



# **3000 Series PXI Modules**

## **Installation Guide for Chassis**

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## 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 printed *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.’

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# 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 (3020A, 3020C, 3021C, 3025, 3025C, 3026C) PXI Digital RF Signal Generators
- 3030 Series (3030A, 3030C, 3035, 3035C) PXI RF Digitizers
- 3060 Series (3060, 3061, 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-, 18- or 20-slot chassis with either an embedded or external controller, and modules fitted depending on your requirements.

The examples below show:

a fully populated 8-slot chassis fitted with an embedded controller...



... and a 20-slot chassis with MXI-Express or MXI-4 interface.



## User manuals

There is a separate user manual for the 3010, the 3020, the 3030 and the 3060 Series. 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\Programs\Aeroflex\PXI Module Documentation

and to the appropriate module folder

*C:\vxipnp\winnt\af3010, ... \af3020, ... \af3030, ... \af3060*

or

*C:\Program Files\IVI Foundation\VISA\winnt\af3010, ... \af3020, ... \af3030, ... \af3060*

**Note:** *this guide does not provide installation and other information for the chassis itself, as that is provided in the relevant [chassis user guide](#), available on the supplied CD-ROM 46886/028.*

## 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 modules in the 3000 Series	PXI Modules CD-ROM, part no. 46886/028 Supplied with the module
Learn about Aeroflex RF synthesizer PXI modules	3010 Series RF Synthesizer User Manual Part no. 46890/637 On the CD-ROM and at <a href="http://www.aeroflex.com/pxi">www.aeroflex.com/pxi</a>
Learn about Aeroflex digital RF signal generator PXI modules	3020 Series Digital RF Signal Generator User Manual Part no. 46890/834 On the CD-ROM and at <a href="http://www.aeroflex.com/pxi">www.aeroflex.com/pxi</a>
Learn about Aeroflex digitizer PXI modules	3020 Series Wideband RF Digitizer User Manual Part no. 46890/836 On the CD-ROM and at <a href="http://www.aeroflex.com/pxi">www.aeroflex.com/pxi</a>
Learn about Aeroflex combiner PXI modules	3060 Series RF Combiner User Manual Part no. 46890/762 On the CD-ROM and at <a href="http://www.aeroflex.com/pxi">www.aeroflex.com/pxi</a>
Install modules into a rack, interconnect them, power up and install drivers.	3000 Series PXI Modules Common Installation Guide Part no. 46882/663 On the CD-ROM and at <a href="http://www.aeroflex.com/pxi">www.aeroflex.com/pxi</a>
Set up and use the universal PXI application for system configuration and operation	PXI Studio User Guide Part no: 46892/809 On the CD-ROM and at <a href="http://www.aeroflex.com/pxi">www.aeroflex.com/pxi</a>
Set up and use a digitizer application for 3010 Series and 3030 Series modules	Getting Started with afDigitizer Part no. 46892/676 On the CD-ROM and at <a href="http://www.aeroflex.com/pxi">www.aeroflex.com/pxi</a>
Set up and use a signal generator application for 3010 Series and 3020 Series modules	Getting Started with afSigGen Part no. 46892/678 On the CD-ROM and at <a href="http://www.aeroflex.com/pxi">www.aeroflex.com/pxi</a>
Overview, installation, pin assignments and maintenance information for the 3000 Series chassis and system controller.	3000/3000B Chassis and 3001B/3001C System Controller User Guide Part no. 46892/837 On the CD-ROM and at <a href="http://www.aeroflex.com/pxi">www.aeroflex.com/pxi</a>
Overview, installation, pin assignments and maintenance information for the 20-slot chassis and system controller interface.	82547 and 82548 Chassis and MXIe/MXI-4 System Controller Interface User Guide Included in folder 44540_221 on the CD-ROM

## Setting up an Aeroflex PXI chassis

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

More detailed information about 3000 Series 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 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

3020A, 3025 Digital RF Signal Generators:	Reverse power handling not to exceed <b>+20 dBm</b>
3020C, 3021C, 3025C, 3026C Digital RF Signal Generator:	Reverse power handling not to exceed <b>+25 dBm</b>
3030A Digitizer:	RF input: <b>+22 dBm</b> continuous (with $\geq 8$ dB input attenuation) IF input: <b>+10 dBm</b>
3035 Digitizer:	RF input: <b>+30 dBm</b> continuous (with $\geq 10$ dB input attenuation and $\geq 10$ dB IF attenuation) IF input: <b>+10 dBm</b>
3030C, 3035C RF Digitizers:	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>+24 dBm</b>
3061 RF Combiner:	$\Sigma$ port: <b>+30 dBm</b> , 40 V dc continuous <b>+33 dBm</b> mark/space 1:1 where mark = $< 0.5$ ms A, B ports: <b>+24 dBm</b>
3065 RF Combiner:	$\Sigma$ port: <b>+27 dBm</b> , 3 V dc continuous <b>+30 dBm</b> mark/space 1:8 where mark $< 0.5$ 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/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 3000 Series 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; *3000 Series PXI Modules Installation Guide for Chassis* (this document) and *3000 Series PXI Modules Common Installation Guide* (part no. 46892/663); chassis user guides.

### 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!

#### **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 3000/3000B 3U or 20-slot chassis
- PCI-to-PXI interface and a PC running Windows 2000, XP or Vista 32-bit  
or  
PXI embedded controller, for example Aeroflex 3001B/3001C running Windows XP or Vista 32-bit
- 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. Figs 1 and 2 show representative installations that 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/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.
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.

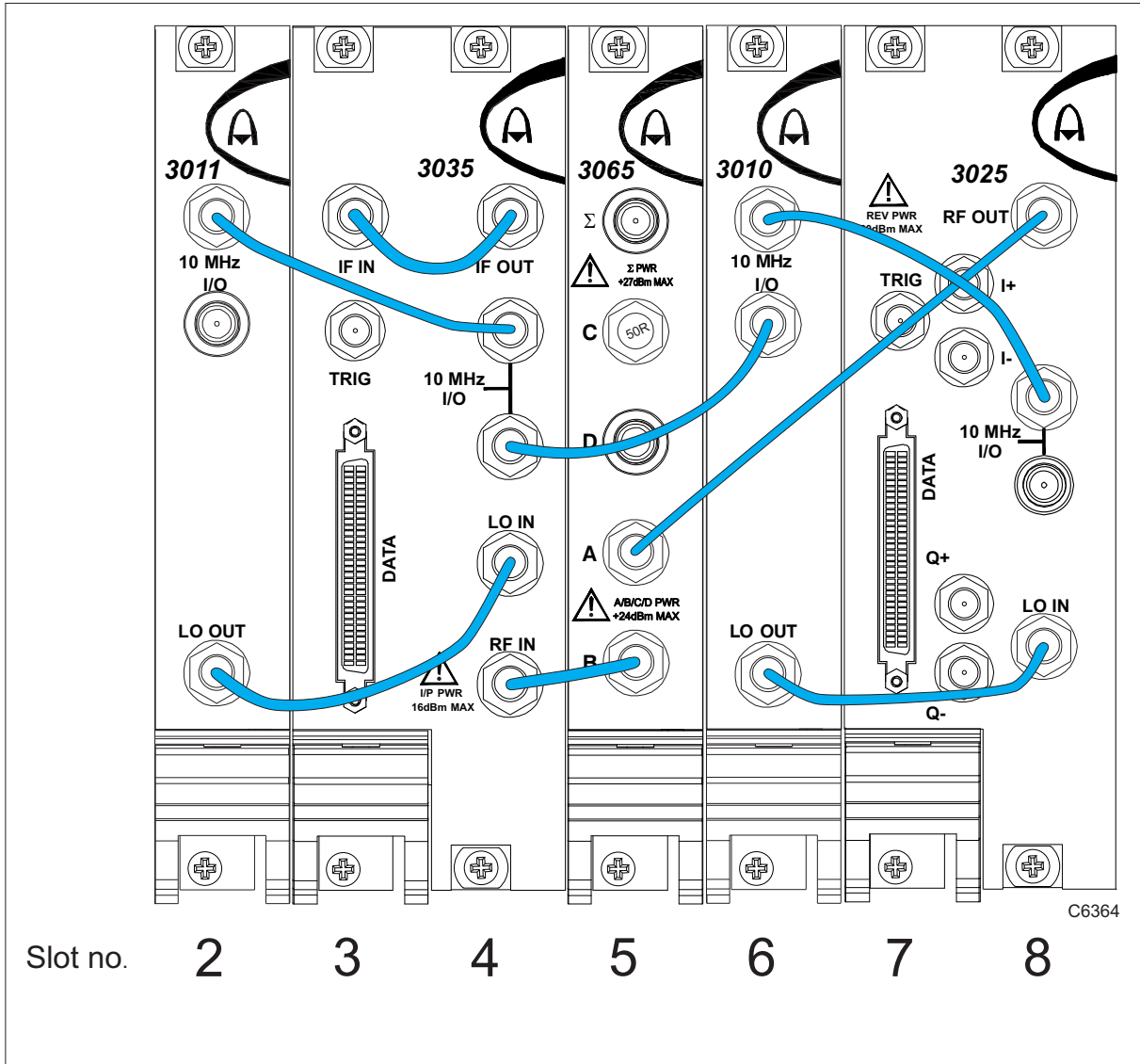


Fig. 1 Interconnection of modules — fully-equipped chassis (example 1)

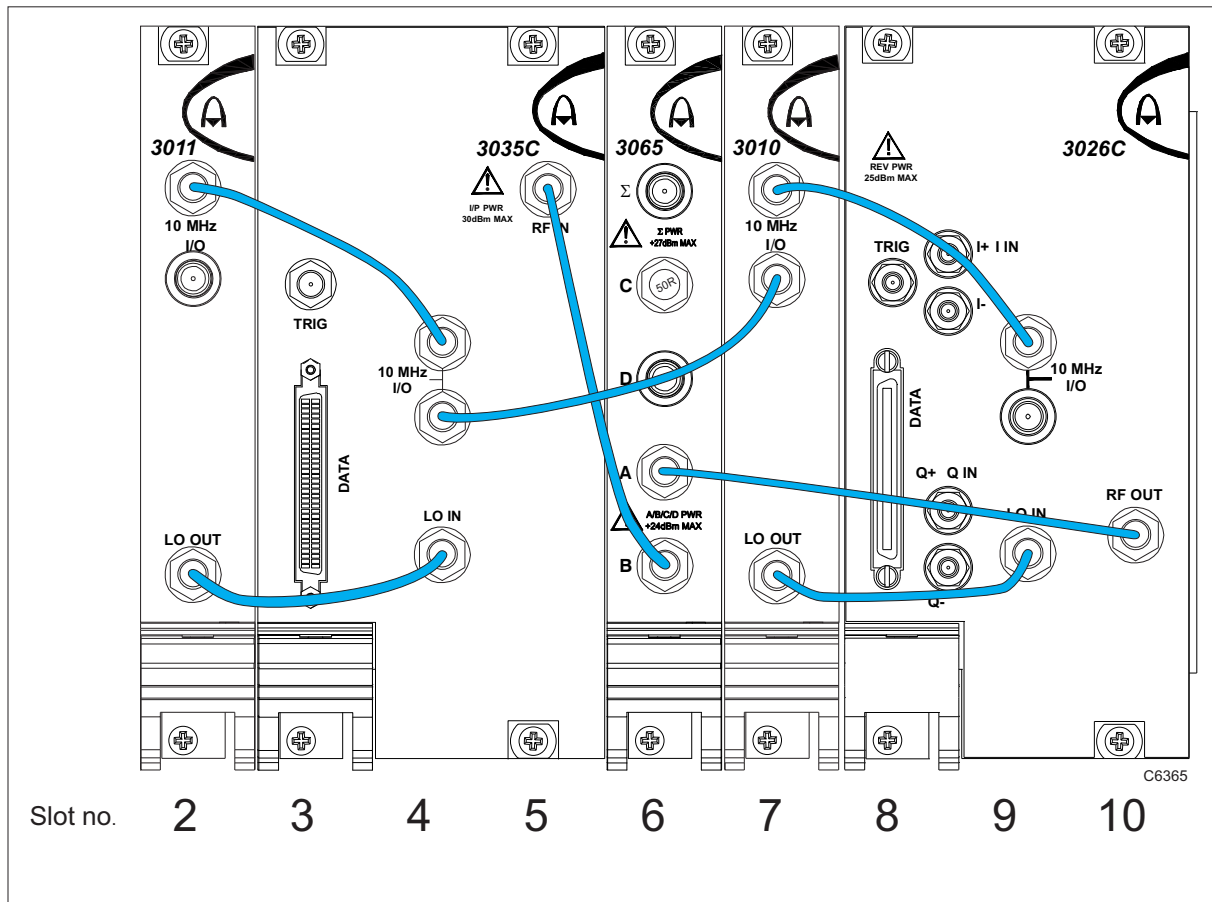


Fig. 2 Interconnection of modules — fully-equipped chassis (example 2)

## 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 is 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 Series.

Interconnect the modules as shown in Figs 1 and 2.

<b>3011</b>	LO OUT	LO output to 3030 Series RF digitizer LO IN
	10 MHz I/O	10 MHz clock to 3030 Series RF digitizer
<b>3030A/3030C/3035/3035C</b>	LO IN	LO input from 3011 synthesizer LO OUT
	10 MHz I/O	External clock from 3011 synthesizer
	10 MHz I/O	10 MHz clock to 3010 synthesizer 10 MHz I/O
	RF IN	Signal input from 3060 Series port B
<b>3030A/3035 only</b>	IF IN/OUT	IF bridge link
<b>3060/3061/3065</b>	B	Feeds signal input to 3030 Series digitizer
	A	Receives signal output from 3020 Series signal generator
<b>3060, 3065 only</b>	C	Terminated with 50 ohms
<b>3065 only</b>	D	No connection
	$\Sigma$ (sum port)	No connection
<b>3010/3011</b>	LO OUT	LO output to 3020 Series RF signal generator input
	10 MHz I/O	Locks to external clock provided by 3011 synthesizer via 3030 Series 10 MHz I/O
	10 MHz I/O	Daisy-chain to 3020 Series 10 MHz I/O
<b>3020A/3020C/3021C/3025 /3025C/3026C</b>	LO IN	LO input from 3010 synthesizer LO OUT
	10 MHz I/O	10 MHz clock 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, 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 [chassis user guide](#).

## 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 [chassis user guide](#). For an Aeroflex 3000 Series chassis, this is the *3000/3000B/3001B/3001C 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.

## 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.

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

### Aeroflex PXI chassis

Refer to the Aeroflex 3000 Series 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>`

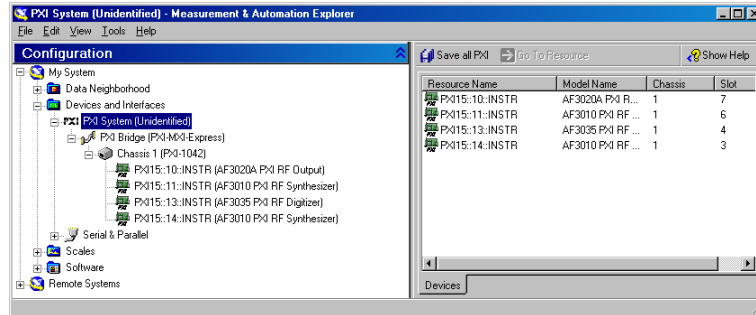
### Other-brand PXI chassis

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

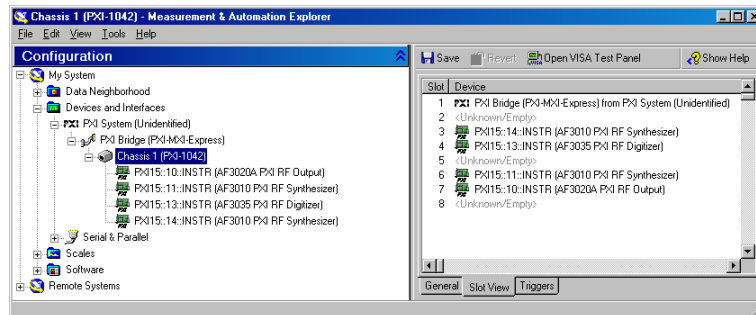
## Identifying modules installed in a chassis

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 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.