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GX7300
GX7310
GX7302
GX7312
GX7305
GX7315

GX7300 3U PXI Instrumentation Platform Series
GxChassis Software

User's Guide

Last updated: September 2, 2014

MARVIN TEST SOLUTIONS

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Table of Contents

Safety and Handling ... iii
Warranty ... iii
If You Need Help ... iii
Disclaimer ... iii
Copyright ... iii
Trademarks ... i
Table of Contents ... ii
Chapter 1 - Introduction ... 1
Manual Scope and Organization ... 1
Manual Scope ... 1
Manual Organization ... 1
Conventions Used in this Manual ... 2
Chapter 2 - Overview ... 3
Introduction ... 3
GX7300 Series Features ... 4
The PXI Standard ... 4
GX73xx Models ... 5
Optional Equipment ... 7
Chassis Description – Front View (GX7300) ... 8
Chassis Description – Rear View ... 9
GX7305 / GX7315 – Rear View ... 10
PXI Slots ... 11
PXI Bus Segments ... 12
System Controller Slot ... 12
Star Trigger Controller Slot ... 12
3U Boards ... 12
Local Bus ... 13
Trigger Bus ... 13
Star Trigger Lines ... 14
System Reference Clock ... 14
System Power Supplies – GX7300 / GX7310 / GX7302 / GX7312 ... 15
Power Distribution ... 15
System Power Supplies – GX7305 / GX7315 ... 15
Overview of the GxChassis Software ... 16
GxChassis driver Features ... 16

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Virtual Panel Description....17
Virtual Panel Initialize Dialog....17
Virtual Panel Temperature Settings....18
Virtual Panel PXI Trigger Lines....20
Virtual Panel Advanced page....21
Virtual Panel About Page....22
Chapter 3 - Setup and Installation....23
Unpacking and Inspecting the Chassis....23
Mounting Information....23
Line Voltage Selection....23
Chassis Installation....23
GX73xx Master and Slave Configurations....24
Installation of the GxChassis Software....25
Configuring Your PXI System using the PXI/PCI Explorer....26
Installing PXI Instruments....27
PXI Instrument Removal....28
Using External Instruments....28
Installation Directories....29
Driver Files Description....29
Driver File and Virtual Panel....29
Interface Files....29
On-line Help and Manual....30
ReadMe File....30
Example Programs....30
Setup Maintenance Program....31
Chapter 4 - Programming the Chassis....33
Overview....33
The GxChassis Driver....33
Programming Using C/C++ Tools....33
Programming Using Visual Basic....33
Programming Using Pascal/Delphi....34
Programming GxChassis Boards Using ATEasy®....34
Using the GxChassis driver functions....35
Chassis Handle....35
Error Handling....35
Driver Version....35
Panel....35

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Distributing the Driver 35
Sample Programs 36
Sample Program Listing 36
Chapter 5 - Functions Reference 43
Introduction 43
GxChassis Functions 44
GxChassisGetAlarmMode 45
GxChassisGetAlarmTemperature 46
GxChassisGetBoardSummary 47
GxChassisGetDriverSummary 48
GxChassisGetErrorString 49
GxChassisGetPowerSuppliesVoltages 51
GxChassisGetFanSpeed 52
GxChassisGetFanThresholdTemperatures 53
GxChassisGetPxiTriggerLine 54
GxChassisGetPxiTriggerLineLevels 56
GxChassisGetShutdownTemperature 57
GxChassisGetSlotsTemperatures 58
GxChassisGetSlotsTemperaturesStates 59
GxChassisGetSlotsTemperaturesStatistics 60
GxChassisGetSlotTemperature 61
GxChassisGetTemperatureScale 62
GxChassisGetTemperatureThresholdMode 63
GxChassisInitialize 64
GxChassisPanel 65
GxChassisRecallSettings 66
GxChassisResetPxiTriggerLines 67
GxChassisSetAlarmMode 68
GxChassisSetAlarmTemperature 69
GxChassisGetFanSpeed 70
GxChassisSetFanThresholdTemperatures 71
GxChassisSetPxiTriggerLine 72
GxChassisSetShutdownTemperature 74
GxChassisSetSlotsTemperaturesStates 75
GxChassisSetTemperatureScale 76
GxChassisSetTemperatureThresholdMode 77
Appendix A – Specifications 79

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

AC Input Power 79
GX7300/GX7310/GX7302/GX7312 79
GX7305 / GX7315 79
Power Supplies 79
GX7300/GX7310/GX7302/GX7312 System Power 79
Power Supply Load, Regulation, Ripple, and Noise Specifications 79
GX7305 / GX7315 System Power 80
Power Supply Regulation, Ripple, and Noise Specifications 80
Cooling 81
GX7300 / GX7305 / GX7302 / GX7312 81
GX7305 / GX7315 81
Temperature Monitoring 81
Power Supply Monitoring 81
PXI 10 MHz Clock 81
External 10 MHz Clock (GX7305 / GX7315) 82
Slots 82
Physical Dimensions 82
Environmental and Compliance 82
Appendix B –PXI Slots Pin Outs 83
P1 (J1) Connector Pin Out for System Controller Slot 84
P2 (J2) Connector Pin Out for System Controller Slot 85
P1 (J1) Connector Pin Out for the Star Trigger Slot 86
P2 (J2) Connector Pin Out for the Star Trigger Slot 87
P1 (J1) Connector Pin Out for the Peripheral Slot 88
P2 (J2) Connector Pin Out for the Peripheral Slot 89
Appendix C – Rear Panel Connector Layout 91
Serial Port Connector 91
Ethernet Connector 91
USB Connector 92
Appendix D – Model Numbers 93
Chassis and Controller Model Numbers 93
Chassis Accessory Model Numbers 93
Index 95

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Chapter 1 - Introduction

Manual Scope and Organization

Manual Scope

The purpose of this manual is to provide all the necessary information to install, use, and maintain the GX7300 PXI chassis. This manual assumes the reader has a general knowledge of PC based computers, Windows operating systems, and some understanding of digital to analog conversion.

This manual also provides programming information using the GxChassis driver. Therefore, good understanding of programming development tools and languages may be necessary.

Manual Organization

The GX7300 PXI chassis manual is organized in the following manner:

Chapter	Content
Chapter 1 - Introduction	Introduces the GX7300 PXI chassis manual. Lists all the supported boards and shows warning conventions used in the manual.
Chapter 2 – Overview	Describes the GX7300 PXI chassis features, chassis description, its architecture, specifications and the GxChassis panel description and operation.
Chapter 3 – Installation and Connections	Provides instructions on how to install the GX7300 accompanying GxChassis software.
Chapter 4 – Programming the Board	Provides a listing of GxChassis driver files, general purpose/generic driver functions, and programming methods. Discusses various supported operating systems and development tools.
Chapter 5 – Functions Reference	Contains a listing of the general GxChassis functions. Each function is described along with its syntax, parameters, and special programming comments. Samples are given for each function.
Appendix A – Specifications	Provides the GX73XX specifications.
Appendix B – PXI Slots Pin Outs	Describes the P1 and P2 connector pin outs for the GX73xx backplane.
Appendix C – Rear Panel Connector Layout	Provides information on the rear panel connectors of the of the GX7300, GX7302 and GX7305.
Appendix D – Model Numbers	Describes the Chassis Model Numbers.

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Conventions Used in this Manual

Symbol Convention	Meaning
	Static Sensitive Electronic Devices. Handle Carefully.
	Warnings that may pose a personal danger to your health. For example, shock hazard.
	Cautions where computer components may be damaged if not handled carefully.
	Tips that aid you in your work.

Formatting Convention	Meaning
`Monospaced Text`	Examples of field syntax and programming samples.
Bold type	Words or characters you type as the manual instructs, programming function names and window control names.
Italic type	Specialized terms. Titles of other reference books. Placeholders for items you must supply, such as function parameters

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Chapter 2 - Overview

Introduction

Thank you for selecting the GX7300 PXI instrumentation chassis. This state-of-the-art chassis is designed for test, data acquisition, process control, and factory automation applications. The GX7300 chassis series is a 19", 3U, PXI chassis and can be used for desktop or rack-mount applications. A variety of mechanical configurations are available including a high power version (GX7305 / GX7315) and a configuration supporting an integrated cable tray / front panel interface (GX7302 / GX7312). . The GX7300 is based on the CompactPCI™ (cPCI) and PXI™ (PCI eXtentions for Instrumentation) standards and accommodates up to 19 3U PXI or cPCI instruments. The design of the GX7300 allows integration of PXI and cPCI boards from any vendor.

The GX7300 PXI instrumentation master chassis comes with the pre-installed GxChassis software. The GxChassis software supports the chassis' Smart functions, which includes the monitoring of chassis temperature and power supplies as well as programming/routing of the PXI trigger lines. The GxChassis software provides API functions for controlling all of the PXI chassis capabilities as well as providing a soft front panel that supports these same capabilities. The software is also included with the Marvin Test Solutions Product CD, which is supplied with every chassis.

The GxChassis driver supports the programming of shutdown and alarm temperature limits, measures slot temperatures, controls the PXI trigger lines' directions and states, measures the system power supply voltages and monitors / controls the system fan(s). In addition, the driver enables the user to save those settings to an on-board EEPROM that can then be used as default settings on power up. The user can also set the temperature scale used for programming or monitoring of any temperature value.



Figure 2-1: GX7300 Instrumentation Chassis

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GX7300 Series Features

The GX73xx models offer the following features:

- Controller module slot and built-in peripherals including DVD/CD-RW, and hard-disk drives (not available on GX7310, GX7312, and GX7315). Note that the GX7305 is not supplied with a DVD drive.
- 19 PXI/cPCI, 3U slots. Slot 1 is dedicated for an embedded controller or for a remote controller. Slot 2 can be used by a PXI Star Trigger Controller or by a PXI/cPCI instrument. Slots 3 through 15 support the PXI Star Trigger and Slots 16-20 accommodate PXI or cPCI instruments without the Star Trigger.
- Full compliance with PXI Hardware Specification Revision 2.2. Supports features such as trigger bus, star trigger, local bus, and system clock.
- Interoperability with 32-bit 33MHz CompactPCI.
- Front-loading mechanism. Boards are inserted from the front for simplified maintenance.
- Board connectors face the front side of the platform enabling easy access to board connectors and cables and a short path to the interface.
- High capacity, rear mounted fan provides airflow for all plug-in instruments (GX7300, GX7310, GX7302, and GX7312).
- Separate fans provide cooling for the chassis power supplies.
- Backplane incorporates a local bus, trigger bus, and a 10MHz reference clock.
- Support for external instrumentation and devices using the built-in serial, USB and Ethernet interfaces.
- Additional chassis may be daisy-chained using a PXI bus expander.
- Innovative PXI-Explorer ™ software provides easy configuration tools for the chassis and instruments.

When bundled with ***ATEasy***™, Marvin Test Solutions' award-winning software development environment, the GX7300 provides a complete system for creating any test and measurement application.

The PXI Standard

The PXI standard has been developed in response to the needs of test systems developers and users who required a new platform that is high-performance, functional and reliable, yet easy to integrate and use.

Based on the PCI, CompactPCI, Microsoft Windows, and VXI standards, PXI brings together the right technologies for PC-based test and measurement, instrumentation, and industrial automation. Further, since PXI is a PC-based platform, it maintains software compatibility with industry-standard personal computers, as well as all PC-Based operating systems, software tools, and instruments drivers. Not only is PXI fully compatible with existing operating systems and software, it also integrates with the Virtual Instrument Software Architecture (VISA) standard that was created by the VXIplug&play System Alliance (see http://www.vxi.org/). VISA is used to locate and communicate with PXI, serial, VXI, and GPIB peripheral modules and is supported by test development software packages such as ***ATEasy***™, LabVIEW™, LabWindows/CVI™ and Agilent VEE™.

PXI expands upon the PCI bus resulting in PXI users receiving all the benefits of PCI and cPCI within an architecture that also supports mechanical, electrical and software features. These features are typically focused on test & measurement, data acquisition, industrial instrumentation and factory automation applications.

The PXI standard is maintained by the PXI Systems Alliance (see http://www.pxisa.org). Manufacturers of PXI products are members of the alliance and sub-committees are assigned to manage different aspects of the specifications. Consequently, PXI users experience full interoperability between devices as all are designed to the same standards. PXI products also are subjected to higher and more carefully defined levels of environmental performance, necessary in today's industrial environments.

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GX73xx Models

The GX73xx is available in several configurations for maximum flexibility:

- GX7300: This innovative chassis includes a DVD-RW and hard disk drives. The GX7300 is designed to operate with the GX7900 family of embedded controllers. Internal circuits connect the embedded controllers to the peripheral devices and many of the controller's interfaces (i.e. USB, RS-232, Ethernet, VGA, etc.) are routed to the rear-panel of the GX7300, minimizing the number of connections required at the front of the chassis.

  NOTE: Your GX7900 controller is provided with documentation that describes its available connections and configuration separately.

- GX7310: This chassis is designed to operate with the PXI bus expanders such as a MXI interface. This configuration allows the use of a desktop PC or another PXI chassis as the system controller.
- GX7300R and GX7310R: Both models are available in desktop or rack-mount configurations. Rack mount configurations have model designations GX7300R and GX7310R.
- GX7302 and GX7312: GX7300R or GX7310R with an integrated cable tray and a hinged front panel with removable covers for creating custom interfaces or adapting to a mass interconnect.
- GX7302-MP and GX7312-MP: GX7302 or GX7312 with a MacPanel Scout mass interconnect receiver.

GX7305 and GX7315: The GX73x5 model is high power, 20 slot 3U PXI chassis with high capacity cooling, supporting up to 60 watts of power per slot. Overall size is the same as the GX7302 / GX7312 models.

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The following figures show the GX7302, GX7302-MP, and GX7315 models.



Figure 2-2: GX7302 Front View with a Left Panel Removed



Figure 2-3: GX7302-MP Front View

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Figure 2-4: GX7315 Front View with Cards Installed, Front Panel Down

Optional Equipment

Marvin Test Solutions offers a variety of products to use with your GX7300 chassis as follows:

- Embedded Controllers
- Remote Controllers
- 3U PXI instruments and switches
- Rack mount kits
- Blank panels

For part numbers, refer to Appendix B or call the office nearest you.

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Chassis Description – Front View (GX7300)

The GX7300 is a modular 3U PXI chassis. **Figure 2-5** shows the front view of the GX7300.

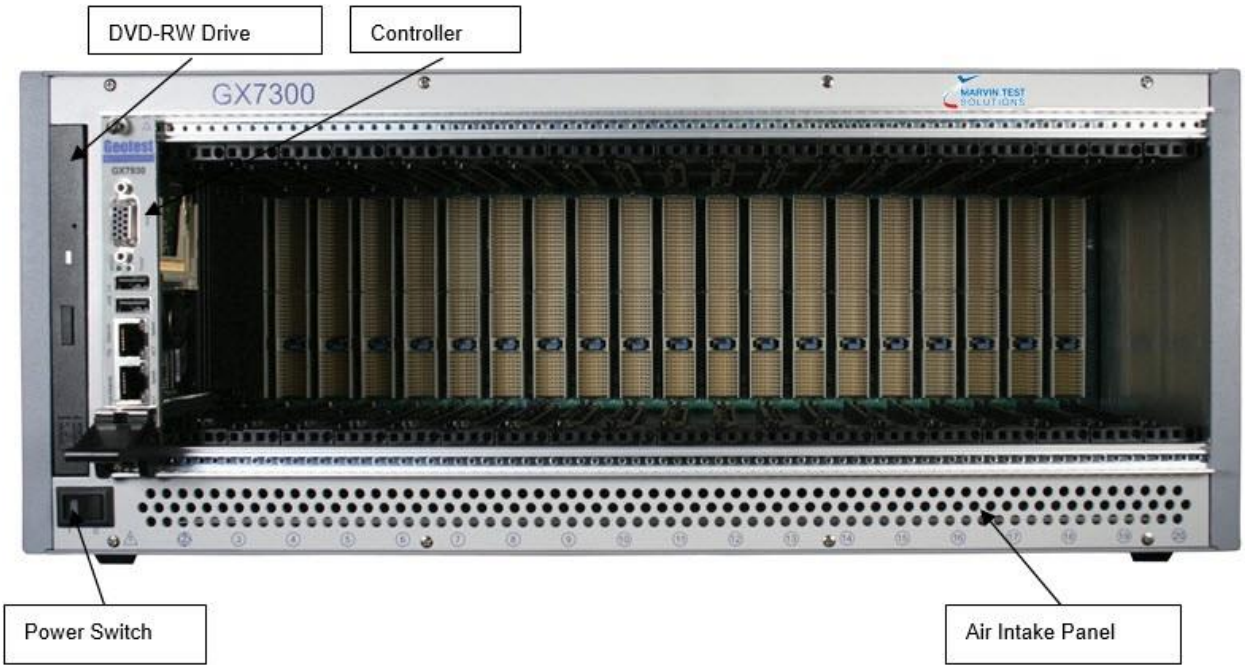


Figure 2-5: GX7300 with Controller Front View

Power Switch

On/Off rocker switch with a power On LED.

System Slot (Slot #1)

The System Slot is the leftmost slot and is used for embedded or remote controllers. The system slot can accept any embedded controller that is 1 slot wide although only the GX7900 provides built-in connections to the built-in drives and rear panel I/O.

Star Trigger Controller Slot (Slot #2)

Either a Star Trigger controller or any PXI/cPCI instrument can use the Star Trigger Controller slot.

Air Intake Panel

This panel, located below the card cage, provides the intake for cooling the GX7300. DO NOT BLOCK THIS PANEL. Note: The GX73x2 and GX73x2-MP have additional inlet air locations on the bottom and sides of the chassis. The use of an integral mass interconnect receiver with a GX7302 or GX7312 chassis will not compromise air flow within the chassis.

DVD-RW Drive

A DVD RW Drive (GX7300 & GX7302 only) is available for use in conjunction with the GX7900 family of embedded controllers.

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Chassis Description – Rear View

When used in conjunction with the GX7900 embedded controllers, many of the controller's peripheral I/O are available through the rear panel.

shows the rear view of the GX7300.

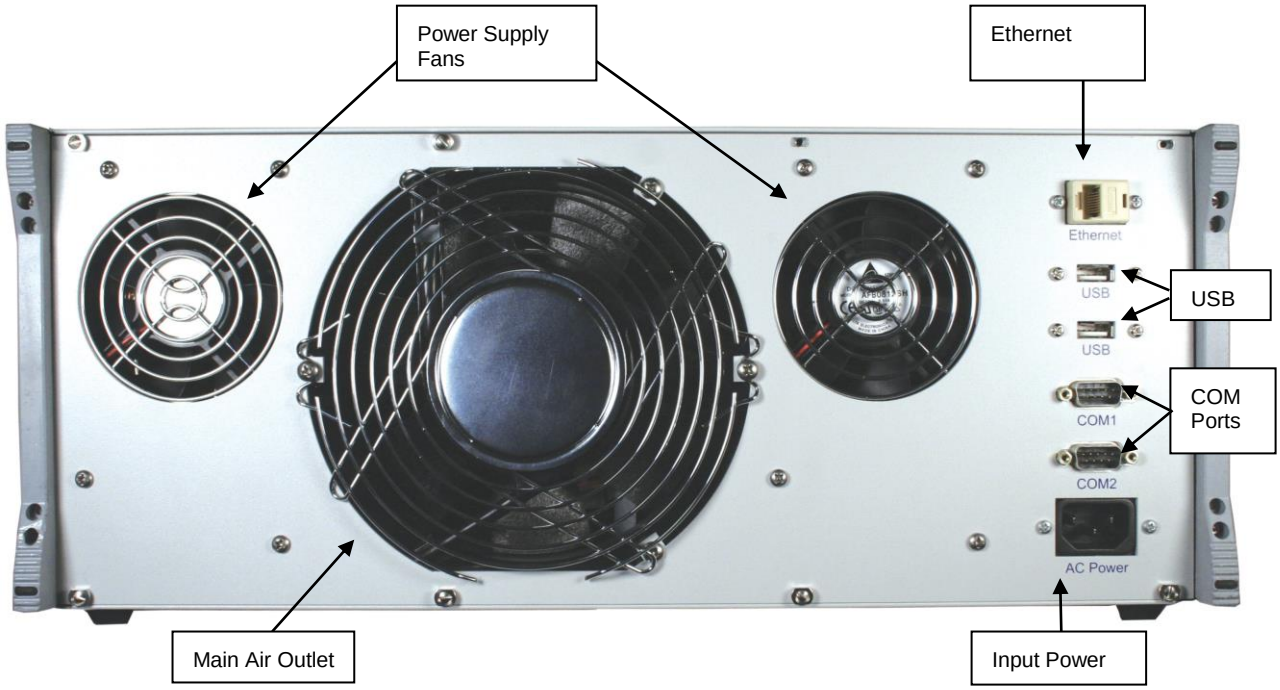


Figure 2-6: GX7300 / GX7302 Rear View

Input Power Receptacle

This receptacle connects to the power cord provided.

Several connections are available only on the GX7300 and only if used with the GX7900 Embedded Controller. The connections are marked on the rear I/O panel. These connections are:

COM - Serial COM port Connectors

Two Serial Ports are available: These ports may be routed to the rear or front panel and are factory preset to RS-232 mode. By default, COM1 is available at the front panel and COM2 at the rear panel.

USB Connectors

2 USB ports

Ethernet Connector

A 10/100 BaseT Ethernet port. By default this port is enabled to the front panel. You must change the CMOS configuration in order to use this port from the rear

Auto / High Fan Speed Control

The fan speed control (not shown in the above model) allows the user to select the fan control to be automatic (controlled by the GxChassis software based on internal chassis temperature) or for high power dissipation applications, the switch can be set to high which will set the fans to operate at high speed continuously

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GX7305 / GX7315 – Rear View

Figure 2-7 details the rear panel of the GX7305 chassis. Note that the rear panel for the GX7315 does not have any computer peripheral connections (VGA, USB, Ethernet, etc).



