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.

Find the *Astronics / C&H Technologies VX431C* at our website: ***Click HERE***

U S E R ' S M A N U A L

VXI 8-BIT FIBER OPTIC I/O MODULE FAMILY

MODEL VX431C

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

COPYRIGHT

C&H Technologies, Inc. (C&H) provides this manual "as is" without warranty of any kind, either expressed or implied, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. C&H may make improvements and/or changes in the product(s) and/or program(s) described in this manual at any time and without notice.

This publication could contain technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of this publication.

Copyright © 1993, 1997 by C&H Technologies, Inc.

The information and/or drawings set forth in this document and all rights in and to inventions disclosed herein which might be granted thereon disclosing or employing the materials, methods, techniques or apparatus described herein, are the exclusive property of C&H Technologies, Inc.

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

VME/VXI MODULE WARRANTY

C&H Technologies, Inc. warrants its VME/VXI products to be free from defects in material and workmanship for three (3) years from date of shipment. C&H will repair or replace the defective product without charge within the warranty period, provided the defective item is shipped, freight prepaid, to C&H Technologies, at 15809 Vision Drive, Pflugerville, TX 78660. C&H will pay return freight charges to any point in the continental United States or Canada.

Obligations under this warranty shall be limited to repair or replacement, at C&H's discretion, of any product or part thereof which has been returned by the original purchaser with transportation prepaid and, upon examination by C&H, found to be defective. C&H assumes no responsibility for loss or damage to equipment being returned for repair or replacement under the terms of this warranty. Equipment which, upon examination by C&H, requires repair or replacement of parts thereof as a result of improper installation, misuse, unauthorized alterations or repairs, or user negligence, will have such repairs or replacement of parts made at then current rates.

This warranty does not cover damage caused by misuse, neglect, accident, or improper application or installation. C&H shall not be liable for consequential damages of any kind arising out of the purchase, installation, use or misuse of the product. C&H makes no representation or warranty of any kind, either expressed or implied, with respect to equipment operation or procedures. Any action that the user may take in reliance upon the operation or accuracy of this equipment shall be taken solely at the user's own responsibility and risk.

Please notify the C&H sales department to obtain a Return Authorization Number (RAN) prior to return of a product under the terms of this warranty. Notification is to include the Model and Serial numbers of the product along with full details of the problem. Modules returned should clearly show the RAN on the outside of the package.

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

AMENDMENT NOTICE

C&H Technologies, Inc. makes every attempt to provide up-to-date manuals with the associated equipment. Occasionally, changes are made to the equipment wherein it is necessary to provide amendments to the manual. If any amendments are provided for this manual they are printed on colored paper and will be found at the rear of this manual.

NOTE

The contents of any amendment may affect operation, maintenance, or calibration of the equipment.

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

INTRODUCTION

This manual describes the operation and maintenance requirements of the C&H model VX431C 8-Bit Fiber Optic Input/Output (I/O) Family of VXI modules. These modules represent a subset of the test and data acquisition/control modules in the VME and VXI format provided by C&H.

Contained within this document is information on the physical and electrical specifications, installation and startup procedures, operating procedures, functional description, figures and diagrams required to adequately use this product.

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

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

TABLE OF CONTENTS

1.0 GENERAL DESCRIPTION 1
1.1 PURPOSE OF EQUIPMENT 1
1.2 SPECIFICATIONS OF EQUIPMENT 1
1.2.1 Key Specifications 1
1.2.2 Electrical 1
1.2.3 Environmental 2
1.2.4 Bus Compliance 2
2.0 INSTALLATION 3
2.1 UNPACKING AND INSPECTION 3
2.2 HANDLING PRECAUTIONS 3
2.3 INSTALLATION 3
2.4 PREPARATION FOR RESHIPMENT 3
3.0 FUNCTIONAL DESCRIPTION 5
3.1 GENERAL 5
3.2 SWITCHES, JUMPERS, AND CONTROLS 5
3.2.1 Logical Address Selection 6
3.2.2 Delay Count Reference Clock Selection 6
3.2.3 Output Power Adjustment 6
3.3 INDICATORS 7
3.4.1 Front Panel Connectors 7
3.4.2 Rear Connectors 7
3.5 CONFIGURATION REGISTERS 8
3.5.1 VXI Configuration Registers 8
3.5.2 General Status/Control Register 10
3.5.3 Port Registers 10
3.6 TRIGGER AND DATA LATCH FUNCTIONALITY 13
3.6.1 Trigger Modes 14
3.6.2 Input Latch and Hold Modes 14
3.6.3 Output Latch 15

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

LIST OF FIGURES

Figure 2. Functional Block Diagram 5
Figure 4. Hardware Configurable Controls 6
Figure 6. Front Panel 7
Figure 7. VXI Configuration Registers 9
Figure 8. General Status/Control Register 10
Figure 9. Interrupt Control Register 11
Figure 10. Port Registers (1 of 2) 12
Figure 11. Trigger and Data Latch Functionality 14
Figure 12. Interrupt Service Program Flow 16
Figure 13. Typical Program Flow 19

LIST OF TABLES

Table I. VXI Register Address Map 8
Table II. Trigger Count Reference Clock Period Selection 14

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

1.0 GENERAL DESCRIPTION

The 8-bit fiber optic I/O module is a VXIbus compatible module that provides general purpose optical drive/receive capability.

1.1 PURPOSE OF EQUIPMENT

This module is well suited for applications within ATE systems, data acquisition systems, communications interface, hardware-in-the-loop simulation systems as well as development laboratory environments.

1.2 SPECIFICATIONS OF EQUIPMENT

1.2.1 Key Specifications

- Eight (8) Fiber Optic Driver and Eight (8) Receivers Capability
- Versatile triggering allows synchronization of multiple boards
- Immediate and Delayed Trigger (Data Latch) Capability
- VXI Interrupt Support
- Read back capability of all driver states
- Output drive enable/disable
- Industry standard [1]ST® connectors
- Optional output optical power adjustment

1.2.2 Electrical

The module only requires the +5V supply from the VXI backplane. The peak module current

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

INPUT CHARACTERISTICS:

Input Device:	HFBR-2412
Wavelength:	820 nanometers
Connection Repeatability:	within 0.2 dB (typical)

1.2.3 Mechanical

The mechanical dimensions of the module are in conformance with the VXIbus specification Rev 1.4 for single slot size 'C' modules. The nominal dimensions are 233.35 (9.187 in) high x 340 mm (13.386 in) deep.

