60-107 User Manual

LXI/USB 12-Slot Modular Chassis



pickeringtest.com

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FM38792

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Worldwide Technical Support and Product Information

Pickering Interfaces Headquarters

Stephenson Road, Clacton-on-Sea, CO15 4NL United Kingdom
Tel: +44 (0)1255-687900
e-mail: sales@pickeringtest.com

USA
Tel: +1 781 897 1710
e-mail: ussales@pickeringtest.com

France
Tel: +33 9 72 58 77 00
e-mail: frsales@pickeringtest.com

Germany
Tel: +49 89 125 953 160
e-mail: desales@pickeringtest.com

Sweden
Tel: +46 340-69 06 69
e-mail: ndsales@pickeringtest.com

Czech Republic
Tel: +420 558 987 613
e-mail: desales@pickeringtest.com

China
Tel: +86 4008 799 765
e-mail: chinasales@pickeringtest.com

Malaysia
Tel: +6012 833 7980
e-mail: aseansales@pickeringtest.com

Product Safety

Safety Symbols

The following safety symbols may be used on the product and throughout the product documentation.

Meaning/Description	Symbol
PROTECTIVE EARTH (GROUND) To identify any terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault, or the terminal of a protective earth (ground) electrode.	
HAZARDOUS LIVE VOLTAGES To indicate hazards arising from dangerous voltages.	
WARNING/CAUTION An appropriate safety instruction should be followed or caution to a potential hazard exists. Refer to the relevant instructions detailed within the product manual.	
HEAVY If this product is heavy reference should be made to the safety instructions for provisions of lifting and moving.	
STATIC SENSITIVE To indicate that static sensitive devices are present and handling precautions should be followed.	

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Warnings & Cautions

WARNING - Usage of Equipment	symbol
This chassis is only intended for indoor use in a dry dust-free location such as an industrial, office or laboratory environment. If is is used in a manner not specified by Pickering, the protection provided by the equipmeny may be compromised. For the environmental conditions under which this unit can operate, see the Technical Specification section of this manual. The ingress protection of this unit is rated at IPXX for indoor use only - unspecified liquids must be kept away from the unit at all times. The unit is intended to operate in a Pollution Degree 2 environment (laboratory/office use).	
WARNING - Hazardous Environments	
This product is not specifically designed for use in hazardous environments, for example in explosive atmospheres. If the product is to be used in hazardous environments we recommend that the user ensures suitable protective measures are taken.	

WARNING - Danger of Electric Shock	Symbol
Modules installed in this chassis may contain hazardous voltages. Before removing a module from the rack remove all supplies and disconnect user I/O signals. Unused slots in the chassis are populated with blanking plates to prevent access to user I/O signals that may be present. Blanking panels are available to order from Pickering in a variety of slot widths. If the product is not used in this manner for example by using an extender card then additional care must be taken to avoid contact with exposed signals. Not to be used in safety critical circuits, refer to the Pickering Interfaces' terms & conditions of sale. Installed modules must not be used for the switching of Mains Circuits. For the switching of voltages up to the module's full specification, Secondary Circuit power supplies and the Device Under Test must be fully isolated from the Mains Circuit and the safety earth. The chassis must be correctly installed and be connected to mains or factory safety ground, please refer to the Installation section of this manual.	

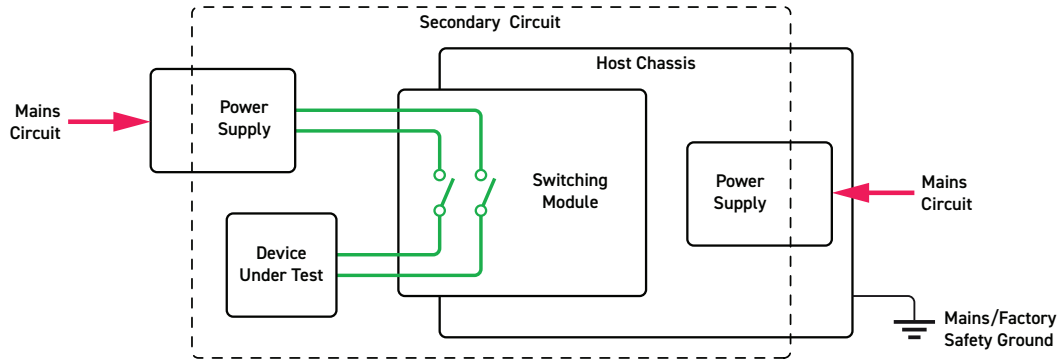


Diagram Showing Separation Between The Mains Circuit and Secondary Circuit / DUT

For the purposes of this document, a Mains Circuit is an installation classified as Overvoltage Category II up to 300 V. Separation between the Secondary Circuit and Mains Circuit is achieved by a transformer in which the primary windings are separated from the secondary windings by reinforced insulation, double insulation, or a screen connected to the protective conductor terminal.

Warnings & Cautions

CAUTION - Handling of Electrostatic-Sensitive Devices	Symbol
Certain semiconductor devices used in this equipment are liable to damage due to static voltage. Observe the following precautions when handling these devices in their unterminated state, or sub-assemblies containing these devices: • Persons removing sub-assemblies from equipment using these devices must be earthed by a wrist strap and a resistor at the point provided on the equipment. • Soldering irons used during the repair operations must be low voltage types with earthed tips and isolated from the mains voltage by a double insulated transformer. • Outer clothing worn must be unable to generate static charges. • Printed Circuit Boards (PCBs) fitted with these devices must be stored and transported in anti-static bags.	

CAUTION - Product Documentation	Symbol
Suitably qualified & trained users (electrical technician or equivalent qualification) should ensure that the accompanying documentation is fully read and understood before attempting to install or operate the product.	

Safety Instructions

Safety Instructions
All cleaning and servicing requires the equipment to be isolated and disconnected from the power source and user I/O signals (refer to the Maintenance Section). • Appropriate manual handling procedures should be followed as dictated by the weight of the individual module or the combined weight of the modules & chassis. • Should a fault occur with the module or chassis, immediately isolate and disconnect the incoming power to the chassis and the user I/O signals. • Ensure the equipment is installed, operated and maintained by trained and authorised personnel. • For suitably equipped products in the event of an emergency press the red "emergency stop" button situated on the front of the unit.



WARNING - RACK MOUNTING

If it is required to fit this unit into an equipment rack, it must be supported by side brackets, runners or a suitable equipment shelf (taking into account the weight of the chassis plus the weight of any modules fitted).

The fixing holes in the front panel flanges are designed only for securing the chassis in the rack and must NOT be used to support the weight of the whole unit.

Section 1 - Technical Specification

- Fully Compliant LXI Interface (1.5)
- Ethernet 1000baseT Interface
- USB 3 Compatible
- Supports 1000+ Pickering PXI & PXIe 3U Switching, Simulation & Instrumentation Modules.
- Version Available With Built-In Scan List Sequence Stores With Triggering Capability (60-107-002)
- Compact Full Rack Width 2U Form Factor
- Removable Embedded Controller
- Removable High Power PSU
- Intelligent Fan Control
- 3 Year Warranty



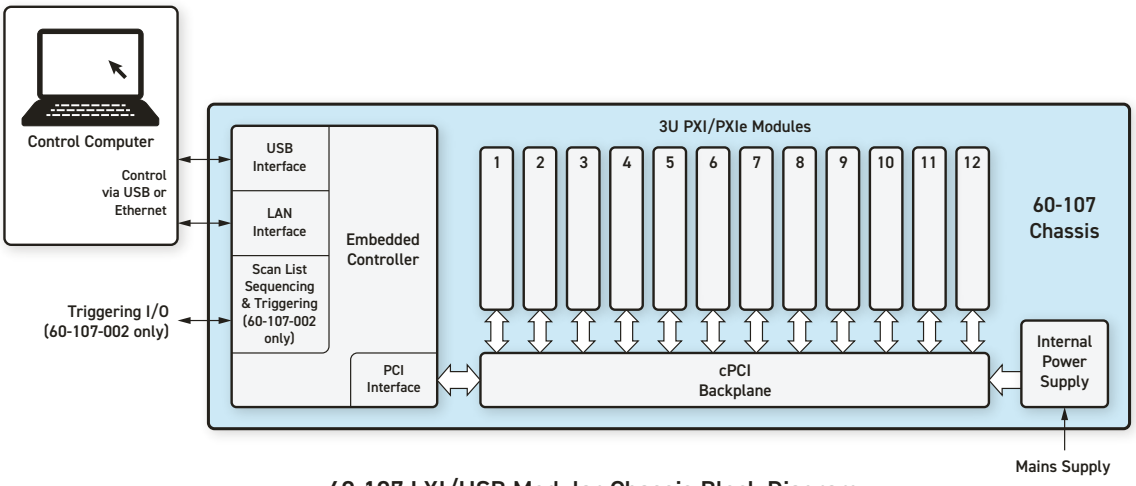
Pickering Interfaces' 60-107-001 modular chassis occupies only a small, 2U rack-height form factor, making it suitable for portable and space-restricted rack-mount applications. This chassis is also available with built-in scan list sequencing and triggering (model 60-107-002).

The chassis supports up to 12 single slot Pickering PXI or PXIe switching, simulation and instrumentation modules.

The USB compatible and LXI compliant interfaces enable the chassis to be controlled directly through standard interfaces found on most personal computers, allowing for a very cost effective route into the modular test and measurement market.

The chassis can be controlled through built in software drivers. Chassis configuration and module control is possible through the W3C web page interface.

The 60-107 is powered from an integrated removable AC mains supply.



60-107 LXI/USB Modular Chassis Block Diagram



The 60-107 is part of a family of LXI/USB chassis capable of supporting Pickering's range of 3U PXI modules. Shown here, along with the 12-slot 60-107, are the 6-slot 60-106, the 4-slot 60-105 and the 2-slot 60-104.



Rear view of the 60-107 LXI/USB chassis showing removable power supply and embedded controller modules.

Section 1 - Technical Specification

Sequencing Service and Triggering (60-107-002)

The Sequencing service provides the user with the ability to set a series of pre-determined sequences on an LXI unit. These sequences can be triggered by software or one of the sixteen software configurable open collector triggers.

As the operations are grouped together, it will minimize the number of control transactions required to achieve a composite change of target switch state, condensing multiple operations in a single sub unit into a single operation, thus reducing the overall system switch settling time. For example, if a user wants to operate matrix crosspoints X1-Y1, X4-Y1, X2-Y2, in the first sequence, only one operation, and one delay, will be used.

Additionally, as the switch state sequences are stored within the LXI controller itself, the burden on the Host CPU and Ethernet traffic is greatly reduced, so the overall system latency is reduced.

This unit features a software reset line which provides the ability for a user supplied reset to be applied to the unit, triggering a software reset of the relays, returning all relays in the unit to their default state. There is also a software fault line available that will be triggered if there is any error detected within the unit. Please note that while these reset and fault lines use dedicated physical connections to the unit, they are software control lines and as such should not be used for safety interlocks etc.

Specifications

Chassis Backplane:	32-bit cPCI Hybrid backplane, compatible with PXI and PXIe.
Chassis Capacity:	12 off 3U user slots available.

PXI Module compatibility

The chassis is supplied with drivers for Pickering PXI/PXIe modules.	
Switching Support:	All of Pickering's 1, 2 & 4 slot 3U PXI/PXIe switching modules. Includes (but not limited to): All 2 and 4-slot 3U BRIC matrices, featuring up to 6624 crosspoints.
Simulation support:	All programmable PXI/PXIe resistor & potentiometer modules offering up to 216 channels, RF attenuators, digital I/O and other simulation modules.

Power Supply

Input Voltage Range:	100 - 240 VAC ±10 %
Input Voltage Frequency:	47 - 63 Hz
Input Current Rating:	11 A 115 VAC or 5.5 A 230 VAC

Cooling

Airflow:	Crossflow
Per-slot Cooling Capacity:	25 W at 50 °C ambient
Fans:	4 off 50 cfm fans & 1 off 7.7 cfm fan

Acoustic Noise Emissions

With fans on maximum:	44 dBA typical

Slot Capacity (Per Slot)

+3.3 V	+5 V	+12 V	-12 V
6 A	6 A	2A	1A

Note: Maximum power is 120 W for each 4 slots segment or 30 W per slot.

LAN Interface

Designed to comply with the LXI Standard Version 1.5	
Connector:	RJ45 Connector.
Connection Speed:	1000BaseT interface.

USB Interface

Designed to be compatible with USB3 (backwardly compatible with USB/USB2)	
Connector:	USB3 type B
Connection Speed:	400 MBps

Mechanical Specification

Dimensions:	Width: 445 mm (17.52") Height: 88.6 mm (3.49") Depth: 485 mm (19.09")
Weight:	10 kg without PXI/PXIe modules
Installation:	Suitable for desktop use or mounting in a standard 19 inch (483 mm) width equipment rack (2U height occupancy).

Triggering (60-107-002)

16x Software Configurable Bidirectional Open Collector Triggers
1x Dedicated Software Reset Line
1x Dedicated Software Fault Line

Scan List Sequencing (60-107-002)

Capable of storing 5000 predefined test sequences, loaded from the host Controller to the LXI unit at process initialization, with the ability to be triggered through software or from any of the sixteen software configurable triggers.

Operating/Storage Conditions

Operating Temperature:	0 °C to +55 °C
Humidity:	Up to 90 % non-condensing
Altitude:	2000 m
Storage/Transport Temperature:	-20 °C to +75 °C
Humidity:	Up to 90 % non-condensing
Altitude:	15000 m

Safety, CE & RoHS Compliance

All products are fully CE compliant and meet applicable EU directives:
Low-voltage safety EN61010-1:2010,
EMC Immunity EN61326-1:2013,
Emissions EN55011:2009+A1:2010.

The 60-107 Chassis also complies with the European Restriction of Hazardous Substances directive (RoHS).

