

# GX5641 SERIES



## BI-DIRECTIONAL DIFFERENTIAL-TTL I/O PXI CARD

- 64 bi-directional conversion channels or 128 digital I/O channels
- Channels can be programmed to operate in conversion or static I/O modes via software control
- Each TTL and differential output port can be individually enabled/disabled via software control
- I/O compatible with NI PXI 7811R / 7813R DAQ FPGA modules
- PXI hybrid slot compatible



## DESCRIPTION

The GX5641 is a 3U PXI instrument card that can be used for general data acquisition, process control, Automatic Test Equipment (ATE), functional test, and factory automation applications. The GX5641 consists of 64 bi-directional TTL-differential I/O channels. Each channel has two ports (TTL and differential) which can be individually set to operate in either conversion or static I/O modes.

The GX5641 can support 128 individual digital inputs or outputs, 64 TTL, and 64 differential, or 64 conversion channels. Each channel on the GX5641 can be individually programmed to operate in conversion or static modes. Conversion direction defaults can be set by configuring on board switches. Depending on the selected mode, the GX5641's channels can be predefined to convert TTL to differential or vice versa.

## FEATURES

Each channel of the GX5641 can be individually set under software control to operate in one of two modes: conversion or static I/O.

In static I/O mode the GX5641 supports 128 individual digital inputs or outputs: 64 TTL and 64 differential ports. The direction of each of these ports can be individually set under software control to be an output or input; e.g., Channel 1 differential port output and Channel 1 TTL port input.

In conversion mode the GX5641 supports 64 individual channels, each of which can be programmed to convert TTL to differential or differential to TTL. Each channel's predefined DIP-switch conversion direction can be loaded at any time, overriding current settings (predefined defaults).

In both modes of operation, the TTL and differential signals can be monitored. On power-up, all 64 channel outputs are disabled. The GX5641 includes a 100-Ohm terminator for each differential I/O signal.

The GX5641 can also be configured to operate as an independent module, without software control. When configured in independent mode, the module operates in the conversion mode only and the direction of each channel is set at power-up according to the default direction switch settings.

The module's I/O is pin compatible with the NI PXI 7811R / 7813R FPGA modules, which allows the customer to use standard, 68 pin SCSI interconnect cables.

## PROGRAMMING AND SOFTWARE

The board is supplied with the GXPIO 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.

A separate software package - [GtLinux](#) - provides support for Linux 32/64 operating systems.

## APPLICATIONS

- Automatic Test Equipment (ATE) and Functional Test
- Data Acquisition
- Process Control
- Factory Automation



# GX5641 SERIES



## SPECIFICATIONS

CHANNEL SPECIFICATIONS, GX5641 AND GX5641-XC			
Number of Channels	128; 64 TTL, 64 Differential		
Maximum Data Rate	35 Mbps		
Propagation Delay, TTL to RS-422	11.5 ns, max		
Propagation Delay, RS-422 to TTL	18 ns, max		
GX5641-XC Tri-State Control	TTL channel 31 (active Hi) tri-states differential channels 0-31 TTL channel 63 (active Lo) tri-states differential channels 32-63		
TTL I/O Levels	Minimum	Typical	Maximum
Input Low	0.0 V		0.8 V
Input High	2.0 V		5.0 V
Output Low, 8 mA Iol	0.0 V	0.2 V	0.45 V
Output High, -400 uA, Ioh	2.7 V	3.0 V	5.0 V
RS-422 / RS-485 I/O Levels; Conforms to TIA/EIA 422-B, 485-A, V.11 & X.27	Minimum	Typical	Maximum
Receiver Differential Threshold	-0.2 V		0.2 V
Receiver Input Hysteresis		60 mV	
Driver Differential $V_{out}$	1.5 V	2.5 V	5.0 V
Driver Common-Mode Range, $V_{out}$	-1		3 V

CHANNEL SPECIFICATIONS, GX5641-3			
Number of Channels	128; 64 TTL (3.3V), 64 Differential		
Maximum Data Rate	32 Mbps		
Propagation Delay, TTL to RS-485	16 ns, max		
Propagation Delay, RS-485 to TTL	25 ns, max		
TTL I/O Levels	Minimum	Typical	Maximum
Input Low	0.0 V		0.8 V
Input High	2.0 V		3.3 V
Output Low, 8 mA Iol			0.4 V
Output High, 8 mA, Ioh	2.4 V		
RS-485 I/O Levels; Conforms to TIA/EIA 485A & ISO 8442:1993	Minimum	Typical	Maximum
Receiver Differential Threshold	-0.2 V		0.01V
Receiver Input Hysteresis		35 mV	
Driver Differential $V_{out}$	1.5 V		3.3 V
Driver Common-Mode Range, $V_{out}$	-1.4 V		2.5 V
POWER - GX5641 AND GX5641-XC			
3.3 $V_{DC}$	0.5 A (max)		
5 $V_{DC}$	1.2 A (typ), 3.8 A (max)		
POWER - GX5641-3			
3.3 $V_{DC}$	1 A (typ), 3.5 A (max)		
5 $V_{DC}$	0.2 A (max)		

DIGITAL I/O



# GX5641 SERIES



ENVIRONMENTAL	
Operating Temperature Range	0 °C to +55 °C
Storage Temperature Range	-20 °C to +70 °C
PHYSICAL	
Size	3U PXI, hybrid slot compatible
Weight	18 oz

Note: Specifications are subject to change without notice

## ORDERING INFORMATION

<b>GX5641</b>	64-Channel Bi-Directional TTL to RS-422 Converter, 3U PXI
<b>GX5641-3</b>	64-Channel Bi-Directional TTL to RS-422 Converter, 3.3V, 3U PXI
<b>GX5641-XC</b>	62-Channel TTL to RS-422 Converter with External Control, 3U PXI

ACCESSORY	
<b>TS-900e-5G-BMC</b>	Blind mate connectors (one pair), DC - 40 GHz, 2.92mm
<b>GT95015</b>	Connector Interface for all Gx5xxx/GX3xxx, SCSI to 100 Mil Grid, Differential
<b>GT95021</b>	2 ft. Shielded Cable for all 5xxx/35xx (68 Pin)
<b>GT95022</b>	3 ft Shielded Cable for all 5xxx/35xx (68 Pin)
<b>GT95022E</b>	3 ft Shielded Cable for all 5xxx/35xx (68 Pin) Not Terminated One End
<b>GT95028</b>	10 ft shielded cable for 5xxx/35xx products (68 Pin)
<b>GT95031</b>	6 ft Shielded Cable for all 5xxx/35xx (68 Pin)
<b>GT95035E-48</b>	Shielded Flying Lead Cable for all 5xxx/35xx (68 Pin), 48".
<b>GT95025</b>	Connector Interface, 68-Pin SCSI to TTI Testron 170-Pin Signal Block
<b>GX98303</b>	3U "Wireless" Scout Adapter for GX528x/GX529x/GX564x/GX5733 (200-Pin Connector)

# GX5641 SERIES



THIS PAGE INTENTIONALLY LEFT BLANK

DIGITAL I/O

