

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Visit our website - *Click HERE*

PCI-104-Express-FBxx

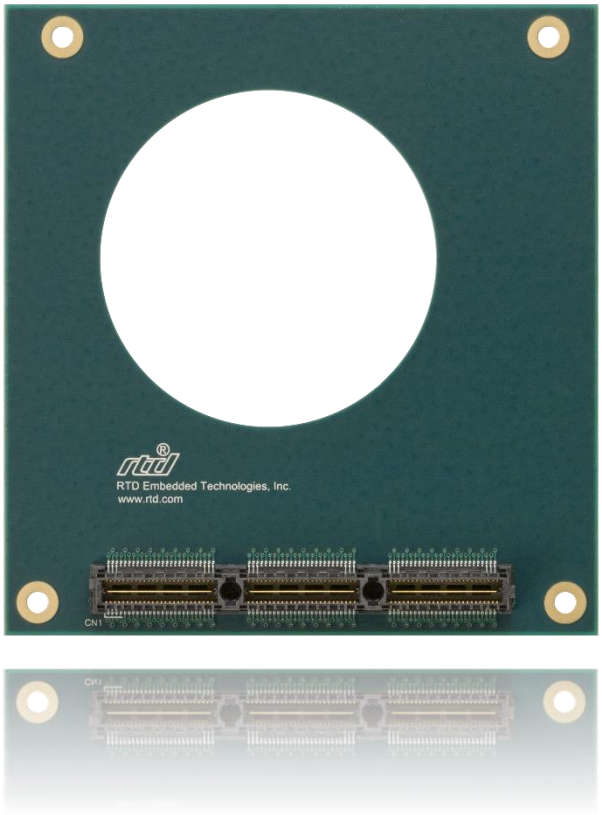
PCIe-104-FBxx

PCI-104-FBxx

PCIe-104-SBxx

PCI-104-SBxx

Spacer Board



User's Manual

BDM-610040018 Rev. A

RTD Embedded Technologies, Inc.
AS9100 and ISO 9001 Certified

RTD Embedded Technologies, Inc.
103 Innovation Boulevard
State College, PA 16803 USA
Telephone: 814-234-8087
Fax: 814-234-5218

www.rtd.com

sales@rtd.com
techsupport@rtd.com







Revision History

Rev A	Initial Release

Advanced Analog I/O, Advanced Digital I/O, aAIO, aDIO, a2DIO, Autonomous SmartCal, "Catch the Express", cpuModule, dspFramework, dspModule, expressMate, ExpressPlatform, "MIL Value for COTS prices", multiPort, PlatformBus, and PC/104EZ are trademarks, and "Accessing the Analog World", dataModule, IDAN, HiDAN, HiDANplus, RTD, and the RTD logo are registered trademarks of RTD Embedded Technologies, Inc. (formerly Real Time Devices, Inc.). PS/2 is a trademark of International Business Machines Inc. PCI, PCI Express, and PCIe are trademarks of PCI-SIG. PC/104, PC/104-Plus, PCI-104, PCIe/104, PCI/104-Express and 104 are trademarks of the PC/104 Consortium. All other trademarks appearing in this document are the property of their respective owners.

Failure to follow the instructions found in this manual may result in damage to the product described in this manual, or other components of the system. The procedure set forth in this manual shall only be performed by persons qualified to service electronic equipment. Contents and specifications within this manual are given without warranty, and are subject to change without notice. RTD Embedded Technologies, Inc. shall not be liable for errors or omissions in this manual, or for any loss, damage, or injury in connection with the use of this manual.

Copyright © 2016 by RTD Embedded Technologies, Inc. All rights reserved.