Figure 2-7: GX7305 Rear View

Input Power Receptacle

This receptacle connects to the power cord provided. (20 amp service required)

USB Connectors

1 USB port

Ethernet Connector

A 10/100 BaseT Ethernet port.

VGA Connector

Connection for system monitor / display

Input Power Circuit Breaker

This circuit breaker disconnects all input power and protects the chassis from an over current or short circuit condition.

PXI 10 MHz Input and Output Connections

An external 10 MHz clock can be provided to the chassis via this connection. When present, the chassis will automatically select this input as the 10 MHz reference for the PXI backplane. The 10 MHz output connection provides a buffered 10 MHz PXI clock output.

Auto / High Fan Speed Control

The fan speed control allows the user to select the fan control to be automatic (controlled by the GxChassis software based on internal chassis temperature) or for high power dissipation applications, the switch can be set to high which will set the fans to operate at high speed continuously

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PXI Slots

The GX73X0 contains 20 3U slots numbered 1 to 20 as shown in Figure 2-8 and Figure 2-9. Slot number 1 is dedicated for an embedded controller or for a GX7990 receiver. Slot 2 can be used by a PXI Star Trigger Controller or by a PXI/cPCI instrument. Slots 3 through 15 supports the PXI Star Trigger and Slots 16-20 accommodate PXI or cPCI instruments without the Star Trigger.

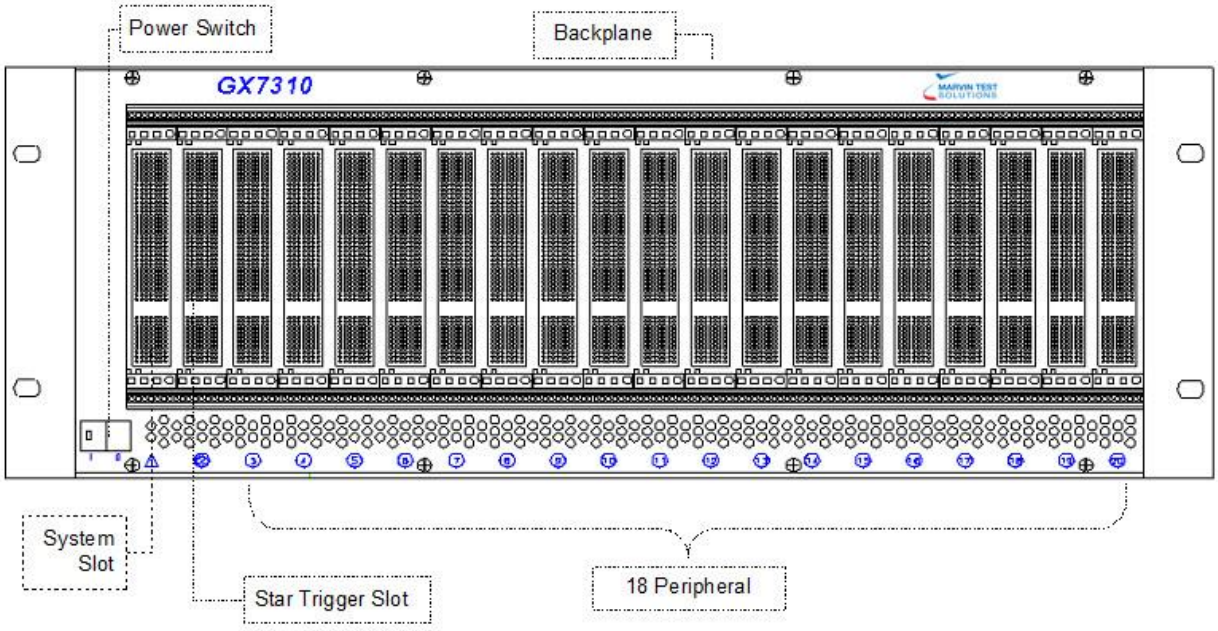


Figure 2-8: GX7310 Slots (Slave chassis with rack mount ears)

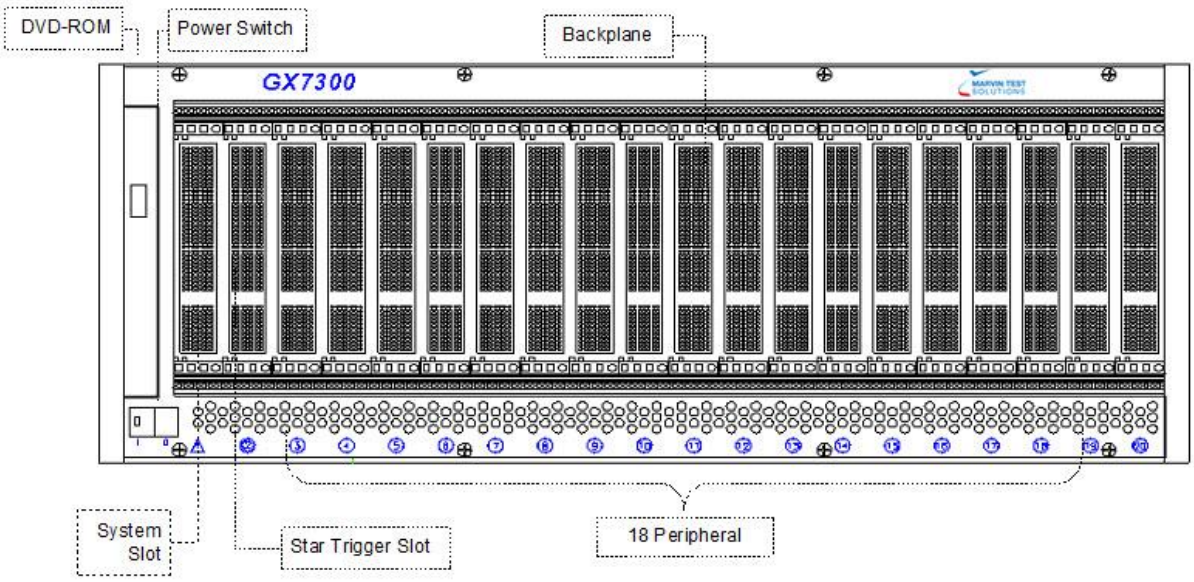


Figure 2-9: GX7300 Slots (Master chassis)

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PXI Bus Segments

The GX7300 slots are divided to three bus segments, which are connected using PCI-PCI bridge technology. The bridge device presents one PCI load on each of the bus segments that it links together. The left bus segment supports the System Slot, the Star Trigger Slot and 5 more peripheral slots (Slot 3 to 7). The second segment supports slots 8 to 13. The third segment supports slots 14 to 20.

System Controller Slot

The System Controller slot is located in slot #1 of the chassis and has a width of 2 PXI slots with the PXI connector residing at the left side of the backplane. Slot numbers are clearly labeled below each slot where slot #1 is the left-most slot and slot #20 is the right most. The GX7300 can accept 3U embedded controllers that are 1-slot wide.

Star Trigger Controller Slot

Slot 2 is the Star Trigger (ST) Controller slot (2nd from the left). This slot has a dedicated trigger line going to slots 3 through 15. The Star Trigger is used to synchronize between 14 instruments and it utilizes back plane traces that are of equal length, providing for a skew of less than 1nSec between slots. If you do not need a Star Trigger Controller, any PXI or cPCI instrument can be used in this slot. See Figure 2-12 in this chapter for more information about the available trigger architectures.

Slots 2 through 15 support the Star Trigger while slots 16 through 20 accommodate PXI or cPCI instruments without the Star Trigger.

3U Boards

The GX7300 supports PXI instruments with form factor of 3U (100 by 160 mm, or 3.94 by 6.3 in.) shown in Figure 2-10:

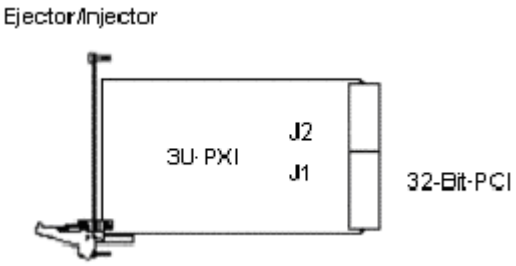


Figure 2-10: 3U PXI Boards

The PXI board has two rear connectors J1 and J2. J1, are used to carry the PCI signals, and J2, which is used to carry the PXI signals. PXI signals include the local bus, star trigger signals and trigger bus signals. They are described later in this chapter.

The GX7300 backplane carries the *interface connectors* (P1 and P2) and provides the interconnection between the controller and peripheral modules.

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Local Bus

The PXI local bus is a daisy-chained bus connecting peripheral slots in the same bus segment. Each local bus is 13 user-defined lines and can be used to pass analog or digital signals between two adjacent modules or to provide a high-speed side-band digital communication path that does not affect the PXI bandwidth.

Local bus signals can support voltages from 0 to 42V DC and up to 200 mA DC current into any local bus line.

The local bus lines for the leftmost peripheral slot of a PXI back plane (slot 2) are used for the star trigger. Figure 2-8 schematically shows a complete PXI system demonstrating the local buses.

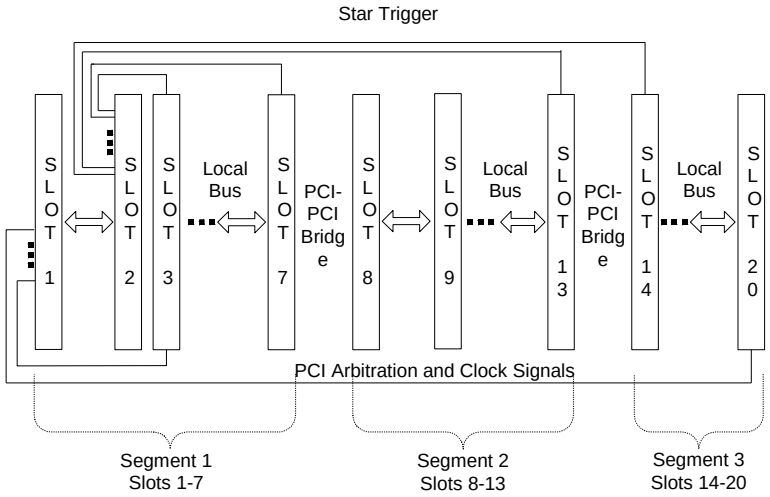


Figure 2-8: PXI Local Bus Routing

Trigger Bus

The eight PXI bused trigger lines can be used in a variety of ways. For example, triggers can be used to synchronize the operation of several different PXI peripheral modules. In other applications, one module can control carefully timed sequences of operations performed on other modules in the system. Triggers may be passed from one module to another, allowing precisely timed responses to asynchronous external events that are being monitored or controlled. The number of triggers that a particular application requires varies with the complexity and number of events involved.

The PXI trigger bus provides connectivity only within a single bus segment and does not allow physical connection to an adjacent bus segment. This maintains the high performance characteristics of the trigger bus and allows the GX7300 to partition instruments into logical groups as show in Figure 2-12. However, logical connections of the trigger bus are allowed. The GX7300 can be configured programmatically enable any of the trigger lines between the segments and set direction.

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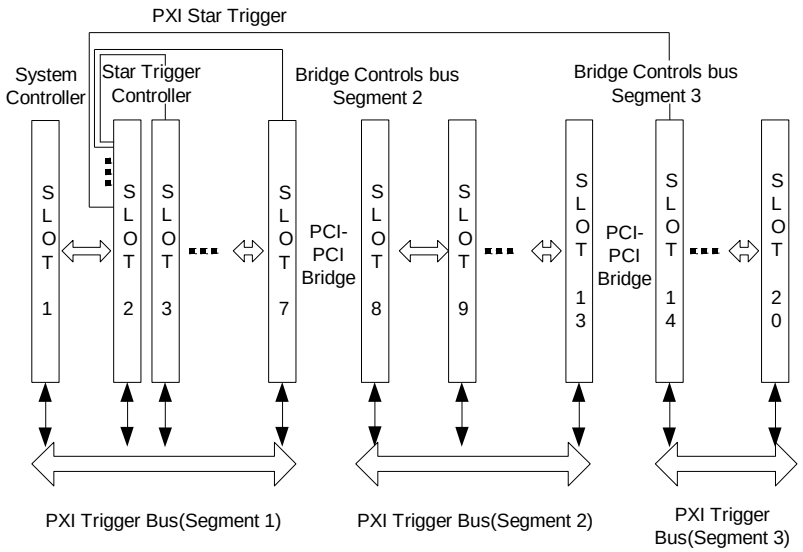


Figure 2-12: PXI Trigger Architecture

Star Trigger Lines

Thirteen PXI trigger lines are connected to slots 3 to 15. The PXI star trigger lines can be used to synchronize the operation of several different PXI peripheral modules.

The PXI star trigger bus offers ultra-high performance synchronization features to users of PXI systems. The star trigger bus implements a dedicated trigger line between the first peripheral slot (adjacent to the system slot) and the other peripheral slots. A star trigger controller can be installed in this slot and can be used to provide very precise trigger signals to other peripheral modules. Systems that do not require this advanced trigger can install any standard peripheral module in this slot. Through the required use of line-length equalization techniques for routing the star triggers, PXI systems can meet demanding triggering requirements for which bused triggers are not appropriate. Note that the star trigger can be used to communicate information back to the star trigger controller, as in the case of reporting a slot's status, as well as responding to information provided by the star trigger controller.

This trigger architecture for PXI gives two unique advantages in augmenting the bused trigger lines. The first advantage is a guarantee of a unique trigger line for each module in the system. For large systems, this eliminates the need to combine multiple module functions on a single trigger line or to artificially limit the number of trigger times available. The second advantage is the low-skew (1nSec) connection from a single trigger point. The PXI backplane defines specific layout requirements such that the star trigger lines provide matched propagation time from the star trigger slot to each module for very precise trigger relationships between each module.

System Reference Clock

The PXI 10 MHz system clock (PXI_CLK10) is distributed to all slots of the GX73xx. This common reference clock can be used for synchronization of multiple instruments in a measurement or control system. The PXI clock supports the use of an external 10 MHz clock that is supplied via a Star Trigger module or external input via the 10 MHz rear panel connection (GX7305 / GX7315). If an external clock is detected from the rear panel or Slot 2, the internal 10 MHz clock will automatically be disconnected. Precedence for the 10 MHz source is as follows:

1. 10 MHz source from Slot 2 timing slot
2. 10 MHz source from external input (rear panel)
3. 10 MHz source from the GX730x backplane

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System Power Supplies – GX7300 / GX7310 / GX7302 / GX7312

Two power supplies provide system power to all slots of the GX7300. A total power of 900 watts is available.

Power Distribution

The GX7300 meets or exceeds the requirements of the PXI specifications regarding the power provided to each slot. The table below lists the power per slot required by the PXI specifications:

Slot \ Voltage	5V	3.3V	+12V	-12V
System Slot	6A	6A	0.5A	0.25A
Instrument Slot	2A	2A	0.5A	0.25A
Total for a 20-Slot Chassis	44A	44A	10A	5A

Table 2-1: The power per slots required by the PXI

The maximum current provided by the GX7300 / GX7310 / GX7302 / GX7312 for any PXI slot is listed in the table below:

Slot \ Voltage	VIO (5V)	5V	3.3V	+12V	-12V
System Slot	11A	8A	10A	1A	1A
Instrument Slot	11A	8A	10A	1A	1A

Table 2-2: The power provided by the GX7300 / GX7310/ GX7302 / GX7312

The unique dual-power supply design of the GX7300 provides for additional power beyond what is specified in the tables. Approximately 30% more power is available to slots 2 through 7.

System Power Supplies – GX7305 / GX7315

Two system power supplies provide operating power to all slots of the GX7305 / GX7315. The maximum current provided for PXI slots is listed in the table below.

Slot \ Voltage	5V	3.3V	+12V	-12V
System Slot	6A	6A	1A	1A
Instrument Slot	8A	10A	1A	1A
Max Total for GX7305 / GX7315	100A	190A	10A	5A

Table 2-3: System power provided by the GX7305 / GX7315

Note: Total DC system power should not exceed 1600 watts when powered from a 120 VAC (+/- 15%), 20 A circuit.

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Overview of the GxChassis Software

Once the GxChassis software installed, the following tools and software components are available:

- **PXI/PCI Explorer applet** – use to configure the PXI chassis, controllers and devices. This is required for accurate identification of your PXI instruments later on when installed in your system. The applet configuration is saved to PXISYS.ini and PXIeSYS.ini that are used by Marvin Test Solutions instruments, the VISA provider and VISA based instruments drivers. In addition, the applet can be used to assign chassis numbers, Legacy Slot numbers and instruments alias names.

  VISA is a standard maintained by the VXI Plug & Play System Alliance and the PXI Systems Alliance organizations (http://www.vxipnp.org/, http://www.pxisa.org/). VISA provides a standard way for instrument manufacturers and users to write and use instruments drivers. The VISA resource managers such as National Instruments **Measurement & Automation** (NI-MAX) can display and configure instruments and their address (similar to Marvin Test Solutions' PXI/PCI Explorer).

- **GxChassis Panel** – use to configure the smart chassis features includes over-temperature behavior, control the system fans, measure slot temperature and system power supply usage and program trigger lines direction and connection between PXI bus segments.
- **GxChassis driver** - a DLL (GxChassis.DLL located in the Windows System folder) used to program and control the board.
- **Programming files and examples** – interface files and libraries for various programming tools, see later in this chapter for a complete list of files and development tools supported by the driver.
- **Documentation** – On-Line help and User's Guide.

GxChassis driver Features

The GxChassis driver has the following features:

- Program the PXI chassis' over-temperature shutdown level.
- Program the PXI chassis' over-temperature alarm level.
- Measure all PXI chassis slot temperatures.
- Enable/disable each of the PXI chassis slots' temperature measurements.
- Measure all PXI chassis backplane power supply voltages (+3.3V, +5V, +12V, -12V).
- Measure the PXI chassis backplane voltage level supplied to the VIO pins.
- Program each PXI trigger lines' direction.
- Enable/disable each of the eight PXI trigger lines.
- Selectable temperature scale.
- Monitor / control system fans
- Save settings to an on-board EEPROM to be used as defaults.
- Complete API calls controlling all of the PXI chassis' capabilities.
- Front panel control of all of the PXI chassis' capabilities.

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Virtual Panel Description

The GxChassis driver includes a virtual panel program, which allows full utilization of the various configurations and controlling modes. To fully understand the front panel operation, it is best to become familiar with the functionality of the chassis.

To open the virtual panel application, select **GxChassis Panel** from the **Marvin Test Solutions**, **GxChassis** menu under the **Start** menu. The GxChassis virtual panel opens as shown in Figure 2-9:

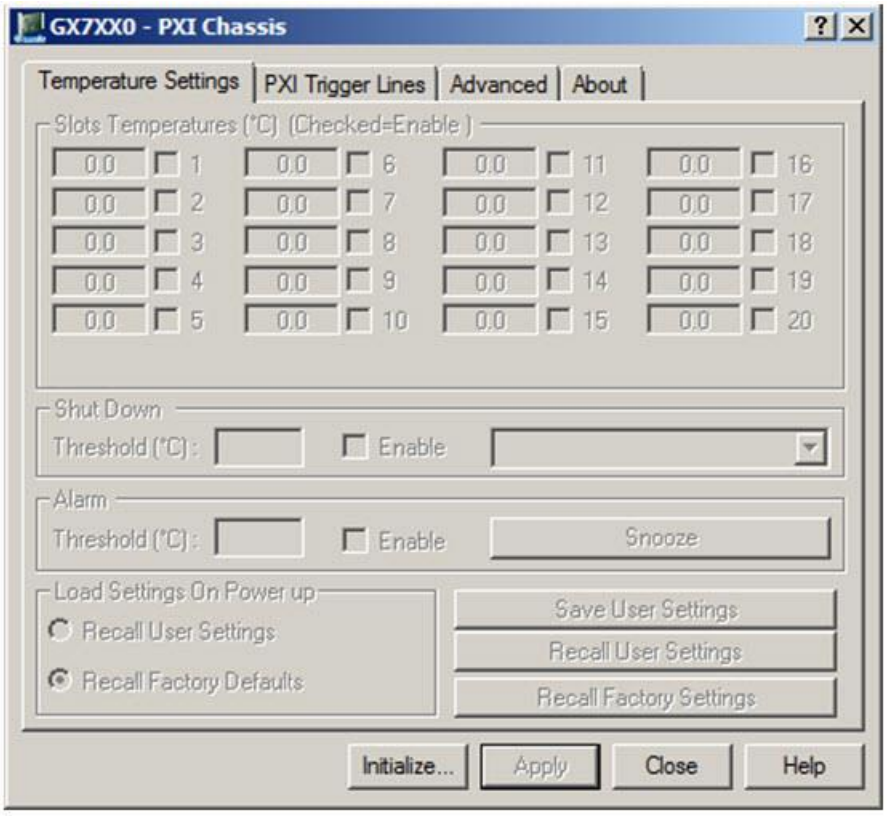


Figure 2-9: GxChassis Virtual Panel – Temperature Settings (not Initialized)

Virtual Panel Initialize Dialog

The Initialize Dialog initializes the chassis while the settings of the chosen chassis **will not change**. The panel will reflect the current settings of the board after the Initialize dialog closes.

The Marvin Test Solutions' **Chassis** number and the model in the Initialize dialog box refer to the PXI **Chassis** number in which it was set. Select the chassis from the drop down list. The list displays all the Marvin Test Solutions' chassis that the PXI Explorer found. The chassis number can also be reviewed or set by using the **PXI/PCI Explorer** applet located in the Windows Control Panel. Select the chassis number and click **OK** to initialize the driver for the specified chassis.

