW2

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example sets the SW1 as the switch to be calibrated.

Terminal input:

```
:FACT:SET:SWIT 1
```

:FACTory:SETup:SWITch?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query which switch is set up to be calibrated.

Input Format

```
:FACTory:SETup:SWITch?
```

Output Format

```
<Sw>
```

Parameter	Type	Value
Sw	Switch number	1 = SW1 2 = SW2

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state

Example

The following example queries which Switch to use for calibration.

Terminal input:

```
:FACT:SET:SWIT?
```

Terminal Output:

```
1
```

:FACTory:CONFig:SWITch

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Sets the address of the 1xn switch. To specify that the switch is not used, use NONE.

Input Format

```
:FACTory:CONFig:SWITch <Sw>,<Addr>
```

Parameter	Value
Sw	1 = SW1 2 = SW2
Addr *	MAP<C>.<S>.<D> USB<0-3> NONE

* Use prefix of MAP for map cassettes, or USB for external Viavi SB/SC switches. Use NONE to disable the 1xn switch option.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-224	Illegal parameter value

Example

The following example sets the MAP address of the SW1 1xn switch for the configuration to the local chassis in slot 2, device 1.

Terminal input:

```
:FACT:CONF:SWIT 1,MAP0.2.1
```

:FACTory:CONFig:SWITch:SIZE

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Sets the channel count for an external Viavi SB/SC switch (switch with a USB address).

Input Format

```
:FACTory:CONFig:SWITch:SIZE <Sw>,<Size>
```

Parameter	Value
Sw	1 = SW1 2 = SW2
Size	2-256

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example sets the channel count for SW2 to 12 channels.

Terminal input:

```
:FACT:CONF:SWIT:SIZE 2,12
```

:FACTory:CONFig:SWITch?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the MAP address of the 1xn switch. If the switch is not used, NONE will be returned.

Input Format

```
:FACTory:CONFig:SWITch? <Sw>
```

Output Format

```
<Addr>
```

Parameter	Value
Sw	1 = SW1 2 = SW2
Addr *	MAP<C>.<S>.<D> USB<0-3> NONE

* Use prefix of MAP for map cassettes, or USB for external Viavi SB/SC switches. Use NONE to disable the 1xn switch option.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-224	Illegal parameter value

Example

The following example queries the MAP address of the SW2 1xn switch for the configuration.

Terminal input:

```
:FACT:CONF:SWIT? 2
```

Terminal Output:

```
NONE
```

The Terminal output indicates that the SW2 switch is not used.

:FACTory:CONFig:BIDir

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Sets the bi-directional operation of the configuration.

Input Format

```
:FACTory:CONFig:BIDir <Use>
```

Parameter	Value
Use	0 = Disable Bi-Directional option 1 = Enable Bi-Directional option

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example enabled the bi-directional operation for the configuration.

Terminal input:

```
:FACT:CONF:BID 1
```

:FACTory:CONFig:BIDir?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the the bi-directional operation of the configuration.

Input Format

```
:FACTory:CONFig:BIDir?
```

Output Format

```
<Use>
```

Parameter	Value
Use	0 = Bi-Directional option disabled 1 = Bi-Directional option enabled

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-224	Illegal parameter value

Example

The following example queries the bi-directional option for the configuration.

Terminal input:

```
:FACT:CONF:BID?
```

Terminal Output:

```
0
```

The Terminal output indicates that the bi-directional option is disabled.

:FACTory:CONFig:CORE

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Selects the core for a dual core MM-PCT module.

Input Format

```
:FACTory:CONFig:CORE <Core>
```

Parameter	Value
Core	0 = Set core to 50µ 1 = Set core to 62.5µ

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example sets the core to 62.5µ.

Terminal input:

```
:FACT:CONF:CORE 1
```

:FACTory:CONFig:CORE?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the selected core for a dual core MM-PCT module.

Input Format

```
:FACTory:CONFig:CORE?
```

Output Format

```
<Core>
```

Parameter	Value
Core	0 = Core set to 50µ 1 = Core set to 62.5µ

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-224	Illegal parameter value

Example

The following example queries the selected core for a dual core MM-PCT module.