Table of Contents

1 Introduction **6**

1.1 Product Overview 6

1.2 Board Features 6

1.3 Ordering Information 6

1.4 Contact Information 7

1.4.1 Sales Support 7

1.4.2 Technical Support 7

2 Specifications **8**

2.1 Operating Conditions 8

3 Board Connection **9**

3.1 Board Handling Precautions 9

3.2 Standoff Height 9

3.3 Physical Characteristics - PCI-104-Express-FBxx, PCIe-104-FBxx, PCI-104-FBxx 9

3.4 Physical Characteristics - PCIe-104-SBxx 10

3.5 Physical Characteristics - PCI-104-SBxx 10

3.6 Steps for Installing 11

4 Troubleshooting **12**

5 Additional Information **13**

5.1 PC/104 Specifications 13

5.2 PCI and PCI Express Specification 13

6 Limited Warranty **14**

Table of Figures

Figure 1: Board Dimensions - PCI-104-Express-FBxx, PCIe-104-FBxx, PCI-104-FBxx 9
Figure 2: Board Dimensions - PCIe-104-SBxx 10
Figure 3: Board Dimensions - PCI-104-SBxx 10
Figure 4: Example 104™ Stack 11

Table of Tables

Table 1: Ordering Options 6
Table 2: Operating Conditions 8

1 Introduction

1.1 Product Overview

RTD Spacer boards can be used in a 104™ stack for several reasons. They can be used to provide additional air flow for boards with high heat dissipation. They can resolve mechanical interference problems between components that exceed the height allocation, or between incompatible bus connectors. They can also be used to provide additional stack height in an enclosure to allow for larger system connectors.

1.2 Board Features

- Based on industry-standard PC/104 specification
- Available in two standoff heights
  - Standard 0.6" [15mm]
  - Extended height 22mm
- Board size options
  - Full-size PC/104 for easier stacking.
  - Small-size for improved airflow

1.3 Ordering Information

The Spacer Boards are available with the following options:

Table 1: Ordering Options

Part Number	Standoff Height Above	PCIe Bus	PCI Bus	Size
PCI-104-Express-FB15	0.6" [15mm]	Yes	Yes	Full-Size
PCI-104-Express-FB22	22mm	Yes	Yes	Full-Size
PCIe-104-FB15	0.6" [15mm]	Yes		Full-Size
PCIe-104-FB22	22mm	Yes		Full-Size
PCI-104-FB15	0.6" [15mm]		Yes	Full-Size
PCI-104-FB22	22mm		Yes	Full-Size
PCIe-104-SB15	0.6" [15mm]	Yes		Small-Size
PCIe-104-SB22	22mm	Yes		Small-Size
PCI-104-SB15	0.6" [15mm]		Yes	Small-Size
PCI-104-SB22	22mm		Yes	Small-Size

Spacer Boards for PC/104 and PC/104-*Plus* are also available. Check the RTD Website (www.RTD.com) for more information.

1.4 Contact Information

1.4.1 Sales Support

For sales inquiries, you can contact RTD Embedded Technologies sales via the following methods:

Phone: 1-814-234-8087 Monday through Friday, 8:00am to 5:00pm (EST).
E-Mail: sales@rtd.com

1.4.2 Technical Support

If you are having problems with your system, please try the steps in the Troubleshooting section of this manual.

For help with this product, or any other product made by RTD, you can contact RTD Embedded Technologies technical support via the following methods:

Phone: 1-814-234-8087 Monday through Friday, 8:00am to 5:00pm (EST).
E-Mail: techsupport@rtd.com

2 Specifications

2.1 Operating Conditions

Table 2: Operating Conditions

Symbol	Parameter	Test Condition	Min	Max	Unit
V_{cc5}	5V Supply Voltage		n/a	n/a	V
V_{cc3}	3.3V Supply Voltage		n/a	n/a	V
V_{cc12}	12V Supply Voltage		n/a	n/a	V
V_{cc-12}	-12V Supply Voltage		n/a	n/a	V
T_a	Operating Temperature		-40	+85	C
T_s	Storage Temperature		-55	+125	C
RH	Relative Humidity	Non-Condensing	0	90%	%
MTBF	Mean Time Before Failure	Telcordia Issue 2 30°C, Ground benign, controlled		TBD	Hours

3 Board Connection

3.1 Board Handling Precautions

To prevent damage due to Electrostatic Discharge (ESD), keep your board in its antistatic bag until you are ready to install it into your system. When removing it from the bag, hold the board at the edges, and do not touch the components or connectors. Handle the board in an antistatic environment, and use a grounded workbench for testing and handling of your hardware.