Product Order Codes

LXI/USB Modular Switching Chassis, 12-Slot	60-107-001
LXI/USB Modular Switching Chassis, 12-Slot with Scan List Sequencing & Triggering	60-107-002

Included in the Package

The 60-107 chassis is shipped as a package which includes:

- Pickering LXI chassis (60-107-001 or 60-107-002) with blank panels fitted to all slots
- USB3 Cable
- Ethernet Cable
- Appropriate power cord for your territory
- Product Information/Driver DVD

Pickering's Range of PXI/PXIe/LXI/USB Chassis

Part Number	Description	Control Options
60-102B-001	7-Slot LXI Modular Switching Chassis	LXI
60-103B-001	18-Slot LXI Modular Switching Chassis	LXI
60-104-001	2-Slot LXI/USB Modular Chassis	LXI/USB
60-105-001	4-Slot LXI/USB Modular Chassis	LXI/USB
60-106-001	6-Slot LXI/USB Modular Chassis	LXI/USB
60-107-001	12-Slot LXI/USB Modular Chassis	LXI/USB
40-914-001	14-Slot PXI Chassis	Remote interface / Embedded controller
40-923A-001	19-Slot PXI Chassis	Remote interface / Embedded controller
40-924-001	8-Slot PXI Chassis	Remote interface / Embedded controller
42-924-001	8-Slot PXIe Hybrid (Gen 3)	Remote interface / Embedded controller
42-925-001	18-Slot PXIe Hybrid (Gen 3)	Remote interface / Embedded controller
42-926-001	18-Slot PXIe Hybrid (Gen 2)	Remote interface / Embedded controller
42-927-001	21-Slot PXIe Hybrid (Gen 2)	Remote interface / Embedded controller

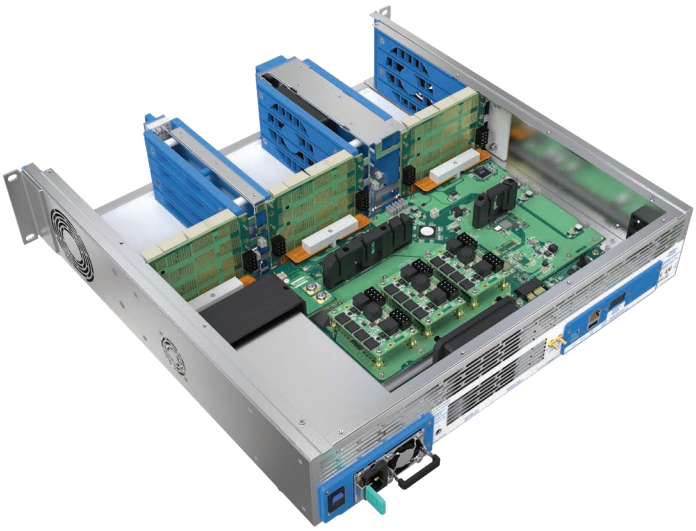
Section 2 - Technical Description

Mechanical Description

The 60-107 Chassis comprises the following:

- 485 mm (D) x 88.6 mm (H) x 445 mm (W) chassis suitable for desk top operation or mounting in an equipment rack.
- 12-slot cPCI backplane, PXI compatible. With 10 MHz & 100 MHz clock. Does not implement PXI Trigger Bus.
- Removable microcontroller assembly providing the interface between the backplane and the control ports.
- Removable power supply assembly for powering the Microcontroller, backplane and peripheral cards.
- Rear panel controller mounted OLED IP address display.
- Front panel mounted status display.
- Rear panel mounted RJ45 1000baseT LAN connection for LXI control of the unit over Ethernet.
- Rear panel mounted USB type B connection for control of the unit over USB.
- Rear panel mounted micro-D connector for sequencing / triggering functions (60-107-002).





Functional Description

The 60-107 LXI/USB Chassis is capable of supporting a wide range of Pickering PXI switching modules in a self-contained unit, the only connections required are power and an Ethernet or USB lead. The chassis consists of a 12-slot cPCI Hybrid backplane (compatible with PXI and PXIe) and a controller assembly with power being supplied from a removable mains power unit. Control and programming information for the PXI modules installed in the chassis is sent to the backplane via a PCI bridge device on the controller assembly. Programming information for the controller is sent to the chassis via the USB interface or the LAN interface from a remote computer using the chassis' unique Ethernet address. Programming documentation for the chassis as well as data for Pickering's compatible switching products is stored in the embedded processor on the controller assembly and can be downloaded via the USB or LAN interface. Displays on the front and rear of the unit indicate condition of the LAN interface and an OLED display on the rear panel provides an indication of the unit's IP address.

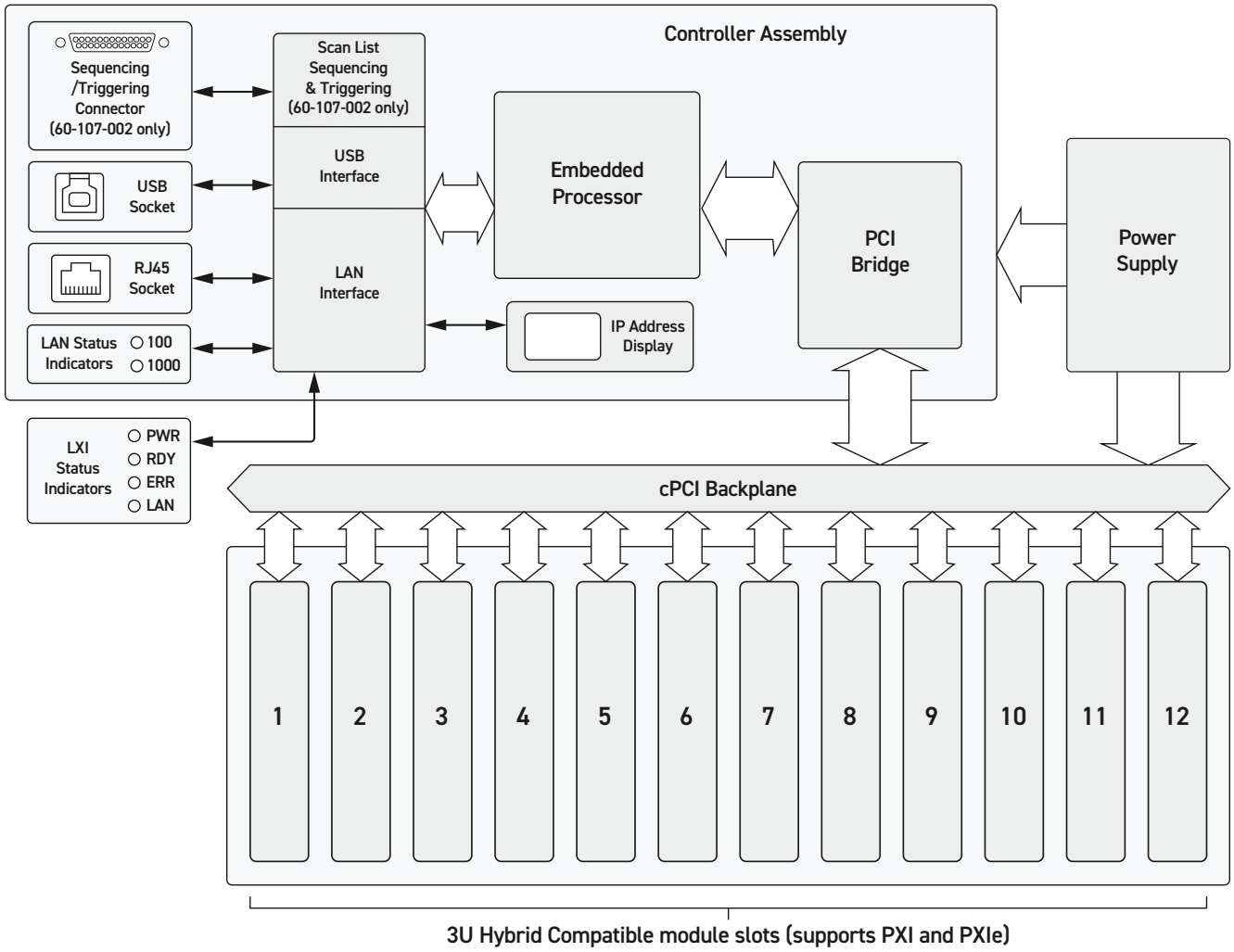


Figure 2.1 - Block Diagram for the 60-107 12-slot LXI/USB Chassis

PXI Module Support

The 60-107 supports a wide variety of Pickering Interfaces 3U PXI modules, the backplane of the chassis conforms with the PXI standard. The chassis' LXI interface conforms with the stated version of the LXI standard.

All Pickering Interfaces' 3U single and dual slot PXI switching modules and resistor modules are supported with the exception of the following:

41-610 - Arbitrary Waveform Generator
41-620 - Function Generator
41-740 - Programmable Power Supply
40-738 - USB 2.0 HUB With Programmable Connect/Disconnect

No third party PXI modules are supported.

The PXI modules are provided with a variety of drivers and this includes an IVI driver as required by the LXI standard, the drivers supported are described in the software section of this manual. Where PXI modules state an operating speed the specification refers to the speed when supported in a PXI chassis which is lightly loaded and not subject to operating system delays, the latency in an Ethernet connected system will increase the operate time under the same conditions (for more information consult you local Pickering Interfaces sales office).

Where speed is important to an application we generally recommend that the IVI driver is not used since IVI imposes additional delays and prevents more efficient operation of the switches by bulk changes (adding more than one path connection in a single operation) – the IVI software model has no facility for this function.

Section 3 - Installation



Refer to the Warnings and Cautions at the front of this manual.
The chassis is designed for indoor use only.

Unpacking



Caution:
When opening the shipping carton, use caution to avoid damaging the chassis.

Consider the following when unpacking and storing the system:

- Leave the system packed until it is needed for immediate installation.
- After unpacking the system, save and store the packaging material in case the system must be returned.

If the packaging is damaged and possible system damage is present, report to the shipper and analyze the damage.



Caution:
When lifting the chassis observe the weight quoted in the Technical Specification section and take into account the extra weight of any PXI modules that may be fitted.

Connecting The Mains Supply





WARNING:
When installing the 60-107 chassis, make sure the mains power is supplied with a means of disconnection such as a switch or circuit breaker with sufficient rating, and make sure the means of disconnection is accessible when the chassis is in use.

Do not use a switch incorporated into the mains supply cord. Make sure the means of disconnection does not interrupt the protective earth conductor.

Connecting Safety Ground



WARNING:
The 60-107 chassis is designed with a three-position IEC connector that connects the ground line to the chassis ground. To minimize shock hazard, make sure your electrical power outlet has an appropriate earth safety ground that is connected whenever you power up the chassis. To maintain a ground connection, make sure that the power cord is securely fitted to the chassis power inlet connector.

If your power outlet does not have an appropriate ground connection, you must connect the factory wire safety ground to the chassis. To connect the safety ground, complete the steps shown below:

- Connect a 16 AWG (1.3 mm) wire to a chassis grounding screw using a toothed grounding lug. The wire must have green insulation with a yellow stripe or must be non-insulated (bare).
- Attach the opposite end of the wire to permanent earth ground using toothed washers or a toothed lug.



WARNING:
This equipment is intended to be accessed, to be installed and maintained by qualified and trained service personnel only (electrical technician or equivalent qualification).

Installing the 60-107 Chassis

Site Considerations

The 60-107 is primarily designed to be installed in a standard 19 inch (483 mm) width equipment rack but can also be operated on a bench or desk top. In these cases, it should be positioned horizontally so the cooling air vents are not restricted.

WARNING:
If the chassis is fitted into an equipment rack, it must be supported by side brackets, runners or a suitable equipment shelf (taking into account the weight of the chassis plus the weight of any modules fitted).

As well as providing sufficient clearance for cooling, space should be allowed at the rear of the chassis for the removal of the mains supply connector in the event of a fault condition.

Where applicable, position the chassis so that it is at a comfortable height to access the controls and read any visual indicators.

Cooling Considerations

The chassis is cooled by four internal fans which expel air via a single vent in the rear of the chassis and draw air through vents on the chassis sides and front panel. The left side panel has an air intake for PXI slots 1, 2, 3 & 4, the front panel has an air intake for slots 5, 6, 7 & 8 and the right side panel has an air intake for PXI slots 9, 10, 11 & 12. The controller assembly is cooled by a fan which has an intake on the left panel and the power supply module has its own internal fan with an air outlet on the rear panel. To maintain the correct internal air flow, ensure blanking panels are fitted to any of the PXI slots if they are unused. It is important for the correct functioning of the unit that all cooling air inlets and outlets are unrestricted and objects such as cabling are kept clear.

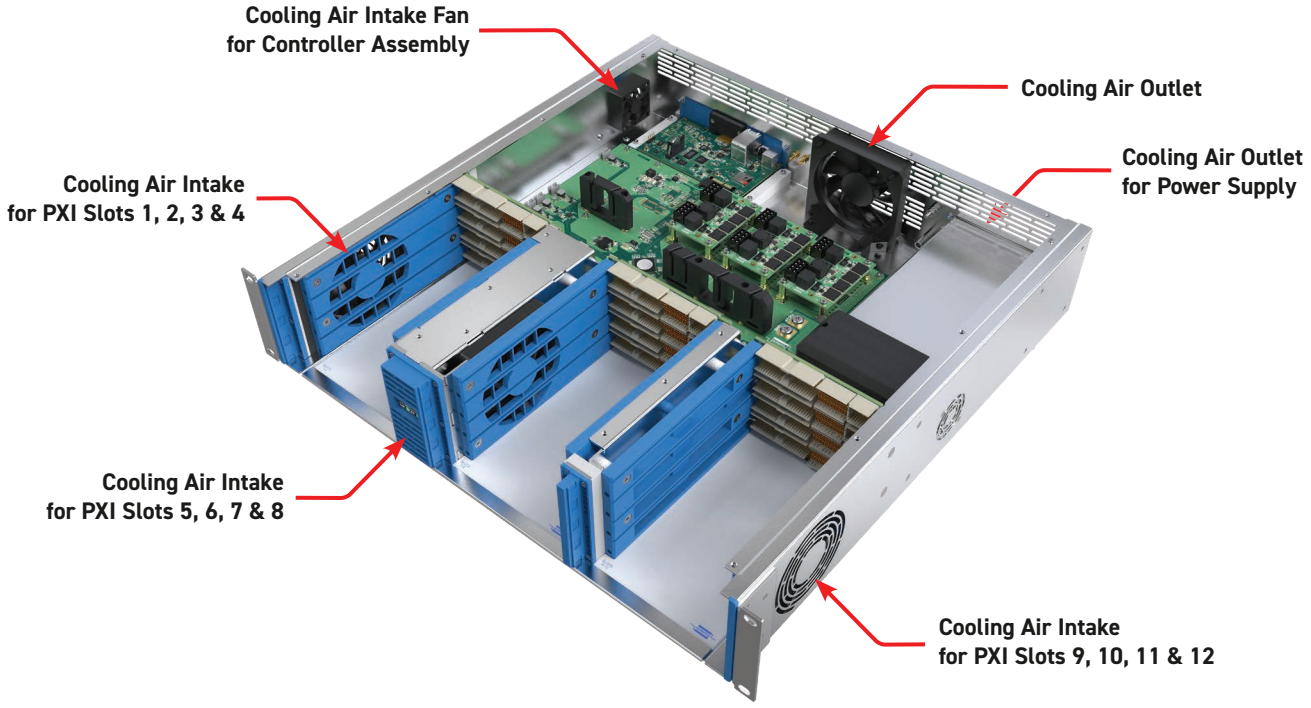


Figure 3.1 - 60-107 LXI/USB Chassis With Top Cover Removed Showing Cooling Vents

Connecting the Chassis

The only connections required to use the 60-107 Chassis are power and a control cable. Power is supplied to the chassis via a standard IEC power lead, control can be via the USB3 type-B socket or the RJ45 Ethernet port on the rear panel. The positions of these connectors are shown in the figure below:

Note: Only connectors and connection acessories that meet the manufacturer's specifications should be attached to this unit. For the specifications of the chassis' connectors, refer to Section 1.

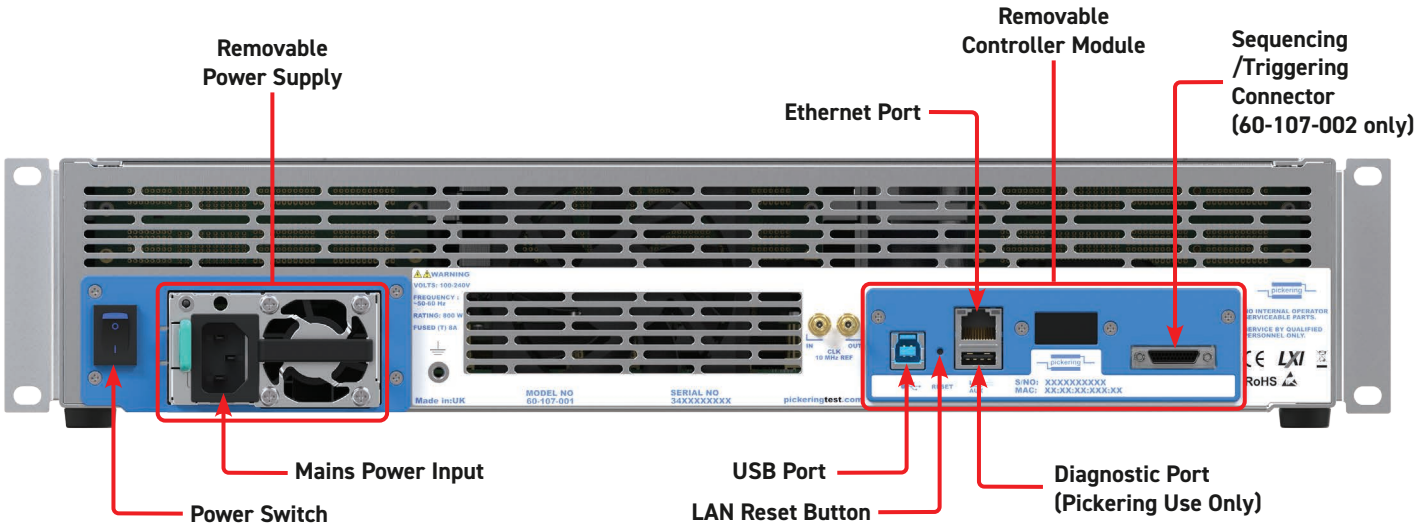


Figure 3.2 - Rear Panel of 60-107 Chassis Showing Positions of Connectors and Switches

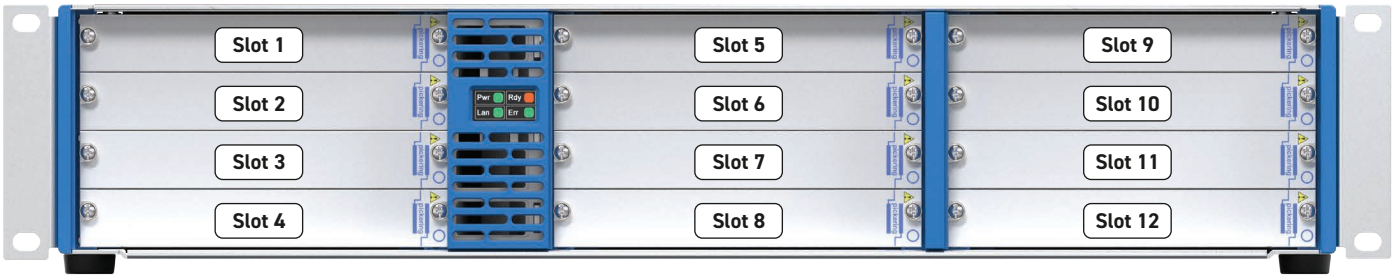


Figure 3.3 - Front Panel of 60-107 Chassis Showing PXI Slot Positions

Installation of Individual Modules

Modules should be installed in accordance with the following procedure:

1. Ensure that the chassis is turned OFF.
2. Choose an appropriate PXI slot in the chassis.
3. Remove the blanking plate for the chosen slot.
4. Ensure that the injector/ejector handle is in its downward position. Align the module with the card guides on the top and bottom of the slot.
   Do not raise the injector/ejector handle whilst inserting the module as the module will not insert properly.
5. Hold the handle whilst slowly sliding the module into the card guides until the handle catches on the injector/ejector rail (refer to Figure 3.4).
6. Raise the injector/ejector handle until the module firmly seats into the backplane. The front panel of the module should be flush with the panel in the adjacent slot and fully seated against the chassis rails.
7. Secure the front panel of the module using both screws to the chassis mounting rails.

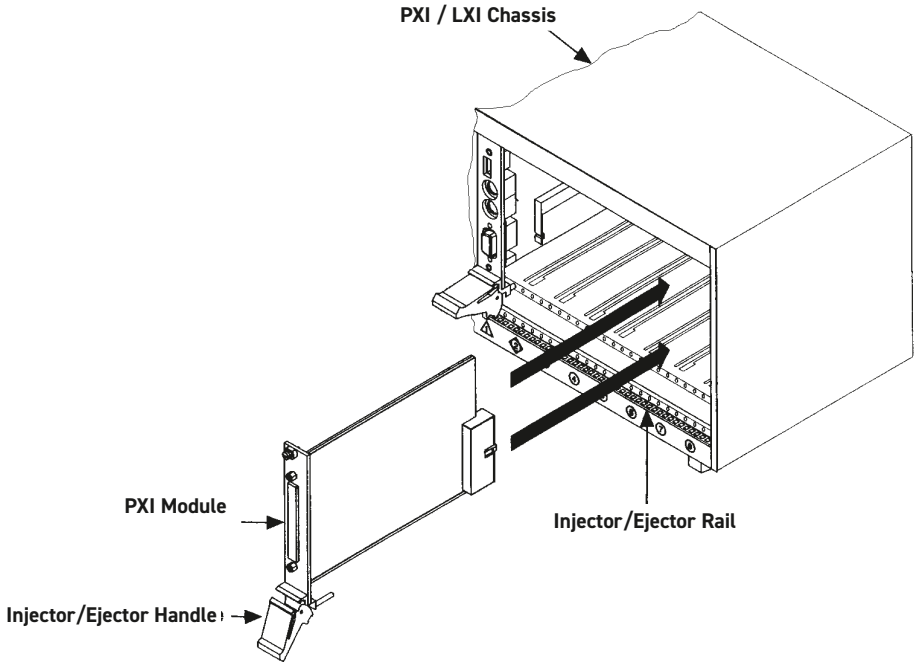


Figure 3.4 - Example Installation of a PXI Module into a PXI/cPCI/LXI Chassis

WARNING:

This chassis is intended to be fitted with modules that conform to the PXI specification. Pickering is not responsible for any unpredictable effects caused by installing non-compliant modules. Refer to "Slot Capacity" in Section 1 for the maximum power rating for modules installed in the chassis.

Ensure that the chassis is powered down before installing PXI modules.

After module installation, make sure any unused slots are fitted with a blanking plate. This is to prevent the possibility of electric shock caused by internal signals being touched by the operator. Also, blanking plates help maintain the air flow through the chassis see "Cooling Considerations" earlier in the section.

Section 4 - Configuration & Set-Up

Default Configuration

The 60-107 Modular Chassis has factory default settings causing it to behave in the ways listed below. If the user makes changes to the chassis' configuration pages this behaviour may no longer apply.

1. **Ethernet cable only connected:**
   Operation is as a standard LXI product.
2. **USB Cable only connected:**
   Operation is no longer LXI, connection is made to the host computer through the RNDIS protocol and will appear as a network adapter on that machine.
3. **USB Cable connected as well as an Ethernet cable:**
   The USB connection is always the priority connection so LXI mode is disabled. Fundamentally the same as configuration 2. The Ethernet interface is not configured.

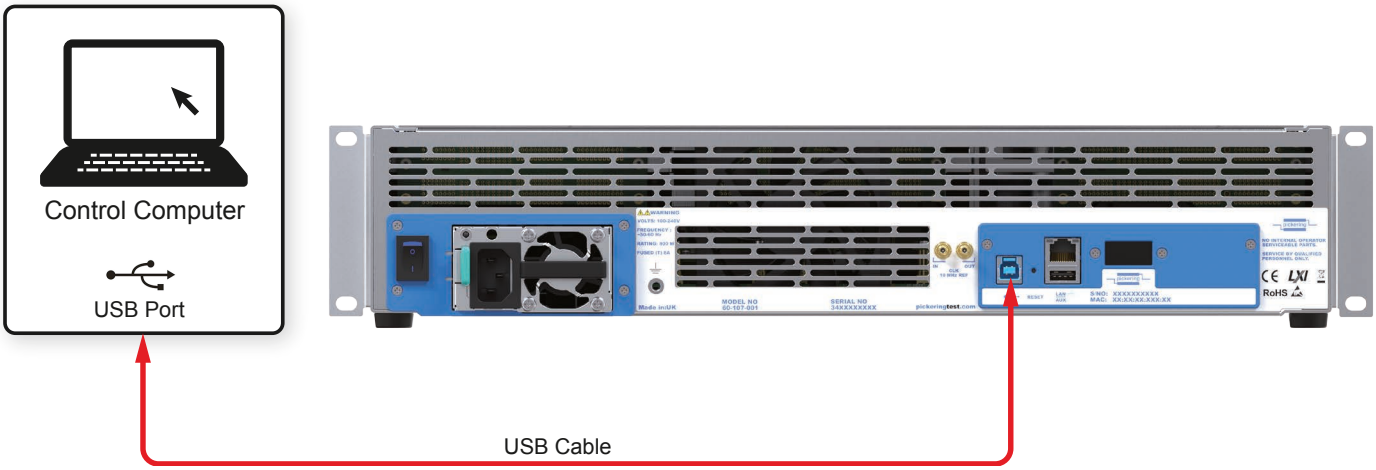
Changes can be made to the chassis' USB configuration page to set the secondary interface to be the Ethernet port. This secondary interface is not LXI compliant and is for the purposes of monitoring software. If an IP Address is set, the interface will broadcast router messages and is able to accept SSH terminal sessions.

A reset using the recessed 'LAN Reset' button on the rear panel of the chassis will work regardless of the cable connection status of the unit and will cause the chassis to revert to the factory default configuration.

USB Configuration

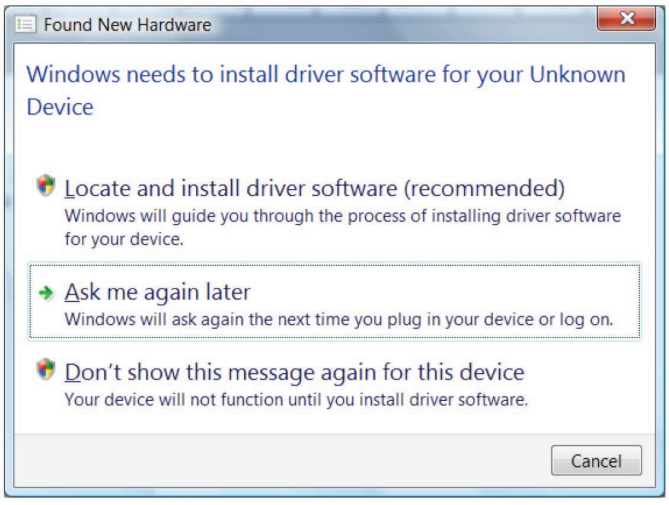
To use the 60-107 Modular Chassis over a USB connection it should be set up and configured using the following instructions:

1. Insert your chosen PXI cards into the chassis as per the instructions in Section 3.
2. With the chassis powered off, insert the supplied USB3 cable into the Type B socket on the rear of the chassis marked with the USB symbol.



3. Insert the other end of the cable into a free USB port on your host computer, then power on the 60-107 chassis.

   If this is the first time the chassis has been connected to your computer, a dialog screen will be displayed:



4. Select **Locate and install driver software**. You will then be asked to insert the supplied 60-107 driver DVD.
5. Once the Found New Hardware wizard has completed a new device will be installed under network adapters listed as: **Pickering 60-107-001**
6. Complete the installation by running the installation package ***ClientBridge*** located on the supplied DVD.

LXI LAN Configuration

To use the 60-107 LXI Modular Chassis over a LAN connection it should be set up and configured as described in the "LXI Getting Started Guide" document. The device's home page is shown below: This shows information about the device including its serial number and MAC address. These are also displayed on the rear panel of the device as shown in Figure 4.3.

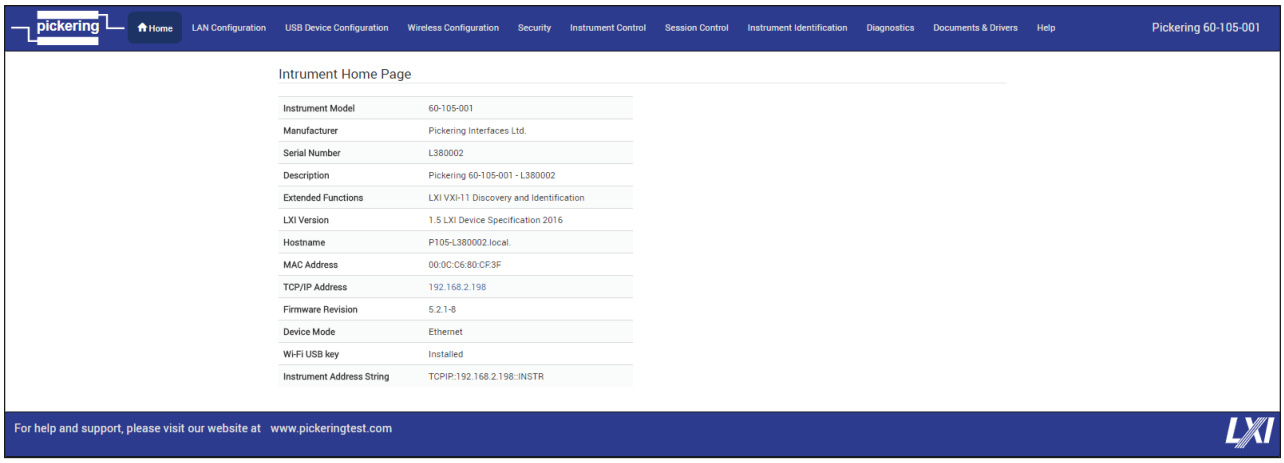


Figure 4.1 - Modular Chassis Instrument Home Page

If the IP address is to be set manually and before connecting to a network, contact your IT department so they can give you the correct settings for:

- IP Address
- Subnet Mask
- Default Gateway
- DNS Server(s)
- Domain name

Once you have the required information, the IP configuration window is used to manually set the IP address. This is shown in the figure below. Incorrect setting will result in a loss of communication indicated by a red LAN LED on the front panel of the unit. If this does occur press the LAN Reset on the rear panel for a full factory reset.

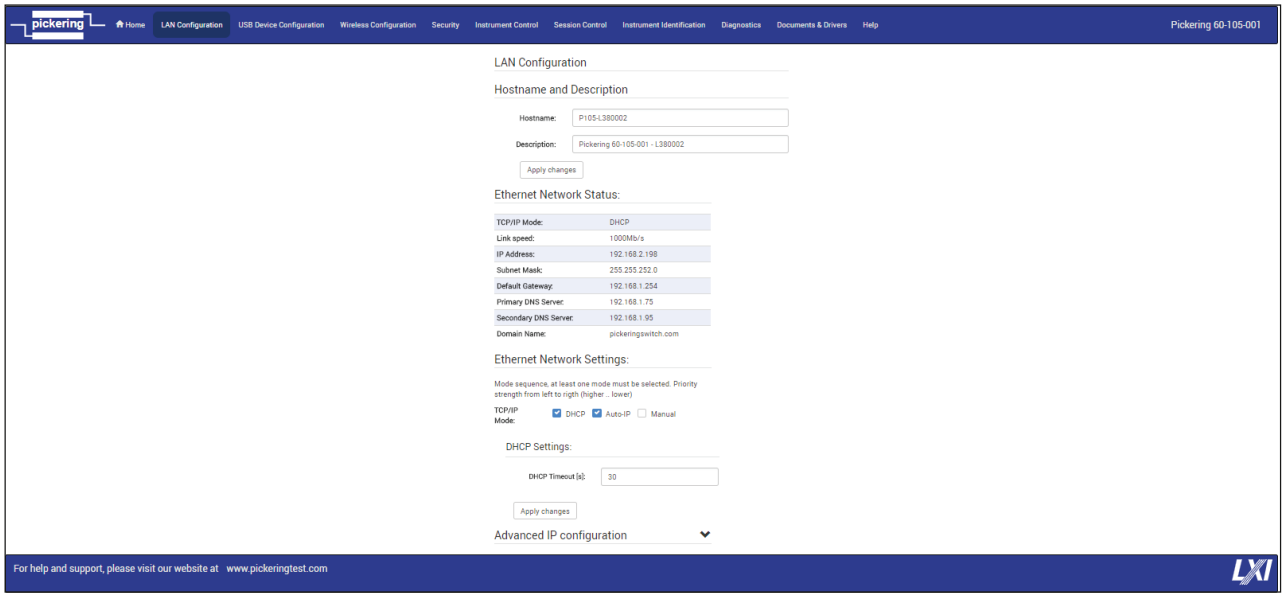


Figure 4.2 - Modular Chassis LAN Configuration Page

Once correctly set, the current IP address of the chassis is indicated on the LCD display on the front panel. The location of this is shown in Figure 4.3 overleaf.

Chassis Status Indicators

The 60-107 chassis includes indicators on the front and rear panels to show the status of the chassis and the LAN interface. The positions of these indicators are shown in the figures below and their meaning is outlined in Table 4.1.

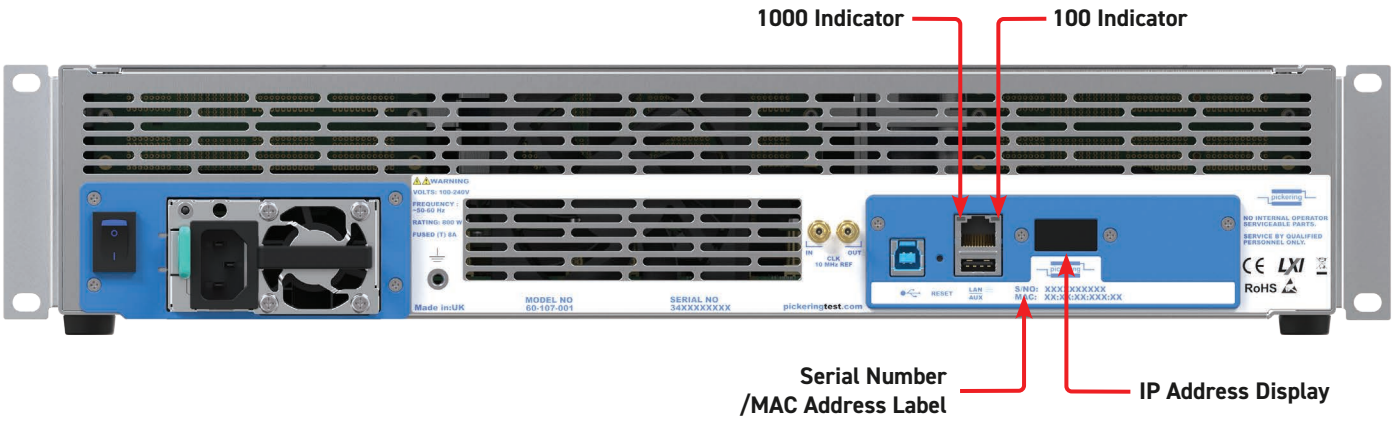


Figure 4.3 - Rear Panel of 60-107 Chassis Showing Ethernet Status Indicator Positions, IP Address Display, Serial Number and MAC Address of the Device

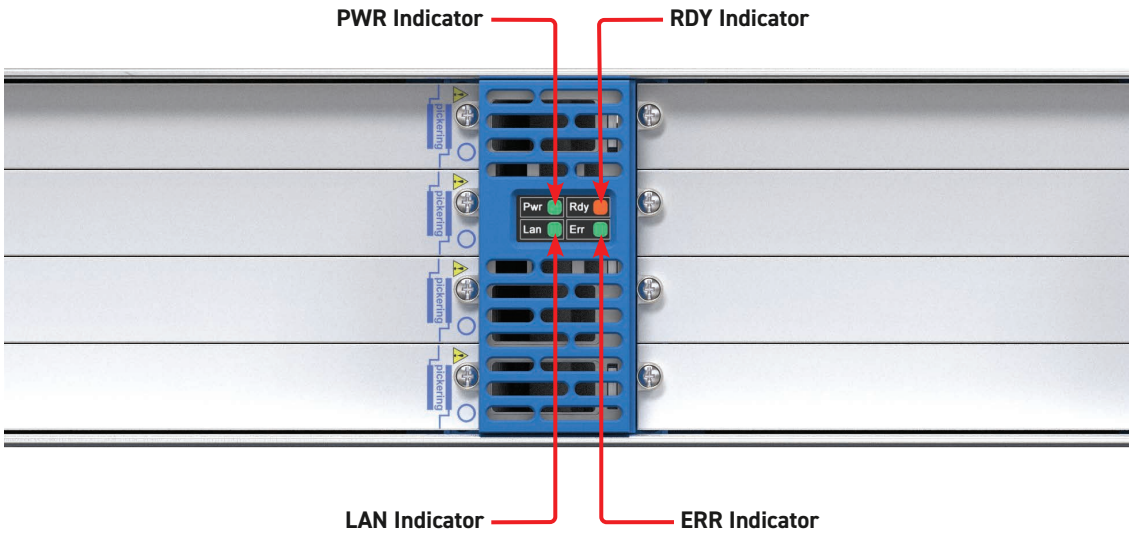


Figure 4.4 - Front Panel of 60-107 Chassis Showing LXI Status Indicator Positions

Table 4.1 - Status Indicator Meaning

Indicator Name	Indicator Meaning		
	On - Steady	**On - Flashing**	**Off**
PWR	Power On	-	Power Off or Hardware Fault
RDY	Ready for Communication	Network Configuration	Network Interface Not Ready
ERR	System Error	IP Conflict or LAN Error	-
LAN	Ethernet On	LXI Identification	USB Mode
1000	1000BaseT	LAN Activity	Both off with "LAN" on - 10BaseT
100	100BaseT	LAN Activity	

Section 5 - Programming

Programming Options for Pickering Interfaces LXI Units

For information on the installation and use of drivers and the programming of Pickering's products in various software environments, please refer to the Software User Manual.

This is available as a download from:
pickeringtest.com/support/software-drivers-and-downloads

Also, it can be accessed from the DVD supplied with the product:
<DVD_DRIVE>\downloads\Documentation\Software-Manual.pdf

Unit Architecture

Before discussing individual drivers it is important to understand the basic architecture of Pickering LXI units.

IP Address, Bus and Device

Each LXI unit has a unique IP address on your network. This address will depend on how you have configured your LXI unit and on network configuration. As delivered most LXI units are configured for dynamic address allocation, that is your network is expected to provide the IP address for the unit as part of its power-up sequence. This address may be configured as a fixed address, but there are possible problems, refer to the Getting Started guide for details on how to discover and configure your LXI unit.

Within an LXI unit, each switch card occupies a PCI slot, and so has a unique bus/device location with the embedded computer. It is vital to know that location in order to specify the address of the switch to be controlled.

Pickering provide software tools to help you discover the bus and device number of the cards in your LXI unit. Refer to the distribution disk that came with your unit in the folder LXI Products/Tools.

Sub-units

Pickering PXI cards contain one or more independently addressable functional blocks, or sub-units. Sub-unit numbers begin at 1, and separate sequences are used for input and output functions. This number is used in function calls to access the appropriate block. Generally, sub-unit numbers correspond directly to the bank numbers specified in hardware documentation.

Sub-unit examples:

Model	Configuration	INPUT sub-unit #1	OUTPUT sub-unit #1	OUTPUT sub-unit #2	OUTPUT sub-unit #3
40-110-021	16 SPDT switches	None	16 SPDT switches	None	None
40-290-121	Dual Programmable resistors + 16 SPDT switches	None	Resistor #1	Resistor #2	16 SPDT switches
40-490-001	Digital I/O	16-channel inputs	32-channel outputs	None	None
40-511-021	Dual 12 x 4 matrix	None	12 x 4 matrix #1	12 x 4 matrix #2	None

Sub-unit characteristics

The numbers of input and output sub-units in a card can be obtained using functions from the library:

For example, in the basic piplx library:

```
PIPLX_EnumerateSubs
PIPLX_SubType, PIPLX_SubInfo
```

Are used to identify the individual sub-units on a card.

Controlling a Switch

To control a Pickering switch the command must contain the full location of the sub-unit being controlled; the IP address of the LXI unit, the bus/device location of the particular card in that LXI unit, and the sub-unit which contains the switch to be controlled.

A number of tools are available to locate the IP address of an LXI unit. Refer to the "Getting Started" guide delivered with your unit, also available on the distribution disk in the "LXI Products" folder. Only Pickering tools such as "Find LXI" will identify the switch card bus/device location. Pickering Direct I/O driver includes functions to allow a Pickering LXI unit to be found programmatically.

To control a card there are a number of steps required. For example using PIPLX it is necessary to first open a session on a specified LXI unit, then to obtain a handle to a particular card in the LXI unit and finally to issue commands to a particular sub-unit on that card.

For example, to access the card at bus 0, device 20, on the LXI unit at 192.168.1.100 :

```
PICMLX_Connect(0, "192.168.1.100", 1024, 2000, &session)
PIPLX_OpenSpecifiedCard(session, 0, 20, &card_num)
PIPLX_OpBit(session, card_num, sub-unit, bit, state)
```

Using the IVI driver, the connect and open functions are combined in the `pi40iv_InitWithOptions` function where the VISA resource string will specify the IP address and the card bus,device location, for example:

```
pi40iv_InitWithOptions("TCPIP::192.168.1.100::0.20::INSTR",….)
```

Here the resource string identifies an IP address of 192.168.1.100 and then the bus, device location as 0.20, that is bus 0, device 20.

For full details of how to access and use Pickering drivers the user is advised to refer to the individual documentation packs provided with the installed drivers, this can be found on the distribution disk that came with your unit.

Installing Drivers

Please download and Install ClientBridge Driver from the DVD and Website.

Website:

pickeringtest.info/downloads/drivers/Sys60/

DVD:

<PATH_TO_DVD_DRIVE>\Drivers_LXI\

The ClientBridge Driver comes with C/C++ and .NET libraries and also provides various example programs and user applications to get the user up to the speed.

USB Drivers

Pickering provides digitally signed USB driver as part of ClientBridge. Once the drivers are installed, the USB chassis will appear under ***Network adapters***.

Note: Each subsequent USB port used on a specific PC will result in a unique identifier being assigned under Network adapters. Figure 5.1a illustrates the identifier for the first installation; Figure 5.1b shows the identifier for the second USB port; Figure 5.1c the third USB port installation.

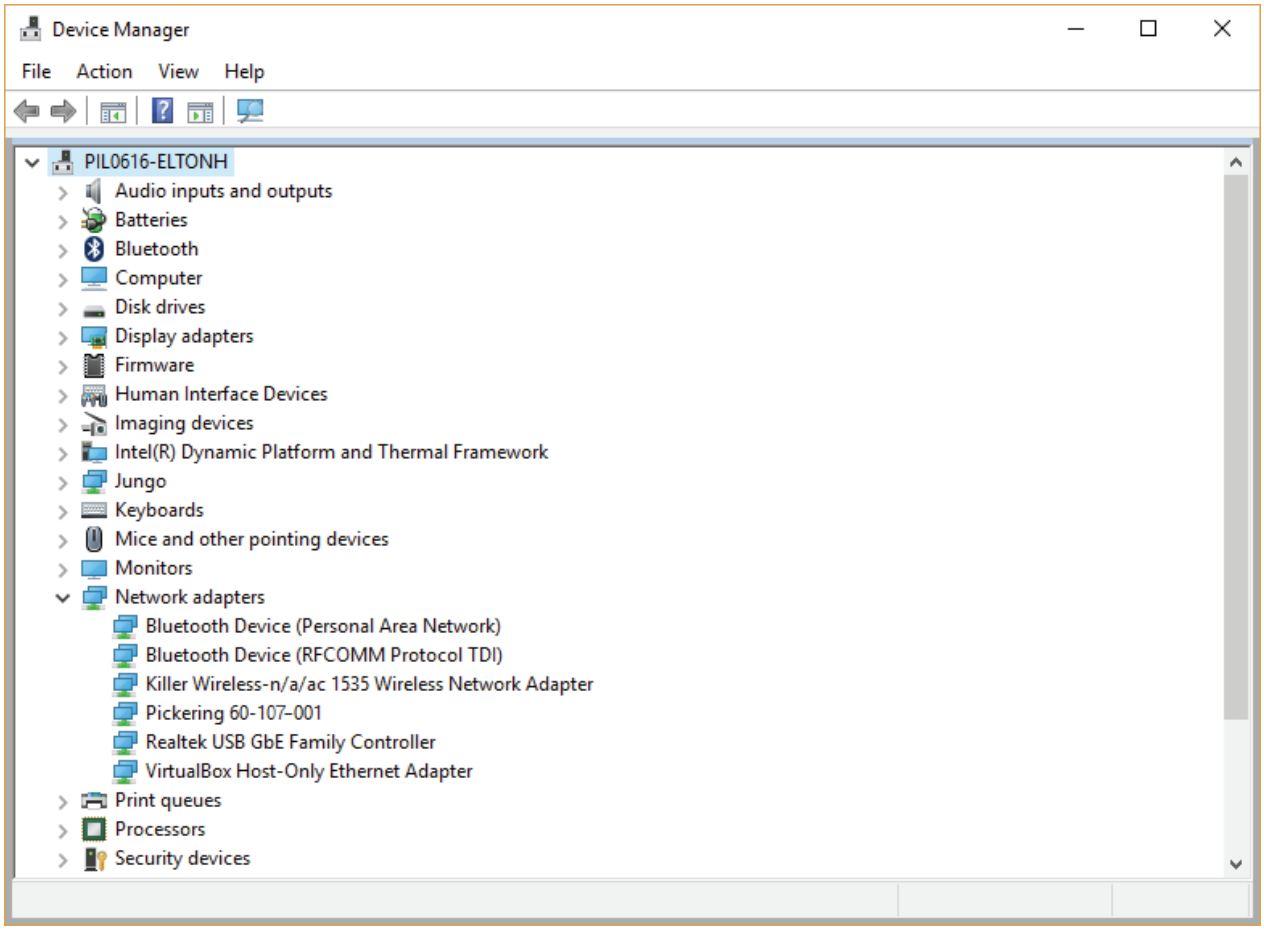


Figure 5.1a - The 60-107 Chassis in the List of Network Adapters

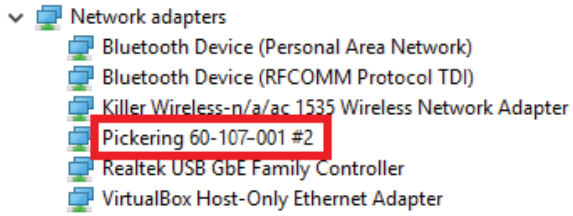


Figure 5.1b - The 60-107 Chassis Connected to a Second USB Port

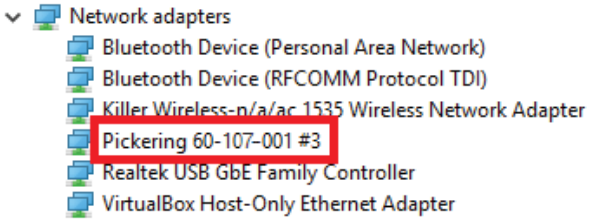


Figure 5.1c - The 60-107 Chassis Connected to a Third USB Port

LXI Discovery Tool

The LXI Discovery Tool uses different discovery protocols to locate LXI Devices on your network, the place where your computer and LXI Device can communicate with each other. The device can be discovered irrespective of USB, Wi-Fi or LAN interface.

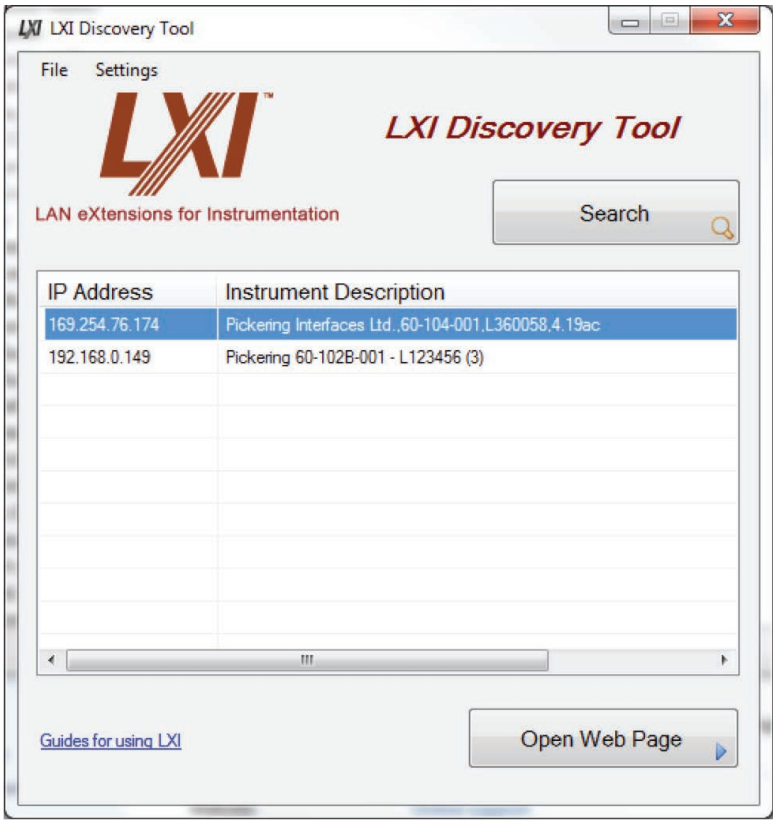


Figure 5.2 - LXI Discovery Tool Window

General Soft Front Panel

Pickering provides General Soft Front Panels for all our PXI/PCI and LXI products to get the user familiarize with our products and get up to speed. Similar to our drivers, our Soft front panels cover all of our cards and dedicated views are provided for selected products. So whether you buy a Fault Insertion Card, a Resistor Card or a Matrix, all our products can be operated from the same SFP.

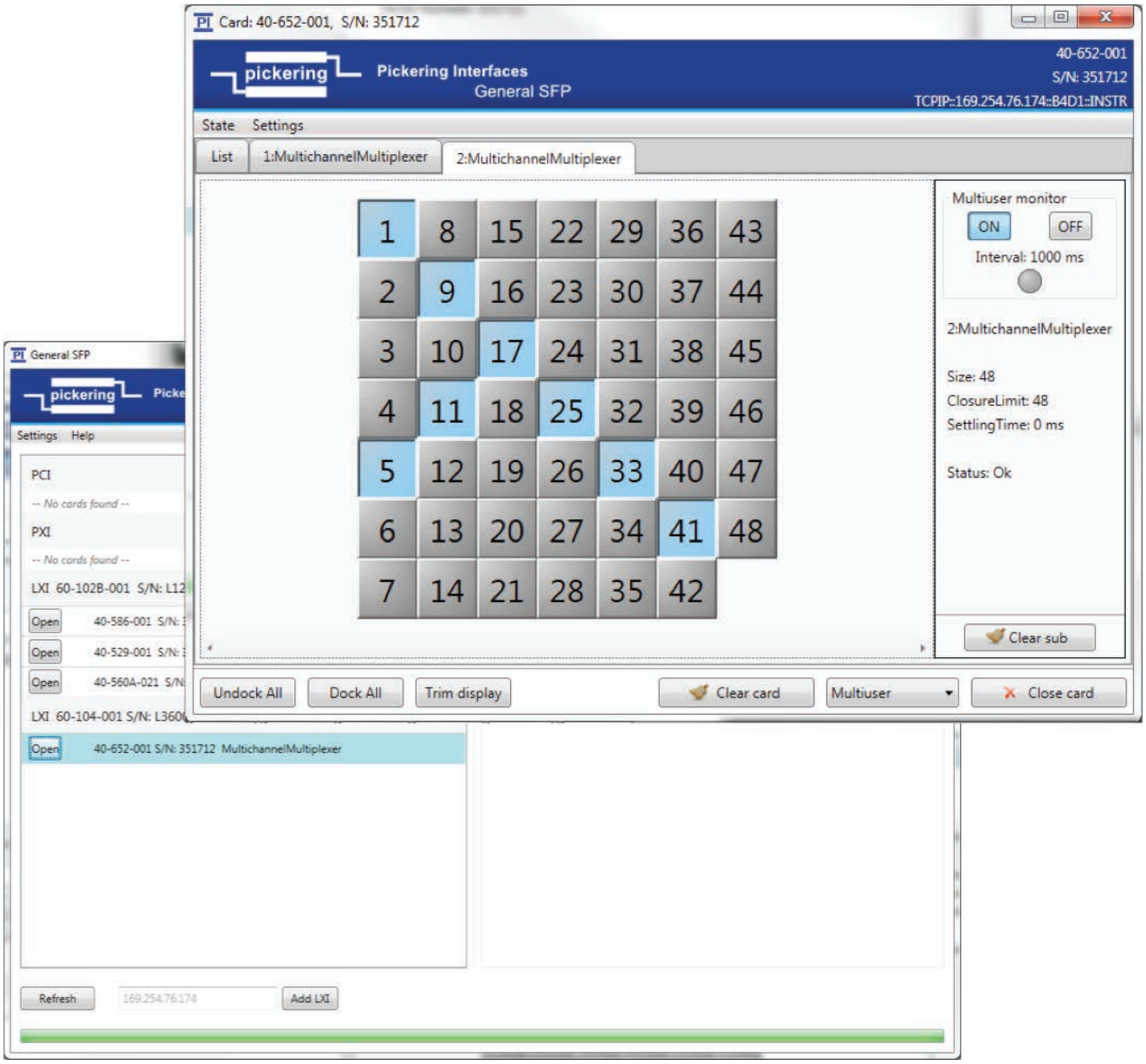


Figure 5.3 - Example of a General Soft Front Panel

HTML5 Soft Front Panel

The HTML5 Soft Front Panel provides platform independent control of Pickering products allowing their use from various PCs (including Linux OS), tablets and other mobile devices. The user can access the HTML5 Soft Front Panel by navigating to the LXI home page and clicking the ***Instrument Control*** tab.

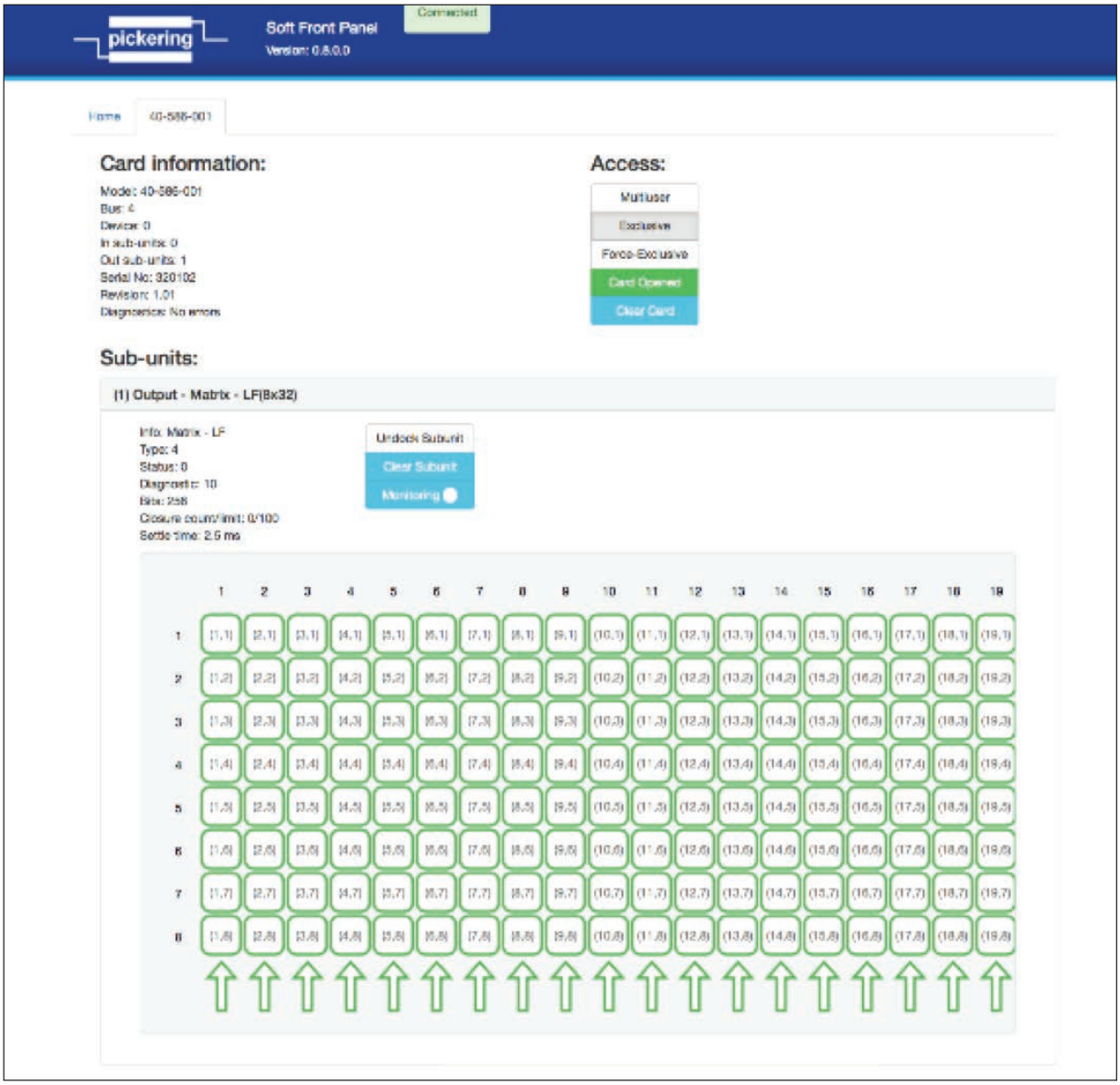


Figure 5.4 - Example of an HTML5 Soft Front Panel

Resource Manager

Pickering's LXI and PXI products can be controlled and operated via aliases using the Pickering Resource Management Library. It allows the user to define aliases for every Pickering PXI and LXI module when writing a test application. This is useful because any change in the hardware interfaces will not affect the test application and only requires modification of the configuration file to point to the right alias.

You can use the Pickering Resource Manager application to define your aliases for the available devices. Alternatively you can use C++ API (Pirml.dll library) and .NET C# connector (Pickering.Resources.PirmlInterop.dll). For more information see the Language Support topic.

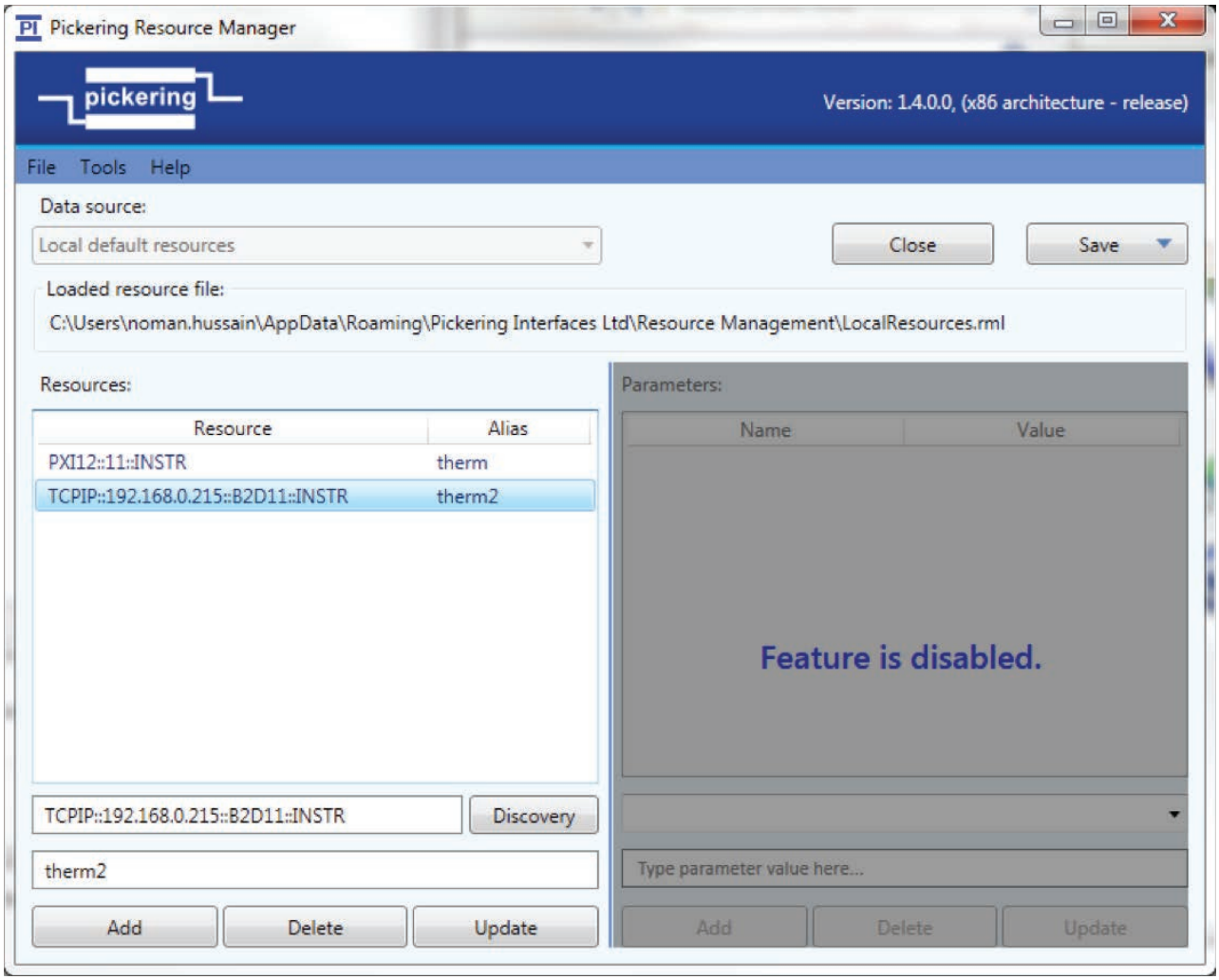


Figure 5.5 - Pickering Resource Manager Window

Command Line Control of Pickering LXI Instruments

Overview

Command line control of the Pickering LXI device range was added in firmware release 2.11. The utility provided was ported to the LXI instrument from the Windows utility PILMon and provides identical functionality.

Enabling the Command Line Control Utility

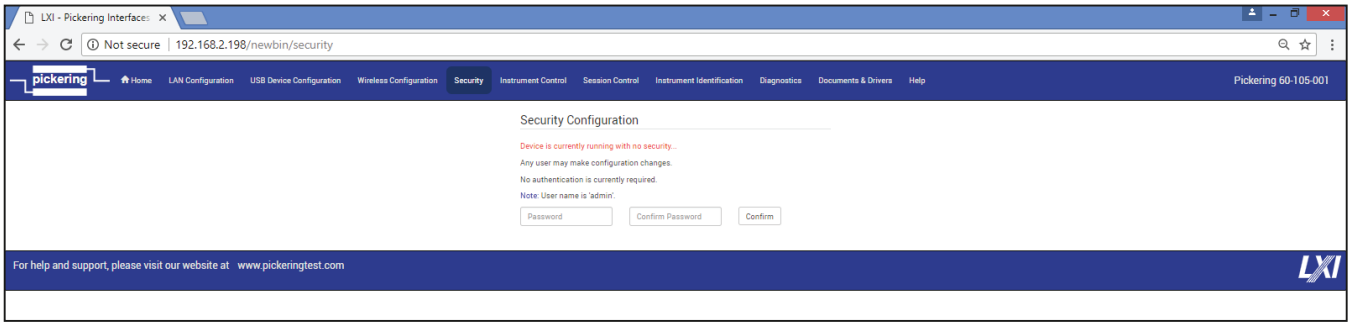
Pickering LXI devices do not provide an SSH server in the normal configuration state, the service must be explicitly enabled.

To do this the user must first enable security, this helps to prevent inadvertent access by limiting the accessibility of instrument services, principally by requiring password access to control functions. Once security is enabled, the SSH server may be started.

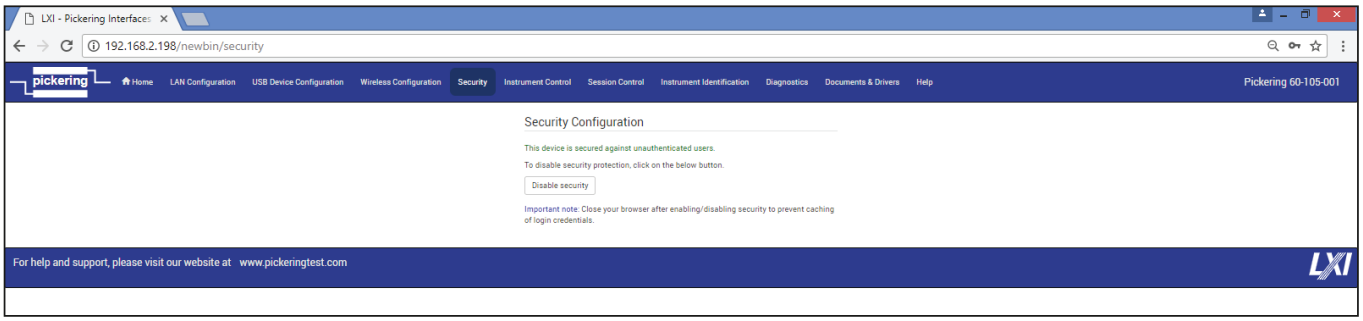
All the following assumes that the user knows the IP address of the LXI device. If this is not known, a number of tools are available, many on the Pickering distribution disk, to allow the IP address to be discovered.

Step 1 - Enable Security

Select the Security Page from the main menu list

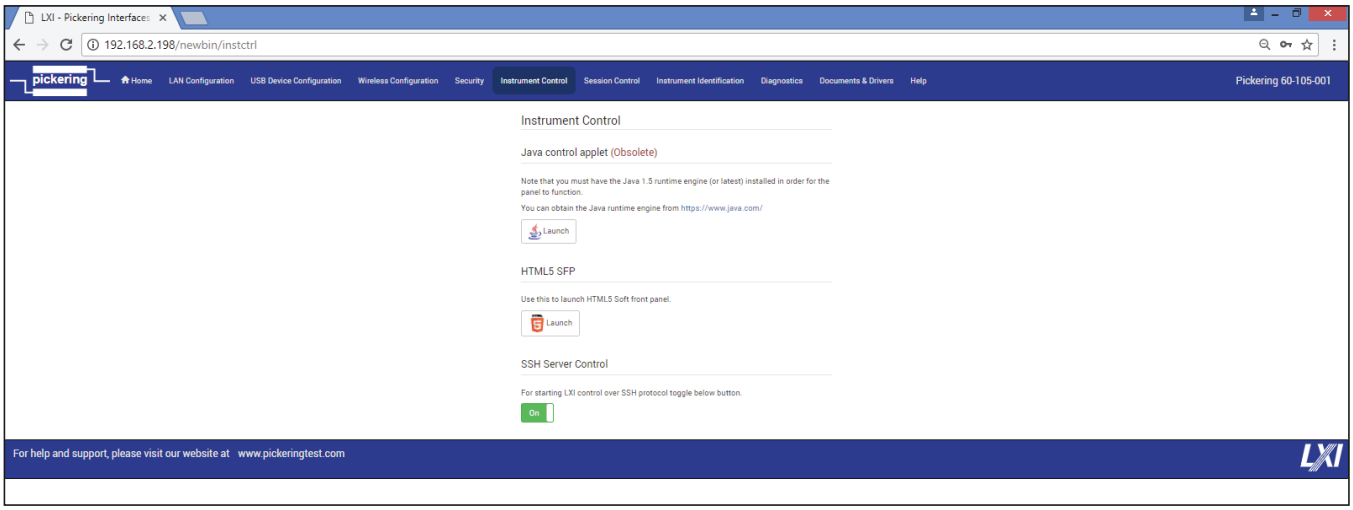


Enter a password and confirm then click on the Submit button.



Step 2 - Enable the SSH server

Select Instrument Control from the main menu



NOTES:

The password and state of the SSH server are stored in non-volatile memory within the LXI device and so will remain in effect even after a power cycle. It is important to remember the password applied. Should the password be forgotten, the device may be reset to initial conditions by operating the LAN Reset button located on the front of the controller module in the appropriate manner, refer to Section 6 of this manual for details of this process.

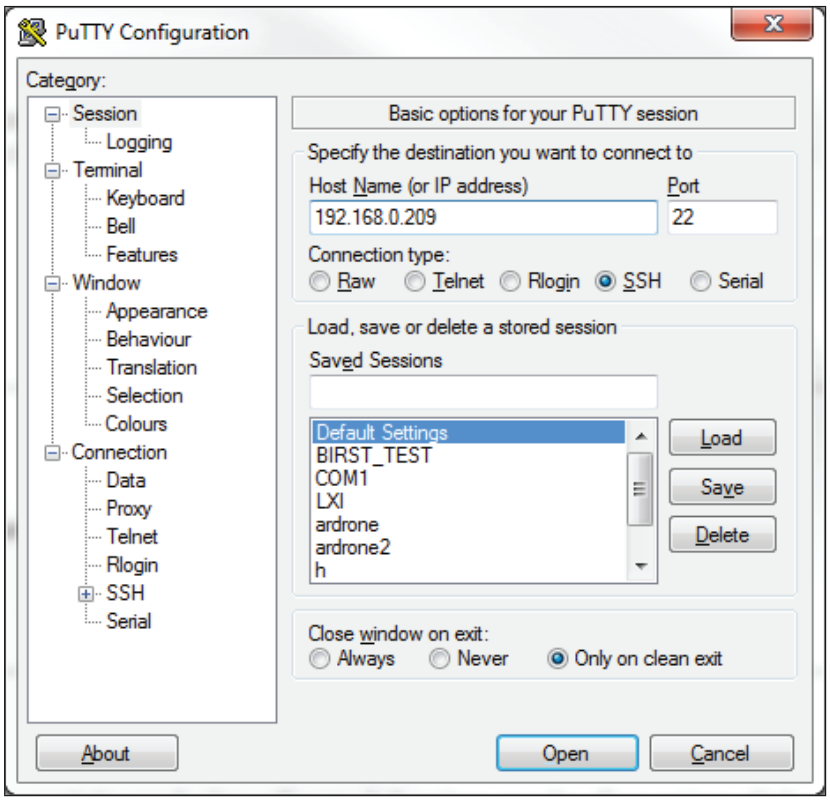
Disabling security will stop the SSH service.

Instrument Control from an SSH Client

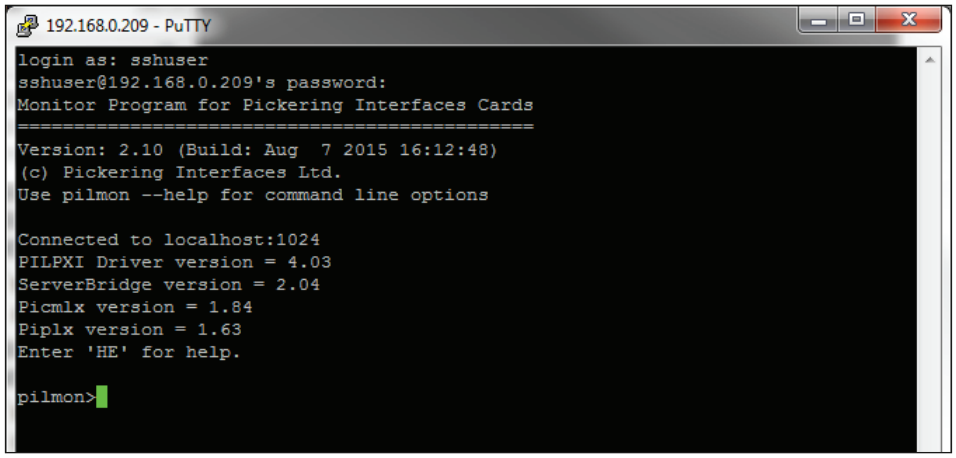
In the following examples the SSH client PuTTY is used, the user will have to adapt the instructions for any other client.

First start up the SSH client and enter the IP address of the LXI device. The user will be prompted for a login name and password.

The username for instrument control is 'sshuser', the password is that defined by the user when setting security.



Once the username and password have been supplied, the LXI device will enter an application providing a command line interface to the switch cards within the device.



When the application is expecting input, the prompt **pilmon>** will be displayed. Card control is achieved using a set of mnemonics plus optional data. Typing **HE** in response to the prompt will list the entire command set available.

These are listed below and on the following pages.

Before attempting to control a card it is important to understand the switch architecture of that card and to know how to address the required switch. Each Pickering switch card is represented as a set of one or more sub-units, each sub-unit containing one or more switches. A sub-unit represents a collection of switches of similar type, it may represent an entire matrix, or a row of simple switches, or a power supply voltage setting.

In the case of a switch sub-unit, each switch is represented by a single bit of data and may be toggled between 0 and 1, 0 representing the off state of the switch relay and 1 representing the on state.

Table 5.1 - PILMon Command List

AttenuatorAttenuationGet	AAG	<no parameters> Get current attenuation of selected subunit. Returns float value.
AttenuatorAttenuationSet	AAS	<attenuation(float)> Set attenuation of selected subunit to <attenuation>.
AttenuatorInfo	AI	<no parameters> Get information about selected attenuator subunit. Returns values: <type>;<number of steps>;<size of each step>
AttenuatorPadValue	AP	<index(int)> Get value of attenuator pad at <index>. Returns float value.
AttenuatorType	AT	<no parameters> Get information about selected attenuator subunit in text form. Returns string in form: ATTEN(<number of steps><step size in dB>)
BatteryCurrentGet	BCG	<no parameters> Get current setting of battery simulator subunit current leak. Returns float value.
BatteryCurrentSet	BCS	<current(float)> Set battery simulator subunit current leak.
BatteryEnableGet	BEG	<no parameters> Get current setting of battery simulator subunit output states. Returns binary pattern characterizing states.
BatteryEnableSet	BES	<pattern(int)> Set battery simulator subunit output states according to pattern.
BatteryInterlockGet	BIG	<no parameters> Get interlock state of battery simulator subunit. Returns 1 if all interlocks are up or 0 if one or more interlocks are down.
BatteryVoltageGet	BVG	<no parameters> Get current setting of battery simulator subunit voltage. Returns float value.
BatteryVoltageSet	BVS	<voltage(float)> Set battery simulator subunit votage.
CalibrationReadInt	LRI	<index(int)> Read integer calibration value of pad <index>. Returns integer value.
CalibrationReadDate	LRD	<store(int)> Read calibration date of subunit. <store> can be 0-for user store 1-for factory store. Returns date in form: <year>;<day>;<interval>.
CalibrationReadFp	LRF	<store(int)> <offset(int)> Read float calibration value of <store> on position <offset>. Returns float value.
CalibrationWriteInt	LWI	<index(int)> <value(int)> Write integer calibration value <value> of pad <index>.
CalibrationWriteDate	LWD	<store(int)> <interval(int)> Write calibration date of subunit. <store> can be 0-for user store 1-for factory store. Date written is current system date <interval> is number of days for cards to be recalibrated.
CalibrationWriteFp	LWF	<store(int)> <offset(int)> <value(float)> Write float calibration value <value> of <store> on position <offset>.
CardClear	CC	<no parameters> Clear all switches on all subunits on selected card.

CardClearAll	CCA	<no parameters> Clear all switches on all subunits on all cards.
CardClose	CL	<no parameters> Close selected card. Card cannot be used until opened again.
CardCloseAll	CLA	<no parameters> Close all opened cards.
CardDiagnostic	CD	<no parameters> Get text diagnostic of selected card. When card is faulty diagnostics shows details about faults. Returns diagnostic text. It does not diagnose the relays, only communication.
CardId	CI	<no parameters> Get card id string in form: <card model>;<serial number>;<card revision>
CardLoc	CLO	<no parameters> Get card physical location. Returns location in form: <bus>;<device>;
CardOpen	CO	<bus(int)> <device(int)> [access(int)] Open card on physical position <bus> <device>. Optional parameter [access] modifies access setting. 1-exclusive access 0-nonexclusive access. Card is opened with exclusive access implicitly.
CardOpenAll	COA	[access(int)] Open all cards in LXI if possible. Optional parameter [access] modifies access setting. 1-exclusive access 0-nonexclusive access. Cards are opened with exclusive access implicitly.
CardStatus	CS	<no parameters> Get status of selected card. Status consists of binary flags detecting various problems of card. Result: hex integer containing status flags.
FindCountCards	FCC	<no parameters> Get number of available cards in LXI. Returns integer value.
FindFreeCards	FFC	<no parameters> Get location of all unopened cards. Returns locations of cards in form: <bus1> <device1>;<bus2> <device2>;...
InputBitRead	IBR	<bit(int)> Read state of individual <bit> of selected input subunit. Returns state of bit= 1-active 0-inactive.
InputSubunitRead	IUR	<no parameters> Read states of all bits of selected input subunit. Returns hex string representing all states of bits.
PSUEnableSet	PES	<state(int)> Set output state of PSU subunit.
PSUInfo	PI	<no parameters> Get info about selected PSU subunit. Returns info in form: <type>;<rated voltage>;<rated current>;<precision>;<capabilities(hex flags)>
PSUType	PT	<no parameters> Get info about selected PSU subunit in string form. Returns info in form: PSUDC(<rated voltage><rated current>).
PSUVoltageGet	PVG	<no parameters> Get current setting of voltage of selected PSU subunit. Returns float value.
PSUVoltageSet	PVS	<voltage(float)> Set voltage setting of selected PSU subunit.
ResistorInfo	RI	<no parameters> Get info about selected programmable precision resistor subunit. Returns: <minres>;<maxres>;<referenceres>;<precisionpc>; <precisiondelta>;<reserved>;<reserved>;<capabilities(hex flags)>
ResistorResistanceGet	RRG	<no parameters> Get output resistance of selected programmable precision resistor subunit. Returns float value.
ResistorResistanceSet	RRS	<resistance(float)> Set output resistance of selected programmable precision resistor subunit to <resistance>.
SwitchClose	SC	<bit(int)> Close switch (energize relay coil) on selected subunit of index <bit>.

SwitchOpen	SO	<bit(int)> Open switch (disengage relay coil) on selected subunit of index <bit>.
SwitchView	SV	<bit(int)> Get state of switch on selected subunit of index <bit>. Returns 1 if coil is energized 0 otherwise.
SwitchMask	SM	<bit(int)> Mask switch on selected subunit of index <bit>. Switch cannot be operated until unmasked.
SwitchUnmask	SU	<bit(int)> Clear mask of switch on selected subunit of index <bit>.
SwitchMaskView	SMV	<bit(int)> Get state of mask of switch on selected subunit of index <bit>. Returns 1 if mask is active 0 otherwise.
SubunitClear	UC	<no parameters> Clear all switches (set relays to their default state) on selected subunit.
SubunitClosureLimit	UCL	<no parameters> Get closure limit of selected subunit. Closure limit is maximum number of switches that can be simultaneously closed on a subunit. Returns integer value.
SubunitEnumerate	UE	<no parameters> Get number of input and output subunits on selected card. Returns: <number of input subunits>;<number of output subunits>
SubunitInfo	UI	[input(int)] Get information about subunit. Optional parameter <input> states whether to get information about input-0 or output-1 subunit. Implicitly its output. Returns information in form: <type>;<number of rows>;<number of columns>"
SubunitSettleTime	USE	<no parameters> Get time in ms that is required for relay contanct to settle down after switch operation. Returns integer value.
SubunitStatus	UST	<no parameters> Get status of selected subunit. Status consists of binary flags detecting various problems of subunit. Result: hex integer containing status flags.
SubunitType	UT	[input(int)] Get string info about selected subunit. Return string contains description of the subunit. Optional parameter <input> states whether to get information about input-0 or output-1 subunit. Implicitly its output. For example: MATRIX(<columns>X<rows>)"
SubunitMaskClear	UMC	<no parameters> Clears all mask bits on selected subunit.
SubunitMaskView	UMV	<no parameters> View states of all mask bits on selected subunit. Returns hex string describing mask. Each bit in hex string represents 1 bit of mask.
SubunitMaskWrite	UMW	<pattern(hex string)> Writes hex string converted to bit array into subunit mask bits. Note that hex string must be started with \0x\"notation".
SubunitView	UV	<no parameters> View states of all switches on selected subunit. Returns hex string describing states of switches. Each bit in hex string represents 1 switch.
SubunitWrite	UW	<pattern(hex string)> Writes hex string converted to bit array into subunit. Note that hex string must be started with \0x\"notation".
VsourceEnableGet	VEG	<no parameters> Get enabled states of selected voltage source subunit as pattern. Returns integer pattern where each bit represents one voltage source output.
VsourceEnableSet	VES	<pattern(int)> Set enabled states of selected voltage source subunit. Each bit in <pattern> represents one voltage source output.
VsourceVoltageGet	VVG	<no parameters> Get voltage settings of selected voltage source subunit. Return float value.
VsourceVoltageSet	VVS	<voltage(float)> Set <voltage> of selected voltage source subunit.

XpointClose	XC	<column(int)> <row(int)> Close switch (energize relay coil) on selected matrix subunit on position <column> <row>.
XpointOpen	XO	<column(int)> <row(int)> Open switch (disengage relay coil) on selected matrix subunit in position <column> <row>.
XpointView	XV	<column(int)> <row(int)> Get state of switch on selected matrix subunit in position <column> <row>. Returns 1 if coil is energized 0 otherwise."
XpointMask	XM	<column(int)> <row(int)> Mask switch on selected matrix subunit in position <column> <row>. Switch can't be operated until unmasked."
XpointUnmask	XU	<column(int)> <row(int)> Clear mask of switch on selected matrix subunit in position <column> <row>.
XpointMaskView	XMV	<column(int)> <row(int)> Get state of mask of switch on selected matrix subunit in position <column> <row>. Returns 1 if mask is active 0 otherwise.
ModeSet	MS	Set driver in different working mode. This feature is to be used only by experts!
MultiAccessSet	MAS	<access(int)> [card(int)] Modify access rights for selected card. <access> is 1 for exclusive access 0 for multiaccess. Optional parameter [card] can be used to change access rights for unopened card.
MultiAccessGet	MAG	[card(int)] Query access rights for selected card. Optional parameter [card] can be used to query access rights for unopened card. Return string describing access rights.
SubunitSelect	USL	<card(int)> <subunit(int)> [input(int)] Selects active <subunit> on card number <card>. Optional parameter <input> states whether to get information about input-0 or output-1 subunit. Implicitly it's output. When called without any parameters returns actual settings.
List	LS	List all cards and show their location. For opened cards more details will be displayed.
Help	HE	Show help about all commands. Help <command> shows more detailed explanation of syntax and meaning of commands.
Quit	Q	Ends work with pilmon. All resources will be freed but states of cards remain unchanged.
SetAttribute	SA	<attrCode(uint)> <attrValue(uint, double)> Set the value of the specific Attribute (defined by attribute code (<attrCode>). See Table 5.2 e.g. **SA 0x40A 1** (Set Low range on Thermocouple card)
GetAttribute	GA	Get the value of the specific Attribute (defined by attribute code (<attrCode>). Returns attribute value: <attrValue>. See Table 5.2 e.g. **GA 0x40A** (returns the set value)

Table 5.2 - List of Attribute Codes

ATTR_MODE	0x401	Gets/Sets DWORD attribute value of Mode of the Card. Applicable for Fault Insertion 40-200 and 40-201 cards to add/remove Fault bus restrictions. Applicable Parameters: UNRESTRICTED = 0 RESTRICTED = 1
ATTR_TS_SET_RANGE	0x40A	Gets/Sets different range on the Thermocouple cards. Applicable 41-760 and 41 761 products. Applicable Parameters: TS_AUTO_RANGE = 0 (Default) TS_LOW_RANGE = 1 TS_MED_RANGE = 2 TS_HIGH_RANGE = 3

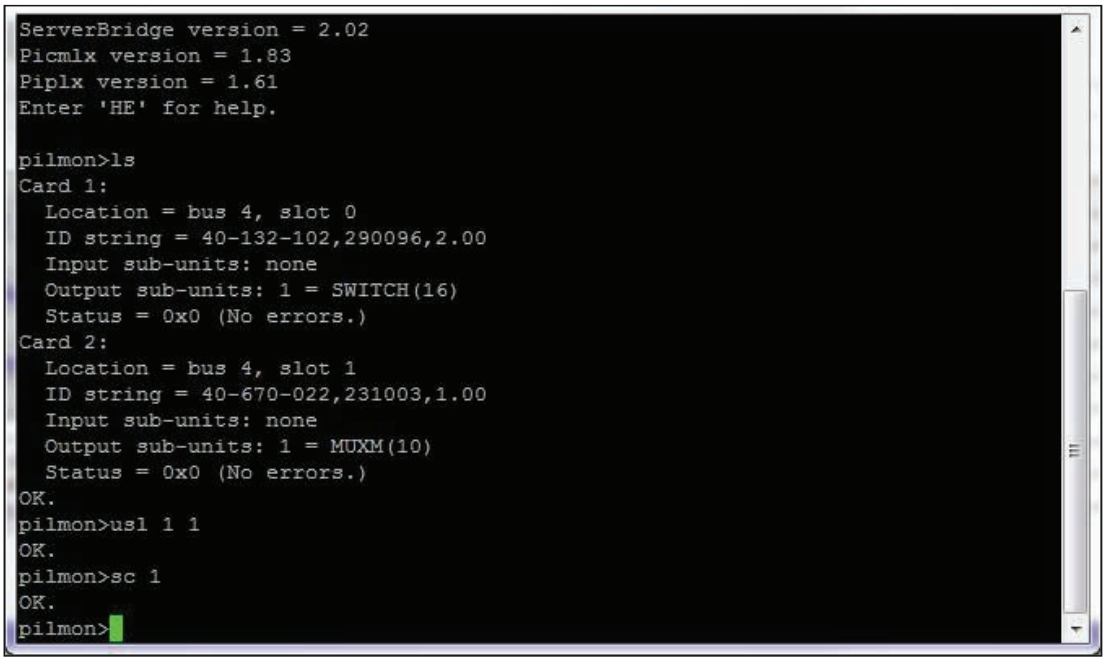
So a quick example to operate a bit on the card would be:

COA > open all cards

LS > list the cards

USL 1 1 > Select the card 1 and sub-unit 1

SC 1 > energize bit 1



Section 6 - Sequence Service & Triggering

Introduction

The Sequencing service provides the user with the ability to set a series of pre-determined sequences on an LXI instrument. These sequences can be triggered by software or - for the 60-107-002 - by one of the sixteen software configurable open drain triggers.

As the operations are grouped together, it will minimize the number of control transactions required to achieve a composite change of target switch state, condensing multiple operations in a single sub unit into a single operation, thus reducing the overall system switch settling time. For example, if a user wants to operate X1-Y1, X4-Y1, X2-Y2, in the first sequence, only one operation, and one delay, will be used.

Additionally, as the switch state sequences are stored within the LXI controller itself, the burden on the Host CPU and Ethernet traffic is greatly reduced, so the overall system latency is reduced.

The 60-107-002 version features a software reset line which provides the ability for a user supplied reset to be applied to the unit, triggering a software reset of the relays, returning all relays in the unit to their default state.

The 60-107-002 also has a software fault line available that will be triggered if there is any error detected within the unit. Please note that while these reset and fault lines use dedicated physical connections to the unit, they are software control lines and as such should not be used for safety interlocks etc.

Sequence Service & Triggering Operation Detail

For information relating to the operation of the sequencing service and triggering features available , please refer to the Sequence Manager Getting Started Guide.

This is available as a download from:

https://downloads.pickeringtest.info/downloads/sequence-manager/Sequence-Manager-Getting-Started-Guide.pdf

Also, it can be accessed from the DVD supplied with the product:

\downloads\Documentation\Sequence-Manager-Getting-Started-Guide.pdf

Interface Port Information

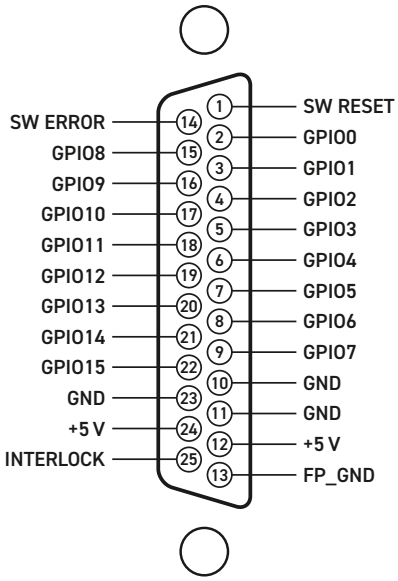


Figure 6.1 - 60-107-002
DIO/Trigger Connector Pinout.
25-pin Male Micro-D Connector
as Viewed from the Rear Panel of the Chassis

Table 6.1 - 60-107-002 DIO/Trigger Connector Signal Descriptions

Signal	Type	Output Stage (see images)	Max Sink/Source Current	Max Voltage	Function
GPIO(0-15)	I/O	Open Drain	Source 600 µA (4.7 kΩ pull-up), Sink 24 mA	5 V	General purpose IO for trigger functions.
SW RESET	I	CMOS Input Buffer WIth 10 kΩ Pull-down	—	5 V	Input signal to command software reset, active high.
SW ERROR	O	Open Drain	Source 600 µA (4.7 kΩ pull-up), Sink 24 mA	5 V	SW error output, programmable rising / falling edge. Logic high indicates a reset condition has occurred and chassis is in 'failsafe' mode.
GND	O	—	—	—	System power supply, ground reference.
+5 V	O	—	1 A (current limited)	—	System power supply, +5 V.
INTERLOCK	I	CMOS Input WIth 4.7 kΩ Pull-down	—	5 V	Interlock for disabling module, active high. Connect to provided +5 V pin for correct operation (module enabled).
FP_GND	O	—	—	—	Metalwork reference point, to be used for screen connection of interconnection accessories.

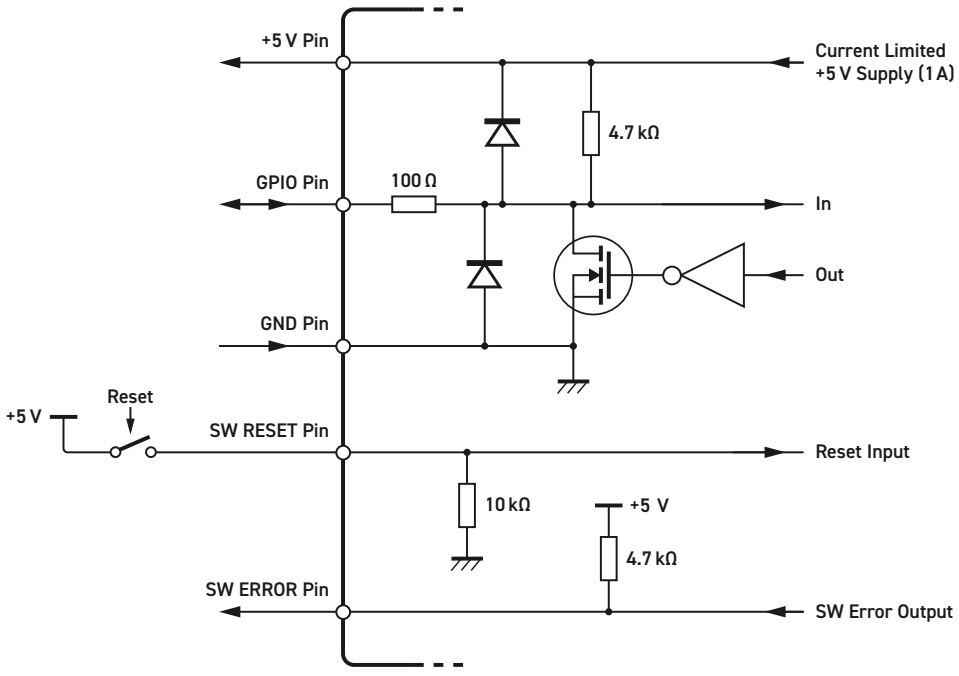


Figure 6.2 - 60-107-002 DIO/Trigger Port Internal Circuitry

Section 7 - Troubleshooting & Maintenance



Refer to the Warnings and Cautions at the front of this manual.
The chassis is designed for indoor use only.

Periodic maintenance

This product does not require any periodic maintenance, contact Pickering if technical asistance is required - see page (iii) for information.

Installation Problems

Inability to start the system frequently results from incorrect installation peripheral modules, or other components. Before starting the system, please ensure that:

- All peripheral modules are properly seated in their slots
- All cables are properly connected to the peripheral modules
- All installed peripheral modules are compatible for use in the chassis
- The power cable is securely plugged into the chassis' power connector and the power outlet

If the system fails to start when all installation conditions are met, remove all installed peripheral modules and try powering up again. If the system starts normally, power down the chassis and install one peripheral module at a time, each time powering up the chassis. Also try installing the modules into different slots until the chassis starts normally.

If any modules or covers are not installed properly, power off the chassis immediately and reinstall following the procedures in Section 3 ensuring that blanking plates are fitted to unused slots to maintain airflow and protect against electric shock.

If the chassis fails due to overtemperature, disconnect the power an leave to cool for 10 minutes before touching.

Handling the Chassis

The 60-107 is designed for both rack-mount and benchtop use. The chassis weighs 10 kg plus the weight of any installed modules, please take care when moving the chassis to avoid any possible injury.

Cleaning the Exterior

Make sure that the system is turned off before cleaning the chassis exterior. Wipe the exterior with a clean microfibre cloth starting from areas that easily accumulate dust or dirt such as the area in and around the chassis and power supply air intake apertures.

Power Requirements

Make sure that the power cord is in good condition before plugging it into the system. It is important to check the reliability of the power source. The 60-107 power supply is capable of handling 100 to 240 VAC within the 50 Hz to 60 Hz range. Do not connect the chassis to an already overloaded circuit.

LXI Status Indicators

Status Indicator / Colour				Status Description
PWR	RDY	ERR	LAN	
Green	Off	Off	Off	**Powering Up Status:** This state occurs when the LXI unit was turned off and the user turns it on. This state will exist for ~10-15 seconds.
Green	Orange	Orange	Orange	**PI Services Init. Status:** This state triggers after powering up status and it means that PI services are initialising (pilserv is starting and initialising). This state should last <1 second.
Green	Green	Off	Green	**Normal Operation Status:** LXI unit is turned on, Ethernet connection is established (LXI unit has assigned IP address from DHCP/AutoIP or static range), ServerBridge is running and listening for incoming connections.
Green	Green	Off	Red	**Network Failure Status:** LXI unit is turned on, but the Ethernet connection is not established (LXI unit is not connected to any network and it has not assigned an IP address). Client cannot access the unit or control any of the plugged in cards.
Green	Off	Red	Green	**ServerBridge Failure Status:** LXI unit is turned on, Ethernet connection is established (LXI unit has assigned IP address from DHCP/AutoIP or static range), ServerBridge is not running. Client can access the LXI unit thru the web interface, but cannot control any of the plugged in cards.
Green	Off/Green (toggling between off & green)	Off/Red (toggling between off & red)	Green	**ServerBridge Failure Status:** LXI unit is turned on, Ethernet connection is established (LXI unit has assigned IP address from DHCP/AutoIP or static range), ServerBridge is still restarting. Client can access the LXI unit thru the web interface, but cannot control any of the plugged in cards. The cause of the fault is usually the pilpxi driver, either of the third party drivers: pi743/pxm78xx or a bug in ServerBridge.
Green	Green	Off	Orange	**Ethernet Change Notification Status:** LXI unit is turned on, Ethernet connection is changing. This is usually caused by user action: connected ethernet cable or LAN configuration change. ServerBridge is terminated in this state and waiting to establish the Ethernet connection.

Section 7 - Troubleshooting & Maintenance

Basic Troubleshooting Guide

Q I have switched my chassis on, but why is the PWR light not illuminated?

A No PWR light could mean one of the following issues:

1. Power supply not connected to the chassis, mains lead not connected to the power supply, mains supply off or power supply faulty.
2. A faulty PXI module has caused an overcurrent in which case the internal PSU will be disabled - switch the chassis off, remove the PXI modules and switch on again to see if PWR is illuminated.
3. There is a hardware fault - contact your local sales office

Q The 100 or 1000 light is on and the PWR light is on, but why does the LAN light flash green?

A This is normal operation, it is used as visual identification to locate the chassis in a densely populated test rack environment.

Q The 100 or 1000 light is on and the PWR light is on, but why does the LAN light flash red?

A There is an IP conflict (you have probably configured your chassis to a static IP address which is in collision with another).

Q The 100 or 1000 light is on and the PWR light is on, but why is the LAN light illuminated red?

A The steady red LAN light indication means one of the following issues:

1. The Ethernet cable is disconnected.
2. Failure to renew an already acquired DHCP lease (in this case the chassis will revert to AutoIP configuration and will look for new renewal value).
3. Detection of a duplicate IP address - (you have probably configured your chassis to a static IP address which is in collision with another).
4. Failure to acquire a valid IP address

Q Why do I have only a green PWR light?

A The chassis is either in USB mode or there is a hardware fault with your chassis - contact your local sales office.

Q What does the orange LAN light indication mean? (The 100 or 1000 light is on and the PWR light is illuminated green).

A This means that the chassis is changing the LAN configuration.

Q How do I know when I can begin communicating with my chassis?

A When the 100 or 1000 light is on, the PWR light on and the LAN light illuminated green.

Please contact your local Pickering Interfaces sales office for any further support or email:

support@pickeringtest.com

You can also visit our website for product updates, help and downloadable materials at:

pickeringtest.com

Unit Reset

If the chassis' operation is inconsistent, you can try cycling the power using the power switch located on the rear panel to re-boot the chassis. Alternatively, you can press the resessed "LAN Reset" button on the rear panel of the chassis causing it to be set back to factory default conditions. This will destroy all user configuration and reset the LAN configuration (enabled DHCP and AutoIP).