Terminal input:

```
:FACT:CONF:CORE?
```

Terminal Output:

```
0
```

The Terminal output indicates that the 50µ core is selected.

:FACTory:CONFig:LPOW

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Sets the MM-PCT module Low Power option.

Input Format

```
:FACTory:CONFig:LPOW <Use>
```

Parameter	Value
Use	0 = Disable Low Power option 1 = Enable Low Power option

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-224	Illegal parameter value
-228	Invalid parameter value for current configuration

Example

The following example enabled the Low Power operation for the configuration.

Terminal input:

```
:FACT:CONF:LPOW 1
```

:FACTory:CONFig:OPM

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Sets the address of the Remote OPM cassette.

Input Format

```
:FACTory:CONFig:OPM <Addr>
```

Parameter	Value
Addr *	MAP<C>.<S>.<D>** NONE

* Use prefix of MAP for map cassettes. Use NONE to disable the Remote OPM option.
** The Device parameter is ignored, and is displayed as an ‘x’.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-224	Illegal parameter value

Example

The following example sets the MAP address of the Remote OPM cassette for the configuration to the local chassis in slot 2.

Terminal input:

```
:FACT:CONF:OPM MAP0.2.x
```

:FACTory:CONFig:OPM?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the MAP address of the Remote OPM cassette.

Input Format

```
:FACTory:CONFig:OPM?
```

Output Format

```
<Addr>
```

Parameter	Value
Addr *	MAP<C>.<S>.<D> NONE

* Use prefix of MAP for map cassettes. Use NONE to disable the Remote OPM option.
** The Device parameter is ignored, and is displayed as an ‘x’.

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-224	Illegal parameter value

Example

The following example queries the MAP address of the Remote OPM cassette for the configuration.

Terminal input:

```
:FACT:CONF:OPM?
```

Terminal Output:

```
NONE
```

The Terminal output indicates that the Remote OPM cassette is not used.

:FACTory:CONFig:LPOW?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the the Low Power operation of the configuration.

Input Format

```
:FACTory:CONFig:LPOW?
```

Output Format

```
<Use>
```

Parameter	Value
Use	0 = Low Power option disabled 1 = Low Power option enabled

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-224	Illegal parameter value

Example

The following example queries the Low Power option for the configuration.

Terminal input:

```
:FACT:CONF:LPOW?
```

Terminal Output:

```
0
```

The Terminal output indicates that the Low Power option is disabled.

:FACTory:CALibration?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query if the PCT module is calibrated.

Input Format

```
:FACTory:CALibration?
```

Output Format

```
<Status>
```

Parameter	Value
Status	YES = module is calibrated NO = module is not calibrated

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example queries if the PCT module is calibrated.

Terminal input:

```
:FACT:CAL?
```

Terminal Output:

```
YES
```

The Terminal output indicates that the PCT module is calibrated.

:FACTory:CALibration:DATe?

Busy Status

☐ Busy Test Required? ☐ Causes Card Busy?

Description

Query the PCT module calibration date.

Input Format

```
:FACTory:CALibration:DATe?
```

Output Format

```
<Date>
```

Parameter	Value
Date	yyyy-mm-dd = if module is calibrated, NO = if module is not calibrated

Errors

Standard error messages.

Command specific errors:

Error Number	Error Description
-204	Invalid while cassette is not selected
-205	Command not valid in current state
-228	Invalid parameter value for current configuration

Example

The following example queries the Low Power option for the configuration.

Terminal input:

```
:FACT:CAL:DATe?
```

Terminal Output:

```
2011-10-01
```

The Terminal output indicates the PCT module calibration date.