1.2.3 Environmental

The environmental specifications of the module are:

Operating Temperature:	0°C to +55°C
Storage Temperature:	-40°C to +75°C
Humidity:	<95% without condensation

1.2.4 Bus Compliance

This module complies with the VXIbus Specification Revision 1.4 for C size register based modules.

Manufacturer ID:	FC1 hex
Model Code:	FF9 hex
Access Type:	Register Based
Addressing:	A16
Data Transfer:	D16
Sysfail:	not supported
Interrupts:	RORA

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

2.0 INSTALLATION

2.1 UNPACKING AND INSPECTION

In most cases the VX431C is individually sealed and packaged for shipment. Verify that there has been no damage to the shipping container. If damage exists then the container should be retained as it will provide evidence of carrier caused problems. Such problems should be reported to the carrier immediately as well as to C&H. If there is no damage to the shipping container, carefully remove the module from its box and plastic bag and inspect for any signs of physical damage. If damage exists, report immediately to C&H.

2.2 HANDLING PRECAUTIONS

The VX431C contains components that are sensitive to electrostatic discharge. When handling the module for any reason, do so at a static-controlled workstation, whenever possible. At a minimum, avoid work areas that are potential static sources, such as carpeted areas. Avoid unnecessary contact with the components on the module.

2.3 INSTALLATION

CAUTION: Read the entire User's Manual before proceeding with the installation and application of power.

Set or verify the module's logical address. Insert the module into the appropriate slot according to the desired priority. Apply power. If no obvious problems exist, proceed to communicate with the module as outlined in Section 4.0 (Operating Instructions).

2.4 PREPARATION FOR RESHIPMENT

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

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

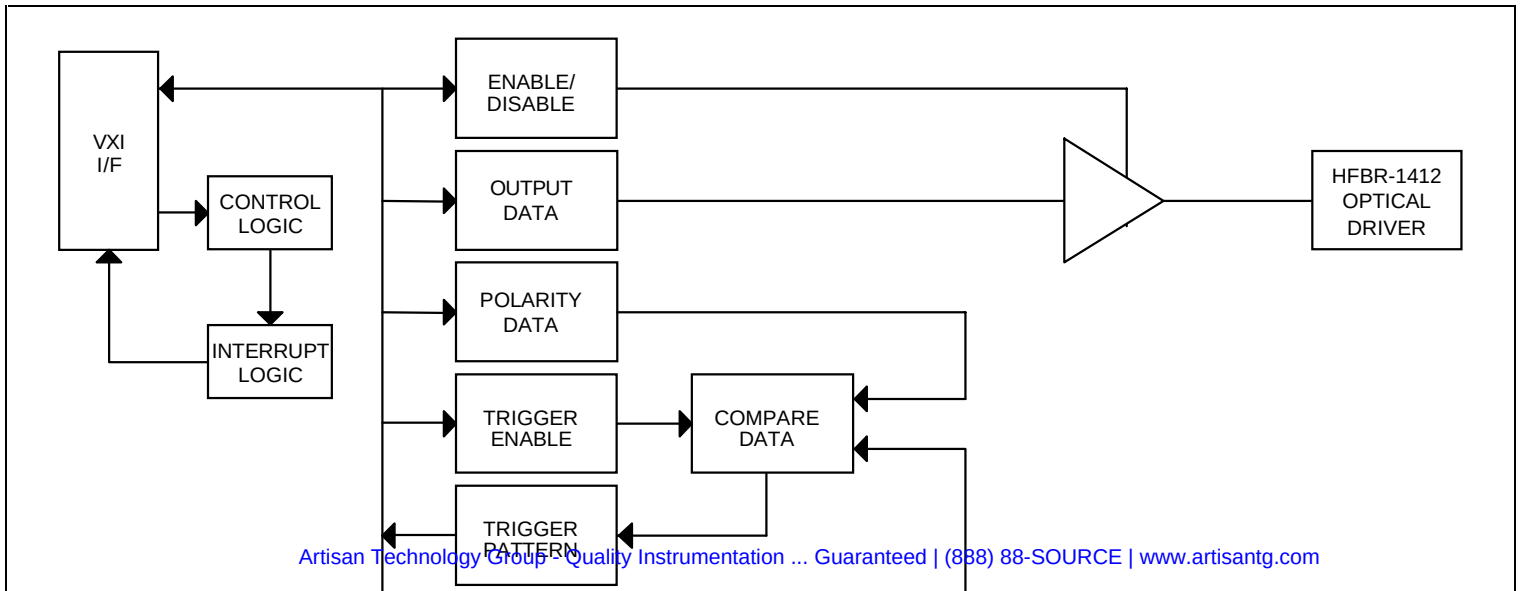
3.0 FUNCTIONAL DESCRIPTION

3.1 GENERAL

The VXI-compatible VX431C provides eight fiber optic drivers and eight fiber optic receivers. The module is configured, controlled, and statused through on-board registers accessible through the VXI backplane.

The digital output level of each optical driver is controlled by writing to an 8-bit output register. The input values of the optical receivers can be read on-the-fly or configured to latch their value on software command, on receipt of an external VXI trigger, or on an input change. Data can be latched immediately on receipt of a trigger or be latched after a programmed delay following a trigger. A trigger signal can also be generated on one of the P2 TTLTRG* lines. This versatile trigger and data hold capability allows a system of multiple cards to latch data synchronously across the backplane. A host interrupt can also be generated in conjunction with a trigger.