3.2 Standoff Height

The Spacer Boards are available with either a standard 0.6" [15mm] or extended 22mm standoff height. This affects the distance between the Spacer Board and the board above it, and thus the size of the standoff used above the Spacer Board. The distance between the Spacer Board and the board below it is determined by the board below it.

3.3 Physical Characteristics - PCI-104-Express-FBxx, PCIe-104-FBxx, PCI-104-FBxx

STEP model is available upon request; contact RTD Tech Support for more information.

- Weight: Approximately 55 g (0.12 lbs.)
- Dimensions: 90.17 mm L x 95.89 mm W (3.550 in L x 3.775 in W)

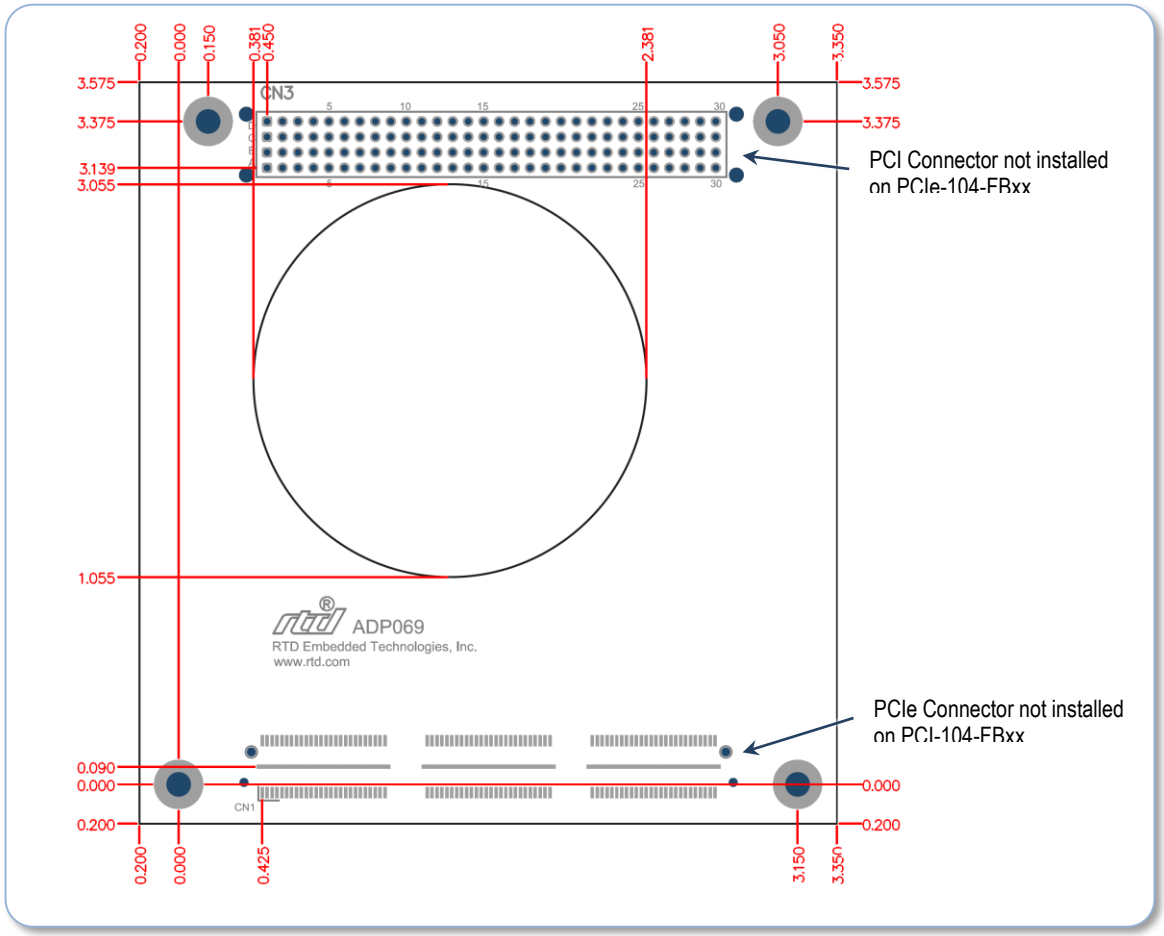


Figure 1: Board Dimensions - PCI-104-Express-FBxx, PCIe-104-FBxx, PCI-104-FBxx

3.4 Physical Characteristics - PCIe-104-SBxx

STEP model is available upon request; contact RTD Tech Support for more information.

- Weight: Approximately 18 g (0.04 lbs.)
- Dimensions: 90.17 mm L x 14.73 mm W (3.550 in L x 0.580 in W)

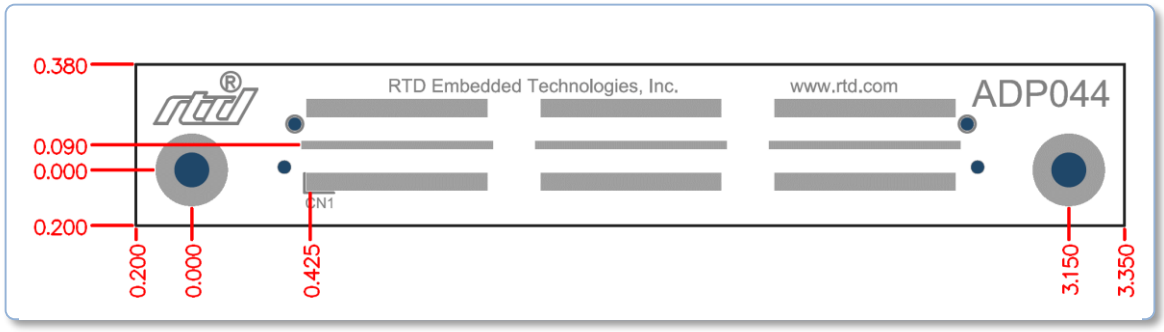


Figure 2: Board Dimensions - PCIe-104-SBxx

3.5 Physical Characteristics - PCI-104-SBxx