Chapter 23: Specifications

mORL-A1 Single-Mode Insertion Loss and Return Loss Module Specifications

Table 3: mORL-A1 Single-mode Specifications

mORL-A1 Single-Mode Insertion Loss and Return Loss Module	
Parameter	Specification
Source	
2-wavelength version	1310, 1550 nm
4-wavelength version	1310, 1490, 1550, 1625 nm
Measurement Time	
Initialization time	< 11 s
Averaging options per wavelength	1, 2, 5, 10, 30, 60 sec
Insertion Loss	
Display resolution	0.001 dB
Total IL uncertainty[1]	±0.02 dB
Additional uncertainties	
Due to 1xN switching (if mOSW-C1 added)	±0.01 dB
Additional uncertainties	
Due to fiber position in the integrating sphere[2]	±0.03 dB
Return Loss	
Display resolution	0.001 dB
DUT length	
DUT reflections (both ends)	< 40 dB >170 cm
DUT reflections (both ends)	> 40 dB >70 cm

mORL-A1 Single-Mode Insertion Loss and Return Loss Module	
Return Loss Repeatability[3, 4]	
–30 to 65 dB	+0.1 dB
–65 to 70 dB	+0.2 dB
–70 to 75 dB	+0.4 dB
–75 to 80 dB	+1.5 dB
Return Loss Accuracy[3]	
–30 to 70 dB	±1.0 dB
–70 to 75 dB	±1.7 dB
– 75 to 80 dB	±3.0 dB
Recalibration	
Period	1 year

1. After valid zero loss, total expanded uncertainty (2σ), and reconnecting the same connector and OPM adaptor, temperature ±1°C, using internal source.
2. 24-channel ribbon fiber
3. All measurement specifications provided at 5 s averaging time and 200 m range, unless otherwise stated.
4. 10 measurements with a stable connection of a 3 m patch cord.

mIL-A2 Multimode Insertion Loss Module Specifications

Table 4: mIL-A2 Multimode Specifications

mIL-A2 Multimode Insertion Loss Module	
Parameter	Specification
Source	
Source type	Dual LED
Wavelength	**850 nm, 1300 nm, or both**
Measurement Time	
Single wavelength	0.8 s
Dual wavelength	1.3 s
Insertion Loss	
Display resolution	0.001 dB
IL dynamic range[1]	>25 dB for both 850/1300 nm
IL linearity[2]	±0.010 dB ±10 pW (1300 nm)
IL stability – 15 min[3]	±0.01 dB
IL long-term stability – typical[4]	±0.05 dB
Fiber	

mIL-A2 Multimode Insertion Loss Module	
Type	50 or 62.5 µm
Recalibration	
Period	1 year

1. With standard AC901 FC adaptor.
2. Temperature ±3°C within 20 to 30°C
3. After 1 minute in repeat mode and at constant temperature with a stable 1 m patch cord connection.
4. Over 20 hours at a temperature within ±3°C from 20 to 30°C and with a stable 1 m patch cord connection.

mORL-A1 Multimode Insertion Loss and Return Loss Module Specifications

Table 5: mORL-A1 Multimode Specifications

mORL-A1 Multimode Insertion Loss and Return Loss Module	
Parameter	Specification
Source	
2-wavelength version (LED or laser mode)	850, 1300 nm
Fiber Types	
Single fiber	50 µm (OM3)
Dual fiber	50 µm (OM3) and 62.5 µm (OM1) (software selectable)
Measurement Time	
Initialization time	<11 s
Averaging options per wavelength	1, 2, 5, 10, 30, 60 sec
Insertion Loss	
Modes	LED or laser (software selectable)
Display resolution	0.001 dB
Total IL uncertainty[1, 2]	±0.05 dB
Additional uncertainties[2]	
Due to 1xN switching (if mOSW-C1 added)	±0.01 dB
Additional uncertainties[2]	
Due to fiber position in integrating sphere[3]	±0.03 dB
Return Loss	
Display resolution	0.01 dB
DUT length	
DUT reflections (both ends)	< 30 dB >170 cm
DUT reflections (both ends)	> 30 dB >70 cm

mORL-A1 Multimode Insertion Loss and Return Loss Module	
Return Loss Repeatability[4, 5]	
–15 to 60 dB	+0.2 dB
–60 to 70 dB	+0.5 dB
Return Loss Accuracy[4]	
–15 to 20 dB	±1.8 dB
–20 to 60 dB	±1.3 dB
Recalibration	
Period	1 year

1. For LED mode, after valid zero loss, total expanded uncertainty (2σ), and reconnecting the same connector and OPM adaptor, temperature ±1°C, using internal source.
2. IL uncertainty from launching condition is not included.
3. 24-channel ribbon fiber.
4. All measurement specifications provided at 5 s averaging time and 200 m range, unless otherwise stated.
5. 10-measurements with a stable connection of a 3 m patch cord.

General Environmental Specifications

Table 6: General Environmental Specifications

General Environmental Specifications (module only, not in MAP-200 chassis)	
Parameter	Specification
Environmental	
Warm-up time	20 min
Operating temperature, humidity	25 ±5°C, non-condensing
Storage temperature	–30 to +60°C
Physical	
Size (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)
Weight (approximate)	1.2 kg (2.65 lbs)

Chapter 24: Warning Codes and Messages

The following warning codes are returned with the SYSTem:WARNing? query.

Code	Warning Message	Explanation
0	No Warning	No Warning
-1	Configuration has changed since last powerup!	Powered up with different modules configuration.
-2	Module is not calibrated!	The module of the current configuration is not factory calibrated.
-3	MTJ usage exceeds limit - please exchange.	After a measurement, when the MTJ has been used for more than a determined number of connections (set in Preferences dialog).
-4	Reference measurement not taken.	When making a DUT measurement and the corresponding reference is not available.
-5	Reference validity expired.	When making a DUT measurement but the corresponding reference measurement's validity time has expired.
-6	Single MTJ reference is required.	When making a Double MTJ DUT measurement, but the corresponding Single MTJ reference is required but not available.
-7	Receive Jumper length is not specified.	Not used.
-8	Laser interlock is engaged!	When making a measurement, if the laser interlock is engaged. This will abort the measurement request.
-9	Specified MTJ length is much different from measured value.	After a reference measurement, if the measured MTJ length is much different from the manual override length entered in the MTJ dialog.
-10	Measured DUT length is undetermined.	After a DUT measurement, when the DUT length is less than a minimum threshold (currently 0.2m).
-11	End of Fiber not detected!	After a measurement, if no EOF event was detected.

Code	Warning Message	Explanation
-12	Internal error. Measurement canceled.	When an internal communication error occurs.
-13	ORL measurement could not be completed.	When the ORL measurement calculation encounters a problem.
-14	Error calculating Calibrated ORL value!	For ORL measurements if the K and N values are invalid.
-15	ILF Zone not set up properly!	If the Internal Launch Fiber zone is invalid.
-16	No events found in DUT zone!	In the K & DeltaT calibration measurement, when an event was not found in the DUT zone.
-17	Division by zero encountered in K calculation!	In the K & DeltaT calibration measurement, when some parameters are invalid.
-18	Log of negative number encountered K calculation!	In the K & DeltaT calibration measurement, when some parameters are invalid.
-19	Log of negative number encountered in deltaF calculation!	In the K & DeltaT calibration measurement, when some parameters are invalid.
-20	Error performing OPM Dark measurement.	When the OPM dark measurement fails.
-21	Error resetting OPM Dark to Factory setting.	When the OPM dark factory measurement fails.
-22	Error upgrading OPM bootloader!	When the OPM bootloader upgrade fails.
-23	Error upgrading OPM firmware!	When the OPM firmware upgrade fails.
-24	Invalid ORL zone.	When an ORL zone is not set up correctly (that is marker A > marker B).
-25	Could not open database!	When the selected database could not be loaded.
-26	Error adding record into tblAcquisition table.	During script test, when an error is encountered saving acquisition data to the acquisition table.
-27	Error adding record into tblMeasurement table.	During script test, when an error is encountered saving measurement results to the measurement table.
-28	Error updating tblAcquisition table.	During script test, when an error is encountered updating the Results field in the acquisition table record.
-29	Error setting up port mapping function.	When the port mapping function is initialized and any internal communication errors are encountered.
-30	Error performing port mapping function.	An internal communication error was encountered when performing the port mapping function.
-31	Could not find output port for input	During port mapping function, when an

Code	Warning Message	Explanation
	channel N.	output port can't be determined for a given input port.
-32	Could not load port mapping table.	When a configuration is initialized and the last saved port map table is not valid anymore due to a change in channel count.
-33	Invalid port map path.	Before making a measurement with Port Map selected, the variable channel in a port path row is not assigned for the current fixed channel.
-34	Error resetting OPM Range setting.	After performing a Port Map function, if the OPM range can't be reset to auto range.
-35	Specified MTJ IL is much different from measured value.	After a reference measurement, if the measured MTJ IL is much different from the manual override IL entered in the MTJ dialog.
-36	License is required for Dual Switch operation.	Before a measurement, if the current configuration is a Dual Switch configuration but the license is missing.
-37	PCT is currently busy – measurement request denied.	Before a measurement, if the state is not Idle or a measurement is already pending. Also when taking a Dark Power measurement and the OPM mode is enabled.
-38	Reference detector has too little power.	When a measurement completes and the internal detector head reports too little power.
-39	Reference detector has too much power.	When a measurement completes and the internal detector head reports too much power.
-40	Error adding record into tblTestPortMap table.	During script test, when an error is encountered saving port map setup to database.
-41	Front Panel Power Ratio is not calibrated!	When a configuration starts and the front panel power ratio calibration is not available.
-42	Launch path loss is high.	When a reference measurement is taken, and the calculated Front Panel IL is too large.
-43	Launch path loss is too low. Front Panel Power Ratio calibration is required.	When a reference measurement is taken, and the calculated Front Panel IL is too small or negative.
-44	Laser operation interrupted during scan.	If the laser shoot was interrupted during an ORL measurement.
-45	ISU upgrade is required for proper operation.	At startup if the ISU version is out of date.
-46	FO upgrade is required for proper	At startup if the FO version is out of date.

Code	Warning Message	Explanation
	operation.	
-47	OPM upgrade is required for proper operation.	At startup if the OPM version is out of date.
-48	Both switches have the same MAP address.	When starting a configuration that has both 1xn switches set up with the same address.
-49	Launch Switch setup is required for override.	When using input MTJ override length and the launch switch is not set up.
-50	Receive Switch setup is required for override.	When using output MTJ override IL or Length and the receive switch is not set up.
-51	Loopback setup is required for override.	Occurs when using output MTJ override IL or Length for a bi-directional module and the module loopback is not set up.
-52	References are invalid with new range setting.	When a new Range setting is selected in the preferences dialog.
-53	References are invalid with change in Low Power mode.	When the “Low Power” option is changed in the Setup dialog.
-54	Invalid Front Panel Distance calibration.	Before making a measurement, when a Front Panel Distance measurement is invalid.
-55	License is required for external switch operation.	Before making a measurement, when using external Viavi SB/SC series switches, and the license is missing or expired.
-56	Measured value is out of expected range.	When making front panel distance/ratio calibration measurements that are much different from what was expected.
-57	Event channel server failed to initialize.	Internal application communication error – unit is in a bad state. Try restarting the unit.
-58	Error backing up database.	Occurs when the database backup routine kicks in but an error occurred during the process.
-59	Remote directory unavailable... file saved to /PCT/remote/	Occurs at the end of a script, when the “export results to remote directory” step fails to save on the remote directory. File will be saved locally instead.
-60	Failed saving CSV results file.	Occurs at the end of a script, when the “export results to remote directory” step encounters an error while saving the file.
-61	Remote OPM Pairing step is not done.	Occurs at configuration startup, when a Remote OPM cassette is selected, but the “Remote OPM Pairing” calibration step was not performed.
-62	Database is getting large. Consider new database.	Periodically checks database size and shows a warning if size exceeds 10MB.

Code	Warning Message	Explanation
-63	Flash is getting full. Move data off the unit using the File Manager.	Periodically checks flash user space, and shows a warning if exceeds 90% used.
-64	Loopback length difference is too large. Invalid measurement.	Occurs when making Loopback calibration measurements, and the length validation fails.
-65	IL measurement timing error.	If the IL measurement could not be completed due to a very short averaging time and busy system.
-66	Measurement is stuck. ESD CONDITION!	If a scan takes at least one minute longer than it should, based on the averaging time, this warning is displayed, rather than rebooting the system.

Chapter 25: Technical Support

Visit this site on the web, http://www.viavisolutions.com/en/services-and-support/support/technical-assistance, select your country and then select “FOPLT” or “MAP-200” to find the MAP-200 technical assistance phone number for your region.

Chapter 26: Service

Storing and Shipping

To maintain optimum operating reliability, do not store the unit in locations where the temperature falls below -30 °C or rises above 60 °C. Avoid any environmental condition that can result in internal condensation. Ensure that these temperature and humidity requirements can also be met whenever the unit is shipped.

Claims and Repackaging

Immediately inform Viavi and, if necessary, the carrier, if

- The contents of the shipment are incomplete
- The unit or any of its components are damaged or defective
- The unit does not pass the initial inspection

In the event of carrier responsibility, Viavi will allow for the repair or replacement of the unit while a claim against the carrier is being processed.

Packing Guidelines With Original Packaging

- Ensure foam is properly placed
- Use the L-Shaped cardboard piece to hold controller in place
- Do not ship with the display mounted on the chassis, ensure it is packaged separately
- Do not ship with MTLS and MTBF populated in the chassis

Packing Guidelines Without Original Packaging

- Do not ship with any modules populated in the chassis
- Do not ship with the display mounted on the chassis, ensure it is packaged separately
- Ensure the bottom of the chassis is supported
- Ensure sufficient cushioning is provided for all modules, chassis and display being shipped

Returning Shipments to Viavi

Viavi only accepts returns for which an approved Return Material Authorization (RMA) has been issued by Viavi. This number must be obtained prior to shipping any material to Viavi. The owner's name and address, the model number and full serial number of the unit, the RMA number, and an itemized statement of claimed defects must be included with the return material.

Return shipments to Viavi in the original shipping container and packing material. If these are not available, packaging guidelines are as follows:

1. Cover the front panel with a strip of foam.
2. Wrap the unit in anti-static packaging.
3. Pack the unit in a reliable shipping container.
4. Use enough shock-absorbing material (10 to 15 cm or 4 to 6 in on all sides) to cushion the unit and prevent it from moving inside the container. Pink poly anti-static foam is the recommended material.
5. Seal the shipping container securely.
6. Clearly mark FRAGILE on its surface.
7. Always provide the model and serial number of the unit and the RMA number on any accompanying documentation.

Please contact the RMA department, using the contact information under Technical Support on page 316 to provide an RMA number and a shipping address.

Chapter 27: Glossary

Term	Definition
CE	European Community
Chassis	Refers to the mechanical MAP enclosure that houses cassettes and cards.
CI Card	Cassette Interface PCB. This is a common component of all MAP cassettes.
Controller	MAP controller card
CSA	Canadian Standards Association
Device	The part of a card that is individually addressed and controlled to perform a particular action based on card type. For example, a switch card contains switch devices that can be controlled to connect specific input channels to specific output channels.
DWDM	Dense Wavelength Division Multiplexer
ESD	Electrostatic Discharge
FC	Fiber Coupler
FC/APC	Ferrule Connector/Angled Polished Connector
FC/PC	Ferrule Connector/Polished Connector
FP laser	Fabry–Pérot laser
GPIB	General Purpose Interface Bus
IEC	International Electrotechnical Commission
IEEE	Institute of Electronic and Electrical Engineers
IL	Insertion Loss
ISO	International Standards Organization
VIAVI	JDS Uniphase Corporation
LXI	LAN-based eXtensions for Instrumentation
MAP	Multiple Application Platform. Refers to one or more shelves that house and control modular cards to form a system.
MM	Multi Mode
Module	Refers to a functional element on a MAP cassette.
OPM	Optical Power Meter. A card containing one or more optical power detectors. Detectors may be internally integrated within the card or consist of a detector ‘head’ connected via cable to the card.

PCB	Printed Circuit Board
PDL	Polarization Dependent Loss
RMA	Return Material Authorization
SCPI	Standard Commands for Programmable Instruments.
SLED or SLD	Superluminescent Light Emitting Diode.
Slot	One of eight physical areas where a card may be inserted within a MAP chassis. Mechanical guides specify where cards may be inserted.
SM	Single Mode
SMF	Single Mode Fiber
TEC	ThermoElectrically Cooled
UCA	Universal Connector Adapter
UL	Underwriters Laboratory
USB	Universal System Bus
WDM	Wavelength Division Multiplexer

mORL-A1, mIL-A2 and PCT Application Framework

Installation and User Guide

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Standard

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English

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