A functional block diagram of the module is shown in 1



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

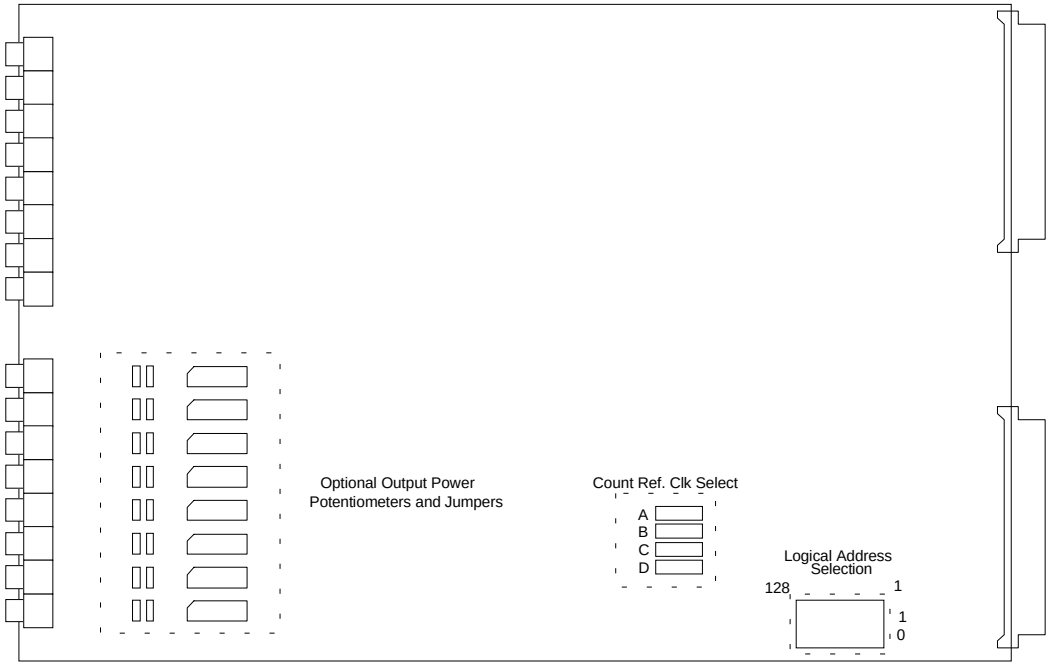


Figure 4. Hardware Configurable Controls

3.2.1 Logical Address Selection

An 8-bit logical address switch is provided to uniquely identify the module in the system.

3.2.2 Delay Count Reference Clock Selection

Jumpers A through D are used to select the divide value for the trigger delay count reference clock. The location of the jumpers is shown in Figure 4.5 The default setting is all jumper links out (1 µs period).

3.2.3 Output Power Adjustment

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

A potentiometer can be added by the user if the output optical power must be lowered. The

3.3 INDICATORS

Two LED indicators are provided on the front panel. One indicates access to the MODID, the other indicates the BOARD_SELECT status.

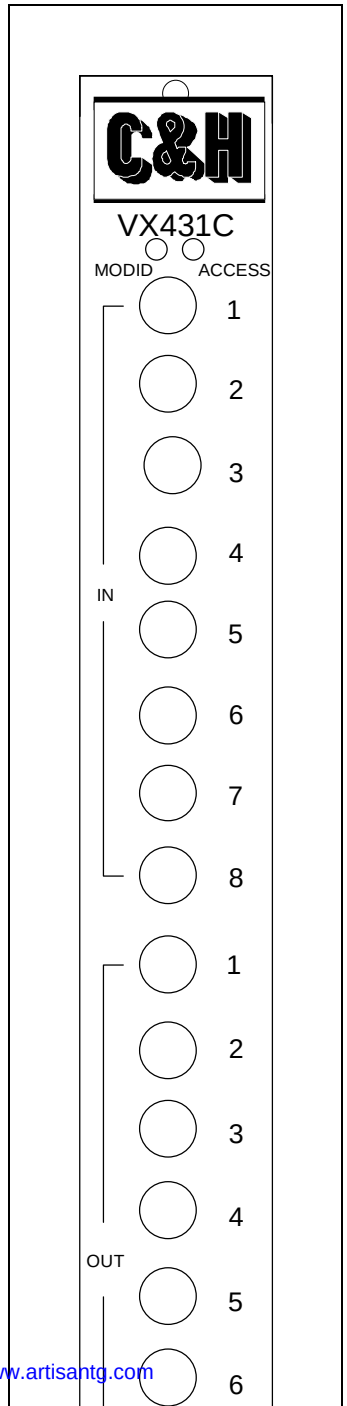
MODID: This front panel LED illuminates whenever the host processor applies the MODID signal to the slot the module is occupying.

BOARD SELECT: This front panel LED illuminates whenever the module is properly accessed by the host processor.

3.4 CONNECTORS

3.4.1 Front Panel Connectors

The fiber optic interface is provided through sixteen ST® type connectors. The connectors are arranged in two groups of eight. One group for the eight receivers, the other group for the eight drivers. The connectors are marked 1 through 8 corresponding to data bits 15 through 8, respectively. A detail of the front panel is shown in Figure 6.



3.4.2 Rear Connectors

3.4.2.1 P1 Connector

The P1 connector is configured in accordance with the VXI P1 specification (See Appendix B).

3.4.2.2 P2 Connector

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

3.5 CONFIGURATION REGISTERS

There are several types of registers used to configure and control the VX431C. The VXI configuration registers provide for control and status as required by the VXIbus specification. The General Status/Control register provides board-level control and status and the Port Register(s) provides port level control and status. An address map of the registers is shown in Table I.

Table I. VXI Register Address Map

Addr (Hex)	Register Write Description		Register Read Description	
Base + 0C	Write Port	N/A	Read Port	N/A
Base + 0A	Interrupt Control Register		Interrupt Control Register	
Base + 08	General Control Register		General Status Register	
Base + 06	VXI Unused Register		VXI Unused Register	
Base + 04	VXI Control Register		VXI Status Register	
Base + 02	VXI Read Only Register		VXI Device Type Register	
Base + 00	VXI Read Only Register		VXI ID Register	
Bit	15 08	07 00	15 08	07 00

3.5.1 VXI Configuration Registers

The VXI configuration registers contain basic information needed to configure a VXIbus system. The configuration information includes: manufacturer identification, product model code, device type, memory requirements, device status, and device control. The registers are briefly described below and are detailed in Figure **Error! Bookmark not defined.**.

VXI Identification (ID) Register (Base + 00h) - A read of this register provides manufacturer identification, device classification (i.e., register based), and the addressing mode (A16). A write to this register has no effect.

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

00	VXI ID															
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Write	Not Used								Not Used							
Read	Device Class		Address Space		Manufacturer ID											

Device Class ⇒ Device Class (Register Based = binary 11)
Address Space ⇒ Address Space (A16 Only = binary 11)
Manuf. ID ⇒ Manufacturer Identification (C & H Technologies = hex FC1)

02	VXI DEVICE TYPE															
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Write	RESERVED															
Read	1	1	1	1	Model Code											

Model Code ⇒ Model code (C&H Model VX431C = hex FF9)

04	VXI Status/Control															
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Write	Not Used															Rst
Read	0	MOD ID*	1	1	1	1	1	1	0	0	0	0	Rdy	Pass	1	1

Rst ⇒ Reset
MOD ID* ⇒ Module ID Status (0 = P2 MODID* line is selected (active-high))
Rdy ⇒ Ready
Pass ⇒ Self-test pass/fail indicator

Figure 7. VXI Configuration Registers

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

3.5.2 General Status/Control Register

This register provides control and status of the board-level trigger and comparison options. It also is used to select the function of the Port Register. Details are shown in Figure 8.

08	GENERAL STATUS/CONTROL															
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Write	SBT	TE	-	-	TS	Trig Sel			Trig Count				-	Port Function		
Read	SBT	TE	-	TRG *	TS	Trig Sel			Trig Count				-	Port Function		

SBT ⇒ Software Board Trigger (1 = Generate trigger level, must be reset to 0)
TE ⇒ Output Trigger Enable (1 = Enable, 0 = Disable)
TRG* ⇒ Trigger Compare Status (0 = Trigger occurred, 1 = No trigger)
TS ⇒ Trigger Source (0 = Board Trigger, 1 = TTLTRGx*)
Trig Sel ⇒ TTLTRGx* Select

bit 10	9	8	
0	0	0	TTLTRG0*
0	0	1	TTLTRG1*
	:		
1	1	1	TTLTRG7*

Trig Count ⇒ Trigger Delay Count (Delay = Count Ref. Clk Period X Count Value)
Port Function ⇒ Port Function Select

bit 2	1	0	
0	0	0	Read Data / Write Data
0	0	1	Read Feedback / Write Data
0	1	0	Read Enable / Write Enable
0	1	1	Read Polarity / Write Polarity
1	0	0	Read Trig Enable / Write Trig Enable
1	0	1	Read Trig Pattern / Write Trig Enable
1	1	X	Read Status /Write Control

Figure 8. General Status/Control Register

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

3.5.3 Port Registers

Port Enable/Disable Register (010) This read/write register enables or disables the output drivers. A low (0) disables the output of the respective driver, a high (1) enables the output driver.

Polarity Register (011) This read/write register is used to determine the input level of a port that should generate a trigger and/or interrupt. A low (0) in a bit will cause a trigger when the input value goes low (absence of light). A high (1) will produce a trigger when the input value goes high (presence of light). A read of this registers provides feedback of the registers contents.

Trigger Enable Register (100) This read/write register is used to enable triggers on one or more bit level changes. A read of this registers provides feedback of the registers contents.

Trigger Pattern Register (101) A write to this register performs the same function as writing to the Trigger Enable Register. A read provides the bit pattern of the channel(s) that produced a trigger. For a trigger to be produced, the bit pattern must be enabled with the Trigger Enable function. A 1 in a bit indicates that a level change occurred on the corresponding input.

Port Status/Control Register (110 or 111) This read/write register controls and provides status of various trigger, latching, and read modes.

0A	**INTERRUPT CONTROL**															
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Write	-			-	-	IRQ Sel			IRQ Vector/L. A.							
Read	-			IP*	-	IRQ Sel			IRQ Vector/L. A.							

IP* ⇒ Interrupt Pending (0 = Interrupt Pending, Read Only)

IRQ Sel ⇒ Interrupt Channel Select

bit 10	9	8	
0	0	0	Interrupt Disabled
0	0	1	IRQ1*
	.		
	.		
	.		
1	1	1	IRQ7*

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

IRQ Vector/L.A. ⇒ Interrupt Vector / Logical Address (For VXI compliant interrupts, set these bits equal to the

Func: 000	PORT DATA REGISTER															
Port	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**Not Used**							
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Write	Output Data Pattern								Not Used							
Read	Input Bits Data Pattern								$FF							

On write - Data written is output to driver
On read - Data pattern read

Func: 001	PORT OUTPUT READBACK REGISTER															
Port	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**Not Used**							
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Write	Output Data Pattern								Not Used							
Read	Latched Output Pattern								$FF							

Func: 010	PORT ENABLE/DISABLE REGISTER															
Port	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**Not Used**							
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Write	Enable/Disable Output Driver Pattern								Not Used							
Read	Enable/Disable Pattern								$FF							

Func: 011	PORT POLARITY REGISTER															
Port	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**Not Used**							
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Write	Polarity Pattern								Not Used							
Read	Polarity Pattern								$FF							

Func: 100	PORT TRIG ENABLE REGISTER															
Port	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**Not Used**							

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

Func: 11x	PORT STATUS/CONTROL REGISTER															
Port	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**Not Used**							
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Write	OT		IT		SPT	Not Used		HLD	Not Used							
Read	OT		IT		HS	Not Used		HLD	$FF							

OT ⇒ Output Trigger Function* (see below)

bit 15	14	Function
0	0	Output data normal
0	1	Output data on immediate trigger
1	0	Output data on delayed trigger
1	1	Not Used

IT ⇒ Input Trigger Function (see below)

bit 13	12	Function
0	0	Input data normal
0	1	Latch input data on immediate trigger
1	0	Latch input data on delayed trigger
1	1	Not Used

SPT ⇒ Software Port Trigger (a 1 generates a TTLTRGx* pulse (~100 ns))

HS ⇒ Hold Status (1 = data is being held)

HLD ⇒ Hold Mode (HMODE) (0 = hold disabled/reset, 1 = hold on trigger)

*Note: An immediate trigger produces a 50ns wide pulse. Data is output on the leading edge and input data is latched on the trailing edge.

Figure 10. Port Registers (2 of 2)

3.6 TRIGGER AND DATA LATCH FUNCTIONALITY

The VX431C provides a number of triggering and data latching capabilities. A functional diagram showing the operation and configuration settings is shown in Figure 11.

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

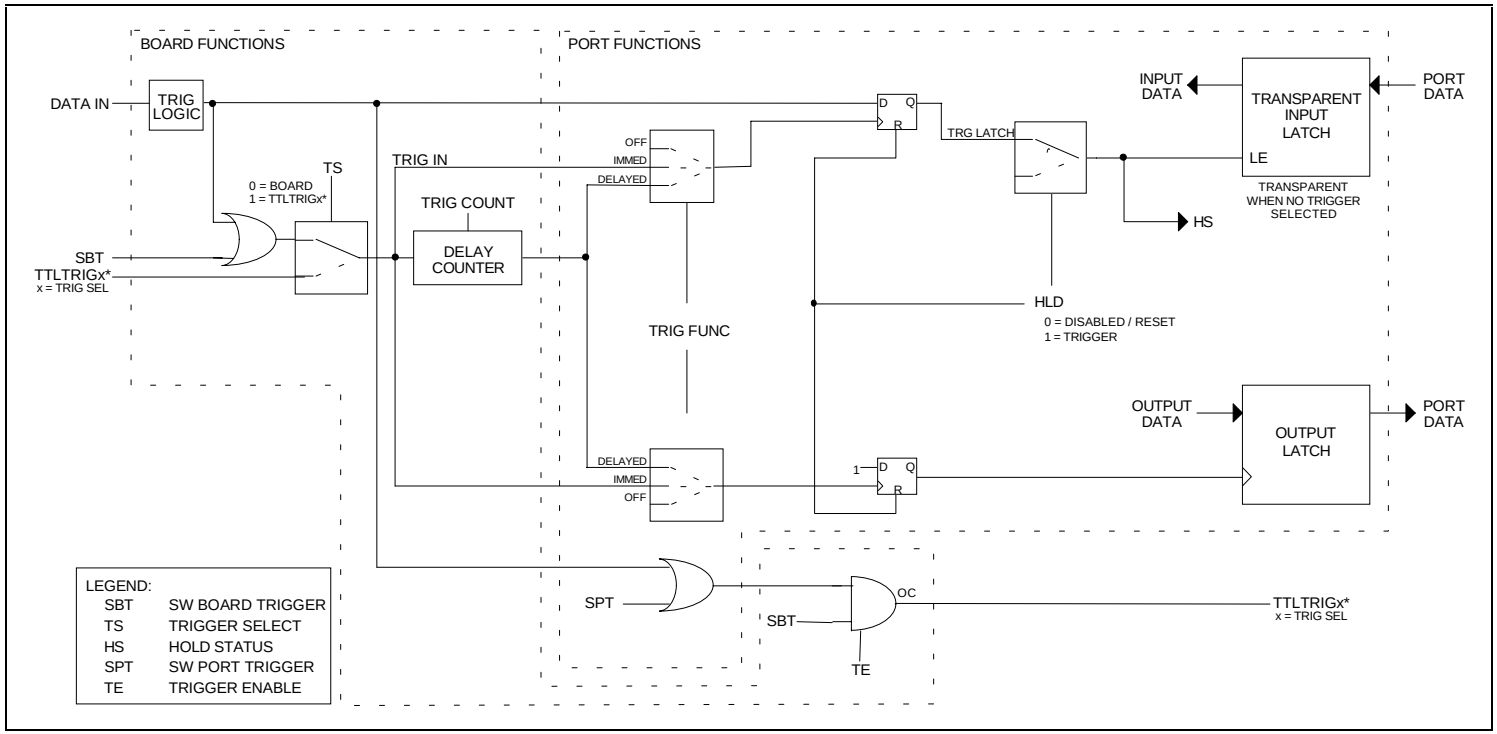


Figure 11. Trigger and Data Latch Functionality

3.6.1 Trigger Modes

A trigger can be caused by a high-to-low transition on the TTLTRGx* line on the VXI P2 connector, by software setting the board trigger (SBT) bit in the General Status/Control Register (Base + $08), or by front panel data signal. This TTLTRGx* or SBT may be applied immediately or delayed a programmed amount of time. The delay time is controlled by selecting the desired count period using jumpers A through D and by programming the Trigger Count value in the General Status/Control Register. The delay time is equal to the Trigger Count value multiplied by the clock period set using jumpers A-D as shown in Table **Error! Bookmark not defined.**. The default setting is all jumper links out (1 µs period). Note that the Trigger Count must be greater than zero to use any internal trigger. Also the trigger delay uses an asynchronous clock and, therefore, may be up to one Count Ref. Clock

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

be held. See Figure 10 for the possible settings.

3.6.3 Output Latch

Output data may be output to the front panel upon register write or on the occurrence of a trigger. A trigger may originate from a software operation, a VXI P2 TTLTRGx* line, or from the front panel. This capability allows data to be output to the front panel synchronously across all ports and across multiple VXI modules. See Figure 10 for the possible settings.

3.6.4 Data Comparison

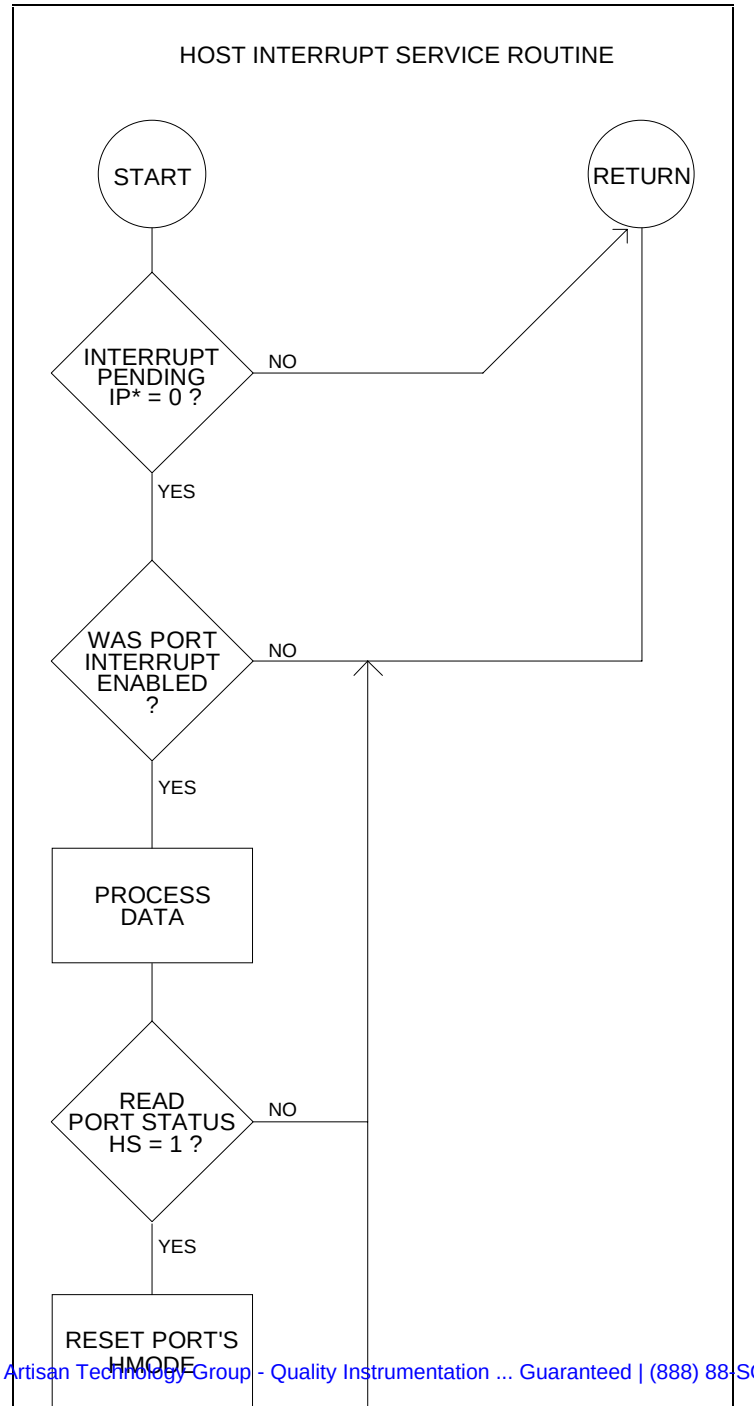
When an input data change occurs, the input data is compared to the expected polarity (if trigger enable is set to 1). The expected polarity pattern is the pattern that was written to the port polarity register. The bit positions set to a 0 in the trigger enable pattern in the Port Trigger Enable Register are ignored during this comparison. If one or more bits match, the Trigger Status (TRG bit in the General Status/Control Register) is cleared (set to 0) and the bits positions failing the comparison are set to a 1 and saved in a separate register. This "fail bit" pattern is provided in the Trigger Pattern Register.

3.6.5 Interrupts

An interrupt is generated according to the Hold Mode (HMODE) in the Port Status/Control Register. If "hold on trigger" is selected, then an interrupt is generated when a data change occurs. Once an interrupt occurs, the interrupt is released by resetting (i.e., writing binary 0) to the HMODE in the Port Status/Control Register. The servicing process is flow charted in Figure 12.

The interrupt level and interrupt vector/logical address are programmed by writing to the Interrupt Control Register (Base +$0A) as detailed in Figure 9. Interrupts can be completely disabled by setting the interrupt level to 000. The level and vector are used for all interrupts generated by the module to the VXI bus. For VXI compliant interrupts, the interrupt

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



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

4.0 OPERATING INSTRUCTIONS

Prior to installation, the module's logical address must be set. The logical address has a range of 0 to 255. Any value within this range is valid, but care should be taken not to set the logical address the same as another module in the system. Position 1 on the switch (marked 128 on the shield) is the most significant bit and has a weighted value of 128 when the switch is in the off position (marked 1 on shield). Position 8 on the switch (marked 1 on the shield) is the least significant bit and has a weighted value of 1 when the switch is in the off position. The sum of the weighted values of all the switches in the off position (marked 1 on the shield) is the module's logical address. The VXI secondary address is the logical address divided by 8.

The default setting for the delay count reference clock period is 1 µs. This setting allows a programmable trigger delay of 1 to 15 µs. If a shorter delay is desired, remove the shield and position the jumper links according to Table **Error! Bookmark not defined.**.

After installation and power-up, configure the General Status/Control Register to the desired trigger and comparison operation and the Port Status/Control Register to the desired latch, hold, trigger, and interrupt modes. An example of accessing the various registers is shown below. The VXI Configuration Registers do not require any setup. The module is now ready for normal input/output operations. The typical program flow is shown in Figure 13.

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

C / LabWindows Register Access Example

```
static int  port0,cont,ad;

main()
{
int     ad;
int     stat_sel,data_sel,fb_sel,en_sel;
int     statin,datain,fbin,enin;

        ad          = 2;  /*  board Logical Address        */
        port0       = 12; /*  port register                */
        cont        = 8;  /*  general status/control       */
        stat_sel    = 7;  /*  port status/control function */
        data_sel    = 0;  /*  port data function           */
        fb_sel      = 1;  /*  port readback function       */
        en_sel      = 2;  /*  port enable/disable function */

        InitVXIlibrary ();

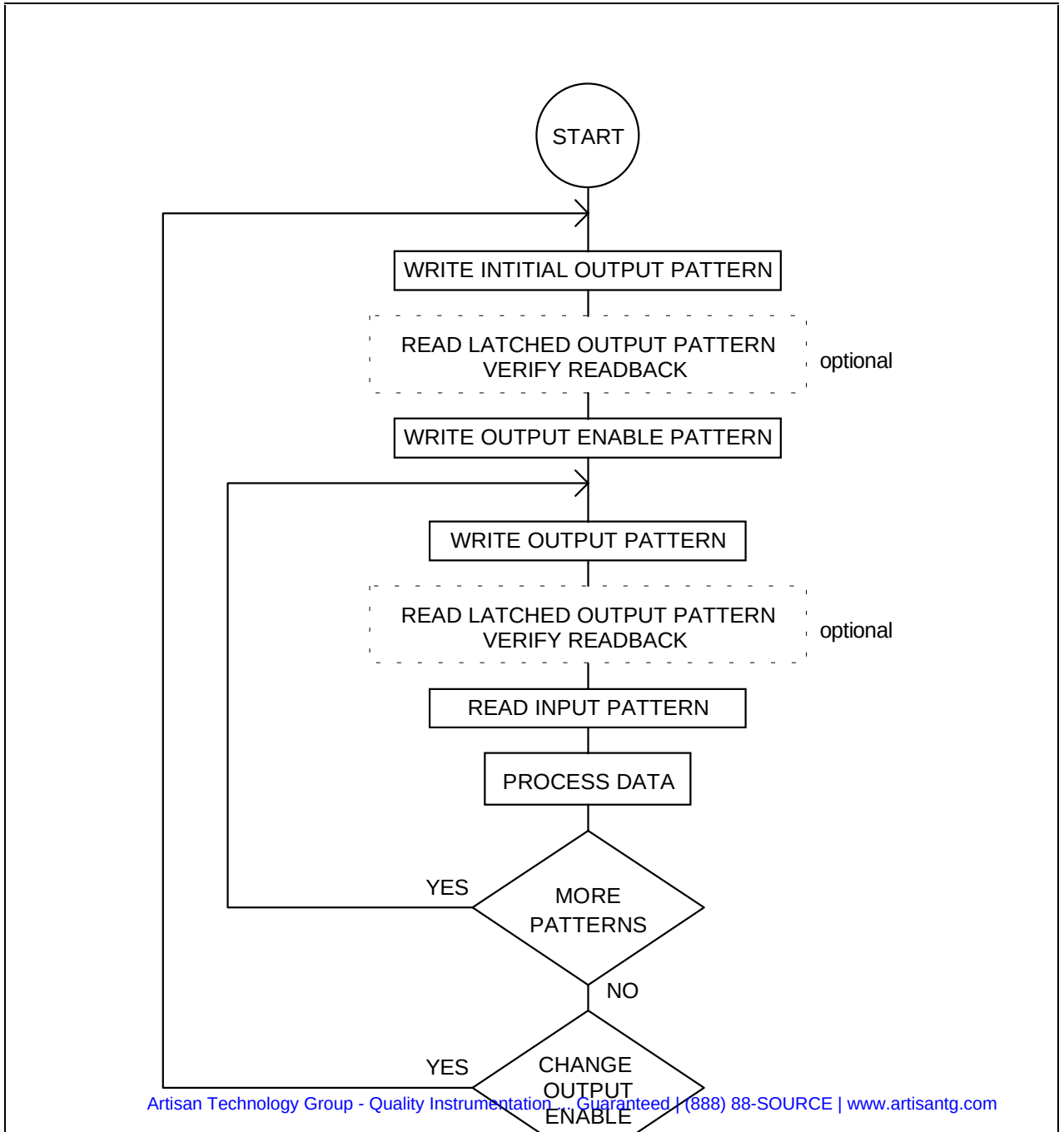
    /*  Set general control register to port status/control.  */
    /*  Write control and read status port registers.         */
        VXIoutReg (ad, cont, stat_sel);
        VXIoutReg (ad, port0, 0x0000);
        VXIinReg (ad, port0, &statin);

    /*  Set general control register to port enable register. */
    /*  Write and read the enable register.                   */
        VXIoutReg (ad, cont, en_sel);
        VXIoutReg (ad, port0, 0xFF00);
        VXIinReg (ad, port0, &enin);

    /*  Set general control register to port write data and   */
    /*  read feedback registers.                              */
    /*  Write and read the data register.                     */
        VXIoutReg (ad, cont, fb_sel);
        VXIoutReg (ad, port0, 0xAA00);
        VXIinReg (ad, port0, &fbin);

    /*  Set general control register to port write data and   */
    /*  read data registers.                                  */
```

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



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

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

5.0 MAINTENANCE

5.1 BUILT IN TEST AND DIAGNOSTICS

A simple diagnostic routine can be written that uses the read back capability of the modules to insure proper operation up to the driver devices.