STEP model is available upon request; contact RTD Tech Support for more information.

- Weight: Approximately 18 g (0.04 lbs.)
- Dimensions: 90.17 mm L x 14.49 mm W (3.550 in L x 0.570 in W)

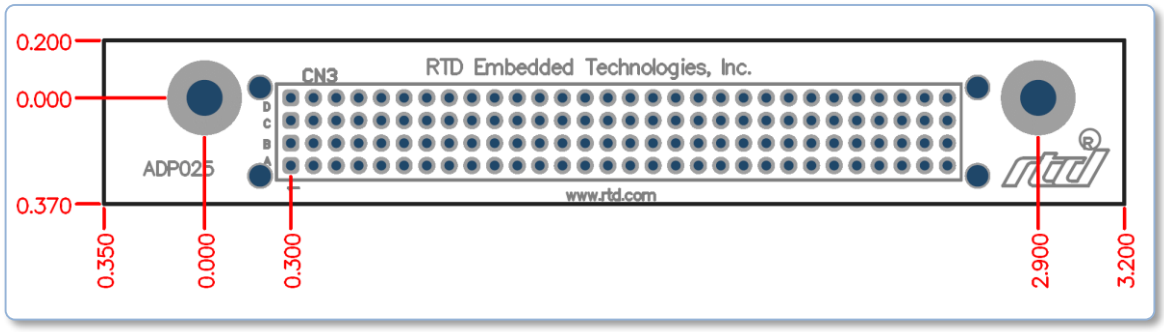


Figure 3: Board Dimensions - PCI-104-SBxx

3.6 Steps for Installing

1. Always work at an ESD protected workstation, and wear a grounded wrist-strap.
2. Turn off power to the PC/104 system or stack.
3. Select and install stand-offs to properly position the module on the stack.
4. Remove the module from its anti-static bag.
5. Check that pins of the bus connector are properly positioned.
6. Check the stacking order; make sure all of the busses used by the peripheral cards are connected to the cpuModule.
7. Hold the module by its edges and orient it so the bus connector pins line up with the matching connector on the stack.
8. Gently and evenly press the module onto the PC/104 stack.
9. If any boards are to be stacked above this module, install them.
10. Attach any necessary cables to the PC/104 stack.
11. Re-connect the power cord and apply power to the stack.
12. Boot the system and verify that all of the hardware is working properly.