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Figure 2-10: Initialize Dialog Box using HW driver

The GxChassis driver includes a virtual panel program, which allows full utilization of the various configurations and controlling modes. To fully understand the front panel operation, it is best to become familiar with the functionality of the chassis.

To open the virtual panel application, select **GxChassis Panel** from the **Marvin Test Solutions**, **GxChassis** menu under the **Start** menu. The GxChassis virtual panel opens as shown here:

Virtual Panel Temperature Settings

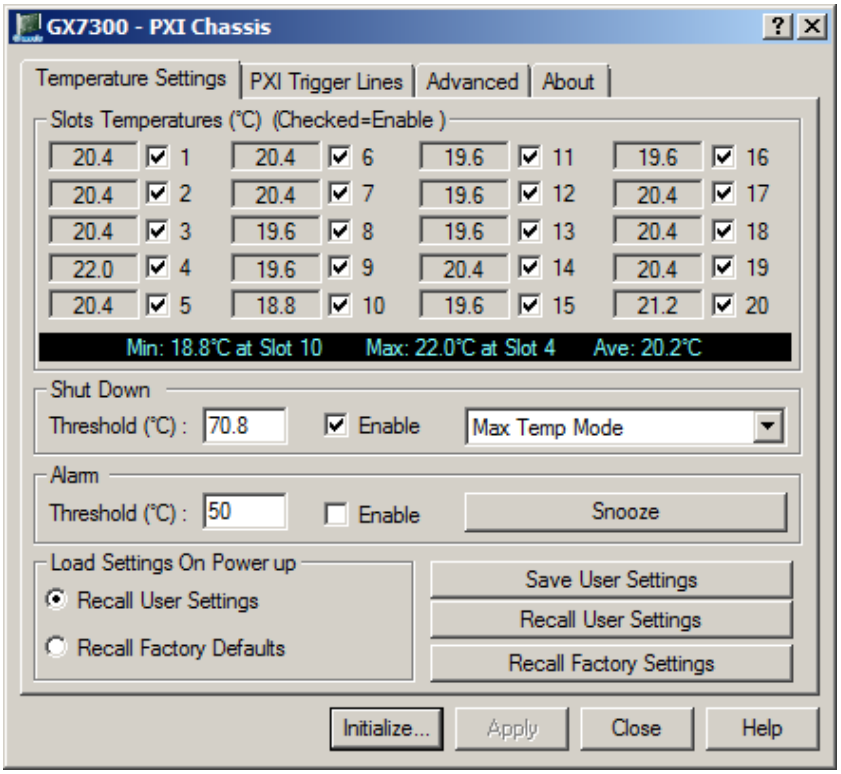


Figure 2-11: GxChassis Virtual Panel – Temperature Settings

The following controls are shown in the Temperature Settings page:

Slots Temperatures (Group Box)

Displays measurement of all active slots' temperatures and sets/displays slots' active states. Only active (enabled) slots determine if the alarm or shutdown thresholds' conditions were met.

Shut Down (Group Box)

Threshold (Edit box): Sets/displays the shutdown Temperature to any value between 20°C and +70°C. The programmed threshold can be saved to the onboard EEPROM and be automatically loaded on the next system power up.

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Enable (Button): If checked, the shutdown Temperature is enabled.**Mode (Combo dropdown list):** Sets/displays the temperature threshold operational mode. The temperature threshold operational mode dictates how the alarm and shutdown thresholds will be activated. When set to Max Temp Mode, the shutdown and alarm temperature will be activated when any of the active slots temperature is above the threshold. When set to Average Temp Mode, the alarm will be activated when the average of all active slots' temperatures are above the alarm threshold.

Alarm (Group Box)

Threshold (Edit box): Sets the Alarm state. When the Alarm is on (threshold condition was met or set to On) both backplane buzzers will beep simultaneously in intervals of 10 seconds.

Enable (Button): Check enables the threshold temperature at which point, the alarm will turn on..

Snooze (Button): Snooze the Alarm when it is on. If the alarm condition reoccurs, the alarm will reactivate.

On Power up (Group Box)

Sets/displays the source settings to be loaded or saved.

Save User Settings (Button): Saves all current settings to the onboard EEPROM as well as which settings will be loaded on the next power up as was specified in the On Power up (Group Box).

Recall User Settings (Button): Loads and applies the last saved user's settings from the onboard EEPROM.

Recall Factory Settings (Button): Loads and applies the factory default settings.

Apply: Applies current settings.

Close: Closes (exits) the GxChassis panel.

Help: Opens the GxChassis on-line help window.

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Virtual Panel PXI Trigger Lines

Clicking on the PXI Trigger Line tab will show the **PXI Trigger Line page** as shown in Figure 2-12:

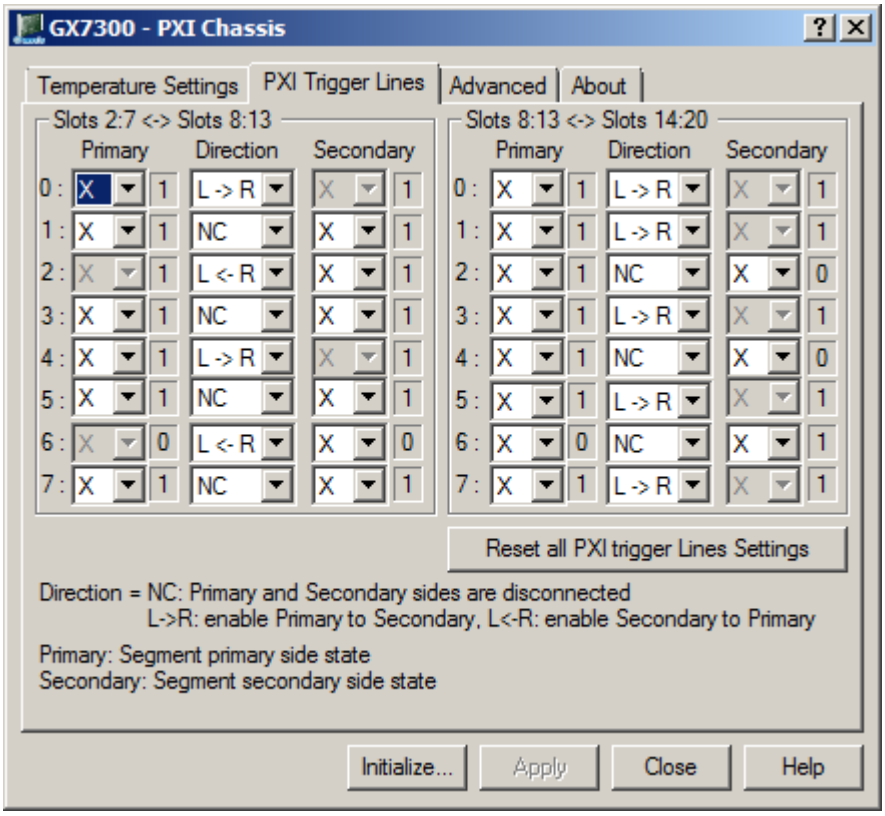


Figure 2-12: GxChassis Virtual Panel – Pxi Trigger Lines

The following controls are shown in the PXI Trigger Lines page:

Slots 1:7 <-> Slots 8:13(Group Box)

Sets/Displays PXI trigger line states and directions between slots 1:7 and slots 8:13.

Slots 8:13 <-> Slots 14:20(Group Box)

Sets/Displays PXI trigger line states and directions between slots 8:13 and slots 14:20.

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Virtual Panel Advanced page

Clicking on the **Advanced** tab will show the **Advanced page** as shown in Figure 2-13:

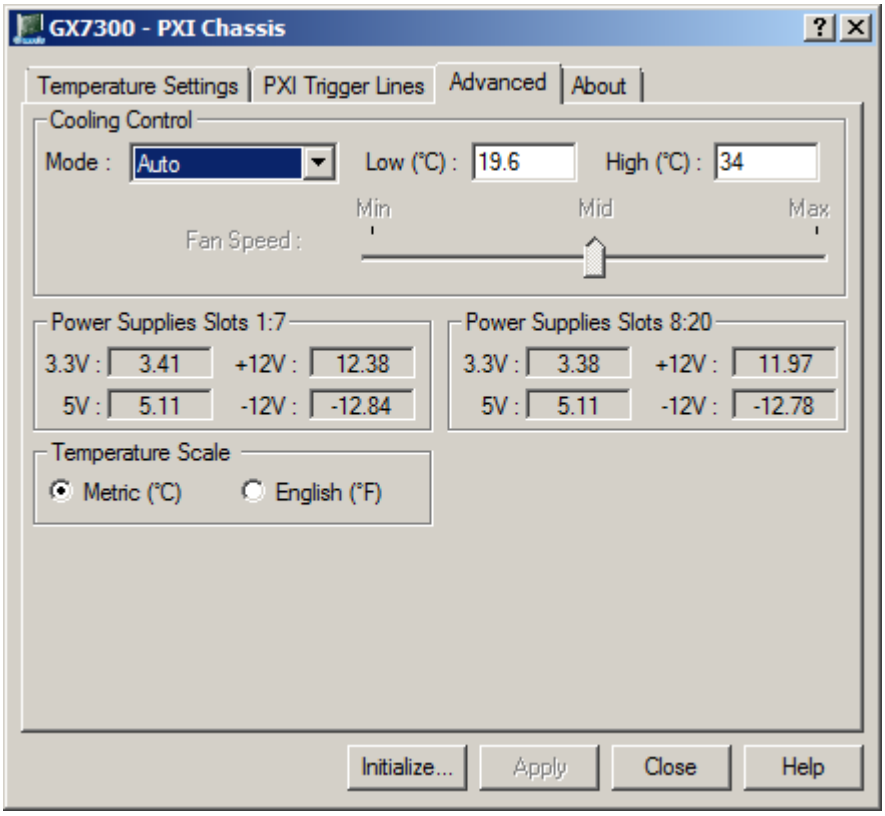


Figure 2-13: GxChassis Virtual Panel – Advanced page

The following controls are shown in the Advanced page:

Power Supplies Slots 1:10 (Group Box)

Displays the measured +3.3V, +5V, +12V and -12V backplane voltages for slots 1 through 10.

Power Supplies Slots 11:20 (Group Box)

Displays the measured +3.3V, +5V, +12Vand -12V backplane voltages for slots 11 through 20.

Temperature Scale (Group Box)

Sets/Displays the temperature scale to Metric or English used for setting or getting any temperature value. Once the temperature scale is set, the same scale will be applied to all temperature values, e.g. shutdown temperature. The temperature scale setting is saved to the host computer.

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Virtual Panel About Page

Clicking on the **About** tab will show the **About page** as shown in Figure 2-14:

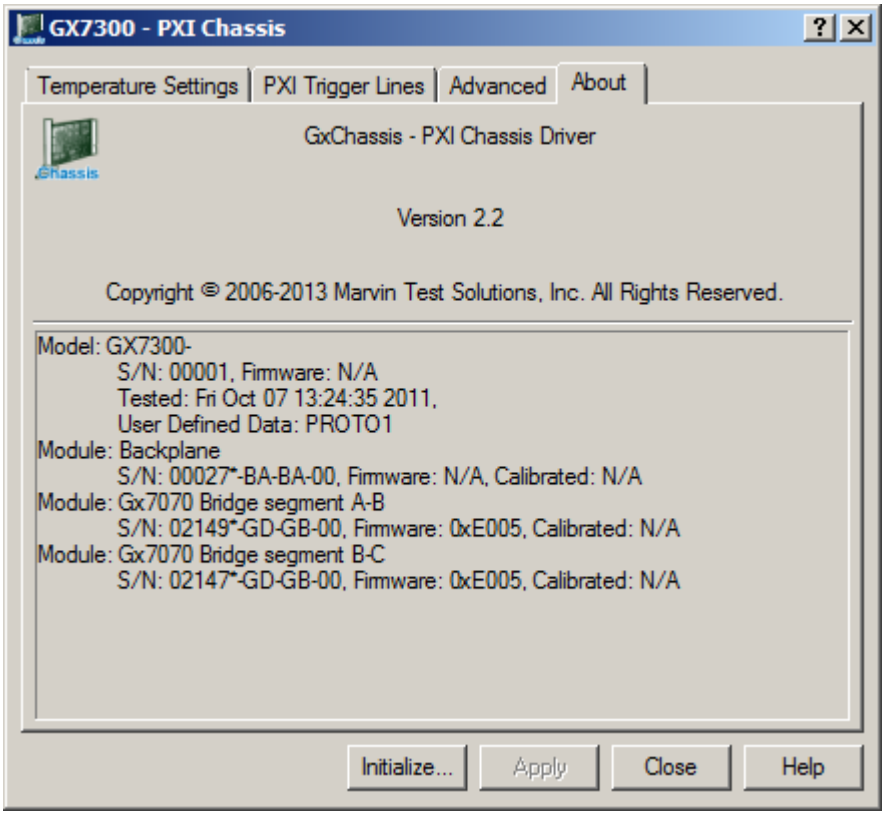


Figure 2-14: GxChassis Virtual Panel – About Page

The top part of the **About** page displays version and copyright of the GxChassis driver. The bottom part displays the board summary, including the EEPROM version; board Revision, FPGA version, board serial number and the calibration time.

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Chapter 3 - Setup and Installation

This chapter describes how to set up the GX7300 chassis and boards.

Unpacking and Inspecting the Chassis

1. Before unpacking the GX7300, check the outside of the shipping package for damage. Note any damage on the shipping bill.
2. Remove the chassis from the shipping carton.
3. Read the packing list to ensure all listed items are enclosed, including hardware, power cords, manuals, etc.
4. Inspect the unit. If any missing items, defects, or damage are noticed, notify Marvin Test Solutions immediately.

Mounting Information

The GX7300 is designed to operate on a bench or within an instrument rack system. Follow the appropriate installation instructions for your GX7300.

Openings in the rear and along the bottom-front panel of the chassis facilitate power supply and instrument cooling. This is very important to the operation of your GX7300. Make sure to place your GX7300 on a bench top or in an instrument rack so the air intake openings in the front and the air outlet openings along the rear panel are not blocked. Keep other equipment a minimum of 3 inches away from the air intake and outlets.

Rack-mount applications require the optional rack-mount kit available from Marvin Test Solutions. Refer to the rack-mount kit documentation to install your GX7300 in an instrument rack.

Line Voltage Selection

The line voltage input selection of the GX7300 is automatic. The GX7300 chassis can operate with line voltages from 100 to 240 VAC, 47 to 63 Hz. Maximum input current for the GX7300 / GX7310 / GX7302 and GX7312 is 15 A (PFC) for line voltages from 100 to 179VAC and 10 A (PFC) for line voltages from 180 to 240 VAC. Maximum input current for the GX7305 / GX7315 is 20 A (PFC) for line voltages 120 VAC (+/- 15%) and 10 A (PFC) for line voltages 240 VAC (+/- 10%).

Chassis Installation

Follow these steps to install the GX7300 chassis:

1. Place the GX7300 chassis on a sturdy, level surface. Leave space behind the chassis for ventilation.
2. Turn off the power switches.
3. Connect the power cable to the chassis and an outlet.
4. Install an embedded controller (master configuration, GX7300 / GX703 / GX7305) or a remote controller (slave configuration, GX7310 / GX7312 / GX7315) to slot #1 if not installed.
5. For a master chassis, connect a keyboard, mouse and VGA monitor to the controller using the controller's front panel connections or the peripheral connections located on the rear of the chassis.
6. Turn on the chassis power and the optional external system (for slave installation turn on the sale first).

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7. Install the **GxChassis** software.
8. Configure your system using the **PXI/PCI Explorer** applet.
9. Install any additional drivers for PXI instruments.
10. Turn off the system.
11. Install PXI modules into the chassis as described in the next procedure.
12. Turn on the chassis power switch and follow the Found New Hardware Wizard instructions for new instruments installed.

GX73xx Master and Slave Configurations

The chassis is provided with two configurations:

1. Master configuration: slot 1 in this case contains embedded controller such as the GX7930. The embedded controller contains a single slot computer with CPU, Memory, USB and Ethernet ports, hard drive and DVD/CD-RW drive.
2. Slave configuration: slot 1 contains PXI expander card (such as a MXI interface) connected to an external PC or another PXI chassis such as a GX7300. The controller resides on the external PC/chassis. Multiple slave chassis can be connected to the controller in a start or daisy chained configuration.

Figure 3-1 outlines a remote configuration with a desktop PC being the system controller.



Figure 3-1: GX7310 Slave Configuration with a Desktop PC

Figure 3-2 outlines a master-slave configuration with another PXI chassis being the system controller.



Figure 3-2: GX7300 (master) Connected to GX7310 (slave)

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Installation of the GxChassis Software

Before installing any board in the chassis it is recommended to install the GxChassis software as described in this section. The software is installed on the chassis controller (for GX7300 / GX7302 / GX7305 master configuration or on the external PC or the chassis where the controller resides (such as a GX7310 slave configuration). To install the GxChassis driver follow the instruction described here:

1. Insert the Marvin Test Solutions CD-ROM and locate the **GxChassis.exe** setup program. If you computer's Auto Run is configured, when inserting the CD a browser will show several options, select the **Marvin Test Solutions Files** option, then locate the setup file (GxChassis.EXE). If Auto Run is not configured you can open the Windows explorer and locate the setup files (usually located under \Files\Setup folder). You can also download the file from Marvin Test Solutions web site (www.marvintest.com). Note: To install the GxChassis software on the GX7305 use an external DVD drive with a USB connection to the chassis or copy the GxChassis.exe file to USB memory device and then connect the memory device to the GX7305 via one of the USB ports.
2. Run the GxChassis setup and follow the instruction on the Setup screen to install the GxChassis driver.

   Note: When installing under Windows NT/2000/XP/VISTA /Windows 7, you may be required to restart the setup after logging-in as a user with an Administrator privileges. This is required in-order to upgrade your system with newer Windows components and to install kernel-mode device drivers (HW.SYS and HWDEVICE.SYS) required by the GxChassis driver to access resources on your chassis.
3. The first setup screen to appear is the Welcome screen. Click **Next** to continue.
4. Enter the folder where GxChassis is to be installed. Either click **Browse** to set up a new folder, or click **Next** to accept the default entry of `C:\Program Files\Marvin Test Solutions\GxChassis`.
5. Select the type of Setup you wish and click **Next.** You can choose between **Typical**, **Run-Time** and **Custom** setups. **Typical** setup type installs all files. **Run-Time** setup type will install only the files required for controlling the board either from its driver or from its virtual panel. **Custom** setup type lets you select from the available components.

The program will now start its installation. During the installation, Setup may upgrade some of the Windows shared components and files. The Setup may ask you to reboot after it complete if some of the components it replaced where used by another application during the installation – do so before attempting to use the software.

You can now continue with the installation to install the board. After the board installation is complete you can test your installation by starting a panel program that let you control the board interactively. The panel program can be started by selecting it from the **Start**, **Programs**, **GxChassis** menu located in the Windows Taskbar.

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Configuring Your PXI System using the PXI/PCI Explorer

To configure your PXI/PCI system using the **PXI/PCI Explorer** applet follow these steps:

1. **Start the PXI/PCI Explorer applet**. The applet can be start from the Windows Control Panel or from the Windows Start Menu, **Marvin Test Solutions**, **HW**, **PXI/PCI Explorer**.
2. **Identify Chassis and Controllers**. After the PXI/PCI Explorer started it will scan your system for changes and will display the current configuration. The PXI/PCI Explorer automatically detects systems that have Marvin Test Solutions controllers and chassis. In addition, the applet detects PXI-MXI-3/4 extenders in your system (manufactured by National Instruments). If your chassis is not shown in the explorer main window, use the Identify Chassis/Controller commands to identify your system. Chassis and Controller manufacturers should provide INI and driver files for their chassis and controllers to be used by these commands.
3. **Change chassis numbers, PXI devices Legacy Slot numbering and PXI devices Alias names.** These are optional steps to be performed if you would like your chassis to have different numbers. Legacy slots numbers are used by older Marvin Test Solutions or VISA drivers. Alias names can provide a way to address a PXI device using your logical name (e.g. "DMM1"). For more information regarding these numbers see the **GxXXXInitialize** and **GxXXXInitializeVisa** functions.
4. **Save you work**. PXI Explorer saves the configuration to the following files located in the Windows folder: PXISYS.ini, PXIeSYS.ini and GxPxiSys.ini. Click on the **Save** button to save you changes. The PXI/Explorer prompt you to save the changes if changes were made or detected (an asterisk sign ' *' in the caption indicated changes).

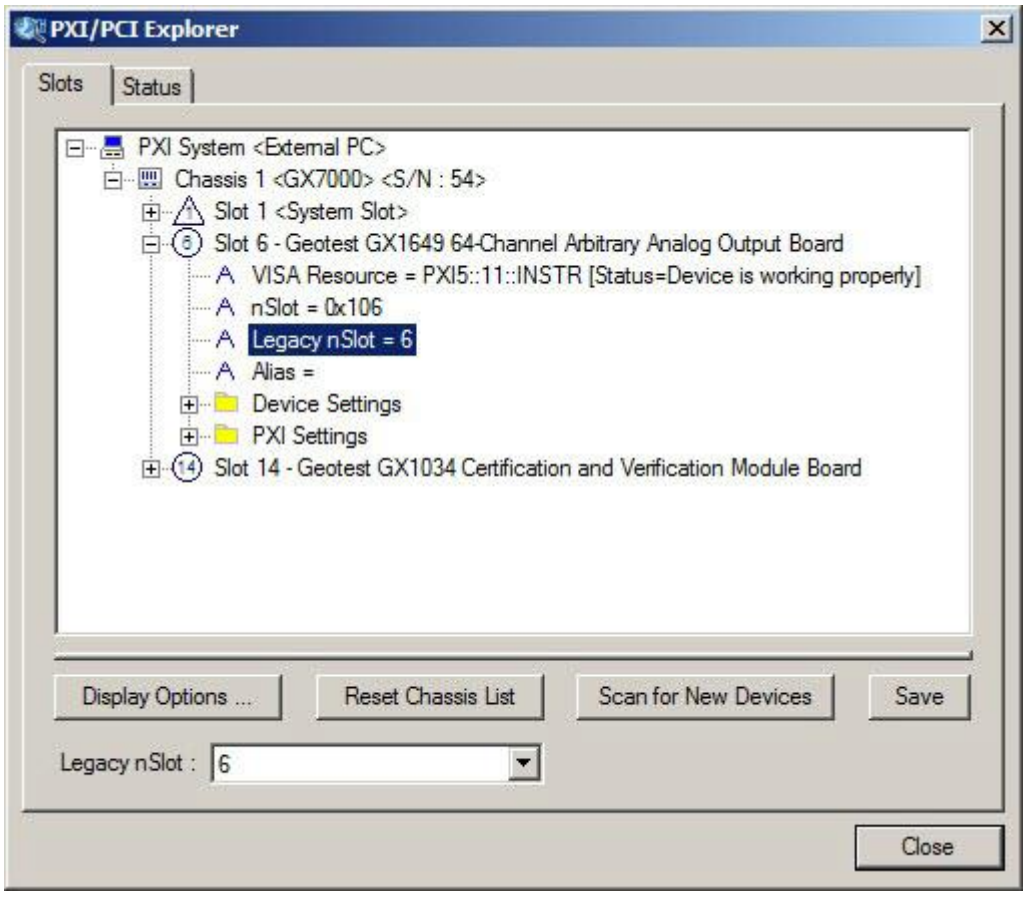


Figure 3-3: PXI/PCI Explorer

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Installing PXI Instruments

Install a PXI Instrument board (PXI module) as follows:

1. Turn off the PXI chassis and unplug the power cord.
2. Set the board switches and jumpers if required.

Caution - Electrostatic discharge can damage components on the GX7300 and other PXI module.

Check the board documentation for details on jumpers and switch settings before the installation.

3. Locate an empty PXI Slot on the chassis.
4. Place the module edges into the PXI chassis rails (top and bottom).
5. Carefully slide the PXI board to the rear of the chassis, make sure that the ejector handles are pushed out (as shown in Figure 3-3).

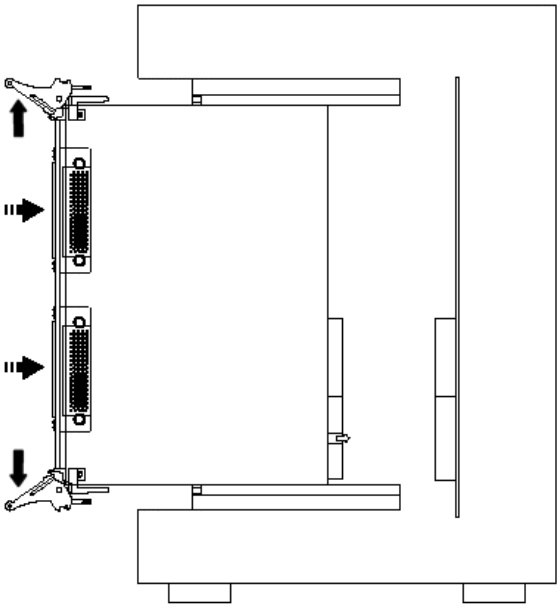


Figure 3-4: Ejector handles position during module insertion

6. After you feel resistance, push in the ejector handles as shown in Figure 3-5 to secure the module into the frame.

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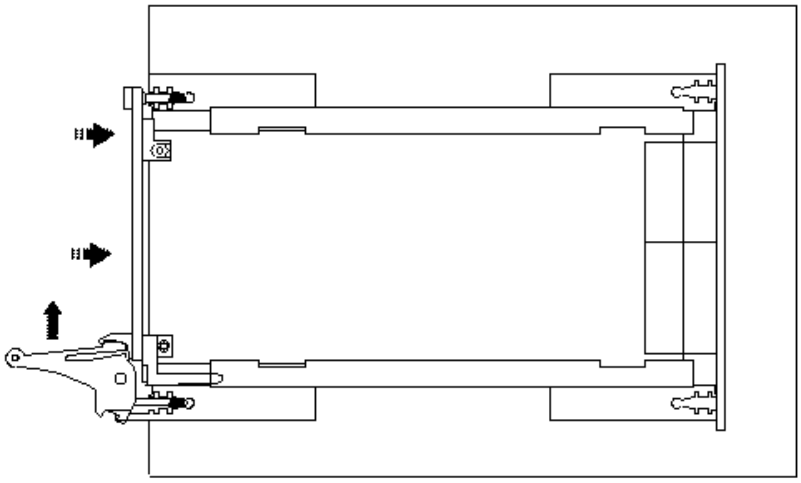


Figure 3-5: Ejector handles position after module insertion

7. Tighten the board's front panel screws to the chassis to secure the module in.
8. Connect any necessary cables to the board.
9. Plug the power cord in and turn on the PXI chassis' power switch.

PXI Instrument Removal

Remove a PXI instrument board as follows:

1. Shut down your system from the Windows Start menu.
2. Turn off the PXI chassis (master and slaves) and unplug the power cord.
3. Disconnect and remove any cables/connectors connected to the board.
4. Unscrew the module's front panel screws from the chassis.
5. Push **outward** the ejector handles and pull the PXI board away from the chassis.

Using External Instruments

Your GX7300 chassis supports all PXI and cPCI instruments and provides interfaces to any USB device. . In some cases however, you may need to connect additional instruments to the GX7300. These additional instruments are typically GPIB (IEEE-488) or VXI. To use external instruments, you will need a Plug-in PXI module that provides an interface to GPIB or to VXI (MXI-2). Such interfaces are available from numerous vendors.

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Installation Directories

The GxChassis driver files are installed in the default directory `C:\Program Files\Marvin Test Solutions\GxChassis`. You can change the default `GxChassis` directory to one of your choosing at the time of installation.

During the installation, `GxChassis` Setup creates and copies files to the following directories:

Name	Purpose / Contents
…\Marvin Test Solutions\GxChassis	The GxChassis directory. Contains panel programs, programming libraries, interface files and examples, on-line help files and other documentation.
…\Marvin Test Solutions\HW	HW device driver. Provides access to your board hardware resources such as memory, IO ports and PCI board configuration. See the README.TXT located in this directory for more information.
…\ATEasy\Drivers	ATEasy drivers directory. GxChassis Driver and examples are copied to this directory only if ATEasy is installed on your machine.
…\Windows\System (Windows 9x/Me), or …\Windows\System32 when running Windows NT/2000/XP / Windows 7	Windows System directory. Contains the GxChassis DLL driver and some upgraded system components, such as the HTML help viewer, etc.

Driver Files Description

The Setup program copies the GxChassis driver, a panel executable, the GxChassis help file, the README.TXT file, and driver samples. The following is a brief description of each installation file:

Driver File and Virtual Panel

GxChassis.dll - 32-Bit MS-Windows DLL for applications running under Windows, 95, 98, Me, NT, 2000, XP, Windows 7 or above.

- GxChassispanel.exe – An instrument front panel program for all GxChassis supported boards.

Interface Files

The following GxChassis interface files are used to support the various development tools:

- GxChassis.h - header file for accessing the DLL functions using the C/C++ programming language. The header file compatible with the following 32 bit development tools:
  - Microsoft Visual C++, Microsoft Visual C++ .NET
  - Borland C++
- GxChassis.LIB - Import library for GxChassis.dll (used when linking C/C++ application that uses GxChassis.dll).
- GxChassisBC.LIB - Import library for GxChassis.dll (used when linking Borland C/C++ application that uses GxChassis.dll).
- GxChassis.pas - interface file to support Borland Pascal or Borland Delphi.
- GxChassis.bas - Supports Microsoft Visual Basic 4.0, 5.0 and 6.0.
- GxChassis.vb - Supports Microsoft Visual Basic .NET.
- GxChassis.drv - ATEasy driver File for GxChassis Virtual Panel Program

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On-line Help and Manual

GxChassis.chm – On-line version of the GxChassis User's Guide. The help file is provided in a Windows Compiled HTML help file (.CHM). The file contains information about the GxChassis board, programming reference and panel operation.

GxChassis.pdf – On line, printable version of the GxChassis User's Guide in Adobe Acrobat format. To view or print the file you must have the reader installed. If not, you can download the Adobe Acrobat reader (free) from http://www.adobe.com.

ReadMe File

README.TXT – Contains important last minute information not available when the manual was printed. This text file covers topics such as a list of files required for installation, additional technical notes, and corrections to the GxChassis manuals. You can view and/or print this file using the Windows NOTEPAD.EXE or any other text file editors.

Example Programs

The sample program includes a C/C++ sample compiled with various development tools, Visual Basic example and an ATEasy sample. Other examples may be available for other programming tools.

Microsoft Visual C++ .NET example files:

- GxChassisExampleC.cpp - Source file
- GxChassisExampleC.ico - Icon file
- GxChassisExampleC.rc - Resource file
- GxChassisExampleC.vcproj - VC++ .NET project file
- GxChassisExampleC.exe - Example executable

Microsoft Visual C++ 6.0 example files:

- GxChassisExampleC.cpp - Source file
- GxChassisExampleC.ico - Icon file
- GxChassisExampleC.rc - Resource file
- GxChassisExampleC.dsp - VC++ project file
- GxChassisExampleC.exe - Example executable

Borland C++ example files:

- GxChassisExampleC.cpp - Source file
- GxChassisExample.ico - Icon file
- GxChassisExampleC.rc - Resource file
- GxChassisExampleC.bpr - Borland project file
- GxChassisExampleC.exe - Example executable

Microsoft Visual Basic .NET example files:

- GxChassisExampleVB.vb - Example form.
- GxChassisExampleVB.resx - Example form resource.
- GxChassisExampleVBapp.config - Example application configuration file.
- GxChassisExampleVBAssembleyInfo.vb - Example application assembly file

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- GxChassisExampleVB.vbproj - Project file
- GxChassisExampleVB.exe - Example executable

Microsoft Visual Basic 6.0 example files:

- GxChassisExampleVB6.frm - Example form
- GxChassisExampleVB6.frx - Example form binary file
- GxChassisExampleVB6.vbp - Project file
- GxChassisExampleVB6.exe - Example executable.

ATEasy driver and examples files (ATEasy Drivers directory):

- GxChassis.drv - driver
- GxChassis.prj - example project
- GxChassis.sys - example system
- GxChassis.prg - example program

LabView Driver

- GxChassis.llb – LabView library

Setup Maintenance Program

You can run the Setup again after GxChassis has been installed from the original disk or from the Windows Control Panel – Add Remove Programs applet. Setup will be in the Maintenance mode when running for the second time. The Maintenance window show below allows you to modify the current GxChassis installation. The following options are available in Maintenance mode:

Modify. Use when you want to add or remove GxChassis components.

Repair. Use to reinstall.

Remove. Use when you want to completely remove GxChassis.

Select one of the options and click **Next**.

Follow the instruction on the screen until Setup is complete.

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Chapter 4 - Programming the Chassis

Overview

This chapter contains information about how to program the Chassis' functions using the GxChassis driver. The GxChassis driver contains functions to initialize, control and retrieve information and settings from the Chassis. A brief description of the functions, as well as how and when to use them, is included in this chapter. Chapter 5 and the specific instrument User's Guide contain a complete and detailed description of the available programming functions.

The GxChassis driver supports many development tools. Using these tools with the driver is described in this chapter. In addition, the GxChassis directory contains examples written for these development tools. Refer to Chapter 3 for a list of the available examples.

An example using the DLL driver with Microsoft Visual C++ 6.0 is included at the end of this chapter. Since the driver functions and parameters are identical for all operating systems and development tools, the example can serve as an outline for other programming languages, programming tools, and other GxChassis driver types.

The GxChassis Driver

The GxChassis driver is a Windows DLL file: GxChassis.dll. The DLL can be used with various development tools such as Microsoft Visual C++, Borland C++ Builder, Microsoft Visual Basic, Borland Pascal or Delphi, ATEasy and more. The following paragraphs describe how to create an application that uses the driver with various development tools. Refer to the paragraph describing the specific development tool for more information.

Programming Using C/C++ Tools

The following steps are required to use the GxChassis driver with C/C++ development tools:

- Include the GxChassis.h header file in the C/C++ source file that uses the GxChassis function. This header file is used for all driver types. The file contains function prototypes and constant declarations to be used by the compiler for the application.
- Add the required .LIB file to the projects. This can be an import library GxChassis.lib for Microsoft Visual C++ and GxChassisBC.lib or Borland C++. Windows based applications that explicitly load the DLL by calling the Windows **LoadLibrary** API should not include the .LIB file in the project.
- Add code to call the GxChassis as required by the application.
- Build the project.
- Run, test, and debug the application.

Programming Using Visual Basic

To use the driver with Visual Basic 6.0 the user must include the GxChassis.bas to the project. For Visual Basic .NET use the GxChassis.vb.

The file can be loaded using *Add File* from the Visual Basic *File menu*. The GxChassis.bas/GxChassis.vb contains function declarations for the DLL driver.

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Programming Using Pascal/Delphi

To use the driver with Borland Pascal or Delphi, the user must include the GxChassis.pas to the project. The GxChassis.pas file contains a **unit** with function prototypes for the DLL functions. Include the GxChassis unit in the **uses** statement before making calls to the GxChassis functions.

Programming GxChassis Boards Using ATEasy®

The GxChassis package is supplied with an ATEasy driver. The ATEasy driver uses the GxChassis.dll to program the chassis' functions. . The ATEasy driver includes an example that contains a program and a system file for use with the ATEasy driver. Plain language commands declared in the ATEasy driver are easier to use than using the DLL functions directly. The driver commands will also generate exception that allows the ATEasy application to trap errors without checking the status code returned by the DLL function after each function call.

The ATEasy driver commands are similar to the DLL functions in name and parameters, with the following exceptions:

- The *nHandle* parameter is omitted. The driver handles this parameter automatically. ATEasy uses driver logical names instead i.e. CHASSIS1, CHASSIS2.
- The *nStatus* parameter was omitted. Use the Get Status commands instead of checking the status. After calling a DLL function the ATEasy driver will check the returned status and will call the error statement (in case of an error status) to generate exception that can be easily trapped by the application using the **OnError** module event or using the **try-catch** statement.

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Using the GxChassis driver functions

The GxChassis driver contains a set of functions that support all of the chassis' Smart features. The **GxChassisInitialize** function returns a handle that must be used with other driver functions to program the chassis. This handle is usually saved in the program as a global variable for later use when calling other functions. The initialize function does not change the state of the chassis. .

Chassis Handle

The chassis handle argument *nHandle* passed (by reference) to the parameter *pnHandle* of the **GxChassisInitialize** is a short integer (16-bit) number. It is used by the GxChassis driver functions to identify the chassis being accessed by the application. Since the driver can support multiple chassis at the same time, the *nHandle* argument is required to identify which chassis is being programmed.

The *nHandle* is created when the application calls the **GxChassisInitialize** function. There is no need to destroy the handle. Once the driver is initialized the handle can be used with other function calls to program the chassis.

Error Handling

All the **GxChassis** functions return a status named *pnStatus* as the last parameter. This parameter can be later used for error handling. The status is zero for success, less than zero for failure or error. When the status is error, the program can call the **GxChassisGetErrorString** function to return a string representing the error. The **GxChassisGetErrorString** reference contains possible error numbers and their associated error strings.

Driver Version

The **GxChassisGetDriverSummary** function can be used to return the current GxChassis driver version. It can be used to differentiate between the driver versions. See the Function Reference for more information.

Panel

Calling the **GxChassisPanel** will display the instrument virtual front panel window. The panel can be used to display its current setting and to control the board interactively. The panel function may be used by the application to allow the user to directly interact with the board.

The **GxChassisPanel** function is also used by the GxChassis.exe panel program that is supplied with this package and provides a stand-alone Windows application that displays the instrument panel.

Distributing the Driver

Once the application is developed, the driver files (GxChassis.dll and the HW device driver files located in the HW folder) can be shipped with the application. Typically, the GxChassis.dll should be copied to the Windows System directory. The HW device driver files should be installed using a special setup program HWSETUP.EXE that is provided with GxChassis driver files. Alternatively, you can provide the GxChassis disk to be installed along with the board.

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Sample Programs

The following example demonstrates how to program the board using the C programming language under Windows. The example shows how to get or set a group or channel voltage.

To run enter the following command line parameters:

GxChassisExample <chassis number> <operation> <param1> <param2> <param3> <param4> <param5>

Sample Program Listing

```
/*****************************************************************************

      FILE        : GxChassisExampleC.cpp

      PURPOSE           : WIN32/LINUX example program for GX7xxx chassis
                          using the GXCNT driver.

      CREATED           : Dec 2005

      COPYRIGHT   : Copyright 2002-2013, Marvin Test Solutions, Inc.

      COMMENTS    :

      To compile the example:

      1. Microsoft VC++
            Load GxChassisExampleC.dsp, .vcproj or .mak, depends on
            the VC++ version from the Project\File/Open... menu
            Select Project/Rebuild all from the menu

      2. Borland C++ Builder
            Load GxChassisExampleC.bpr from the Project/Open
                  Project... menu
            Select Project/Build all from the menu

      3. Linux (GCC for CPP and Make must be available)
            make -fGxChassisExampleC.mk [CFG=Release[64] | Debug[64]]
            [rebuild | clean]

*****************************************************************************/
#ifndef __GNUC__
#include "windows.h"
#endif
#include "GxChassis.h"
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <ctype.h>

#if defined(__BORLANDC__)
#pragma hdrstop
#include <condefs.h>
USELIB("GxChassisBC.lib");
USERC("GxChassisExampleC.rc");
#endif  // defined(__BORLANDC__)
```

```
//*****************************************************************************
//          DisplayMsg
//*****************************************************************************
void DisplayMsg(PCSTR lpszMsg)
{
#ifndef __GNUC__
      MessageBeep(0);
      MessageBox(0, lpszMsg, "GxChassis example program", MB_OK);
#else
    printf("\r\nGxChassis example program: %s\r\n", lpszMsg);
#endif
      return;
}

//*****************************************************************************
//          __strupr
//*****************************************************************************
char * __strupr(char * sz)
{
    int i;

    for (i=0; sz[i]; i++)
        sz[i] = toupper(sz[i]);
    return sz;
}

//*****************************************************************************
//          DisplayUsage
//*****************************************************************************
void DisplayUsage(void)
{
      DisplayMsg(
            "This example shows how to use the GxChassis driver:\r\n"
            "Usage: GxChassisExample <chassis number> <operation> <param1> \
            <param2> <param3> <param4> <param5>\r\n"
            "\r\nWhere : \r\n"
            "chassis number: chassis number as was set by PXI Explorer\r\n"
            "operation one of the followings :\r\n"
            "  GetAlarmState = Get Alarm State (no parameters)\r\n"
            "  SetAlarmState = Set Alarm State, parameters:\r\n"
            "                  <param1>: 0-Disable, 1-Enable\r\n"
            "  GetAlarmTemp = Get Alarm Temperature (no parameters)\r\n"
            "  SetAlarmTemp = Set Alarm Temperature, parameters:\r\n"
            "                  <param1>: Alarm Temperature\r\n"
            "  GetShutdownTemp = Returns Shutdown Temperature (no \
                                 parameters)\r\n"
            "  SetShutdownTemp = Set Shutdown Temperature, parameters:\r\n"
            "                  <param1>: 0-Disable, 1-Enable\r\n"
            "                  <param2>: Shutdown Temperature\r\n"
            "  GetVoltages  = Get Power Supplies Voltages (no \
               parameters)\r\n"
            "  GetTemps = Get Slots Temperatures (no parameters)\r\n"
            "  GetPxiTrigLine = Returns the specified PXI Trigger Line \
                              direction and mode\r\n"
            "  SetPxiTrigLine = Sets the specified PXI Trigger Line \
                               direction and mode\r\n"
```

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```
            "                   <param1>: Trigger line 0-7\r\n"
            "                   <param2>: Chassis Segments: 0-segment 0 to 1, \
                                      1-segment 1 to 2\r\n"
            "                   <param3>: Direction, 0-Disconnect, 1-Connect \
                                      Left to Right, 2-Connect Right to \
                                                  Left\r\n"
            "                   <param4>: Primary side mode, 0-Monitor, \
                                      1-Drive Low, 2-Drive High\r\n"
            "                   <param5>: Secondary side mode, 0-Monitor, \
                                      1-Drive Low, 2-Drive High\r\n"
            "  SUM = Print board summary\r\n"
            "\r\nTo change command line under Windows:\r\n"
            "\tRight click on the example shortcut from the start menu\r\n"
            "\tand type the new command line"
            );
      exit(1);
}

//*****************************************************************************
//          CheckStatus
//*****************************************************************************
void CheckStatus(SHORT nStatus)
{
    CHAR    sz[1024];

      if (!nStatus) return;
      GxChassisGetErrorString(nStatus, sz, sizeof sz, &nStatus);
      DisplayMsg(sz);
      DisplayMsg("Aborting the program...");
      exit(nStatus);
}

/*****************************************************************************
 MAIN

 This main function receives between 0 to 2 parameters

 GxChassis operation (e.g. SetShutdownTemp=Set Shutdown Temperature)

 GetAlarmState:    Returns Alarm State (no parameters)
 SetAlarmState:    Set Alarm State, parameters:
                        <param1>: 0-Disable, 1-Enable
 GetAlarmTemp:     Returns Alarm Temperature (no parameters)
 SetAlarmTemp:     Set Alarm Temperature, parameters:
                        <Temperature>: Alarm Threshold
 GetShutdownTemp:Returns Shutdown Temperature (no parameters)
 SetShutdownTemp:Set Shutdown Temperature, parameters:
                        <param1>: Shutdown Temperature
                        <param2>: 0-Disable, 1-Enable
 GetVoltages:      Returns Power Supplies Voltages (no parameters)
 GetTemps:         Returns Slots Temperatures (no parameters)
 GetPxiTrigLine:   Returns the specified PXI Trigger Line direction and mode
 SetPxiTrigLine:   Sets the specified PXI Trigger Line direction and mode,
                    parameters:
                        <param1>: Trigger line 0-7
                        <param2>: Chassis Segment: 0-segment 0 to 1,
                          1-segment 1 to 2
```

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```
                        <param3>: Direction, 0-Disconnect, 1-Connect Left to
                          Right, 2-Connect Right to Left
                        <param4>: Primary side mode, 0-Monitor, 1-Drive Low,
                              2-Drive High
                        <param5>: Secondary side mode, 0-Monitor,
                              1-Drive Low, 2-Drive High
 SUM:               Print board summary
*****************************************************************************/
int main(int argc, char **argv)
{
      CHAR* szOperation;      // Board Operation
      SHORT nChassisNum;      // Chassis number
      SHORT nHandle;          // Board handle
      SHORT nStatus;          // Returned status
      SHORT nMode;
      SHORT nTrigline;        // PXI trigger bus line number
      SHORT nChassisSeg;      // Chassis Segment
      SHORT nDirection;       // PXI trigger bus direction
      SHORT nPrimSideMode;    // PXI trigger bus Primary side mode
      SHORT nSecSideMode;     // PXI trigger bus Secondary Side Mode
      DOUBLE dThreshold;
      BOOL  bEnable;
      INT   i;
      char  sz[512];          // board summary

      // Check number of arguments recived
      if (argc<2) DisplayUsage();
      nChassisNum=(SHORT)strtol(*(++argv), NULL, 0);
      szOperation = __strupr(*(++argv));

      GxChassisInitialize(nChassisNum, &nHandle, &nStatus);
      CheckStatus(nStatus);

      if (!strcmp(szOperation, "GETALARMMODE"))
      {     GxChassisGetAlarmMode(nHandle, &nMode, &nStatus);
            CheckStatus(nStatus);
            printf("Alarm Mode is %s\r\n", nMode==0? "disabled": "enabled");
      }
      else if(!strcmp(szOperation, "SETALARMSTATE"))
      {     // Check number of arguments recived
            if (argc<3) DisplayUsage();
            nMode=(SHORT)strtol(*(++argv), NULL, 0);
            GxChassisSetAlarmMode(nHandle, nMode, &nStatus);
            CheckStatus(nStatus);
            printf("Alarm Mode is %s\r\n", nMode==0? "disabled": "enabled");
      }
      else if(!strcmp(szOperation, "GETALARMTEMP"))
      {     GxChassisGetAlarmTemperature(nHandle, &dThreshold, &nStatus);
            CheckStatus(nStatus);
            printf("Temperature Alarm Threshold is %0.1f\r\n", dThreshold);
      }
      else if(!strcmp(szOperation, "SETALARMTEMP"))
      {     // Check number of arguments recived
            if (argc<3) DisplayUsage();
            dThreshold=(SHORT)strtol(*(++argv), NULL, 0);
            GxChassisSetAlarmTemperature(nHandle, dThreshold, &nStatus);
            CheckStatus(nStatus);
```

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```
        GxChassisGetAlarmTemperature(nHandle, &dThreshold, &nStatus);
        printf("Temperature Alarm Threshold is %0.1f\r\n", dThreshold);
}
else if(!strcmp(szOperation, "GETSHUTDOWNTEMP"))
{       GxChassisGetShutdownTemperature(nHandle, &bEnable, &dThreshold,
       &nStatus);
        CheckStatus(nStatus);
        printf("Shutdown Temperature is %0.1f\r\n", dThreshold);
}
else if(!strcmp(szOperation, "SETSHUTDOWNTEMP"))
{       // Check number of arguments recived
        if (argc<4) DisplayUsage();
        bEnable=(INT)strtol(*(++argv), NULL, 0);
        dThreshold=(SHORT)strtol(*(++argv), NULL, 0);
        GxChassisSetShutdownTemperature(nHandle, bEnable, dThreshold,
              &nStatus);
        CheckStatus(nStatus);
        GxChassisGetShutdownTemperature(nHandle, &bEnable, &dThreshold,
              &nStatus);
        printf("Shutdown Temperature is %0.1f\r\n", dThreshold);
}
else if(!strcmp(szOperation, "GETVOLTAGES"))
{       DOUBLE adVoltage[8];
        GxChassisGetPowerSuppliesVoltages(nHandle, adVoltage, &nStatus);
        CheckStatus(nStatus);
        for (i=0; i<2; i++)
        {       printf("%s +12V Power Supply Voltage=%0.1f\r\n", i==0?
                      "Slots 1:10":"Slots 11:20", adVoltage[i*4]);
                printf("%s -12V Power Supply Voltage=%0.1f\r\n", i==0?
                      "Slots 1:10":"Slots 11:20", adVoltage[i*4+1]);
                printf("%s 3.3V Power Supply Voltage=%0.1f\r\n", i==0?
                      "Slots 1:10":"Slots 11:20", adVoltage[i*4+2]);
                printf("%s 5V Power Supply Voltage=%0.1f\r\n", i==0?
                      "Slots 1:10":"Slots 11:20", adVoltage[i*4+3]);
        }
}
else if(!strcmp(szOperation, "GETTEMPS"))
{       DOUBLE adTemp[20];
        GxChassisGetSlotsTemperatures(nHandle, adTemp, &nStatus);
        CheckStatus(nStatus);
        for (i=0; i<20; i++)
                printf("Slot %i Temperature=%0.1f\r\n", i+1, adTemp[i]);
}
else if(!strcmp(szOperation, "GETPXITRIGLINE"))
{       // Check number of arguments recived
        if (argc<5) DisplayUsage();
        nTrigline=(SHORT)strtol(*(++argv), NULL, 0);
        nChassisSeg=(SHORT)strtol(*(++argv), NULL, 0);
        GxChassisGetPxiTriggerLine(nHandle, nTrigline, nChassisSeg,
                &nDirection, &nPrimSideMode, &nSecSideMode, &nStatus);
        CheckStatus(nStatus);
        printf("PXI Trigger Line %i Segment %i settings: Direction=%i, \
                 Primary Side Mode=%i, Secondary Side Mode=%i\r\n",
                 nTrigline, nChassisSeg, nDirection, nPrimSideMode,
                 nSecSideMode);
}
else if(!strcmp(szOperation, "SETPXITRIGLINE"))
```

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```
        {       // Check number of arguments recived
                if (argc<8) DisplayUsage();
                nTrigline=(SHORT)strtol(*(++argv), NULL, 0);
                nChassisSeg=(SHORT)strtol(*(++argv), NULL, 0);
                nDirection=(SHORT)strtol(*(++argv), NULL, 0);
                nPrimSideMode=(SHORT)strtol(*(++argv), NULL, 0);
                nSecSideMode=(SHORT)strtol(*(++argv), NULL, 0);
                GxChassisSetPxiTriggerLine(nHandle, nTrigline, nChassisSeg,
                            nDirection, nPrimSideMode, nSecSideMode, &nStatus);
                CheckStatus(nStatus);
                printf("PXI Trigger Line %i Segment %i settings: Direction=%i, \
                       Primary Side Mode=%i, Secondary Side Mode=%i\r\n",
                       nTrigline, nChassisSeg, nDirection, nPrimSideMode,
                       nSecSideMode);
        }
        else if (!strcmp(szOperation, "SUM"))
        {       // print board summary
                GxChassisGetBoardSummary(nHandle, sz, sizeof sz, &nStatus);
                CheckStatus(nStatus);
                printf("Board Summary: %s.\n", sz);
        }
        else
                DisplayUsage();

        return 0;
}

//===========================================================================
//          End Of File
//===========================================================================
```

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Chapter 5 - Functions Reference

Introduction

The GxChassis driver functions reference chapter is organized in alphabetical order. Each function description contains the function name; purpose, syntax, parameters description and type followed by Comments, an Example (written in C), and a See Also section.

All function parameter syntax follows the same rules:

- Strings are ASCIIZ (null or zero character terminated).
- The first parameter of most functions is *nHandle* (16-bit integer). This parameter is required for accessing the chassis and is returned by the **GxChassisInitialize** function. The *nHandle* is used to identify the chassis when calling a function for programming and controlling the operation of the chassis. .
- All functions return a status with the last parameter named *pnStatus*. The *pnStatus* is zero if the function was successful, or less than zero for error conditions. The description of the error is available using the **GxChassisGetErrorString** function or by using a predefined constant, defined in the driver interface files: GxChassis.h, GxChassis.bas, GxChassis.pas or GxChassis.drv.
- Parameter names are prefixed as follows:

Prefix	Type	Example
a	Array, prefix this before the simple type.	*anArray* (Array of Short)
n	Short (signed 16-bit)	*nMode*
d	Double - 8 bytes floating point	*dReading*
dw	Double word (unsigned 32-bit)	*dwTimeout*
hwnd	Window handle (32-bit integer).	*hwndPanel*
l	Long (signed 32-bit)	*lBits*
p	Pointer. Usually used to return a value. Prefix this before the simple type.	*pnStatus*
sz	Null (zero value character) terminated string	*szMsg*
w	Unsigned short (unsigned 16-bit)	*wParam*

Table 5-1: Parameter Name Prefixes

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GxChassis Functions

The following list is a summary of functions available for the GxChassis:

Driver Functions	Description
GxChassisGetAlarmMode	Returns the Alarm Mode.
GxChassisGetAlarmTemperature	Returns the Alarm Temperature threshold settings.
GxChassisGetBoardSummary	Returns the board summary.
GxChassisGetDriverSummary	Returns the driver name and version.
GxChassisGetErrorString	Returns the error string associated with the specified error number.
GxChassisGetFanSpeed	Returns the fan speed and control settings
GxChassisGetFanThresholdTemperatures	Returns the fan low and high threshold temperatures.
GxChassisGetPowerSuppliesVoltages	Returns the backplane's eight power supplies voltages.
GxChassisGetPxiTriggerLine	Returns the specified PXI trigger line bridge direction mode and its direction configuration (left or right).
GxChassisGetPxiTriggerLineLevel	Returns the specified PXI trigger line segment's logic levels.
GxChassisGetShutdownTemperature	Returns the shutdown Temperature and active mode.
GxChassisGetSlotsTemperatures	Returns all slot temperature values
GxChassisGetSlotsTemperaturesStates	Returns all active slot temperature values.
GxChassisGetSlotsTemperaturesStatistics	Returns the slot with the lowest temperature, slot with the highest temperature and the average temperature of active slots.
GxChassisGetSlotTemperature	Returns the specified slot temperature value
GxChassisGetTemperatureScale	Returns the temperature scale used for setting or getting any temperature value.
GxChassisGetTemperatureThresholdMode	Returns the Temperature threshold operation mode.
GxChassisInitialize	Initializes the driver.
GxChassisPanel	Opens a virtual panel used to interactively control the GxChassis.
GxChassisRecallSettings	Loads and applies the settings as specified by the settings source parameter.
GxChassisResetPxiTriggerLines	Resets all PXI trigger lines for the specified segment
GxChassisSetAlarmMode	Sets the Alarm mode.
GxChassisSetAlarmTemperature	Sets the Alarm Temperature threshold.
GxChassisSetFanSpeed	Sets the fan speed and control settings
GxChassisSetFanThresholdTemperatures	Sets the fan low and high threshold temperatures.
GxChassisSetPxiTriggerLine	Sets the specified PXI trigger line bridge direction mode and its direction (Left or Right mode).
GxChassisSetShutdownTemperature	Sets the shutdown Temperature and active mode.
GxChassisSetSlotsTemperaturesStates	Sets the active state for slots monitoring temperature
GxChassisSetTemperatureScale	Sets the temperature scale used for setting or getting any temperature value.
GxChassisSetTemperatureThresholdMode	Sets the Temperature threshold operational mode.

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GxChassisGetAlarmMode

Purpose

Returns the alarm mode.

Syntax

GxChassisGetAlarmMode (nHandle, *pnMode*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX**mainframe Chassis.
pnMode	PSHORT	Alarm mode is one of the following: 0. GXCHASSIS_OVER_TEMPERATURE_ALARM_DISABLE – Alarm disabled. 1. GXCHASSIS_OVER_TEMPERATURE_ALARM_ENABLE – Alarm enabled (default). 2. GXCHASSIS_OVER_TEMPERATURE_ALARM_ON – Alarm is on. 3. GXCHASSIS_OVER_TEMPERATURE_ALARM_SNOOZE – Silence the Alarm after the Alarm threshold condition is met. If the alarm condition reoccurs, the buzzer will be activated again.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

When the Alarm is on (threshold condition was met or set to On) both backplane buzzers will beep simultaneously in intervals of 10 seconds.

Example

The following example returns the Alarm state:

```
SHORT   nMode, nStatus;
GxChassisGetAlarmMode (nHandle, &nMode, &nStatus);
```

See Also

GxChassisSetAlarmMode, **GxChassisSetAlarmTemperature**, **GxChassisSetTemperatureThresholdMode, GxChassisSetShutdownTemperature**, **GxChassisGetErrorString**

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GxChassisGetAlarmTemperature

Purpose

Returns the alarm temperature threshold setting.

Syntax

GxChassisGetAlarmTemperature (*nHandle, pdTemp, pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
pdTemp	PDOUBLE	Alarm temperature threshold setting.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

The Alarm temperature can be programmed to any value between –20°C and +70°C. The programmed temperature can be saved to the onboard EPROM and automatically loaded on the next system power up (using the front panel only).

The temperature resolution is 0.8 degree.

Note: Manufacture default Alarm temperature setting is +50°C.

Example

The following example returns the Alarm Temperature:

```
SHORT   nStatus;
DOUBLE  dTemp
GxChassisGetAlarmTemperature (nHandle, &dTemp, &nStatus);
```

See Also

GxChassisSetAlarmTemperature, GxChassisSetTemperatureThresholdMode, GxChassisSetAlarmMode, GxChassisSetShutdownTemperature, **GxChassisGetErrorString**

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GxChassisGetBoardSummary

Purpose

Returns a summary of chassis backplane information.

Syntax

GxChassisGetBoardSummary (nHandle, *szSummary*, *nSumMaxLen*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
szSummary	PSTR	Buffer to contain the returned board info (null terminated with 512 bytes).
nSumMaxLen	SHORT	Size of the buffer to contain the board info string.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

The board summary retrieves an array of information from the chassis and the chassis backplane bridges. The information ranges from the component's serial number to firmware versions.

For example, the returned board info can be as follows:

"Model: GX7300, S/N: 00063, Firmware: N/A, Tested: Tue Jun 24 13:40:39 2008, User Defined Data: GX7600-0063

Module: Backplane, S/N: 00583*-CN-CA-00, Firmware: N/A, Calibrated: N/A

Module: Gx7070 Bridge segment A-B, S/N: 03251*-GH-GD-00, Firmware: 0xE004, Calibrated: N/A"

Module: Gx7070 Bridge segment B-C, S/N: 03252*-GH-GD-00, Firmware: 0xE004, Calibrated: N/A"

Example

```
CHAR sz[512];
SHORT nStatus;

GxChassisGetBoardSummary (nHandle, sz, sizeof sz, &nStatus);
```

See Also

GxChassisGetDriverSummary, GxChassisGetErrorString

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GxChassisGetDriverSummary

Purpose

Returns the driver name and version.

Syntax

GxChassisGetDriverSummary (*pszSummary ,nSummaryMaxLen, pdwVersion, pnStatus*)

Parameters

Name	Type	Comments
pszSummary	PSTR	Buffer to the returned driver summary string.
nSummaryMaxLen	SHORT	The size of the summary string buffer.
pdwVersion	PDWORD	Returned version number. The high order word specifies the major version number and the low order word specifies the minor version number.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

The returned string is: GxChassis - Marvin Test Solutions's PXI Chassis Driver for the Gx7XX0 family, Version 1.0, Copyright © 2006 Marvin Test Solutions - MTS Inc., All rights reserved".

Example

The following example prints the driver version:

```
CHAR sz[128];
DWORD dwVersion;
SHORT nStatus;

GxChassisGetDriverSummary (sz, sizeof sz, &dwVersion, &nStatus);
printf("Driver Version %d.%d", (INT)(dwVersion>>16), (INT)dwVersion &0xFFFF);
```

See Also

GxPxiGetBoardSummary, GxChassisGetErrorString

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GxChassisGetErrorString

Purpose

Returns the error string associated with the specified error number.

Syntax

GxChassisGetErrorString (*nError*, *pszMsg*, *nErrorMaxLen*, *pnStatus*)

Parameters

Name	Type	Comments
nError	SHORT	Error number as returned by the *pnStatus* of any of the driver functions. See table below for possible values. The number should be a negative number, otherwise the function returns the "No error has occurred" string.
pszMsg	LPSTR	Buffer containing the returned error string (null terminated string).
nErrorMaxLen	SHORT	Size of the buffer *pszMsg*.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

The function returns the error string associated with the *nError* as returned from other driver functions. The following table displays the possible error values. Not all errors apply to this type of driver.

Resource Errors	Description
-2	Unable to open the HW device/Service
-5	Unable to register the PCI device
-6	Unable to allocate system resource or memory for the PCI device
-8	Unable to create panel
-9	Unable to create a Windows timer
Parameter Errors	
-20	Invalid parameter
-22	Invalid board handle
-25	Invalid mode
-27	Invalid string length
Board specific parameter error	
-50	Invalid over temperature threshold value
-51	Invalid trigger direction, settings will result in a conflicting trigger lines direction.
-52	Invalid PXI trigger bus line direction, settings will result in a conflicting trigger lines direction
-53	Invalid PXI trigger bus line mode, settings will result in a conflicting trigger lines direction
-54	Invalid PXI trigger bus segment
-55	Invalid number of fan poles
-56	Invalid chassis type
Board Errors/Warnings	
-60	Controller is busy, return on timeout
-61	Controller communication error

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-62	Error backplane left bridge, unable to communicate with the backplane left bridge
-63	Error backplane right bridge, unable to communicate with the backplane right bridge
-64	Error backplane bridges, unable to communicate with any of the backplane bridges
-65	Error backplane bridges, unable to detect any of the backplane bridges
-66	Error backplane left bridge, unable to detect with the backplane left bridge
-67	Error backplane right bridge, unable to detect with the backplane right bridge
Miscellaneous Errors	
-99	Invalid or unknown error number

Example

The following example initializes the board. If the initialization fails, the following error string is printed:

```
CHAR    sz[256];
SHORT   nStatus, nHandle;

GxChassisInitialize(0, &Handle, &Status);
if (nStatus<0)
{
    GxChassisGetErrorString(nStatus, sz, sizeof sz, &nStatus);
    printf(sz);        // prints the error string returns
}
```

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GxChassisGetPowerSuppliesVoltages

Purpose

Returns the backplane's eight power supplies voltages.

Syntax

GxChassisGetPowerSuppliesVoltages (nHandle, *pdVoltage*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
pdVoltage	PDOUBLE	An array containing the backplane power supply voltages.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

The returned eight power supply voltages are arranged as follows:

Array index	Power supplies voltage
0	+12V of Slots 1-10
1	-12V of Slots 1-10
2	3.3V of Slots 1-10
3	5V of Slots 1-10
4	+12V of Slots 11-20
5	-12V of Slots 11-20
6	3.3V of Slots 11-20
7	5V of Slots 11-20

Example

The following example returns the backplane's eight power supplies voltages:

```
SHORT  nStatus;
DOUBLE adVoltage[8];
GxChassisGetPowerSuppliesVoltages (nHandle, adVoltage, &nStatus);
```

See Also

GxChassisSetTemperatureThresholdMode, GxChassisSetAlarmMode, **GxChassisSetAlarmTemperature, GxChassisSetShutdownTemperature**, **GxChassisGetErrorString**

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GxChassisGetFanSpeed

Purpose

Returns the fan speed and control settings.

Syntax

GxChassisGetFanSpeed (*nHandle, pnSpeedControl, pnSpeed, pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
pnSpeedControl	PSHORT	Returns the fan speed control mode as follows: 0. GXCHASSIS_FAN_SPEED_MODE_AUTO: fan speed is automatically controlled by the chassis. When mode is set to Auto the user can specify fan speed based on user defined high and low temperature thresholds. 1. GXCHASSIS_FAN_SPEED_MODE_USER_DEFINED: Fan speed is specified by the user (*pnSpeed value*).
pnSpeed	PSHORT	Returns the fan speed as follows: 0. GXCHASSIS_FAN_SPEED_MIN: Fan speed is at the minimum operational range. 1. GXCHASSIS_FAN_SPEED_MID: Fan speed is at the middle operational range. 2. GXCHASSIS_FAN_SPEED_MAX: Fan speed is at the maximum operational range.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

When the fan speed control is set to Auto (GXCHASSIS_FAN_SPEED_MODE_AUTO), the user can specify the temperature threshold range (low and high). When threshold is <=low temp then the fan speed will be set to low, when threshold is >=high temp the fan speed will be set to high. In between those threshold points the chassis will set the fan speed relative to the measured chassis temperature, e.g. if the fan's low threshold temperature is set to 20 and the high threshold temperature is set to 40 and the chassis temperature is 30 then the fan speed will be set to the medium speed.

When fan speed control is set to user defined (GXCHASSIS_FAN_SPEED_MODE_USER_DEFINED) then the fan speed will stay constant according to the programmed *pnSpeed* value.

Note: this functionality is supported by bridgeboard revisions G and above.

Example

The following example returns fan speed and control settings:

```
SHORT   nStatus;
SHORT   nSpeedControl, nSpeed;
GxChassisGetFanSpeed (nHandle, &nSpeedControl, &nSpeed, &nStatus);
```

See Also

GxChassisSetFanSpeed, **GxChassisGetFanThresholdTemperatures, GxChassisGetErrorString**

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GxChassisGetFanThresholdTemperatures

Purpose

Returns the fan low and high threshold temperatures.

Syntax

GxChassisGetFanThresholdTemperatures (*nHandle, pdMinThreshold, pdMaxThreshold, pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
pdMinThreshold	PDOUBLE	Returns the fan's low threshold temperature speed, value is either in Fahrenheit or Celsius as was set by the GxChassisSetTemperatureScale function call.
pdMaxThreshold	PDOUBLE	Returns the fan's high threshold temperature speed, value is either in Fahrenheit or Celsius as was set by the GxChassisSetTemperatureScale function call.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

When the fan speed control is set to Auto (GXCHASSIS_FAN_SPEED_MODE_AUTO), the user can specify the temperature threshold range (low and high). When the threshold is <=low temp then the fan speed will be set to low, when the threshold is >=high temp the fan speed will be set to high. In between those threshold points the chassis will set the fan speed relative to the measured chassis temperature, e.g. if the fan's low threshold temperature is set to 20 and the fan's high threshold temperature is set to 40 and the chassis temperature is 30 then the fan speed will be set to the medium speed.

The temperature resolution is 0.8 degree.

Note: this functionality is supported by bridgeboard revisions G and above.

Example

The following example returns the fan low and high threshold temperatures.

```
SHORT   nStatus;
DOUBLE  dMinThreshold, dMaxThreshold;
GxChassisGetFanThresholdTemperatures (nHandle, &dMinThreshold, &dMaxThreshold, &nStatus);
```

See Also

GxChassisSetFanThresholdTemperatures, GxChassisSetFanSpeed,, GxChassisGetErrorString

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GxChassisGetPxiTriggerLine

Purpose

Returns the specified PXI trigger line bridge direction mode and its Left and Right mode.

Syntax

GxChassisGetPxiTriggerLine (nHandle, *nLine, nSegment, pucDirection, pnPrimaryMode, pnSecondaryMode, pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
nLine	SHORT	Specified PXI trigger line of the specified PXI chassis Segment: 0. GXCHASSIS_PXI_TRIGGER_BUS_LINE0 - PXI trigger line 0 1. GXCHASSIS_PXI_TRIGGER_BUS_LINE1 - PXI trigger line 1 2. GXCHASSIS_PXI_TRIGGER_BUS_LINE2 - PXI trigger line 2 3. GXCHASSIS_PXI_TRIGGER_BUS_LINE3 - PXI trigger line 3 4. GXCHASSIS_PXI_TRIGGER_BUS_LINE4 - PXI trigger line 4 5. GXCHASSIS_PXI_TRIGGER_BUS_LINE5 - PXI trigger line 5 6. GXCHASSIS_PXI_TRIGGER_BUS_LINE6 - PXI trigger line 6 7. GXCHASSIS_PXI_TRIGGER_BUS_LINE7 - PXI trigger line 7
nSegment	SHORT	Specified PXI chassis Segments: 0. GXCHASSIS_SEGMENT_0_TO_SEGMENT_1 – Segment Slots 2:7 connecting to Segment Slots 8:13 (chassis left side bridge). 1. GXCHASSIS_SEGMENT_1_TO_SEGMENT_2 - Segment Slots 8:13 connecting to Segment Slots 14:20 (chassis right side bridge).
pnDirection	PSHORT	Returns the Specified PXI trigger line segment direction as follows: 0. GXCHASSIS_PXI_TRIGGER_BUS_LINE_DISCONNECT - Disconnect the PXI trigger line from the Right segment and the Left segment. I.e. PXI trigger line is not connected to either segment. 1. GXCHASSIS_PXI_TRIGGER_BUS_LINE_LEFT_TO_RIGHT - Connect the PXI trigger line direction to cross from Left segment to the Right segment. 2. GXCHASSIS_PXI_TRIGGER_BUS_LINE_RIGHT_TO_LEFT - Connect the PXI trigger line direction to cross from Right segment to the Left segment.
pnPrimaryMode	PSHORT	Returns the Specified PXI trigger line primary side mode, modes are as follows: 0. GXCHASSIS_PXI_TRIGGER_BUS_LINE_MONITOR: the primary segment side (left) does not drive the specified trigger line (default). 1. GXCHASSIS_PXI_TRIGGER_BUS_LINE_DRIVE_LOW: the primary segment side (left) drives the specified trigger line low (default). 2. GXCHASSIS_PXI_TRIGGER_BUS_LINE_DRIVE_HIGH: the primary segment side (left) drives the specified trigger line high (default). **Note**: this functionality is supported by bridgeboard revisions G and above; previous bridgeboard revision will not be affected.
pnSecondaryMode	PSHORT	Returns the Specified PXI trigger line secondary side mode, modes are as follows:

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0. GXCHASSIS_PXI_TRIGGER_BUS_LINE_MONITOR: the secondary segment side (right) does not drive the specified trigger line (default).
1. GXCHASSIS_PXI_TRIGGER_BUS_LINE_DRIVE_LOW: the secondary segment side (right) drives the specified trigger line low (default).
2. GXCHASSIS_PXI_TRIGGER_BUS_LINE_DRIVE_HIGH: the secondary segment side (right) drives the specified trigger line high (default).

Note: this functionality is supported by bridgeboard revisions G and above; previous bridgeboard revision will not be affected.

pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

The user can monitor the specified trigger line level, high or low, using the **GxChassisGetPxiTriggerLineLevels** (supported by bridgeboard revisions G and above).

Example

The following example returns PXI trigger line 0 Segment Slots 2:7 connecting to Segment Slots 8:13 settings:

```
SHORT   nStatus;
SHORT   nDirection, nPrimaryMode, nSecondaryMode;
GxChassisGetPxiTriggerLine (nHandle, GXCHASSIS_PXI_TRIGGER_BUS_LINE0,
                            GXCHASSIS_SEGMENT_0_TO_SEGMENT_1, &nDirection, &nPrimaryMode,
                            &nSecondaryMode, nStatus);
```

See Also

GxChassisSetPxiTriggerLine, **GxChassisGetPxiTriggerLineLevels, GxChassisGetErrorString**

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GxChassisGetPxiTriggerLineLevels

Purpose

Returns the specified PXI trigger line segment Left and Right logic levels.

Syntax

GxChassisGetPxiTriggerLineLevels (nHandle, *nLine*, *nSegment*, *pnPrimary*, *pnSecondary*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
nLine	SHORT	Specified PXI trigger line of the specified PXI chassis Segment: 0. GXCHASSIS_PXI_TRIGGER_BUS_LINE0 - PXI trigger line 0 1. GXCHASSIS_PXI_TRIGGER_BUS_LINE1 - PXI trigger line 1 2. GXCHASSIS_PXI_TRIGGER_BUS_LINE2 - PXI trigger line 2 3. GXCHASSIS_PXI_TRIGGER_BUS_LINE3 - PXI trigger line 3 4. GXCHASSIS_PXI_TRIGGER_BUS_LINE4 - PXI trigger line 4 5. GXCHASSIS_PXI_TRIGGER_BUS_LINE5 - PXI trigger line 5 6. GXCHASSIS_PXI_TRIGGER_BUS_LINE6 - PXI trigger line 6 7. GXCHASSIS_PXI_TRIGGER_BUS_LINE7 - PXI trigger line 7
nSegment	SHORT	Specified PXI chassis Segments: 0. GXCHASSIS_SEGMENT_0_TO_SEGMENT_1 – Segment Slots 2:7 connecting to Segment Slots 8:13 (chassis left side bridge). 1. GXCHASSIS_SEGMENT_1_TO_SEGMENT_2 - Segment Slots 8:13 connecting to Segment Slots 14:20 (chassis right side bridge).
pnPrimary	PSHORT	Returns the Specified PXI trigger line primary side logic level: 0. The primary segment side (left) specified trigger line is low. 1. The primary segment side (left) specified trigger line is high..
pnSecondary	PSHORT	Returns the Specified PXI trigger line secondary side logic level: 0. The secondary segment side (right) specified trigger line is low. 1. The secondary segment side (right) specified trigger line is high.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

Note: this functionality is supported by bridgeboard revisions G and above.

Example

The following example returns PXI trigger line 0 Segment Slots 2:7 connecting to Segment Slots 8:13 levels:

```
SHORT   nStatus;
SHORT   nPrimary, nSecondary;
GxChassisGetPxiTriggerLine (nHandle, GXCHASSIS_PXI_TRIGGER_BUS_LINE0,
                            GXCHASSIS_SEGMENT_0_TO_SEGMENT_1, &nPrimary, &nSecondary,
                            nStatus);
```

See Also

GxChassisSetPxiTriggerLine, **GxChassisGetErrorString**

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GxChassisGetShutdownTemperature

Purpose

Returns the shutdown temperature and shutdown state.

Syntax

GxChassisGetShutdownTemperature (nHandle, *pbEnable, pdThreshold, pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
pbEnable	PBOOL	Shutdown state: 0. Disabled. 1. Enabled (default).
pdThreshold	PDOUBLE	Shutdown Temperature threshold settings, value can be between +20°C to +70°C.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

The programmable over temperature shutdown can be programmed to any value between –20°C and +70°C. The programmed temperature can be saved to the onboard EEPROM and be automatically loaded on the next system power up (using the front panel only).

The temperature resolution is 0.8 degree.

Note: the manufacture default threshold is programmed to +70°C.

Example

The following example returns the shutdown temperature and active mode:

```
SHORT   nStatus;
BOOL    bEnable
DOUBLE  dThreshold;
GxChassisGetShutdownTemperature (nHandle, &bEnable, &dThreshold, &nStatus);
```

See Also

GxChassisSetTemperatureThresholdMode, GxChassisSetAlarmMode, **GxChassisSetAlarmTemperature, GxChassisSetShutdownTemperature**, **GxChassisGetErrorString**

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GxChassisGetSlotsTemperatures

Purpose

Returns all slot temperatures.

Syntax

GxChassisGetSlotsTemperatures (nHandle, *pdTemp*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
pdTemp	SHORT	Array holding all measured slot temperatures. Measured temperature of slot 1 returned in array index 0.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

The temperature resolution is 0.8 degree.

Note: Slots' temperatures are measured regardless if the slots are active or not. See the **GxChassisSetSlotsTemperaturesStates** function for details.

Example

The following example returns all twenty measured slots' temperatures into an array:

```
SHORT   nStatus;
DOUBLE  adTemp[20];
GxChassisGetSlotsTemperatures (nHandle, adTemp, &nStatus);
```

See Also

GxChassisSetSlotsTemperaturesStates, GxChassisSetTemperatureThresholdMode, GxChassisSetAlarmMode, **GxChassisSetAlarmTemperature, GxChassisSetShutdownTemperature**, **GxChassisGetErrorString**

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GxChassisGetSlotsTemperaturesStates

Purpose

Returns all active (enabled) slot temperatures.

Syntax

GxChassisGetSlotsTemperaturesStates (nHandle, *pdwStates*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
pdwStates	PDWORD	Returns slots with active or enabled temperature monitoring, bits 0 through 19 represents slots 1 through 20. • Bit high – specified slot is enabled. • Bit low – specified slot is disabled.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

Only active (enabled) slots determine if alarm threshold or shutdown threshold conditions are met.

Example

The following example returns the slots' temperatures' active states:

```
SHORT   nStatus;
DWORD   dwStates;
GxChassisGetSlotsTemperaturesStates (nHandle, &dwStates, &nStatus);
```

See Also

GxChassisSetSlotsTemperaturesStates, GxChassisSetTemperatureThresholdMode, GxChassisSetAlarmMode, **GxChassisSetAlarmTemperature, GxChassisSetShutdownTemperature**, **GxChassisGetErrorString**

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GxChassisGetSlotsTemperaturesStatistics

Purpose

Returns the slot with the lowest temperature, the slot with the highest temperature and the average temperature of the active slots.

Syntax

GxChassisGetSlotsTemperaturesStatistics (nHandle, *pnMinTempSlot, pdMinTemp, pnMaxTempSlot, pdMaxTemp, pdAveTemp, pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
pnMinTempSlot	PSHORT	The slot number with the lowest temperature out of all active slots.
pdMinTemp	PDOUBLE	The temperature of the slot number with the lowest temperature out of all active slots.
pnMaxTempSlot	PSHORT	The slot number with the highest temperature out of all active slots.
pdMaxTemp	PDOUBLE	The temperature of the slot number with the highest temperature out of all active slots.
pdAveTemp	PDOUBLE	The average temperature of all active slots.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

This function returns all the slots' temperatures and out of the active slots determines the slot with the lowest temperature, the slot with the highest temperature and the average temperature.

The function can be most useful to determine shutdown threshold and alarm threshold settings as well as monitoring the slots' temperatures range.

The temperature resolution is 0.8 degree.

Example

The following example returns the minimum, maximum and average temperatures of the active slots:

```
SHORT   nMinTempSlot, nMaxTempSlot, nStatus;
DOUBLE  dMinTemp, dMaxTemp, dAveTemp;
GxChassisGetSlotsTemperaturesStatistics (nHandle, &nMinTempSlot, &dMinTemp, &nMaxTempSlot,
                                         &dMaxTemp, &dAveTemp, &nStatus);
```

See Also

GxChassisSetSlotsTemperaturesStates, GxChassisSetTemperatureThresholdMode, GxChassisSetAlarmMode, **GxChassisSetAlarmTemperature, GxChassisSetShutdownTemperature**, **GxChassisGetErrorString**

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GxChassisGetSlotTemperature

Purpose

Returns the specified slot temperature.

Syntax

GxChassisGetSlotTemperature (nHandle, *nSlot*, *pdTemp*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
nSlot	SHORT	Specified slot temperature. Slot number can be from 1 to 20.
pdTemp	SHORT	Array holding all measured slots' temperatures. Measured temperature of slot 1 returned in array cell number 0.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

The temperature resolution is 0.8 degree.

Note: Slots' temperatures are measured regardless if the slots are active or not. See the **GxChassisSetSlotsTemperaturesStates** function for details.

Example

The following example returns slot number 2's temperature:

```
SHORT   nStatus;
DOUBLE  aTemp;
GxChassisGetSlotTemperature (nHandle, 2, &dTemp, &nStatus);
```

See Also

GxChassisSetSlotsTemperaturesStates, GxChassisSetTemperatureThresholdMode, GxChassisSetAlarmMode, **GxChassisSetAlarmTemperature, GxChassisSetShutdownTemperature**, **GxChassisGetErrorString**

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GxChassisGetTemperatureScale

Purpose

Returns the temperature scale used for setting or getting any temperature value.

Syntax

GxChassisGetTemperatureScale (nHandle, *pnScale*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
pnScale	PSHORT	Temperature scale: 0. GXCHASSIS_TEMPERATURE_SCALE_METRIC 1. GXCHASSIS_TEMPERATURE_SCALE_ENGLISH
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

Once the temperature scale is set, the same scale will be applied to all temperature values, e.g. shutdown temperature. The temperature scale setting is saved to the host computer.

Example

The following example returns the temperature scale:

```
SHORT   nScale, nStatus;
GxChassisGetTemperatureScale (nHandle, &nScale, &nStatus);
```

See Also

GxChassisSetTemperatureScale, GxChassisSetSlotsTemperaturesStates, GxChassisSetTemperatureThresholdMode, GxChassisSetAlarmMode, **GxChassisSetAlarmTemperature, GxChassisSetShutdownTemperature**, **GxChassisGetErrorString**

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GxChassisGetTemperatureThresholdMode

Purpose

Returns the Temperature threshold operation mode.

Syntax

GxChassisGetTemperatureThresholdMode (nHandle, *pnMode*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
pnMode	PSHORT	Temperature threshold operation modes are: 0. GXCHASSIS_OVER_TEMPERATURE_MODE_MAX_SLOT (default) 1. GXCHASSIS_OVER_TEMPERATURE_MODE_AVERAGE_SLOTS
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

The temperature threshold operational mode dictates how the alarm threshold and shutdown threshold will be activated. The modes are: GXCHASSIS_OVER_TEMPERATURE_MODE_MAX_SLOT:

- Shutdown activated when any of the enabled slots' temperature is above the shutdown temperature.
- Alarm activated when any of the enabled slots' temperature is above the alarm temperature.

GXCHASSIS_OVER_TEMPERATURE_MODE_AVERAGE_SLOTS:

- Shutdown activated when the average temperature of all active slots are above the shutdown temperature.
- Alarm activated when the average temperature of all active slots are above the alarm temperature.

Example

The following example returns the Temperature threshold operational mode:

```
SHORT   nMode, nStatus;
GxChassisGetTemperatureThresholdMode (nHandle, &nMode, &nStatus);
```

See Also

GxChassisSetTemperatureThresholdMode, GxChassisSetAlarmMode, **GxChassisSetAlarmTemperature, GxChassisSetShutdownTemperature**, **GxChassisGetErrorString**

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GxChassisInitialize

Purpose

Initialize the driver for the specified chassis number.

Syntax

GxChassisInitialize (*nChassis, pnHandle, pnStatus*)

Parameters

Name	Type	Comments
nChassis	SHORT	PXI Chassis number.
pnHandle	PSHORT	Returned handle for the to a **GX73XX** Chassis. The handle is set to zero on error and <> 0 on success.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

This function returns a handle that can be used with other GxChassis functions to program the chassis. The function does not change any of the chassis' settings.

Example

The following example initializes two PXI Chassis 1 and 2.

```
SHORT   nHandle1, nHandle2, nStatus;

GxChassisInitialize (1, &nHandle1, &nStatus);
if (nHandle1==0)
    printf("Unable to Initialize the board");

GxChassisInitialize(2, &nHandle2, &nStatus);
if (nHandle2==0)
    printf("Unable to Initialize the board");
```

See Also

GxChassisGetErrorString

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GxChassisPanel

Purpose

Opens a virtual panel used to interactively control the GxChassis mainframe.

Syntax

GxChassisPanel (*pnHandle, hwndParent, nMode, phwndPanel, pnStatus*)

Parameters

Name	Type	Comments
pnHandle	PSHORT	Handle to a **GX73XX** Chassis. This number may be zero if the board is to be initialized by the panel window.
hwndParent	HWND	Sets the panel parent window handle. A value of 0 sets the desktop as the parent window.
nMode	SHORT	The mode in which the panel main window is created. 0 for modeless and 1 for modal window.
phwndPanel	LPHWND	Returned window handle for the panel (for modeless panel only).
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

This function is used to create the virtual panel. The panel window may be opened as a modal or a modeless window, depending on the *nMode* parameters.

If the mode is set to modal dialog (*nMode*=1), the panel will disable the parent window (*hwndParent*) and the function will return only after the user closes the window. In that case the *pnHandle* returns the handle created by the user using the panel Initialize dialog. This handle then may be used when calling other GxChassis functions.

If a modeless dialog was created (*nMode*=0), the function returns immediately after creating the panel window, returning the window handle to the panel - *phwndPanel.* It is the responsibility of the calling program to dispatch window messages to this window, so that the window can respond to messages.

Example

The following example opens the panel in modal mode:

```
HWND    hwndPanel;
SHORT   nHandle=0, nStatus;
...
GxChassisPanel (&nHandle, 0, 1, &hwndPanel, &nStatus);
```

See Also

GxChassisInitialize, **GxChassisGetErrorString**

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GxChassisRecallSettings

Purpose

Loads and applies the settings as specified by the settings source parameter.

Syntax

GxChassisRecallSettings (nHandle, *nSettingSource*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
nSettingSource	SHORT	Recall Settings source are: 0. GXCHASSIS_RECALL_FACTORY_SETTINGS - Loads and applies the factory default settings 1. GXCHASSIS_RECALL_USER_SETTINGS - Loads and applies the last saved users' settings from the onboard EEPROM.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

Factory default settings are:

- All slots' temperatures enabled.
- Temperature threshold mode is set to Max Temp Mode.
- Shutdown temperature is 70°C.
- Shutdown temperature state enabled
- Alarm temperature is 50°C.
- Alarm state disabled.
- PXI Trigger lines are all disabled.

Note: Users can only save their settings to the on-board EEPROM when running the front panel.

Example

The following example loads and applies the last saved user settings:

```
SHORT   nStatus;
GxChassisRecallSettings (nHandle, GXCHASSIS_RECALL_USER_SETTINGS, &nStatus);
```

See Also

GxChassisGetAlarmMode, **GxChassisSetAlarmTemperature**, **GxChassisSetTemperatureThresholdMode, GxChassisSetShutdownTemperature**, **GxChassisGetErrorString**

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GxChassisResetPxiTriggerLines

Purpose

Resets all PXI trigger lines in a specified segment.

Syntax

GxChassisResetPxiTriggerLines (nHandle, *nSegment*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
nSegment	SHORT	Specified PXI chassis Segments: 0. GXCHASSIS_SEGMENT_0_TO_SEGMENT_1 – Segment Slots 2:7 connecting to Segment Slots 8:13 (chassis left side bridge). 1. GXCHASSIS_SEGMENT_1_TO_SEGMENT_2 - Segment Slots 8:13 connecting to Segment Slots 14:20 (chassis right side bridge).
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

After calling this function the specified segment settings will be as follows:

Direction: A segement's primery and secondary sides are disconnected (GXCHASSIS_PXI_TRIGGER_BUS_LINE_DISCONNECT).

Primary side: monitor state (GXCHASSIS_PXI_TRIGGER_BUS_LINE_MONITOR).

Secondary side: monitor state (GXCHASSIS_PXI_TRIGGER_BUS_LINE_MONITOR).

Example

The following example resets the first segment:

```
SHORT   nStatus;
GxChassisResetPxiTriggerLines (nHandle, GXCHASSIS_SEGMENT_0_TO_SEGMENT_1, &nStatus);
```

See Also

GxChassisSetPxiTriggerLine, **GxChassisgetPxiTriggerLine**, **GxChassisGetErrorString**

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GxChassisSetAlarmMode

Purpose

Sets the over temperature alarm mode.

Syntax

GxChassisSetAlarmMode (nHandle, *nMode*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
nMode	SHORT	Over Temperature Alarm mode is one of the following: 0. GXCHASSIS_OVER_TEMPERATURE_ALARM_DISABLE – Alarm disabled. 1. GXCHASSIS_OVER_TEMPERATURE_ALARM_ENABLE – Alarm enabled. 2. GXCHASSIS_OVER_TEMPERATURE_ALARM_ON – Alarm is on. 3. GXCHASSIS_OVER_TEMPERATURE_ALARM_SNOOZE – Silence the Alarm after the Alarm threshold condition is met. If the alarm condition reoccurs, the buzzer will activate again.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

When the Alarm is on (threshold condition was met or set to On) both backplane buzzers will beep simultaneously in intervals of 10 seconds.

Example

The following example enables the Over Temperature Alarm:

```
SHORT   nStatus;
GxChassisSetAlarmMode (nHandle, GXCHASSIS_OVER_TEMPERATURE_ALARM_ENABLE, &nStatus);
```

See Also

GxChassisGetAlarmMode, **GxChassisSetAlarmTemperature**, **GxChassisSetTemperatureThresholdMode, GxChassisSetShutdownTemperature**, **GxChassisGetErrorString**

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GxChassisSetAlarmTemperature

Purpose

Sets the alarm temperature threshold.

Syntax

GxChassisSetAlarmTemperature (nHandle, *dTemp*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
dTemp	DOUBLE	Alarm temperature threshold settings
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

The programmable Alarm temperature can be programmed to any value between –20°C and +70°C. The programmed temperature can be saved to the onboard EEPROM and be automatically loaded on the next system power up (using the front panel only).

The temperature resolution is 0.8 degree.

Note: Manufacturer default Alarm temperature is +50°C.

Example

The following example sets the Alarm temperature to 45°C:

```
SHORT  nStatus;
GxChassisSetAlarmTemperature (nHandle, 45, &nStatus);
```

See Also

GxChassisSetTemperatureThresholdMode, GxChassisSetAlarmMode, **GxChassisSetAlarmTemperature, GxChassisSetShutdownTemperature**, **GxChassisGetErrorString**

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GxChassisGetFanSpeed

Purpose

Sets the fan speed and control settings.

Syntax

GxChassisSetFanSpeed (*nHandle, nSpeedControl, nSpeed, pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
nSpeedControl	SHORT	Sets the fans speed control mode as follows: 0. GXCHASSIS_FAN_SPEED_MODE_AUTO: fan speed is automatically controlled by the chassis. When mode is set to Auto the user can specify fan speed based on user defined high and low temperature thresholds. 1. GXCHASSIS_FAN_SPEED_MODE_USER_DEFINED: Fans speed is specified by the user (*pnSpeed value*).
nSpeed	SHORT	Sets the fans speed as follows: 0. GXCHASSIS_FAN_SPEED_MIN: Fan speed is at the minimum operational range. 1. GXCHASSIS_FAN_SPEED_MID: Fan speed is at the middle operational range. 2. GXCHASSIS_FAN_SPEED_MAX: Fan speed is at the maximum operational range.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

When the fan speed control is set to Auto (GXCHASSIS_FAN_SPEED_MODE_AUTO), the user can specify the temperature threshold range (low and high). When threshold is <=low temp then the fan speed will be set to low, when threshold is >=high temp the fan speed will be set to high. In between these threshold points the chassis will set the fan speed relative to the measured chassis temperature, e.g. if the fan's low threshold temperature is set to 20 and the high threshold temperature is set to 40 and the chassis temperature is 30 then the fan speed will be set to the medium speed.

When fan speed control is set to user defined (GXCHASSIS_FAN_SPEED_MODE_USER_DEFINED) then the fan speed will stay constant according to the programmed *pnSpeed* value.

Note: this functionality is supported by bridgeboard revisions G and above.

Example

The following example sets the fan speed to Auto:

```
SHORT   nStatus;
GxChassisSetFanSpeed (nHandle, GXCHASSIS_FAN_SPEED_MODE_AUTO, 0, &nStatus);
```

See Also

GxChassisGetFanSpeed, **GxChassisSetFanThresholdTemperatures, GxChassisGetErrorString**

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GxChassisSetFanThresholdTemperatures

Purpose

Sets the fan low and high threshold temperatures.

Syntax

GxChassisSetFanThresholdTemperatures (*nHandle, dMinThreshold, dMaxThreshold, pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
dMinThreshold	DOUBLE	Fan's low threshold temperature speed. Value is either in Fahrenheit or Celsius as was set by the GxChassisSetTemperatureScale function call.
dMaxThreshold	DOUBLE	Fan's high threshold temperature speed,. Value is either in Fahrenheit or Celsius as was set by the GxChassisSetTemperatureScale function call.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

When the fan speed control is set to Auto (GXCHASSIS_FAN_SPEED_MODE_AUTO), the user can specify the temperature threshold range (low and high). When threshold is <=low temp then the fan speed will be set to low, when the threshold is >=high temp the fan speed will be set to high. In between these threshold points the chassis will set the fan speed relative to the measured chassis temperature, e.g. if fan low threshold temperature is set to 20 and the high threshold temperature is set to 40 and the chassis temperature is 30 then the fan speed will be set to the medium speed.

The temperature resolution is 0.8 degree.

Note: this functionality is supported by bridgeboard revisions G and above.

Example

The following example sets the fan low and high threshold temperatures in Celsius.

```
SHORT   nStatus;
GxChassisSetFanThresholdTemperatures (nHandle, 20, 40, &nStatus);
```

See Also

GxChassisGetFanThresholdTemperatures, GxChassisSetFanSpeed,, GxChassisGetErrorString

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GxChassisSetPxiTriggerLine

Purpose

Sets the specified PXI trigger line bridge direction mode and the Left and Right mode.

Syntax

GxChassisSetPxiTriggerLine (nHandle, *nLine, nSegment, ucDirection, nPrimaryMode, nSecondaryMode, pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
nLine	SHORT	Specified PXI trigger line of the specified PXI chassis Segment: 0. GXCHASSIS_PXI_TRIGGER_BUS_LINE0 - PXI trigger line 0 1. GXCHASSIS_PXI_TRIGGER_BUS_LINE1 - PXI trigger line 1 2. GXCHASSIS_PXI_TRIGGER_BUS_LINE2 - PXI trigger line 2 3. GXCHASSIS_PXI_TRIGGER_BUS_LINE3 - PXI trigger line 3 4. GXCHASSIS_PXI_TRIGGER_BUS_LINE4 - PXI trigger line 4 5. GXCHASSIS_PXI_TRIGGER_BUS_LINE5 - PXI trigger line 5 6. GXCHASSIS_PXI_TRIGGER_BUS_LINE6 - PXI trigger line 6 7. GXCHASSIS_PXI_TRIGGER_BUS_LINE7 - PXI trigger line 7
nSegment	SHORT	Specified PXI chassis Segments: 0. GXCHASSIS_SEGMENT_0_TO_SEGMENT_1 – Segment Slots 2:7 connecting to Segment Slots 8:13 (chassis left side bridge). 1. GXCHASSIS_SEGMENT_1_TO_SEGMENT_2 - Segment Slots 8:13 connecting to Segment Slots 14:20 (chassis right side bridge).
nDirection	SHORT	Specified PXI trigger line segment direction as follows: 0. GXCHASSIS_PXI_TRIGGER_BUS_LINE_DISCONNECT - Disconnect the PXI trigger line from the Right segment and the Left segment. I.e. PXI trigger line is isolated between the left and right segment.. 1. GXCHASSIS_PXI_TRIGGER_BUS_LINE_LEFT_TO_RIGHT - Connect the PXI trigger line direction to cross from the Left segment to the Right segment. 2. GXCHASSIS_PXI_TRIGGER_BUS_LINE_RIGHT_TO_LEFT - Connect the PXI trigger line direction to cross from the Right segment to the Left segment.
nPrimaryMode	SHORT	Specified PXI trigger line primary side mode, modes are as follows: 0. GXCHASSIS_PXI_TRIGGER_BUS_LINE_MONITOR: the primary segment side (left) does not drive the specified trigger line (default). 1. GXCHASSIS_PXI_TRIGGER_BUS_LINE_DRIVE_LOW: the primary segment side (left) drives the specified trigger line low (default). 2. GXCHASSIS_PXI_TRIGGER_BUS_LINE_DRIVE_HIGH: the primary segment side (left) drives the specified trigger line high (default). **Note**: this functionality is supported by bridgeboard revisions G and above; previous bridgeboard revision will not be affected.
nSecondaryMode	SHORT	Specified PXI trigger line secondary side mode, modes are as follows: 0. GXCHASSIS_PXI_TRIGGER_BUS_LINE_MONITOR: the secondary

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segment side (right) does not drive the specified trigger line (default).

1. GXCHASSIS_PXI_TRIGGER_BUS_LINE_DRIVE_LOW: the secondary segment side (right) drives the specified trigger line low (default).
2. GXCHASSIS_PXI_TRIGGER_BUS_LINE_DRIVE_HIGH: the secondary segment side (right) drives the specified trigger line high (default).

Note: this functionality is supported by bridgeboard revisions G and above; previous bridgeboard revision will not be affected.

pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

The user can monitor the specified trigger line level, high or low, using the **GxChassisGetPxiTriggerLineLevels** (supported by bridgeboard revisions G and above).

Example

The following example sets PXI trigger line 0 Segment Slots 2:7 connecting to Segment Slots 8:13 settings:

```
SHORT   nStatus;
SHORT   nDirection, nPrimaryMode, nSecondaryMode;
GxChassisSetPxiTriggerLine (nHandle, GXCHASSIS_PXI_TRIGGER_BUS_LINE0,
                            GXCHASSIS_SEGMENT_0_TO_SEGMENT_1,
                            GXCHASSIS_PXI_TRIGGER_BUS_LINE_LEFT_TO_RIGHT,
                            GXCHASSIS_PXI_TRIGGER_BUS_LINE_MONITOR,
                            GXCHASSIS_PXI_TRIGGER_BUS_LINE_MONITOR, nStatus);
```

See Also

GxChassisSetPxiTriggerLine, **GxChassisGetPxiTriggerLineLevels, GxChassisGetErrorString**

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GxChassisSetShutdownTemperature

Purpose

Sets the shutdown temperature and shutdown state.

Syntax

GxChassisSetShutdownTemperature (nHandle, *bEnable, dThreshold, pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
bEnable	BOOL	Shutdown state: 0. Disabled. 1. Enabled (default).
dThreshold	DOUBLE	Shutdown Temperature threshold settings, value can be between +20°C to +70°C.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

The programmable shutdown temperature can be programmed to any value between +20°C and +70°C. The programmed temperature can be saved to the onboard EEPROM and be automatically loaded on the next system power up (using the front panel only).

The temperature resolution is 0.8 degree.

Note: Manufacturer default threshold is programmed to +70°C.

Example

The following example sets the shutdown temperature to 50°C and enables the shutdown:

```
SHORT   nStatus;
GxChassisSetShutdownTemperature  (nHandle, TRUE, 50, &nStatus);
```

See Also

GxChassisSetTemperatureThresholdMode, GxChassisSetAlarmMode, **GxChassisGetOverTemperatureAlarmThreshold, GxChassisSetShutdownTemperature**, **GxChassisGetErrorString**

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GxChassisSetSlotsTemperaturesStates

Purpose

Sets (enables) all slots for active temperature monitoring

Syntax

GxChassisSetSlotsTemperaturesStates (nHandle, *dwStates*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
dwStates	DWORD	Defines slots that will be actively monitored for temperature. Bits 0 through 19 represents slots 1 through 20. • Bit high – specified slot enabled. • Bit low – specified slot disabled.
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

Only active (enabled) slots determine if alarm threshold or shutdown threshold conditions are met.

Example

The following example enables slots 1 through 6 only:

```
SHORT  nStatus;
GxChassisSetSlotsTemperaturesStates (nHandle, 0x3F, &nStatus);
```

See Also

GxChassisGetSlotsTemperaturesStates, GxChassisSetTemperatureThresholdMode, GxChassisSetAlarmMode, **GxChassisSetAlarmTemperature, GxChassisSetShutdownTemperature**, **GxChassisGetErrorString**

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GxChassisSetTemperatureScale

Purpose

Sets the temperature scale used for setting or getting any temperature value.

Syntax

GxChassisGetTemperatureScale (nHandle, *nScale*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
nScale	SHORT	Temperature scale: 0. GXCHASSIS_TEMPERATURE_SCALE_METRIC 1. GXCHASSIS_TEMPERATURE_SCALE_ENGLISH
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

Once the temperature scale is set, the same scale will be applied to all temperature values, e.g. shutdown temperature. The temperature scale setting is saved to the host computer.

Example

The following example sets the temperature scale used for setting or getting any temperature value to the English scale:

```
SHORT   nStatus;
GxChassisSetTemperatureScale (nHandle, GXCHASSIS_TEMPERATURE_SCALE_ENGLISH, &nStatus);
```

See Also

GxChassisGetTemperatureScale, GxChassisSetSlotsTemperaturesStates, GxChassisSetTemperatureThresholdMode, GxChassisSetAlarmMode, **GxChassisSetAlarmTemperature, GxChassisSetShutdownTemperature**, **GxChassisGetErrorString**

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GxChassisSetTemperatureThresholdMode

Purpose

Sets the Temperature threshold operational mode.

Syntax

GxChassisSetTemperatureThresholdMode (nHandle, *nMode*, *pnStatus*)

Parameters

Name	Type	Comments
nHandle	SHORT	Handle to a **GX73XX** Chassis.
pnMode	PSHORT	Temperature threshold operational modes are: 0. GXCHASSIS_OVER_TEMPERATURE_MODE_MAX_SLOT (default) 1. GXCHASSIS_OVER_TEMPERATURE_MODE_AVERAGE_SLOTS
pnStatus	PSHORT	Returned status: 0 on success, negative number on failure.

Comments

The temperature threshold operational mode dictates how the alarm threshold and shutdown threshold will be activated. The modes are:

GXCHASSIS_OVER_TEMPERATURE_MODE_MAX_SLOT:

- Shutdown activated when any of the enabled slots' temperature is above the shutdown temperature.
- Alarm activated when any of the enabled slots' temperature is above the alarm temperature.

GXCHASSIS_OVER_TEMPERATURE_MODE_AVERAGE_SLOTS:

- Shutdown activated when the average temperature of all active slots are above the shutdown temperature.
- Alarm activated when the average temperature of all active slots are above the alarm temperature.

Example

The following example sets the Temperature threshold operational mode to average:

```
SHORT   nStatus;
GxChassisSetTemperatureThresholdMode (nHandle, GXCHASSIS_OVER_TEMPERATURE_MODE_AVERAGE_SLOTS,
                                      &nStatus);
```

See Also

GxChassisGetTemperatureThresholdMode, GxChassisSetAlarmMode, GxChassisSetAlarmTemperature, GxChassisSetShutdownTemperature, GxChassisGetErrorString

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Appendix A – Specifications

AC Input Power

GX7300/GX7310/GX7302/GX7312

100VAC to 179 VAC, 15 A max, (PFC)

180 VAC to 240 VAC, 10 A max, (PFC)

47 – 63 Hz

GX7305 / GX7315

120 VAC +/- 15%, 20 A max, (PFC)

240 VAC +/- 10%, 10 A max, (PFC)

47 – 440 Hz

Power Supplies

GX7300/GX7310/GX7302/GX7312 System Power

Two DC power supplies providing total of 900W. The specification of each power supply is listed in a table below. One power supply provides power to slots 1-7 and the other to slots 8-20. Total power for the +5V and +3.3V cannot exceed 300 watts for slots 1-7 combined and slots 8-20 combined.

Power Supply Load, Regulation, Ripple, and Noise Specifications

Output Voltage		Load Range		Regulation		Ripple & Noise*	
		Min.	Max.	Min.	Max.	Max.	mV P-P
1	+3.3V	0.2 A	40.0 A	- 3 %	+ 5 %	50	mV
2	+5.0V	2.5 A	60.0 A	- 3 %	+ 5 %	50	mV
3	+12.0V	0.5 A	32.0 A	- 5 %	+ 5 %	150	mV
4	-12.0V	0.0 A	3.0 A	- 5 %	+ 5 %	200	mV

*Noise Bandwidth: DC – 20 MHz

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GX7305 / GX7315 System Power

Slot \ Voltage	5V	3.3V	+12V	-12V
System Slot	6A	6A	0.5A	0.25A
Instrument Slot	10A	10A	0.5A	0.25A
Max Total for GX7305 / GX7315	100A	180A	10A	5A

Total system power should not exceed 1600 Watts for a low line, 120 VAC, 20A configurations.

Power Supply Regulation, Ripple, and Noise Specifications

Output Voltage	Regulation	Ripple (RMS)	Ripple (p-p)*
+3.3 V	+/- 30 mV	10 mV	33 mV
+5.0 V	+/- 30 mV	10 mV	50 mV
+12.0 V	+ /- 48 mV	12 mV	120 mV
-12.0 V	+ / - 48 mV	12 mV	120 mV

***** Bandwidth: DC – 20 MHz

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Cooling

GX7300 / GX7305 / GX7302 / GX7312

One 235 CFM fan mounted on rear panel. Two 50 CFM fans for system power supplies. Fan speed control and monitoring is automatic or can be controlled / monitored via the GxChassis software.

GX7305 / GX7315

Four (4) 100 CFM fans mounted under the PXI card cage provide positive air flow across the PXI modules. Air flows exhausts at the rear of the chassis. Separate fans provide cooling for the system power supplies. Fan speed control and monitoring is automatic or can be controlled / monitored via the GxChassis software.

Temperature Monitoring

Integrated temperature monitoring via an on-board microcontroller with audible and software notification when preset temperature limits are exceeded.

Temperature Monitoring features:

- Per slot monitoring, 1 reading/sec/slot
- 4 second moving average value
- User selectable alarm criteria: Maximum slot temperature, Average slot temperatureAccuracy: +/- 2 ° C
- Default warning and shutdown limits: +50 ° C & +70° C
- Warning and shutdown limits programmable via software driver
- Status: Query via software driver and audible alarm for a warning limit condition

Power Supply Monitoring

Monitored voltages: 3.3, 5, +12, =12, VIO value

Accuracy: +/- 2% of reading

PXI 10 MHz Clock

All GX73xx chassis include an integrated 10MHz PXI system clock with auto-detect function. Presence of an external 10 MHz PXI clock will disable the internal clock source. External source can be from the Star Trigger Controller Slot (slot 2) or an external input (GX7305 or GX7315 only). . Precedence is as follows:

1. 10 MHz source from Slot 2 timing slot
2. 10 MHz source from external input (rear panel)
3. 10 MHz source from the GX7305 backplane

10 MHz clock accuracy: +/- 100 ppm

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External 10 MHz Clock (GX7305 / GX7315)

External 10 MHz input: TTL compatible

External 10 MHz output: TTL compatible

Slots

The GX7300 has a total of 20 slots:

- 1 System Controller Slot
- 1 PXI Star Trigger Controller Slot (can be used by any PXI/cPCI instrument)
- 13 PXI/cPCI Instruments with Star Trigger
- 5 PXI/cPCI Instruments (without Star Trigger)

Physical Dimensions

Empty Weight:	GX7300: 33lbs GX7310: 30 lbs GX7302: 35 lbs GX7312: 32 lbs GX7305: 40 lbs GX7315: 37 lbs
Dimensions:	GX7300 / GX7310: 17.6" W x 7" H (4U) x 16" D GX7302, GX7312, GX7305, GX7315: 17.6" W x 10.5" H (6U), x 23.8" D

Environmental and Compliance

Operating Temperature Range:	0ºC to 50ºC
Storage Temperature Range:	-20ºC to +60ºC
Operating relative humidity:	10 to 90%, non-condensing
Storage relative humidity:	5 to 95%, non-condensing
Emissions:	EN 55011:1991 Group 1 Class A at 10 m FCC Class A at 10 m
CE compliance:	EN61010-1 EN61326
PXI compliance	PXI Hardware Specification Revision 2.2

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Appendix B –PXI Slots Pin Outs

This appendix describes the P1 and P2 connector pin outs for the GX7300 backplane.

- Table B-1 shows the P1 (J1) connector pin out for the System Controller slot.
- Table B-2 shows the P2 (J2) connector pin out for the System Controller slot.
- Table B-3 shows the P1 (J1) connector pin out for the Star Trigger slot.
- Table B-4 shows the P2 (J2) connector pin out for the Star Trigger slot.
- Table B-5 shows the P1 (J1) connector pin out for the peripheral slots.
- Table B-6 shows the P2 (J2) connector pin out for the peripheral slots.

To help in reviewing the tables in this section and locating the appropriate specification for signal requirements, Table B-1 lists all signals alphabetically by original specification (PXI, CompactPCI, or PCI).

System	Signals		
PXI	PXI_BRSV	PXI_LBL[0:12]	PXI_STAR[0:12]
	PXI_CLK10	PXI_STAR[0:12]	PXI_TRIG[0:7]
	PXI_CLK10_IN	PXI_TRIG[0:7]	
CompactPCI	BD_SEL#	HEALTHY#	REQ#[0:6]
	BRSV	INTP	RSV
	CLK[0:6]	INTS	SYSEN#
	DEG#	IPMB_PWR	SMB_ALERT#
	ENUM#	IPMB_SCL	SMB_SCL
	FAL#	IPMB_SDA	SMB_SDA
	GA0-GA4	PRST#	UNC
	GNT#[0:6]		
PCI	ACK64#	AD[0:63]	C/BE[0:7]#
	CLK	DEVSEL#	FRAME#
	GND	GNT#	IDSEL
	INTA#	INTB#	INTC#
	INTD#	IRDY#	LOCK#
	M66EN	PAR	PAR64
	PERR#	REQ#	REQ64#
	RST#	SERR#	STOP#
	TCK	TDI	TDO
	TMS	TRDY#	TRST#
	V(I/O)	3.3 V	5 V
	+12 V	-12 V	

Table B-1: Signal Names grouped by BUS

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P1 (J1) Connector Pin Out for System Controller Slot

Pin	Z	A	B	C	D	E	F
25	GND	5V	REQ64#	ENUM#	3.3V	5V	GND
24	GND	AD[1]	5V	V(I/O)	AD[0]	ACK64#	GND
23	GND	3.3V	AD[4]	AD[3]	5V	AD[2]	GND
22	GND	AD[7]	GND	3.3V	AD[6]	AD[5]	GND
21	GND	3.3V	AD[9]	AD[8]	M66EN	C/BE[0]#	GND
20	GND	AD[12]	GND	V(I/O)	AD[11]	AD[10]	GND
19	GND	3.3V	AD[15]	AD[14]	GND	AD[13]	GND
18	GND	SERR#	GND	3.3V	PAR	C/BE[1]#	GND
17	GND	3.3V	IPMB_SCL	IPMB_SDA	GND	PERR#	GND
16	GND	DEVSEL#	GND	V(I/O)	STOP#	LOCK#	GND
15	GND	3.3V	FRAME#	IRDY#	GND	TRDY#	GND
12–14	Key	Area					
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2]#	GND
10	GND	AD[21]	GND	3.3V	AD[20]	AD[19]	GND
9	GND	C/BE[3]#	GND	AD[23]	GND	AD[22]	GND
8	GND	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND
6	GND	REQ0#	GND	3.3V	CLK0	AD[31]	GND
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND	GNT0#	GND
4	GND	IPMB_PWR	HEALTHY#	V(I/O)	INTP	INTS	GND
3	GND	INTA#	INTB#	INTC#	5V	INTD#	GND
2	GND	TCK	5V	TMS	TDO	TDI	GND
1	GND	5V	–12V	TRST#	+12V	5V	GND

Table B-2: P1 (J1) Connector Pin Out for the System Controller Slot

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P2 (J2) Connector Pin Out for System Controller Slot

Pin	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK6	GND	TDN1	RDN1	RDP1	GND
20	GND	CLK5	GND	TDP1	GND	VCC	GND
19	GND	GND	GND	RES	RES Bat	+3.3V	GND
18	GND	KDAT[1]	UV2-	UV4+	RTC	+3.3V	GND
17	GND	KCLK[1]	ROUT(GND)	PRST#	REQ6#	GNT6#	GND
16	GND	PMDAT[1]	UV2+	DEG#	GND	UV4-	GND
15	GND	PMCLK[1]	GOUT (GND)	FAL#	REQ5#	GNT5#	GND
14	GND	2RIN	2DSR	2RTS	VSYNC (GND)	2CTS	GND
13	GND	2RXD	FANSENSE(GND)	BOUT (VIO)	2DTR	2DCD	GND
12	GND	1DSR	1RTS	1CTS	HSYNC (GND)	2TXD	GND
11	GND	1DTR	BOUT (GND)	IDE_PD[9]	1DCD	1RIN	GND
10	GND	IDE_PD[8]	IDE_RST#	1TXD	IDE_PD[10]	1RXD	GND
9	GND	IDE_PD[6]	IDE_PD[7]	IDE_PD[4]	IDE_PD[5]	IDE_PD[11]	GND
8	GND	IDE_PD[3]	IDE_PD[12]	IDE_PD[2]	GND	IDE_PD[1]	GND
7	GND	IDE_PD[14]	IDE_PD[0]	IDE_PD[15]	IDE_PDRQ#	IDE_PIOW #	GND
6	GND	IDE_PIOR	IDE_PIORDY	IDE_PDACK #	IDE_PD[13]	IDE_PIRQ14	GND
5	GND	IDE_PA[1]	GND	IDE_PA[0]	IDE_PA[2]	TH_GP/SLP_S3	GND
4	GND	VIO	VCC	IDE_PCS1#	GND	IDE_PCS3#	GND
3	GND	CLK4	GND	GNT3#	REQ4#	GNT4#	GND
2	GND	CLK2	CLK3	SYSEN#	GNT2#	REQ3#	GND
1	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND

1) These signals can only be used on the rear I/O interface, and are supported in conjunction with the CP306-EXT-PS2-RIO module when used on the 4 HP CP306 version.

Table B-3: P2 (J2) Connector Pin Out for the System Controller Slot

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P1 (J1) Connector Pin Out for the Star Trigger Slot

Pin	Z	A	B	C	D	E	F
25	GND	5V	REQ64#	ENUM#	3.3V	5V	GND
24	GND	AD[1]	5V	V(I/O)	AD[0]	ACK64#	GND
23	GND	3.3V	AD[4]	AD[3]	5V	AD[2]	GND
22	GND	AD[7]	GND	3.3V	AD[6]	AD[5]	GND
21	GND	3.3V	AD[9]	AD[8]	M66EN	C/BE[0]#	GND
20	GND	AD[12]	GND	V(I/O)	AD[11]	AD[10]	GND
19	GND	3.3V	AD[15]	AD[14]	GND	AD[13]	GND
18	GND	SERR#	GND	3.3V	PAR	C/BE[1]#	GND
17	GND	3.3V	IPMB_SCL	IPMB_SDA	GND	PERR#	GND
16	GND	DEVSEL#	GND	V(I/O)	STOP#	LOCK#	GND
15	GND	3.3V	FRAME#	IRDY#	BD_SEL#	TRDY#	GND
12–14	Key	Area					
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2]#	GND
10	GND	AD[21]	GND	3.3V	AD[20]	AD[19]	GND
9	GND	C/BE[3]#	IDSEL	AD[23]	GND	AD[22]	GND
8	GND	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND
6	GND	REQ#	GND	3.3V	CLK	AD[31]	GND
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND	GNT#	GND
4	GND	IPMB_PWR	HEALTHY#	V(I/O)	INTP	INTS	GND
3	GND	INTA#	INTB#	INTC#	5V	INTD#	GND
2	GND	TCK	5V	TMS	TDO	TDI	GND
1	GND	5V	–12V	TRST#	+12V	5V	GND

Table B-4: P1 (J1) Connector Pin out for the Star Trigger Slot

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P2 (J2) Connector Pin Out for the Star Trigger Slot

Pin	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	PXI_LBR0	GND	PXI_LBR1	PXI_LBR2	PXI_LBR3	GND
20	GND	PXI_LBR4	PXI_LBR5	PXI_STAR0	GND	PXI_STAR1	GND
19	GND	PXI_STAR2	GND	PXI_STAR3	PXI_STAR4	PXI_STAR5	GND
18	GND	PXI_TRIG3	PXI_TRIG4	PXI_TRIG5	GND	PXI_TRIG6	GND
17	GND	PXI_TRIG2	GND	RSV	PXI_CLK10_IN	PXI_CLK10	GND
16	GND	PXI_TRIG1	PXI_TRIG0	RSV	GND	PXI_TRIG7	GND
15	GND	PXI_BRSVA15	GND	RSV	PXI_STAR6	PXI_LBR6	GND
14	GND	AD[35]	AD[34]	AD[33]	GND	AD[32]	GND
13	GND	AD[38]	GND	V(I/O)	AD[37]	AD[36]	GND
12	GND	AD[42]	AD[41]	AD[40]	GND	AD[39]	GND
11	GND	AD[45]	GND	V(I/O)	AD[44]	AD[43]	GND
10	GND	AD[49]	AD[48]	AD[47]	GND	AD[46]	GND
9	GND	AD[52]	GND	V(I/O)	AD[51]	AD[50]	GND
8	GND	AD[56]	AD[55]	AD[54]	GND	AD[53]	GND
7	GND	AD[59]	GND	V(I/O)	AD[58]	AD[57]	GND
6	GND	AD[63]	AD[62]	AD[61]	GND	AD[60]	GND
5	GND	C/BE[5]#	GND	V(I/O)	C/BE[4]#	PAR64	GND
4	GND	V(I/O)	PXI_BRSVB4	C/BE[7]#	GND	C/BE[6]#	GND
3	GND	PXI_LBR7	GND	PXI_LBR8	PXI_LBR9	PXI_LBR10	GND
2	GND	PXI_LBR11	PXI_LBR12	UNC	PXI_STAR7	PXI_STAR8	GND
1	GND	PXI_STAR9	GND	PXI_STAR10	PXI_STAR11	PXI_STAR12	GND

Table B-5: P2 (J2) Connector Pin out for the Star Trigger Slot

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P1 (J1) Connector Pin Out for the Peripheral Slot

Pin	Z	A	B	C	D	E	F
25	GND	5V	REQ64#	ENUM#	3.3V	5V	GND
24	GND	AD[1]	5V	V(I/O)	AD[0]	ACK64#	GND
23	GND	3.3V	AD[4]	AD[3]	5V	AD[2]	GND
22	GND	AD[7]	GND	3.3V	AD[6]	AD[5]	GND
21	GND	3.3V	AD[9]	AD[8]	M66EN	C/BE[0]#	GND
20	GND	AD[12]	GND	V(I/O)	AD[11]	AD[10]	GND
19	GND	3.3V	AD[15]	AD[14]	GND	AD[13]	GND
18	GND	SERR#	GND	3.3V	PAR	C/BE[1]#	GND
17	GND	3.3V	IPMB_SCL	IPMB_SDA	GND	PERR#	GND
16	GND	DEVSEL#	GND	V(I/O)	STOP#	LOCK#	GND
15	GND	3.3V	FRAME#	IRDY#	BD_SEL#	TRDY#	GND
12–14	Key	Area					
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2]#	GND
10	GND	AD[21]	GND	3.3V	AD[20]	AD[19]	GND
9	GND	C/BE[3]#	IDSEL	AD[23]	GND	AD[22]	GND
8	GND	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND
6	GND	REQ#	GND	3.3V	CLK	AD[31]	GND
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND	GNT#	GND
4	GND	IPMB_PWR	HEALTHY#	V(I/O)	INTP	INTS	GND
3	GND	INTA#	INTB#	INTC#	5V	INTD#	GND
2	GND	TCK	5V	TMS	TDO	TDI	GND
1	GND	5V	–12V	TRST#	+12V	5V	GND

Table B-6: P1 (J1) Connector Pin out for the Peripheral Slot

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P2 (J2) Connector Pin Out for the Peripheral Slot

Pin	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	PXI_LBR0	GND	PXI_LBR1	PXI_LBR2	PXI_LBR3	GND
20	GND	PXI_LBR4	PXI_LBR5	PXI_LBL0	GND	PXI_LBL1	GND
19	GND	PXI_LBL2	GND	PXI_LBL3	PXI_LBL4	PXI_LBL5	GND
18	GND	PXI_TRIG3	PXI_TRIG4	PXI_TRIG5	GND	PXI_TRIG6	GND
17	GND	PXI_TRIG2	GND	RSV	PXI_STAR	PXI_CLK10	GND
16	GND	PXI_TRIG1	PXI_TRIG0	RSV	GND	PXI_TRIG7	GND
15	GND	PXI_BRSVA15	GND	RSV	PXI_LBL6	PXI_LBR6	GND
14	GND	AD[35]	AD[34]	AD[33]	GND	AD[32]	GND
13	GND	AD[38]	GND	V(I/O)	AD[37]	AD[36]	GND
12	GND	AD[42]	AD[41]	AD[40]	GND	AD[39]	GND
11	GND	AD[45]	GND	V(I/O)	AD[44]	AD[43]	GND
10	GND	AD[49]	AD[48]	AD[47]	GND	AD[46]	GND
9	GND	AD[52]	GND	V(I/O)	AD[51]	AD[50]	GND
8	GND	AD[56]	AD[55]	AD[54]	GND	AD[53]	GND
7	GND	AD[59]	GND	V(I/O)	AD[58]	AD[57]	GND
6	GND	AD[63]	AD[62]	AD[61]	GND	AD[60]	GND
5	GND	C/BE[5]#	GND	V(I/O)	C/BE[4]#	PAR64	GND
4	GND	V(I/O)	PXI_BRSVB4	C/BE[7]#	GND	C/BE[6]#	GND
3	GND	PXI_LBR7	GND	PXI_LBR8	PXI_LBR9	PXI_LBR10	GND
2	GND	PXI_LBR11	PXI_LBR12	UNC	PXI_LBL7	PXI_LBL8	GND
1	GND	PXI_LBL9	GND	PXI_LBL10	PXI_LBL11	PXI_LBL12	GND

Table B-7: P2 (J2) Connector Pin out for the Peripheral Slot

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Appendix C – Rear Panel Connector Layout

This section provides information on the rear panel connectors of the GX7300, GX7302 and GX7305 (when used in conjunction with an embedded controller). Note: Not all of these connectors are applicable to each chassis model.

Serial Port Connector

Connector Type: D-Sub, 9 pins

Mating Connector: 9-pin D-Sub, Female

Pin #	Signal Name	Signal Function	Direction
1	DCD	Data carrier detect	In
2	RXD	Receive data	In
3	TXD	Transmit data	Out
4	DTR	Data terminal ready	Out
5	GND	Signal ground	--
6	DSR	Data send request	In
7	RTS	Request to send	Out
8	CTS	Clear to send	In
9	RI	Ring indicator	In

Table C-1: Serial Port Connector Pin out

Ethernet Connector

Connector Type: RJ45

Mating Connector: RJ45, Male

Pin #	Signal Name	Signal Function	Direction
1	TX+	Transmit +	Out
2	TX-	Transmit –	Out
3	RX+	Receive +	In
4	NC	--	--
5	NC	--	--
6	RX-	Receive –	In
7	NC	--	--
8	NC	--	--

Table C-2: Ethernet Connector Pin out

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USB Connector

Connector Type: USB

Mating Connector: USB

Pin #	Signal Name	Signal Function	Direction
1	VCC	VCC	--
2	UV0-	Differential USB-	In/Out
3	UV0+	Differential USB+	In/Out
4	GND	GND	--

Table C-3: USB Connector Pin out

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Appendix D – Model Numbers

Chassis and Controller Model Numbers

The following are the PXI chassis and controller model numbers:

Model #	Description
GX7300	2U, 20 Slot PXI Chassis with built-in DVD-RW drive and Hard Disk drives.
GX7310	3U, 20 Slot PXI Chassis for use with a remote controller
GX7300R	3U, 20 slot PXI chassis with DVD-RW and Hard Disk drives with rack mount
GX7310R	3U, 20 slot PXI chassis with rack mount. For use with PXI bus expander
GX7302-MP	3U, 20 slot PXI chassis with DVD-RW, hard drive, and MacPanel receiver. Includes cable tray and recessed chassis with front door assembly
GX7312-MP	3U, 20 slot PXI chassis with MacPanel receiver for use with remote controller. Includes cable tray and recessed chassis with front door assembly
GX7302	3U, 20 slot PXI chassis with DVD-RW and hard drive. Includes cable tray and recesses chassis with front door assembly
GX7312	3U, 20 slot PXI chassis for use with remote controller. Includes cable tray and recessed chassis with front door assembly
GX7305	3U, 20 slot, high power PXI chassis with hard drive. Includes cable tray and recessed chassis with front door assembly
GX7315	3U, 20 slot, high power PXI chassis for use with remote controller. Includes cable tray and recessed chassis with front door assembly
GX7930-14512	CPU Plug-in controller for GX7300. 1.4 GHz/512 MB RAM, Pentium M
GX7930-181024	CPU Plug-in controller for GX7300. 1.8 GHz/1 GB RAM, Pentium M
GX7930-14512E	CPU Plug-in controller for GX7300.1.4 GHz/512 MB RAM, Pentium extended temperature range, -40 to +85 C
GX7934-152048	CPU, Plug-in controller for GX7300. 1.5 GHz / 2 MB RAM, Core 2 Duo

Chassis Accessory Model Numbers

The following are the PXI chassis accessory model numbers:

Model #	Description
GX97111	Blank Panel for GX7300, 1-slot wide
GX97112	Blank Panel for GX7300, 2-slots wide
GX97114	Blank Panel for GX7300, 4-slots wide

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Index

.

.NET i

3

3U Boards 3, 4, 8, 11, 12

6

6U Boards 4, 12, 94

A

AC Input Power 80
Air Intake Panel 8
Architecture 1
ATEasy ..... i, 4, 30, 31, 34, 35

B

Board Handle 36
Borland 30, 34, 35
Borland-Delphi 35

C

C/C++ 30, 31, 34
C++ 34
CD-ROM 4, 94
Chassis Accessory Model Numbers 94
Chassis Configuration 24
Chassis Description 1
Chassis Description 8
Chassis Description 9
Chassis Installation 24
Chassis Model Numbers 94
Clock 82
COM 9
CompactPCI 3, 4, 84
Corrupt files 32
cPCI 3, 4, 8, 11, 12, 29, 83

D

Delphi ..... i, 30, 34, 35
Dimensions, GX7300 83
Directories 30
Distributing 36
Driver
  Directory 30
  Files 30
DVD-ROM 8

E

Environmental 83
Error-Handling 36
Ethernet Connector 9, 10, 92
Example 31

F

Fan 82
Features 4
Functions Reference 44

G

GPIB 4, 29
GX7300 PXI chassis 1
GX7300 Slots 11
GX7310 ..... 4, 5, 15, 81, 94
GX7310 Slots 11
GX7900 ..... 5, 8, 9, 92, 94
GX7990 ..... 4, 5, 8, 11, 25, 94
GxChassis
  Driver-Description 34
  Header-file 34
  Help-File-Description 31
  Panel-File-Description 30
  Supported-Development-Tools 34
GxChassis driver Features 16
GxChassis Functions 45
GxChassis.bas 30
GxChassis.BAS 34
GxChassis.dll 30, 34, 35
GxChassis.exe 36
GxChassis.h 30, 34
GxChassis.lib 34
GxChassis.LIB 30
GxChassis.pas 30, 35
GxChassis.vb 30
GxChassisBC.lib 34
GxChassisBC.LIB 30
GxChassisGetAlarmMode 46
GxChassisGetAlarmTemperature 47
GxChassisGetBoardSummary 48
GxChassisGetDriverSummary 36
GxChassisGetDriverSummary 49
GxChassisGetErrorString 36
GxChassisGetFanSpeed 53, 71
GxChassisGetFanThresholdTemperatures 54
GxChassisGetPowerSuppliesVoltages 52
GxChassisGetPxiTriggerLine 55, 57
GxChassisGetShutdownTemperature 58
GxChassisGetSlotsTemperatures 59

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GxChassisGetSlotsTemperaturesStates 60
GxChassisGetSlotsTemperaturesStatistics 61
GxChassisGetSlotTemperature.....62
GxChassisGetTemperatureScale 63
GxChassisGetTemperatureThresholdMode.....64
GxChassisInitialize.....36, 65
GxChassisPanel 36, 66
GxChassispanel.exe.....30
GxChassisRecallSettings 67
GxChassisResetPxiTriggerLines 68
GxChassisSetAlarmMode.....69
GxChassisSetAlarmTemperature.....70
GxChassisSetFanThresholdTemperatures 72
GxChassisSetPxiTriggerLine 73
GxChassisSetShutdownTemperature.....75
GxChassisSetSlotsTemperaturesStates.....76
GxChassisSetTemperatureScale 77
GxChassisSetTemperatureThresholdMode 78
GXCNT 26

H

handle 28
Handle 36
HW 26, 30, 36

I

Input Power Receptacle 9, 10
Inspecting the GX7300 24
Installation
  Chassis.....24
  Mounting information.....24
  PXI Module 28
Installation Directories 30

J

J1 *See* P1
J2 88, *See* P2

L

LabView 32
Line Voltage Selection 24
Local Bus.....13

M

Model Numbers 94

N

nHandle 35, 36

O

OnError.....35
Optional Equipment.....7

P

P1.....12, 85, 87, 89
P2.....12, 86, 88, 90
Panel 17, 18, 20, 21, 22, 30, 32, 36
Pascal.....30, 34, 35
PCI.....30
Pinouts 84
pnStatus 36
Power Distribution.....15
Power Supplies 80
Power Switch.....8
Program-File-Descriptions 30
Programming
  Borland-Delphi 35
  Error-Handling 36
  Panel-Program 36
PXI.....3, 4, 8, 17, 27, 28, 29
PXI Bus Segments 12
PXI Instrument Removal 29
PXI Module Installation 28
PXI Slots.....11
Pxi Trigger Lines 20
PXI/PCI Explorer 17, 27

R

README.TXT 30, 31
Readme-File 31
Rear Panel.....92
RS-232.....5, 29

S

Sample Program Listing 37
Sample Programs.....37
Serial.....4
Serial COM ports.....9
Serial Port Connector.....92
Setup 26, 30, 32
Setup Maintenance Program.....32
Slot..... 4, 8, 12, 15, 28, 81, 83, 87, 88, 89, 90, 94
Slots 4, 11, 12, 83, 84
  Star Trigger.....8, 12
  System 8, 12, 15, 83, 85, 86
Specifications 1, 80
Stand Alone Configuration 25
System
  Directory.....30
System Reference Clock.....14, 15

T

Temperature Settings.....18
Trigger Bus.....13, 14

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U

Unpacking the GX7300 24
USB Connector 93
USB Connectors 9, 10
Using External Instruments 29

V

Virtual Panel 17, 18, 20, 21, 22, 26, 30
  About Page 22
  Advanced page 21
  Initialize Dialog 17
Virtual Panel Description 17
Visual Basic ..... i, 34
Visual C++ ..... i, 30, 34
VXI 4, 29

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