



# **3000 Series PXI Modules**

## **Installation Guide for**

### **Chassis**

© Aeroflex International Ltd. 2008

*No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, or recorded by any information storage or retrieval system, without permission in writing by Aeroflex International Ltd. (hereafter referred to throughout the document as 'Aeroflex').*

Document part no. 46892/667

Issue 6

20 October 2008

---

# Contents

Precautions .....	iii
Introduction .....	iv
Operating manuals .....	v
Associated documentation .....	vi
Setting up an Aeroflex 3000 Series PXI chassis .....	1
Maximum safe powers .....	1
Setting up your chassis — checklist .....	2
Unpacking the chassis .....	3
Contents of packing .....	3
Handling precautions .....	3
Initial visual check .....	3
Typical full system .....	4
Check the safety documentation .....	4
Check positioning of modules .....	4
Positioning guide lines .....	4
Connect peripherals .....	5
Connecting and torquing SMA connectors .....	6
Check interconnection of modules .....	7
Position of chassis .....	7
Switch on power .....	8
Installing drivers and associated software .....	8
Identifying modules installed in a chassis .....	9
Further information .....	9
Maintenance .....	10
Connector maintenance .....	10
Fan filters .....	10
Repackaging .....	11

## Precautions

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

Please observe also the safety precautions that apply to 3000 Series PXI modules: this information is in the 3000 Series PXI Modules Safety Instructions document (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.'

National Instruments, NI and LabView™ are trademarks of National Instruments  
Microsoft®, Visual C++® and Visual Basic® are registered trademarks of Microsoft Corporation  
Windows™, Windows XP™ and Windows NT™ are trademarks of Microsoft Corporation

## Introduction

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

This guide covers the following Aeroflex PXI modules:

- 3010 Series (3010, 3011) PXI RF Synthesizers
- 3020 Series (3020, 3020A, 3020C, 3025, 3025C) PXI Digital RF Signal Generators
- 3030 Series (3030, 3030A, 3030C, 3035, 3035C) PXI RF Digitizers
- 3060 Series (3060, 3065) PXI RF Combiners

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 an 8 or 18 slot chassis with either an embedded or external controller, and modules fitted depending on your requirements.

The example below shows a fully populated 8-slot chassis fitted with an embedded controller.



*Fig. 1 Typical Aeroflex PXI system*

## Operating manuals

There is a separate operating manual for each 3000 Series module. Each manual contains information about installing, connecting and operating the module, an explanation of the soft front panel, and a technical description. All the operating manuals are included on the PXI Modules CD-ROM, part no. 46886/028, and are installed by the installer to:

Start\Programs\Aeroflex\PXI Module Documentation

and to the appropriate module folder

*C:\VXIPNP\WINNT\af3010, ... \af3020, ... \af3030, ... \af3060.*

## Associated documentation

<b>PXI Modules CD-ROM</b>	Part no. 46886/028	Compilation containing PXI module software installer, soft front panels, drivers, DLL components, COM interfaces, help files, data sheets, application notes and operating manuals for all modules in the 3000 Series.
<b>Operating manuals</b>	Part no.	
	46892/637	3010/3011 RF Synthesizer
	46892/638	3020 Digital RF Signal Generator
	46892/717	3020A Digital RF Signal Generator
	46892/847	3020C Digital RF Signal Generator
	46892/721	3025 6 GHz Digital RF Signal Generator
	46892/834	3025C 6 GHz Digital RF Signal Generator
	46892/639	3030 RF Digitizer
	46882/718	3030A RF Digitizer
	46882/835	3030C RF Digitizer
	46882/722	3035 6 GHz RF Digitizer
	46882/836	3035C 6 GHz RF Digitizer
	46892/640	3060 RF Combiner
	46892/762	3065 6 GHz RF Combiner
<b>3000/3000A Chassis and 3001A System Controller User Guide</b>	Part no. 46892/837	Overview, installation, pin assignments and maintenance information for chassis and system controller.
<b>Common Installation Guide</b>	Part no. 46892/663	Multilingual safety precautions. Information on installing software and hardware drivers, and installing modules into chassis, software licence agreement and warranty.
<b>PXI Studio User Guide</b>	Part no. 46892/809	Setting up and using the universal PXI application for system configuration and operation.
<b>Getting Started with afDigitizer</b>	Part no. 46892/676	Setting up and using the digitizer application for 3010 & 3030 Series modules.
<b>Getting Started with afSigGen</b>	Part no. 46892/678	Setting up and using the signal generator application for 3010 & 3020 Series modules.

## Setting up an Aeroflex 3000 Series PXI chassis

This guide explains how to install and configure an Aeroflex 3000 Series PXI chassis, fitted with one or more 3000 Series modules and a system controller.