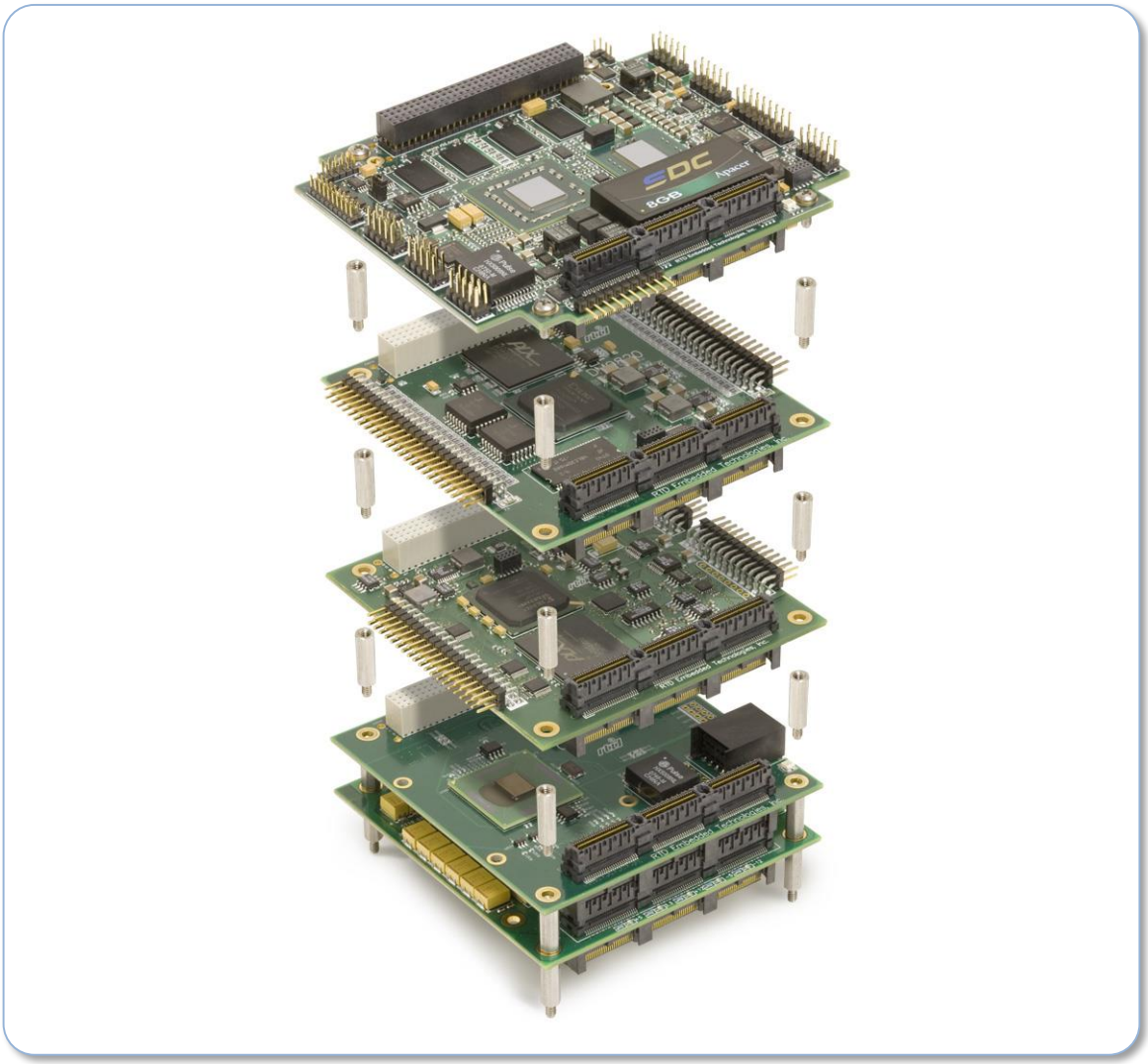


Figure 4: Example 104™ Stack

4 Troubleshooting

If you are having problems with your system, please try the following initial steps:

- **Simplify the System** – Remove modules one at a time from your system to see if there is a specific module that is causing a problem. Perform you troubleshooting with the least number of modules in the system possible.

- **Swap Components** – Try replacing parts in the system one at a time with similar parts to determine if a part is faulty or if a type of part is configured incorrectly.

If problems persist, or you have questions about configuring this product, contact RTD Embedded Technologies via the following methods:

Phone: +1-814-234-8087
E-Mail: techsupport@rtd.com

Be sure to check the RTD web site (http://www.rtd.com) frequently for product updates, including newer versions of the board manual and application software.

5 Additional Information

5.1 PC/104 Specifications

A copy of the latest PC/104 specifications can be found on the webpage for the PC/104 Embedded Consortium:

www.pc104.org

5.2 PCI and PCI Express Specification

A copy of the latest PCI and PCI Express specifications can be found on the webpage for the PCI Special Interest Group:

www.pcisig.com

6 Limited Warranty

RTD Embedded Technologies, Inc. warrants the hardware and software products it manufactures and produces to be free from defects in materials and workmanship for one year following the date of shipment from RTD Embedded Technologies, Inc. This warranty is limited to the original purchaser of product and is not transferable.

During the one year warranty period, RTD Embedded Technologies will repair or replace, at its option, any defective products or parts at no additional charge, provided that the product is returned, shipping prepaid, to RTD Embedded Technologies. All replaced parts and products become the property of RTD Embedded Technologies. Before returning any product for repair, customers are required to contact the factory for a Return Material Authorization (RMA) number.

This limited warranty does not extend to any products which have been damaged as a result of accident, misuse, abuse (such as: use of incorrect input voltages, improper or insufficient ventilation, failure to follow the operating instructions that are provided by RTD Embedded Technologies, “acts of God” or other contingencies beyond the control of RTD Embedded Technologies), or as a result of service or modification by anyone other than RTD Embedded Technologies. Except as expressly set forth above, no other warranties are expressed or implied, including, but not limited to, any implied warranties of merchantability and fitness for a particular purpose, and RTD Embedded Technologies expressly disclaims all warranties not stated herein. All implied warranties, including implied warranties for merchantability and fitness for a particular purpose, are limited to the duration of this warranty. In the event the product is not free from defects as warranted above, the purchaser's sole remedy shall be repair or replacement as provided above. Under no circumstances will RTD Embedded Technologies be liable to the purchaser or any user for any damages, including any incidental or consequential damages, expenses, lost profits, lost savings, or other damages arising out of the use or inability to use the product.

Some states do not allow the exclusion or limitation of incidental or consequential damages for consumer products, and some states do not allow limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you.

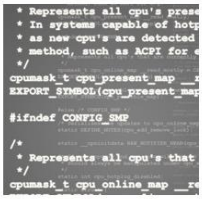
This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

RTD Embedded Technologies, Inc.
103 Innovation Boulevard
State College, PA 16803 USA
Telephone: 814-234-8087
Fax: 814-234-5218

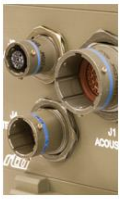
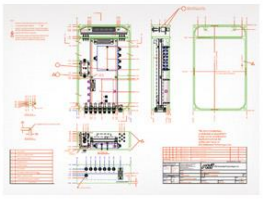
www.rtd.com

sales@rtd.com
techsupport@rtd.com








Copyright 2016 by RTD Embedded Technologies, Inc. All rights reserved.

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP