

PXI Modules

Installation Guide for Chassis

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Document part no. 46892/667

Issue 14

17 June 2015

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Precautions

Please observe the safety precautions information that accompanies the chassis and controllers. A chassis contains LINE voltages.

Please observe also the safety precautions that apply to Cobham PXI modules: this information is in the printed document *Cobham PXI Modules Safety Instructions* (part no. 46882/882) that accompanies your modules.

Warning

This is a class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.'

Introduction

This installation guide provides an overview of a configured PXI system comprising Cobham modules installed in a PXI chassis, together with a PXI controller, drivers and application software.

This guide covers the following Cobham PXI modules:

- 3010 Series PXI RF Synthesizers
- 3020 Series and 3050A PXI Digital RF Signal Generators
- 3030 Series and A PXI RF Digitizers
- 3060 Series PXI RF Combiners
- 3320 Series PXI Arbitrary Waveform Generators

and the chassis and embedded or external controller.

It explains how to set up a populated chassis ready for use.

The system supplied to you consists of a PXI or PXIe chassis with either an embedded or external controller, and modules fitted depending on your requirements.

User manuals

There is a separate user manual for the 3010, the 3020, the 3030 and the 3060 Series, and for the 3050A, 3070A and 3320. Each manual contains information about installing, connecting and operating the module, an explanation of the soft front panel, and a technical description. The user manuals are included on the PXI Modules CD-ROM, part no. 46886/028, and are installed by the installer to:

Start\All Programs\Aeroflex\PXI Module Documentation

and to the appropriate module folder

C:\vxipnpl\winnt\af3010, ...af3020, and so on

or

C:\Program Files (x86)\IVI Foundation\VISA\WinNT\af3010, ...af3020, and so on

<p>Note: <i>this guide does not provide installation and other information for the chassis itself, as that is provided in the relevant chassis user guide.</i></p>

Associated documentation

If you want to...	Refer to...
Find information about soft front panels, drivers, application software, data sheets, installation, getting started and user manuals for this and other PXI modules	PXI Modules CD-ROM, part no. 46886/028 Supplied with the module
Learn about Cobham RF synthesizer PXI modules	3010 Series RF Synthesizer User Manual Part no. 46892/637 On the CD-ROM and at www.cobham.com/wireless
Learn about Cobham digital RF signal generator PXI modules	3020 Series Digital RF Signal Generator User Manual Part no. 46892/834 On the CD-ROM and at www.cobham.com/wireless 3050A PXI Low Noise RF Signal Generator User Manual Part no. 47092/197 On the PXI Modules CD-ROM and at www.cobham.com/wireless
Learn about Cobham digitizer PXI modules	3030 Series Wideband RF Digitizer User Manual Part no. 46892/836 On the CD-ROM and at www.cobham.com/wireless 3070A PXI High Performance Wideband RF Digitizer User Manual Part no. 47090/198 On the PXI Modules CD-ROM and at www.cobham.com/wireless
Learn about Cobham combiner PXI modules	3060, 3061, 3065, 3065A RF Combiner PXI Modules User Manual Part no. 46892/762 On the CD-ROM and at www.cobham.com/wireless 3066 PXI Multi-way Active RF Combiner User Manual Part no. 47090/121 On the PXI Modules CD-ROM and at www.cobham.com/wireless
Learn about Cobham AWG PXI modules	3320 PXI Dual Channel Arbitrary Waveform Generator User Manual Part no. 47090/129 On the CD-ROM and at www.cobham.com/wireless
Set up and use the universal PXI application for system configuration and operation	PXI Studio 2 User Guide Part no: 46892/809 At www.cobham.com/wireless
Set up and use a digitizer application for 3010 Series and 3030 Series modules <i>(document currently not maintained — for information only)</i>	Getting Started with afDigitizer Part no. 46892/676 On the CD-ROM and at www.cobham.com/wireless
Set up and use a signal generator application for 3010 Series and 3020 Series modules <i>(document currently not maintained — for information only)</i>	Getting Started with afSigGen Part no. 46892/678 On the CD-ROM and at www.cobham.com/wireless

Setting up a Cobham PXI chassis

This guide explains how to install and configure a chassis fitted with one or more Cobham PXI modules and a system controller, or a PXI chassis fitted with an external controller interface.

More detailed information about Cobham PXI modules, how to operate them and how they work, is given in the relevant User Manuals; these are PDF documents on the PXI Modules CD-ROM (part no. 46886/028) packaged with the module(s).

Please read the cautions and instructions below before installing any module into the PXI chassis.

CAUTION

Always power down the chassis before inserting or removing any PXI module.

CAUTION

Maximum safe RF powers

3020A, 3025 Digital RF Signal Generators:	Reverse power handling not to exceed +20 dBm
3020C, 3021C, 3025C, 3026C Digital RF Signal Generator:	Reverse power handling not to exceed +25 dBm
3050A Low Noise RF Signal Generator:	Reverse power handling not to exceed +25 dBm
3030A Digitizer:	RF input: +22 dBm continuous (with ≥ 8 dB input attenuation) IF input: +10 dBm
3035, 3036 Digitizer:	RF input: +30 dBm continuous (with ≥ 10 dB input attenuation and ≥ 10 dB IF attenuation) IF input: +10 dBm
3030C, 3035C RF Digitizers:	RF input: +30 dBm continuous (with ≥ 10 dB input attenuation)
3070A High Performance RF Digitizer:	RF input: +30 dBm (for reference level setting 0 dBm) +24 dBm (for reference level setting below 0 dBm)
3060 RF Combiner:	Σ port: +27 dBm , 3 V dc A, B, C ports: +24 dBm
3061 RF Combiner:	Σ port: +30 dBm , 40 V dc continuous +33 dBm mark/space 1:1 where mark = < 0.5 ms A, B ports: +24 dBm
3065 RF Combiner:	Σ port: +27 dBm , 3 V dc continuous +30 dBm mark/space 1:8 where mark < 0.5 ms A, B, C, D ports: +24 dBm
3065A RF Combiner:	Σ port: +30 dBm , 3 V dc continuous +33 dBm mark/space 1:8 where mark < 0.5 ms A, B, C, D ports: +24 dBm
3066 RF Combiner:	DUT ports: +34 dBm avg/CW, 38 dBm PEP RF input: 25 dBm avg/CW RF output: 17 dBm avg/CW (reverse power)

Setting up your chassis — checklist

- 1 Check condition of [delivered items](#)
- 2 Check [installation and safety instructions](#)
- 3 Check [positioning](#) of modules in chassis
- 4 Connect [keyboard/display/mouse](#) (where necessary: not supplied)
- 5 [Interconnect](#) modules
- 6 Apply [power](#)
- 7 Check for correct boot-up
- 8 Perform self test

Unpacking the chassis

Contents of packing

- Chassis, possibly fitted with Cobham PXI module(s) and either an embedded or external controller (PCI-to-PXI interface)
- PCI-to-PXI interconnection cable for external controller
- PXI Modules CD-ROM (part no. 46886/028), containing drivers, associated software and soft front panels; data sheets and user manuals; *Cobham PXI Modules Installation Guide for Chassis* (this document) and *Cobham PXI Modules Common Installation Guide* (part no. 46892/663); chassis user guides.

WARNING

Initial visual check

Before and after unpacking the chassis and modules, inspect the packaging for any signs of damage. If there is damage, keep the packaging for examination by the carrier in the event that a claim is made. Examine the chassis and modules for signs of damage, especially to the connectors. Do not power up a suspect unit as internal electrical damage could result in a fire.

WARNING

Before installing an additional module into the chassis, check that:

- (a) no foreign conductive bodies are present between pins on the backplane or module connectors
- (b) no pins on the backplane or module connectors are bent or damaged.
- (c) the PXI backplane slot arrangement is compatible with the module.
- (d) the chassis' power rating is compatible with the DC requirements for the module.
- (e) the chassis' cooling capability is compatible with the requirements of the module.

CAUTION

Handling precautions

Do not remove the chassis from its protective packaging until you are ready to insert the power cord (thereby grounding it).

If you remove any module, avoid static damage by wearing a wrist strap or by touching a good ground frequently whilst handling the module.

Be especially careful not to touch connectors.

CAUTION

DO NOT insert or remove a module while the chassis is powered up — the module will probably be damaged!

Connector protection panel

The chassis may be supplied fitted with a connector protection panel (Fig. 1).



Fig. 2 Connector protection panel fitted to chassis

- 1 Remove the screws that secure the protection panel to the chassis and carefully slide the protection panel forwards and away from the front of the chassis. Take care not to catch any item on the front of the chassis with the edge of the protection panel as you do this.
- 2 Fit the front feet (supplied) to the chassis, unless it is to be installed in a rack.
- 3 Store the protection panel together with the screws, in case it is needed again.

Typical system

- PXI chassis, for example Cobham 18-slot chassis
 - PCI/PCIe-to-PXI interface kit and a PC running Windows® 7 or PXI embedded controller.
 - Cobham PXI module(s): 3010 Series RF synthesizer, 3020 Series RF signal generator, 3050 Series RF signal generator, 3030 Series RF digitizer, 3070 Series RF digitizer, 3060 Series RF combiner, 3320 Series arbitrary waveform generator.
- EMC filler panels fitted to all unoccupied slots.
- PXI slot blockers fitted to all unoccupied slots.

Check the safety documentation

Read the safety and installation instructions that accompany the chassis and embedded controller or PCI-to-PXI interface.

CAUTION

Always power down the chassis before inserting or removing any Cobham PXI module.

Check positioning of modules

A chassis fitted with an embedded controller is normally supplied with modules installed and configured. If they are removed for any reason, it is important that they are replaced correctly in the chassis and relative to each other. Fig 3 shows a representative installation that provides signal generation and analysis.

Positioning guidelines

Modules can be installed in any slot, but there are a few PXI requirements and 3000 Series-specific rules to be observed:

- Slot 1 Reserved for controller or PCI/PCIe-to-PXI interface.
- Slot 2 Reserved for star trigger controller. If star trigger is not needed, this can be used as a normal expansion slot.
- 3020 Series and 3030 Series Access to the PXI local bus is available only on the left-hand side of the 2-slot modules (viewed from the front panel). Any associated 3010/3011 should therefore be located to the left to benefit from local bus communication.

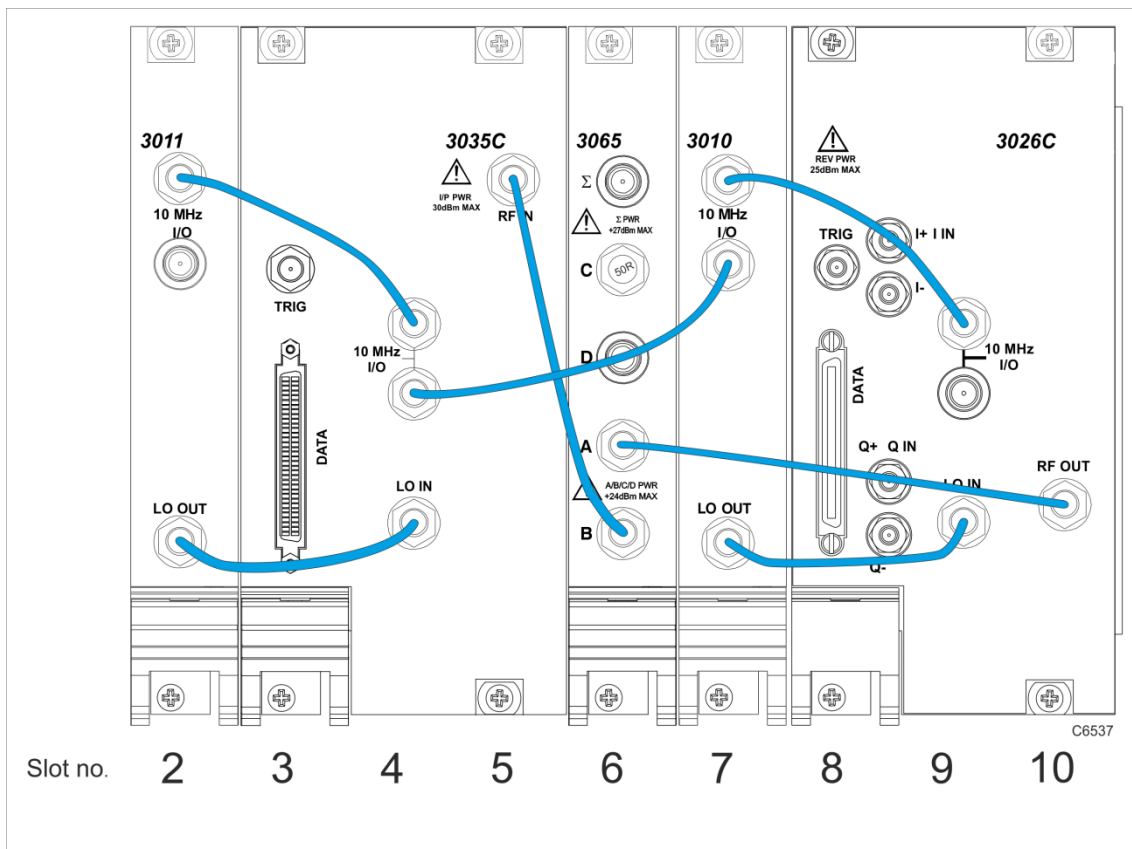


Fig. 3 Interconnection of modules — fully-equipped chassis

Connect peripherals

Connect a VGA monitor, keyboard and mouse (not supplied) to the embedded controller as explained in the installation guide supplied with the controller.

If the chassis uses a PCIe/PCI-to-PXI interface, ensure you complete the PCIe/PCI interface installation to the external PC controller, following the PCIe/PCI interface user instructions, before applying power.

Connecting and torquing SMA connectors

- 1 First, ensure that the mating halves of the connector are correctly aligned.
- 2 Next, engage the threads of the nut and tighten it by hand, ensuring that the mating halves do not move relative to each other.
- 3 Then use a torque spanner to tighten the connector, in order to ensure consistent matching and to avoid mechanical stress.

Torque settings for connectors are:

0.56 Nm test torque (development use, semi-permanent installations)

1 Nm final torque (permanent installations)

Never use pliers to tighten connectors.

Do not allow center pins to rotate!

Do not allow the center pins of connectors to rotate when you connect and remove cables.

Use a connector saver!

Use a connector saver (part no. 46885/224):

- (a) on any SMA connector where the cable is routinely connected and disconnected
- (b) when the connector on the cable, or the cable end of the connector saver, has not been gaged.

Torque to 1 Nm the end of the connector saver that connects to the module, and torque to 0.56 Nm the end that connects to the cable.

Check interconnection of modules

Actual interconnection is determined by module configuration. The table below shows the connections as used for a standard configuration of Cobham 3000 Series modules 3010, 3011, 3020 Series, 3030 Series and 3060 Series.

Interconnect the modules as shown in Fig 3.

3011	LO OUT	LO output to 3030 Series RF digitizer LO IN
	10 MHz I/O	10 MHz ref to 3030 Series RF digitizer
3030A/3030C/3035/3035C/3036/3070A	LO IN	LO input from 3011 synthesizer LO OUT
	10 MHz I/O	External ref from 3011 synthesizer
	10 MHz I/O	10 MHz ref to 3010 synthesizer 10 MHz I/O
	RF IN	Signal input from 3060 Series port B
3030A/3035 only	IF IN/OUT	IF bridge link
3060/3061/3065	B	Feeds signal input to 3030 Series digitizer
	A	Receives signal output from 3020 Series signal generator
3060, 3065, 3065A only	C	Terminated with 50 ohms
3065, 3065A only	D	No connection
	Σ (sum port)	No connection
3010/3011	LO OUT	LO output to 3020 Series RF signal generator input
	10 MHz I/O	Locks to external ref provided by 3011 synthesizer via 3030 Series 10 MHz I/O
	10 MHz I/O	Daisy-chain to 3020 Series 10 MHz I/O
3020A/3020C/3021C/3025 /3025C/3026C/3050A	LO IN	LO input from 3010 synthesizer LO OUT
	10 MHz I/O	10 MHz ref IN daisy-chained from 3010 10 MHz I/O
	10 MHz I/O	No connection
	RF OUT	Signal output to 3060 Series combiner port A

Position of chassis

Because of their small size and close packaging, PXI modules depend on efficient cooling in the chassis. Check that the fans have clearance to expel air, and that inlet vents are not covered over. Allow an air space above and below the chassis.

Switch on power

Refer to the user guide supplied with the chassis.

Note: for the PC to recognize the modules in the chassis, the chassis must be powered up before the PC. If necessary, shut down the PC, power up the chassis, then reboot the PC. Similarly, shut down the PC before powering down the chassis.

Installing drivers and associated software

Refer to the *Cobham PXI Modules Common Installation Guide* (part no. 46892/663) on PXI Modules CD-ROM (part no. 46886/028) supplied with your Cobham PXI modules for information about installing module driver software.

Cobham supplies embedded controllers with all software pre-installed. For chassis and controller software, refer to the user guide supplied with the chassis.

Optional Cobham software components, when purchased, are pre-installed. If you need to re-install these, refer to the software installation information in the Common Installation Guide.

Where Cobham supplies external controllers, refer to *Hardware installation for PCI-to-PXI interface kit users* in the Common Installation Guide for the correct installation procedure.

Installing the chassis description file (*chassis.ini*)

To allow inter-operability of PXI platform and modules from different vendors, PXI specifications define the hardware description files to describe the hardware characteristics in ASCII text format. System integrators can use the hardware description files to configure the system with various PXI controllers, chassis and modules.

Cobham provides a complete list of chassis description files (*chassis.ini*) for the PXI chassis.

Cobham PXI chassis

Refer to the Cobham PXI Modules CD-ROM, part no. 46886/028:

<cdrom>:\PXIChassis\INI Files

Also refer to the following location for any additional software for your PXI chassis:

<cdrom>:\PXIChassis*<product code>*

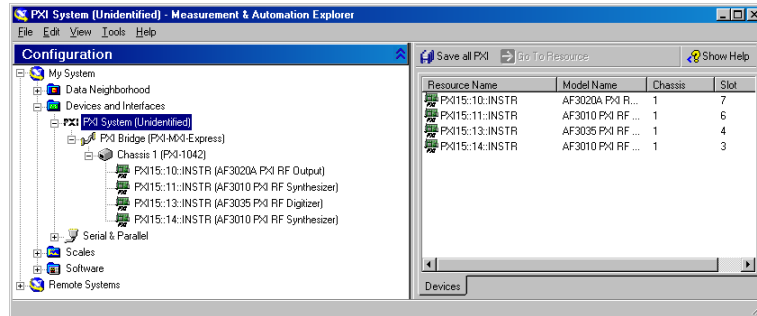
Other-brand PXI chassis

Refer to the documentation supplied by the manufacturer of a non-Cobham-branded PXI chassis.

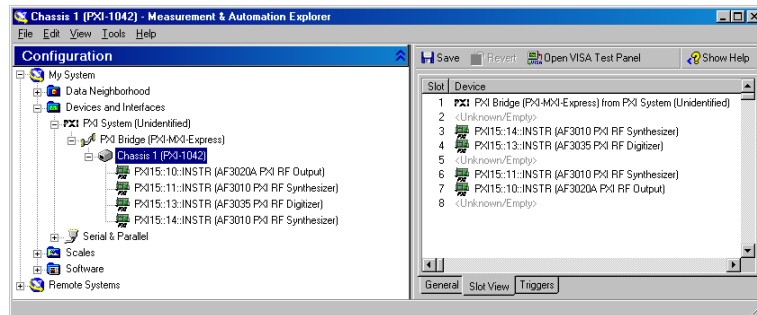
Identifying modules installed in a chassis

National Instruments Measurement and Automation Explorer (MAX) is installed automatically when you install National Instruments hardware drivers or development environments.

MAX allows you to identify modules by their resource string:



or by their slot number in the chassis:



Further information and options are available by right-clicking on individual instruments. Drop-down lists allow you to identify the chassis and other components that you are using.

Further information

Refer to National Instruments MAX documentation for further information on this useful tool. Go to the Help menu in MAX and open the *Measurement & Automation Explorer Help for PXI* by navigating to Help Topics\PXI. Find setup information under the entry *PXI System Configuration*.

Maintenance

Connector maintenance

Clean connectors regularly, using a cotton bud dipped in isopropyl alcohol. Wipe all accessible surfaces, then use a dry cotton bud to finish off. Check for any deposits.

Do not use other cleaners, as they can cause damage to the plastic insulators within the connectors.

Cap unused connectors.

See [here](#) for important information on correct connector handling.

Fan filters

To maintain efficient cooling in the chassis, check the fan filters (when fitted) at regular intervals as instructed in the documentation accompanying the chassis.

Repackaging for return

If you need to return a module or chassis to us, please observe the following points:

Tagging

Tag the returned item(s) with:

- your name and address
- the nature of the repair needed
- the type, model number and serial number.

Shipping containers

Repackage the items in their original container and packing material. If the original shipping containers and materials are not available, contact Customer Service Department for shipping instructions.

Freight costs

See 'Warranty Packet' for freight charge policy on warranty claims. Freight costs on shipments out of warranty are borne by the customer.

Repacking procedure

If the original container or materials are not available, use a strong double-walled carton packed with a 7 to 10 cm (3 to 4 inch) layer of shock-absorbing material around all sides of the module or chassis to hold it firmly. Protect the front panel with the [connector protection panel](#) supplied with the chassis, or with a plywood or cardboard load-spreader. A rear load-spreader is also advisable.

COBHAM

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