

GX3748 SERIES



48 CHANNEL THRESHOLD COMPARATOR FPGA PXI CARD

- 48 Threshold Comparator Channels
- Timestamp Capability on Selected Channels
- Wide Input Voltage Range: 0 to 50 volts
- PXI hybrid slot compatible



DESCRIPTION

The GX3748 is a user configurable, FPGA-based, 3U PXI card which features 48 voltage comparator channels. The daughter board interfaces to the GX3700 FPGA baseboard which employs the Altera Stratix III FPGA. Each input channel can accept input voltage signals from 0 to 50 volts, with programmable threshold levels. Three of the 48 channels are supported by the board's timestamp event feature.

FEATURES

The GX3748 offers the following capabilities:

- 48 threshold comparators
- Timestamp capabilities on any three of the 48 channels
- Programmable window threshold comparator for 16 channels
- Programmable level threshold level for 32 channels
- 0 to 50 volt input voltage range
- 3 Digitizer channels
- Voltage measurement on all channels
- Selectable pull-up / pull-down resistors on each input channel
- Cable ID input

The GX3748 has three modes of operation: direct read of each threshold comparator state, generation of a system interrupt or a PXI trigger based on the occurrence of a pre-defined comparator state event, and timestamp functionality for 3 of the 48 comparator channels. Any single channel from each group can be connected to a digitizer with 87,300 sample memory; additionally, the voltage level for all 48 channels can be read. Four programmable voltage sources provide the 2 threshold levels for the window comparators with the remaining two voltage sources providing the threshold levels for channels 17 to 32 and channels 33 to 48 respectively.

Timestamp functionality records both the state and time of events for three of the 48 channels. Any of the 48 channels can be selected for time stamping. Minimum recording time is 4 minutes with 1 uSec of resolution. Recording time will be longer with lower timestamp resolution. The user has the ability to capture all states or only transitions.

The module has access to all of the PXI bus resources including the PXI 10 MHz clock, the local bus, and the PXI triggers; allowing the user to create a custom instrument which incorporates all PXI bus resources. Control and access to the FPGA is provided via the GX3748's driver which includes the ability to download compiled FPGA code as well as perform register reads and writes.

PROGRAMMING AND SOFTWARE

The board is supplied with the GxFPGA library, a software package that includes a virtual instrument panel, and a Windows 32/64-bit DLL driver library and documentation. The virtual panel can be used to interactively program and control the instrument from a window that displays the instrument's current settings and status. In addition, interface files are provided to support access to programming tools and languages such as [ATEasy](#), LabVIEW, LabVIEW/Real-Time, C/C++, Microsoft Visual Basic®, Delphi, and Pascal. An On-Line help file and PDF User's Guide provides documentation that includes instructions for installing, using and programming the board.

APPLICATIONS

- Automatic Test Equipment (ATE)
- Custom interface emulation
- Custom instrumentation

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SPECIFICATIONS

THRESHOLD COMPARATOR CHANNELS	
Number of Channels	48
Input Voltage Range	0 to 50 volts
Input Impedance	> 1 M Ohm
Selectable Pull-Up	10 k Ohm per channel, controlled for each group of 16 connected to an external pull-up voltage source
Selectable Pull-Down	10 k Ohm per channel, controlled for each group of 16 connected to ground
Comparator Window / Threshold Sources	4, programmable, 0 to 50 V range Resolution: 12 mV Accuracy: ± 100 mV + 2% of programmed value
Window Comparator	Channels 1 - 16, programmable high and low thresholds
Threshold Comparator	Channels 17 - 48, programmable threshold voltage sources for channels 17-32 & channels 33-48
Comparator Response Time	400 ns (typ), 1 us max.
Comparator Channel Voltage Measurement	Range: 0 to 50 V Resolution: 12 mV Accuracy: ± 5 mV
INTERRUPT AND PXI TRIGGER GENERATION	
Source	Any or all of the 48 comparator channels
Event Hold-off Time	Resolution: 1 us Range: 1 uSec to 1 Second
DIGITAL EVENT CAPTURE	
Functionality	Timestamp events and / or states from any of the (3) comparator channels
Number of Channels	3
Source	3 of the 48 comparator channels
Recorded Events or States	12K max.
Timestamp Resolution	1 usec (min)
Timestamp Range	1 uSec to 1 mSec Selectable 1×2^N , N = 0 to 15 uSec

Timestamp Record Duration	4 min. @ 1 usec resolution
DIGITIZER	
Functionality	Samples input of one selected channel from each group
Number of Channels	3
Source	(1) from each group
Sample Memory	83,700 Samples per channel (max.)
Sample Clock Resolution	1 uSec
Sample Clock Range	1 uSec to 1 mSec Selectable 1×2^N , N = 0 to 8 uSec
TIMING SOURCES	
PXI Bus	10 MHz
Internal	80 MHz oscillator, ± 20 ppm
FPGA AND MEMORY	
FPGA Type	Altera Stratix III, EP3SL50F780
Number of PLLs	Four
Logic Elements	47.5 K
Internal Memory	1.836 Mb
On-Board Memory	256 K x 32 SSRAM
On-Board Flash	16 MB
CABLE ID	
Digital I/O Inputs	3 bits
Logic Level	TTL
POWER	
3.3 VDC	1.5 A max.
5 VDC	0.4 A typical, 1 A max.
+12 VDC	0.5 A max.
-12 VDC	0.1 A max.

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ENVIRONMENTAL AND PHYSICAL	
Operating Temperature Range	GX3748: 0 °C to +50 °C GX3748-M: 0 °C to +83 °C; contact factory for extended temperature range specifications
Storage Temperature Range	-20 °C to +85°C
Relative Humidity (operating)	5% to 85%, temperature range 0°C to 60°C 5% to 60% for operating temperatures above 60°C
Altitude (operating)	4600 meters (max)
Connector	62 pin, D-sub female
Size	3U PXI, hybrid slot compatible
Weight	200 g

Note: Specifications are subject to change without notice

ORDERING INFORMATION

GX3748	PXI FPGA 48 - Channel Threshold Comparator Card
GX3748-M	PXI FPGA 48 - Channel Threshold Comparator Card - Ruggedized / Extended Temp

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