5.2 TROUBLE ANALYSIS GUIDE

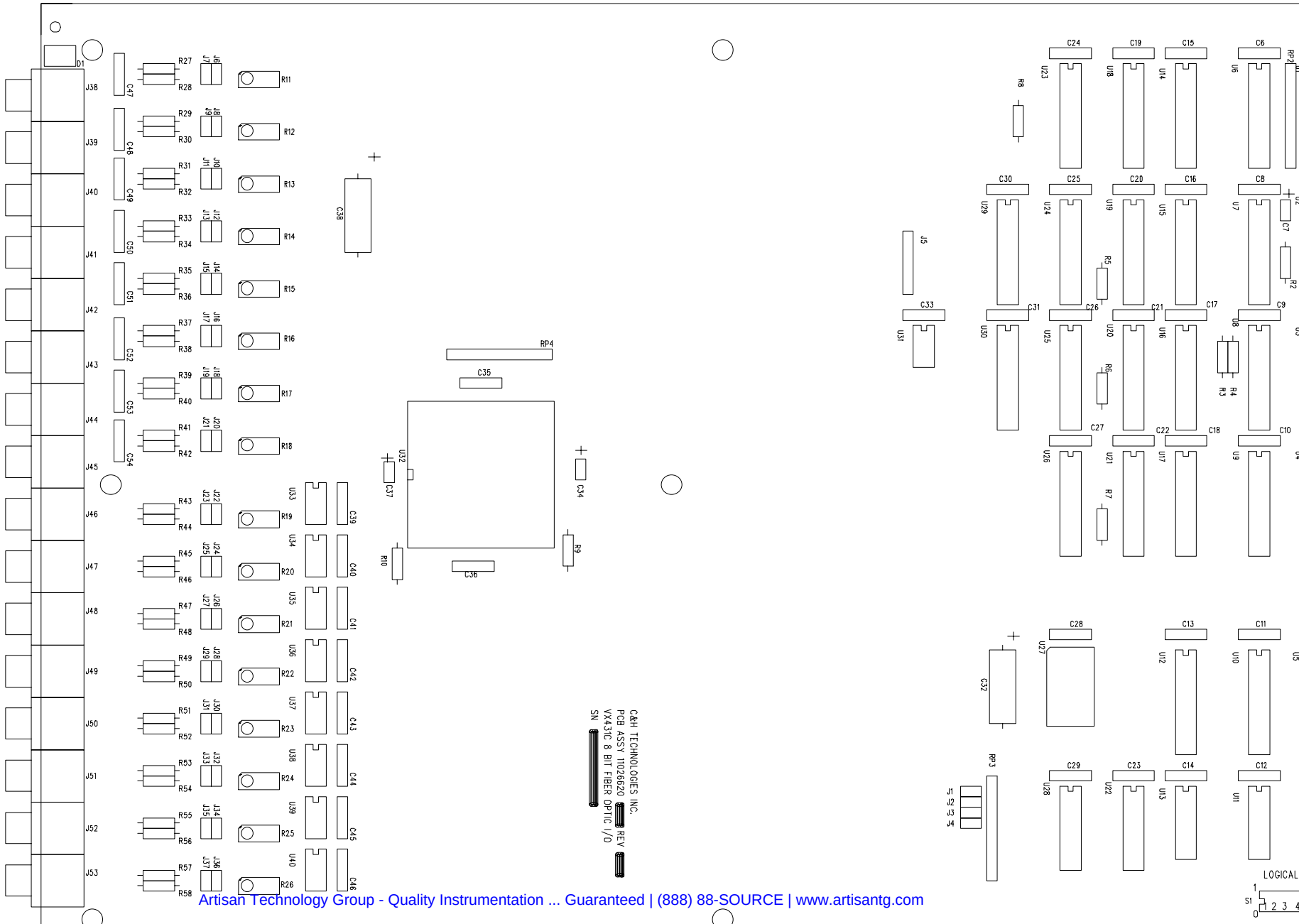
If a bus error or bus time-out error occurs, verify that the address and mode switch settings are properly set for the system access type. Verify correct program addressing and word size and check the system memory mapping strategy.

If bit errors occur, utilize the modules read back capability to verify the module's internal states. When diagnosing output problems, isolate the module from external loads by removing the connectors.

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

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

APPENDIX A - BOARD LAYOUT



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

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

APPENDIX B - CONNECTORS

PIN	C	B	A
1	D08	-	D00
2	D09	-	D01
3	D10	-	D02
4	D11	BG0IN*	D03
5	D12	BG0OUT*	D04
6	D13	BG1IN*	D05
7	D14	BG10UT*	D06
8	D15	BG2IN*	D07
9	GND	BG20UT*	GND
10	-	BG3IN*	-
11	-	BG3OUT*	-
12	SYSRESET*	-	DS1*
13	LWORD*	-	DS0*
14	AM5	-	WRITE*
15	-	-	-
16	-	AM0	DTACK*
17	-	AM1	-
18	-	AM2	-
19	-	AM3	-
20	-	GND	IACK*
21	-	-	IACKIN*
22	-	-	IACKOUT*
23	A15	GND	AM4
24	A14	IRQ7*	A07
25	A13	IRQ6*	A06
26	A12	IRQ5*	A05
27	A11	IRQ4*	A04
28	A10	IRQ3*	A03
29	A09	IRQ2*	A02
30	A08	IRQ1*	A01
31	+12 V	-	-12 V
32	+5 V	+5 V	+5 V

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

PIN	C	B	A
1	-	+5V	-
2	-	GND	-
3	-	-	-
4	-	-	GND
5	-	-	-
6	-	-	-
7	GND	-	-
8	-	-	-
9	-	-	-
10	GND	-	GND
11	-	-	-
12	-	GND	-
13	-	+5V	-
14	-	-	-
15	0	-	-
16	GND	-	GND
17	-	-	-
18	-	-	-
19	-	-	-
20	-	-	-
21	-	-	-
22	GND	GND	GND
23	TTLTRG1*	-	TTLTRG0*
24	TTLTRG3*	-	TTLTRG2*
25	GND	-	+5V
26	TTLTRG5*	-	TTLTRG4*
27	TTLTRG6*	-	TTLTRG6*
28	GND	-	GND
29	-	-	-
30	GND	-	MODID
31	-	GND	GND
32	-	+5V	-

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

Figure B-2. P2 Pin Configuration

NOTES

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

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

READER'S COMMENT FORM

Your comments assist us in improving the usefulness of C&H's publications; they are an important part of the inputs used for revision.

C&H Technologies, Inc. may use and distribute any of the information that you supply in any way that it believes to be appropriate without incurring any obligation whatsoever. You may, of course, continue to use the information which you supply.

Please refrain from using this form for technical questions or for requests for additional publications; this will only delay the response. Instead, please direct your technical questions to your authorized C&H representative.

COMMENTS: _____

_____

_____

_____

_____

_____

_____

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

INSTRUCTIONS

In its continuing effort to improve documentation, C&H Technologies, Inc. provides this form for use in submitting any comments or suggestions that the user may have. This form may be detached, folded along the lines indicated, taped along the loose edge (DO NOT STAPLE), and mailed. Please try to be as specific as possible and reference applicable sections of the manual or drawings if appropriate. Also, indicate if you would like an acknowledgment mailed to you stating whether or not your comments were being incorporated.

NOTE: This form may not be used to request copies of documents or to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

(Fold along this line)

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

(Fold along this line)

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

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