More detailed information about modules, how to operate them and how they work, is given in the relevant Operating Manuals; these are PDF documents on the PXI Modules CD-ROM packaged with your module.

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 powers

3020, 3020A, 3020C, 3025 Digital RF Signal Generators:	Reverse power handling not to exceed <b>+20 dBm</b>
3025C Digital RF Signal Generator:	Reverse power handling not to exceed <b>+25 dBm</b>
3030, 3030A, 3035 RF Digitizers:	RF input: <b>+16 dBm</b> continuous (with 0 dB input attenuation) RF input: <b>+22 dBm</b> continuous (with $\geq 8$ dB input attenuation) IF input: <b>+10 dBm</b> (with 0 dB IF attenuation)
3030C, 3035C RF Digitizers:	RF input: <b>+25 dBm</b> continuous (with 0 dB input attenuation) RF input: <b>+30 dBm</b> continuous (with $\geq 10$ dB input attenuation)
3060 RF Combiner:	$\Sigma$ port: <b>+27 dBm</b> , 3 V dc A, B, C ports: <b>+17 dBm</b>
3065 RF Combiner:	$\Sigma$ port: <b>+27 dBm</b> , 3 V dc continuous <b>+30 dBm</b> mark/space 1:8 where M < 0.5 ms A, B, C, D ports: <b>+24 dBm</b>

## 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](#) (not supplied)
- 5 [Interconnect](#) modules
- 6 Apply [power](#)
- 7 Check for correct boot-up
- 8 Perform acceptance tests Refer to module operating manuals

## Unpacking the chassis

### Contents of packing

- Chassis, fitted with 3000 Series module(s) and either 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 operating manuals; *3000 Series PXI Modules Installation Guide for Chassis* (this document) and *3000 Series PXI Modules Common Installation Guide* (part no. 46892/663); ARB files for 3020 Series Digital RF Signal Generator acceptance test.
- User guide accompanying the chassis.

### 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.

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

### **WARNING**

### Initial visual check

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.

## Typical full system

- PXI chassis, for example Aeroflex 3000/3000A 3U chassis
- PCI-to-PXI interface and a PC running Windows 98, NT4, 2000 or XP or  
PXI embedded controller, for example Aeroflex 3001A running Windows XP
- Aeroflex PXI module(s), combination of 3010 or 3011 RF Synthesizer, 3020 Series Digital RF Signal Generator, 3030 Series RF Digitizer, 3060 Series RF Combiner
- EMC filler panels fitted to all unused 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 AEROFLEX 3000 SERIES 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. 2 shows a representative installation to provide 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-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.
3030 Series and 3020 Series	Access to the PXI local bus is available only on the left-hand side of these 2-slot modules (viewed from the front panel). Any associated 3010/3011 should therefore be located to the left to benefit from the improved frequency switching times that can result from PXI_LBL triggering.
18-slot configuration	18-slot chassis are populated from slot position 3 onwards, thus always leaving slot position 2 available for insertion of a star trigger controller.

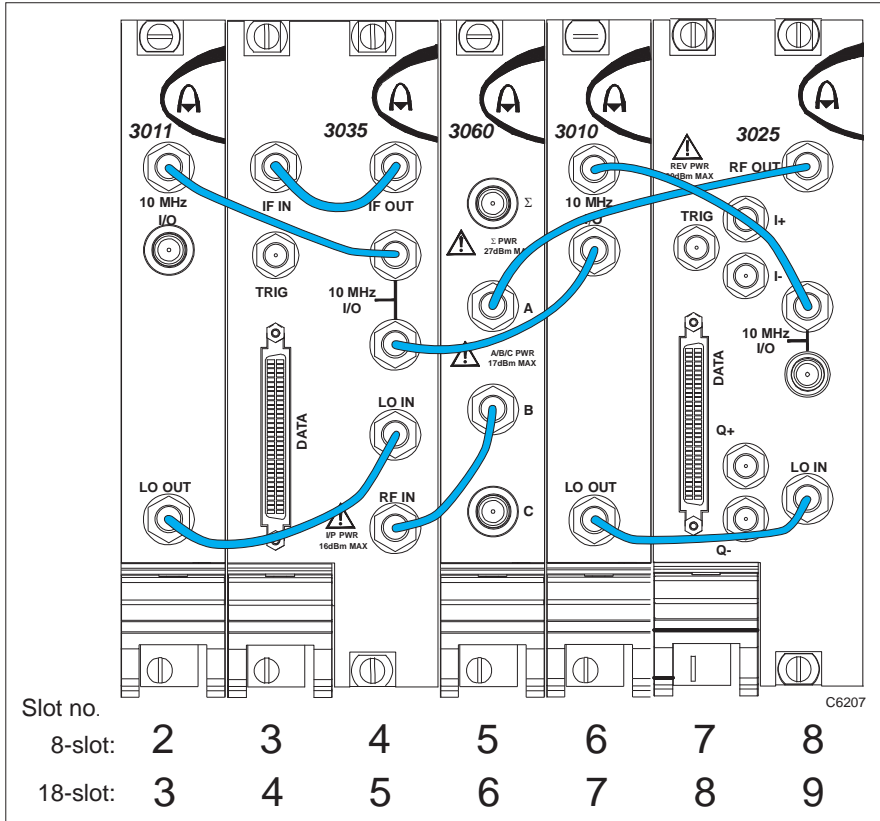


Fig. 2 Interconnection of modules — fully-equipped chassis

## Connect peripherals

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

If the chassis uses a PCI-to-PXI interface, ensure you complete the PCI interface installation to the external PC controller, following the chassis 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.

## Check interconnection of modules

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

Interconnect the modules as shown in Fig. 2.

<b>3011</b>	LO OUT 10 MHz I/O	LO output to 3030 Series RF digitizer LO IN 10 MHz clock to 3030 Series RF digitizer
<b>3030/3030A/3035</b>	LO IN 10 MHz I/O 10 MHz I/O IF IN/OUT RF IN	LO input from 3011 synthesizer LO OUT External clock from 3011 synthesizer 10 MHz clock to 3010 synthesizer 10 MHz I/O IF bridge link Signal input from 3060 Series port B
<b>3060/3065</b>	B A  C $\Sigma$ (sum port)	Feeds signal input to 3030 Series digitizer Receives signal output from 3020 Series signal generator  Terminated with 50 ohms No connection
<b>3010</b>	LO OUT  10 MHz I/O  10 MHz I/O	LO output to 3020 Series RF signal generator input  Locks to extenal clock provided by 3011 synthesizer via 3030 Series 10 MHz I/O Daisy-chain to 3020 Series 10 MHz I/O
<b>3020/3020A/3020C/3025</b>	LO IN 10 MHz I/O  10 MHz I/O RF OUT	LO input from 3010 synthesizer LO OUT 10 MHz clock IN daisy-chained from 3010 10 MHz I/O  No connection 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, even more so than traditional larger instruments. Check that the fans have clearance to expel air, and that inlet vents are not covered over.

## Switch on power

Refer to the manual supplied with the chassis.

## Installing drivers and associated software

Refer to the *3000 Series PXI Modules Common Installation Guide* (part no. 46892/663) on PXI Modules CD-ROM (part no. 46886/028) supplied with your 3000 Series modules for information about installing module driver software.

Aeroflex supplies embedded controllers with all software pre-installed. For chassis and controller software, refer to the documentation supplied with the chassis. For an Aeroflex 3000 Series chassis, this is the User Guide, part no. 46892/837.

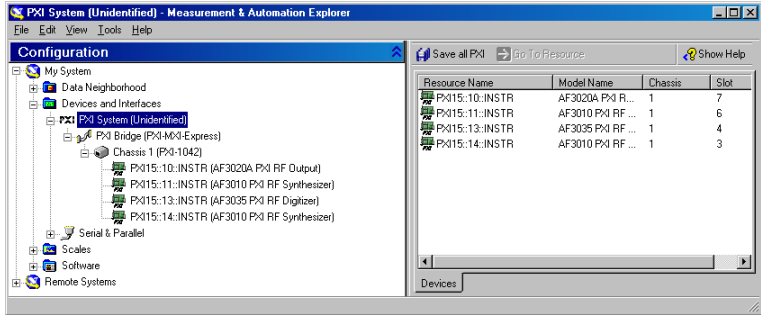
Optional Aeroflex software components, when purchased, are pre-installed. If you need to re-install these, refer to the software installation information in the Common Installation Guide.

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

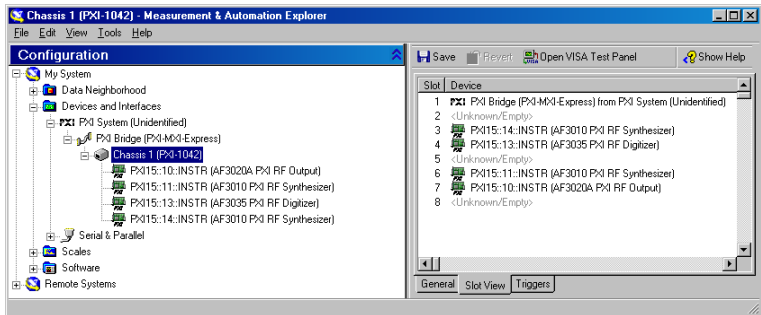
## Identifying modules installed in a chassis

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 at regular intervals as instructed in the documentation accompanying the chassis.

## Repackaging

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 a plywood or cardboard load-spreader. A rear load-spreader is also advisable.