VMIACC-344x
Surge Protection Transition Panels

Product Manual

A GE Fanuc Company

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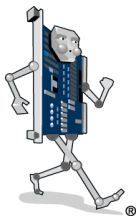

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Overview

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Introduction

The VMIACC-344x is a family of surge protection panels that meets the ANSI/IEEE C37.90.1-1989 Surge Withstand Capacity standard. Each of these panels works with one or more of VMIC's VMEbus based products. They also provide discrete wire to flat-ribbon cable transition between the external user equipment and VMIC's VMEbus based interface boards. Some of the features of this product line are listed below.

- Surge protection of each I/O line.
- Discrete wire interface to VMEbus boards.
- Meets the ANSI/IEEE C37.90.1-1989 Surge Withstand Specification.
- EIA standard RS-310C 19-inch rack mountable in 1U space.

Table 1 on page 12 lists some of the VMIC boards and their associated transition panels. Please contact the factory for the latest compatibility list. Once a panel is chosen, go to the ordering information table in the specification for that particular panel and find the option (if applicable) that matches the voltage range of the VMEbus board you are using.

Functional Description

The purpose of these panels is to provide VMIC I/O boards with protection from high voltage transients. These surges may be natural (such as nearby lightning strikes) or man-made (from something like an arc welder). Such high energy transients can destroy an input circuit or entire systems. These panels will attenuate the transients to a safe level for the compatible I/O boards in a VMEbus based system.

Table 1 Guide to Transition Panel Interfacing

VMIC's VMEbus boards Model Number	Transition Panels Model Number
VMIVME-1150	VMIACC-3441
VMIVME-1160A	VMIACC-3441
VMIVME-2170A	VMIACC-3441
VMIVME-2210	VMIACC-3449
VMIVME-2232	VMIACC-3445
VMIVME-3413	VMIACC-3447
VMIVME-3417A	VMIACC-3447
VMIVME-3418	VMIACC-3448
VMIVME-4150	VMIACC-3446

Reference Material List

For a detailed description of the VMEbus, refer to *The VMEbus Specification and Handbook* available from:

VMEbus International Trade Association (VITA)

7825 Gelding Dr. Suite No. 104
Scottsdale, AZ 85620-3415
(602) 951-8866
Fax: (602) 951-0720
e-mail: info@vita.com
Internet: www.vita.com

Physical Description and Specifications, refer to *Product Specifications*:

SSS-003441-000

SSS-003445-000

SSS-003446-000

SSS-003447-000

SSS-003448-000

SSS-003449-000

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www.vmic.com

The following Application and Configuration Guides are available from VMIC to assist the user in the selection, specification and implementation of systems based on VMIC's products:

Title	DOCUMENT NO.
Digital Input Board Application Guide	825-000000-000
Cosmodule™ Application Guide	825-000000-002
Digital I/O Products (with Built-in-Test) Product Line Description	825-000000-003
Connector and I/O Cable Application Guide	825-000000-006

Safety Summary

The following general safety precautions must be observed during all phases of the operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of this product.

VMIC assumes no liability for the customer's failure to comply with these requirements.

Ground the System

To minimize shock hazard, the chassis and system cabinet must be connected to an electrical ground. A three-conductor AC power cable should be used. The power cable must either be plugged into an approved three-contact electrical outlet or used with a three-contact to two-contact adapter with the grounding wire (green) firmly connected to an electrical ground (safety ground) at the power outlet.

Do Not Operate in an Explosive Atmosphere

Do not operate the system in the presence of flammable gases or fumes. Operation of any electrical system in such an environment constitutes a definite safety hazard.

Keep Away from Live Circuits

Operating personnel must not remove product covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

Do Not Service or Adjust Alone

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

Do Not Substitute Parts or Modify System

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the product. Return the product to VMIC for service and repair to ensure that safety features are maintained.

Dangerous Procedure Warnings

Warnings, such as the example below, precede only potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

STOP: Dangerous voltages, capable of causing death, are present in this system. Use extreme caution when handling, testing, and adjusting.

Safety Symbols Used in This Manual

STOP: This symbol informs the operator the that a practice or procedure should not be performed. Actions could result in injury or death to personnel, or could result in damage to or destruction of part or all of the system.

WARNING: This sign denotes a hazard. It calls attention to a procedure, a practice, a condition, which, if not correctly performed or adhered to, could result in injury or death to personnel.

CAUTION: This sign denotes a hazard. It calls attention to an operating procedure, a practice, or a condition, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the system.

NOTE: Calls attention to a procedure, a practice, a condition or the like, which is essential to highlight.

CHAPTER

1

Theory of Operation

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Introduction

The purpose of these panels is to prevent high energy transients from damaging the I/O circuitry on VMIC's VMEbus boards. These transients can be natural, such as nearby lightning strikes, or man made, such as arc welders. The surge protection circuit used on these panels is a transient voltage suppressor diode with a spark gap from the signal's return or common to the surge return. Each signal that goes into or out of the system cabinet is given this protection. A surge return is provided on many of the terminals, but at least one return should be used. It is provided to give the transient a separate path to ground.

When cabling from the surge protection panels to the VMEbus boards, keep the cables short, unless a strain relief is provided. The length of the cable influences how much force it will exert on the panels. Long unsupported cables may exert too much force and damage or break the surge protection panel. Table 1-1 on page 18 lists the VMIC VMEbus board, the cable(s) from it to the surge protection panel and the number of panels or bus boards supported.

The main differences between these panels are the interfaces to the VMIC boards. Not all of the pinouts of the VMEbus board connectors are the same and that means a different surge protection panel for each new pinout. Some of the panels go to several VMEbus Boards. For example, the VMIACC-3447 can protect up to two of the VMIVME-3417A Boards, while some panels can be used by several different VMEbus boards, such as the VMIACC-3441. It can go with the VMIVME-1150 or the VMIVME-1160A.

The signals are brought into the panel via discrete wire from the external equipment and connected to a terminal on the panel. The discrete wire terminals are lift clamps which are made to accommodate wire without the need for crimp-on terminals (like ring or spade lugs), and they are oriented to accommodate cable trays mounted below the panel. This signal is routed to its protection circuit and then to an output connector where mass terminated or discrete wire cables carry the signal to the VMEbus I/O board.

Table 1-1 Cable Interface

PROTECTION PANEL	CABLE GOING TO	VMEbus I/O BOARD	COMMENTS
VMIACC-3441	VMIVME-000-64-XXX 1 per panel	VMIVME-1150 VMIVME-1160A VMIVME-2170A	2 - 3441s are needed to protect all 64 I/O channels of these boards
VMIACC-3445	VMICBL-000-50-XXX 2 per panel	VMIVME-2232	1 - 3445 can support 1 - 2232 board
VMIACC-3446	VMICBL-000-37-XXX 6 per panel	VMIVME-4150	1 - 3446 can support up to 3 - 4150s
VMIACC-3447	VMIVME-000-64-XXX 2 per panel	VMIVME-3417A	1 - 3447 can support up to 2 - 3417As
VMIACC-3448	VMIVME-000-64-XXX 2 per panel	VMIVME-3418	1 - 3448 can support up to 2 - 3418s
VMIACC-3449	VMICBL-000-96-XXX 1 per panel	VMIVME-2210	1 - 2210 can use up to 2 - 3449s

NOTE: *The -XXX in the table above is the length of the cable in feet. For example, a -025 option is a cable 25 feet long.

The VMIACC-3441

This panel protects the digital I/O boards that have 64-pin DIN connectors where row A has the signal and row C the signal's return. For example, the VMIACC-3441 protects the VMIVME-1150 or the VMIVME-1160A Digital Input Boards as well as the VMIVME-2170A Digital Output Board. However, the VMIVME-2511 cannot be used with the panel. Due to the number of terminals available, only 32 channels can be protected by the VMIACC-3441. Therefore, it will take two of these panels to protect all of the signals of the 64-channel digital I/O boards. The input terminal pattern is shown in Figure 1-1 below. Chapter 2 contains a complete listing of the terminal pinout.

Figure 1-2 on page 20 shows a typical VMIACC-3441 signal's protection circuitry. The diode goes between the incoming or outgoing signal and its ground, which is supplied by the VMEbus board and not by the protection panel. The spark gap provides a path for the surge to be discharged to a safe ground point. The panel has many surge return terminals for the user to choose from, which lets the user pick the most appropriate point in the system to connect the surge return.

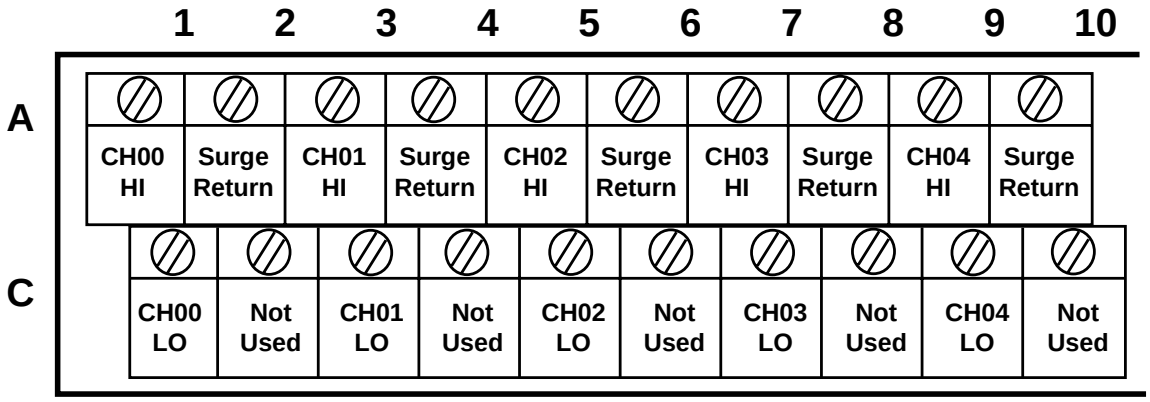

Figure 1-1 VMIACC-3441 Terminal Pattern

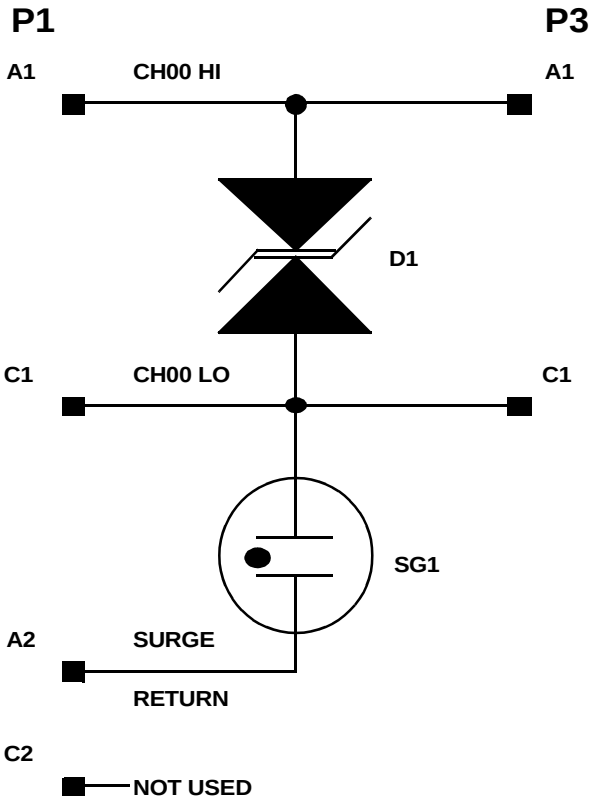

Figure 1-2 A Typical VMIACC-3441 Channel

NOTE: *Users must consider the configuration of the I/O board in designing the field wire connections.

The VMIACC-3441 adds surge protection to each individual signal line, and routes the barrier terminals to the connector pins as indicated (the A1 barrier terminal goes to A1 on the connector, etc.). The I/O board determines the signal function not the VMIACC-3441. Thus, the configuration of the I/O board determines the external wiring to the VMIACC-3441 terminals.

Most of VMIC's analog and digital I/O boards use row A pins for the high side of a voltage sourcing I/O signal and the row C pins for the source's return or ground. The signal names in the tables are based on this assumption. However, some of the I/O boards, like the VMIVME-1150 and the VMIVME-1160, switch the roles of their row A and C pins when they are configured for current sinking inputs. Some of the analog input boards also change the functions of their row A and C pins when they are set up for various input configurations, such as differential or single-ended inputs.

The VMIACC-3445

The VMIACC-3445 is used to protect the contacts of the VMIVME-2232 32-channel relay board. Each contact's arm is brought out to a 50-pin SCSI type connector (like it is done on the VMIVME-2232 board) and then to the terminals on the front of the panel. Figure 1-3 below shows the terminal pattern for this panel. Section 4 of this manual contains a complete listing of the terminal pinout. Figure 1-4 below shows a typical channel's protection circuitry.

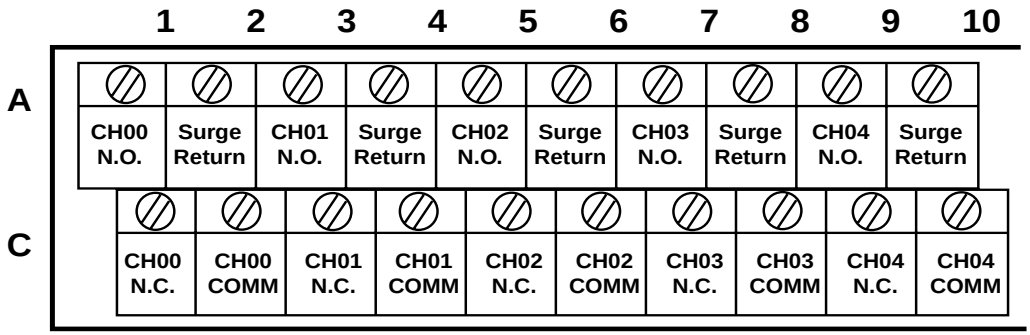

Figure 1-3 VMIACC-3445 Terminal Pattern

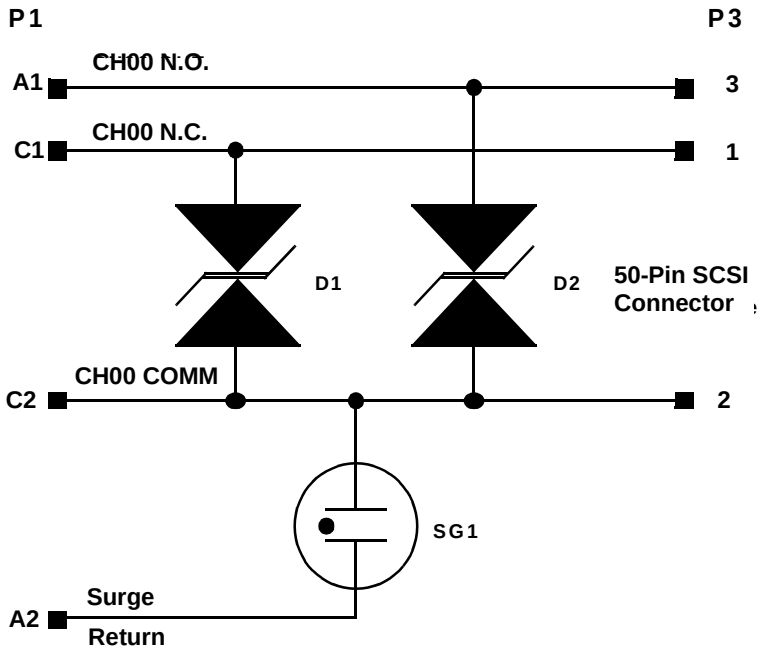

Figure 1-4 A Typical VMIACC-3445 Channel

The VMIACC-3446

The VMIACC-3446 is built to work with the VMIVME-4150 Analog Output Board. This panel provides surge protection for the output signals. The VMIACC-3446 can protect up to three VMIVME-4150 Boards. There are six 37-pin D subminiature connectors on the VMIACC-3446 and each goes to a similar connector on one of the VMIVME-4150s. Figure 1-5 shows the terminal pattern for this panel. Section 4 of this manual contains a complete listing of the terminal pinout. Figure 1-6 shows a typical channel's protection circuitry.

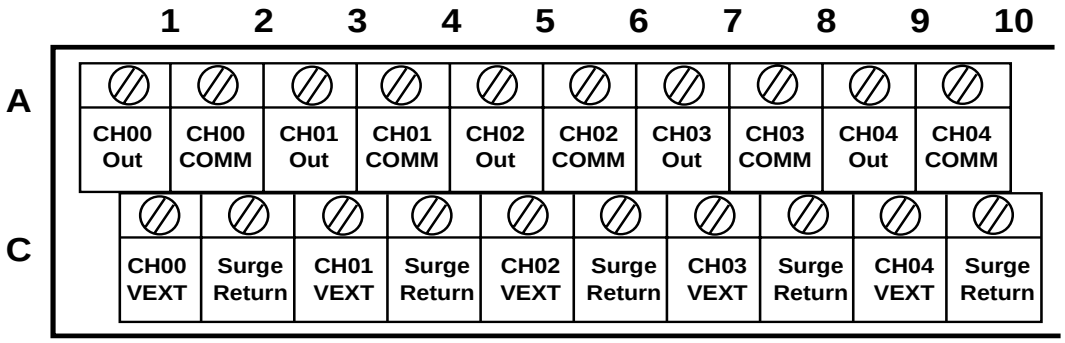

Figure 1-5 Figure VMIACC-3446 Terminal Pattern

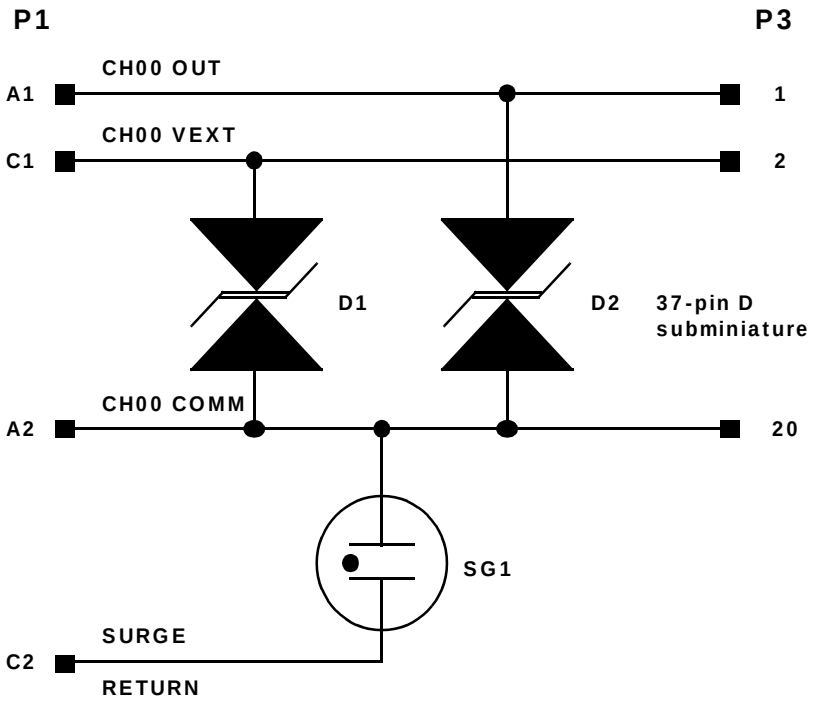

Figure 1-6 A Typical VMIACC-3446 Channel

The VMIACC-3447

The VMIACC-3447 is built to work with the VMIVME-3417A Analog Signal Conditioning Board. The VMIACC-3447 provides protection for each channel's signal lines. The VMIACC-3447 can protect up to two VMIVME-3417A boards. One of the VMIACC-3447 connectors go to the P3 connector on the VMIVME-3417A. Figure 1-7 shows the terminal pattern for this panel. Section 4 of this manual contains a complete listing of the terminal pinout. Figure 1-8 shows a typical channel's protection circuitry.

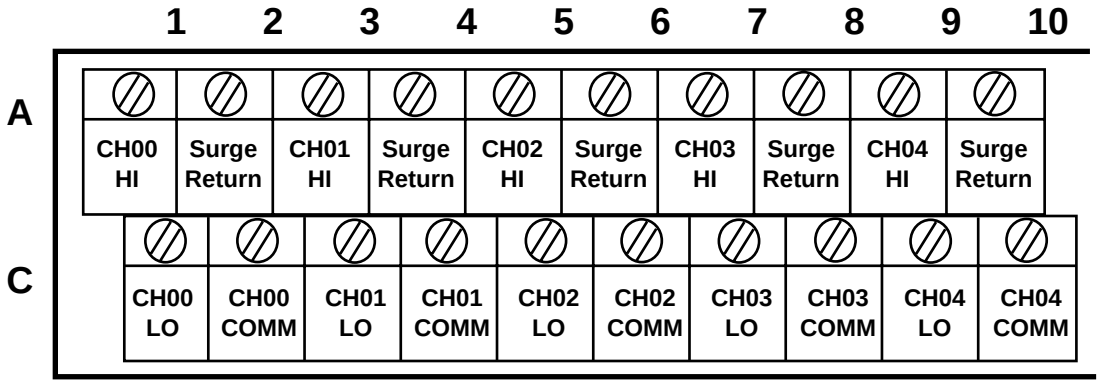

Figure 1-7 VMIACC-3447 Terminal Pattern

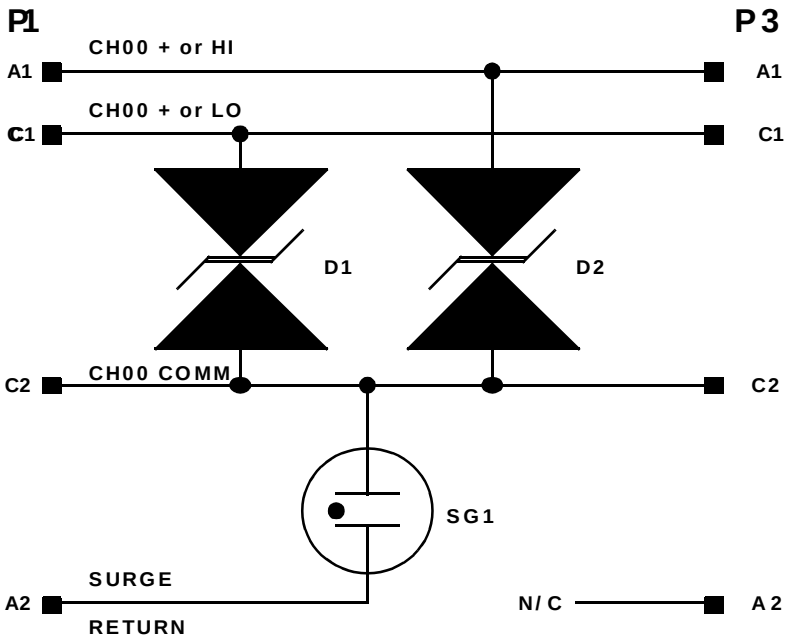

Figure 1-8 A Typical VMIACC-3447 Channel

The VMIACC-3448

The VMIACC-3448 is built to work with the VMIVME-3418 Analog Signal Conditioning Board. The VMIACC-3448 provides protection for each channel's signal lines. The VMIACC-3448 can protect up to two VMIVME-3418 boards. One of the VMIACC-3448 connectors goes to the P3 connector on the VMIVME-3418. Figure 1-9 shows the terminal pattern for this panel. Section 4 of this manual contains a complete listing of the terminal pinout. Figure 1-10 shows a typical channel's protection circuitry.

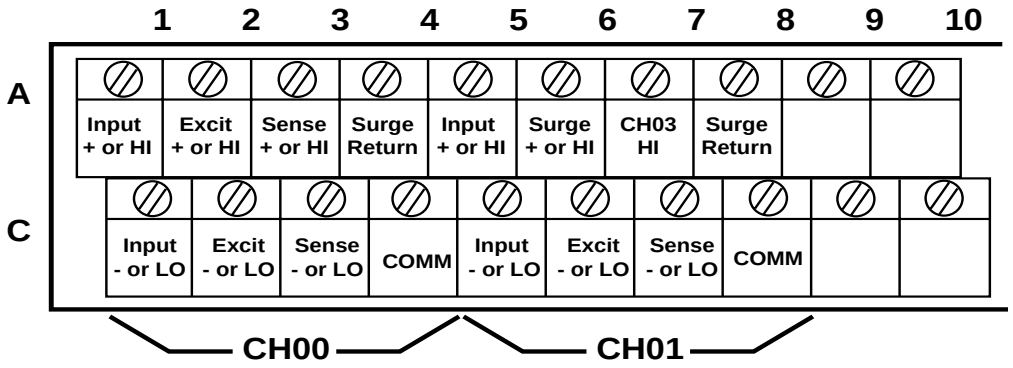

Figure 1-9 VMIACC-3448 Terminal Pattern

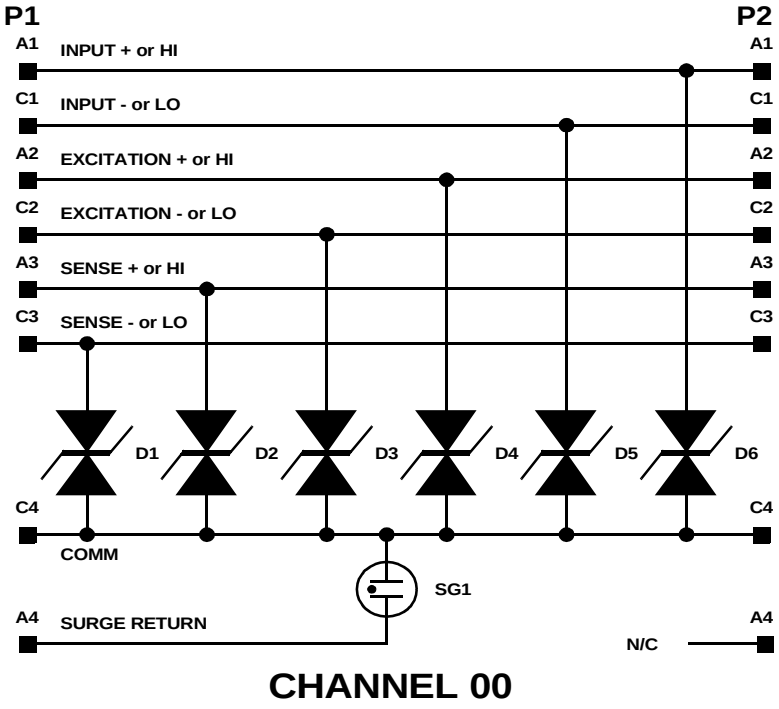

Figure 1-10 A Typical VMIACC-3448 Channel

The VMIACC-3449

The VMIACC-3449 is used to protect the contacts of the VMIVME-2210 64-Channel Relay Board. Each contact's arms are brought out to a 64-pin DIN connector and then to the terminals on the front of the panel. The circuitry for this board is like the VMIACC-3445 only the pinouts are different. Because the VMIACC-3449 can only protect 32 channels, it will take two of these protection panels to protect all of the channels of one VMIVME-2210 board. Figure 1-11 shows the terminal pattern for this panel. Section 4 of this manual contains a complete listing of the terminal pinout. Figure 1-12 shows a typical channel.

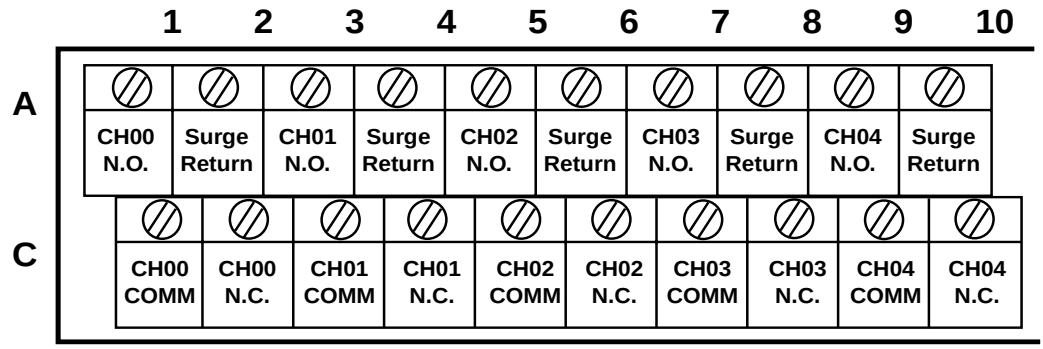

Figure 1-11 VMIACC-3449 Terminal Pattern

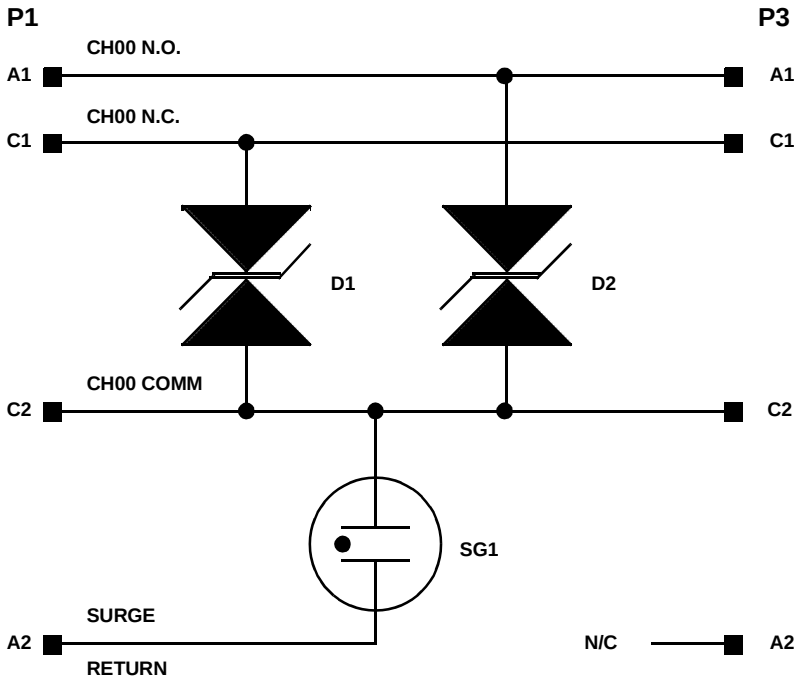

Figure 1-12 A Typical VMIACC-3449 Channel

CHAPTER
2

Cable Pinouts

Introduction

The following tables list the terminal block to connector pin assignments for the surge protection transition panels.

Table 2-1 Pinout for the VMIACC-3441 Panel

Terminals going to Surge Panel P1 Terminal Block Pin	Output to VMIC board P3 Pin	Signal Name
A1	A1	CH01 signal (+ IN / OUT)
C1	C1	CH01 return (- IN / OUT)
A2 Surge Return		
C2 N / C		
A3	A2	CH02 signal (+ IN / OUT)
C3	C2	CH02 return (- IN / OUT)
A4 Surge Return		
C4 N / C		
A5	A3	CH03 signal (+ IN / OUT)
C5	C3	CH03 return (- IN / OUT)
A6 Surge Return		
C6 N / C		
A7	A4	CH04 signal (+ IN / OUT)
C7	C4	CH04 return (- IN / OUT)
A8 Surge Return		
C8 N / C		
A9	A5	CH05 signal (+ IN / OUT)
C9	C5	CH05 return (- IN / OUT)
A10 Surge Return		
C10 N / C		
A11	A6	CH06 signal (+ IN / OUT)
C11	C6	CH06 return (- IN / OUT)
A12 Surge Return		
C12 N / C		
A13	A7	CH07 signal (+ IN / OUT)
C13	C7	CH07 return (- IN / OUT)
A14 Surge Return		
C14 N / C		
A15	A8	CH08 signal (+ IN / OUT)
C15	C8	CH08 return (- IN / OUT)
A16 Surge Return		
C16 N / C		
A17	A9	CH09 signal (+ IN / OUT)
C17	C9	CH09 return (- IN / OUT)
A18 Surge Return		

Table 2-1 Pinout for the VMIACC-3441 Panel (Continued)

Terminals going to Surge Panel P1 Terminal Block Pin	Output to VMIC board P3 Pin	Signal Name
C18 N / C		
A19	A10	CH10 signal (+ IN / OUT)
C19	C10	CH10 return (- IN / OUT)
A20 Surge Return		
C20 N / C		
A21	A11	CH11 signal (+ IN / OUT)
C21	C11	CH11 return (- IN / OUT)
A22 Surge Return		
C22 N / C		
A23	A12	CH12 signal (+ IN / OUT)
C23	C12	CH12 return (- IN / OUT)
A24 Surge Return		
C24 N / C		
A25	A13	CH13 signal (+ IN / OUT)
C25	C13	CH13 return (- IN / OUT)
A26 Surge Return		
C26 N / C		
A27	A14	CH14 signal (+ IN / OUT)
C27	C14	CH14 return (- IN / OUT)
A28 Surge Return		
C28 N / C		
A29	A15	CH15 signal (+ IN / OUT)
C29	C15	CH15 return (- IN / OUT)
A30 Surge Return		
C30 N / C		
A31	A16	CH16 signal (+ IN / OUT)
C31	C16	CH16 return (- IN / OUT)
A32 Surge Return		
C32 N / C		
A1	A17	CH17 signal (+ IN / OUT)
C1	C17	CH17 return (- IN / OUT)
A2 Surge Return		
C2 N / C		
A3	A18	CH18 signal (+ IN / OUT)

Table 2-1 Pinout of the VMIACC-3441 Panel (Continued)

Terminals going to Surge Panel P2 Terminal Block Pin	Output to VMIC board P3 Pin	Signal Name
C3	C18	CH18 return (- IN / OUT)
A4 Surge Return		
C4 N / C		
A5	A19	CH19 signal (+ IN / OUT)
C5	C19	CH19 return (- IN / OUT)
A6 Surge Return		
C6 N / C		
A7	A20	CH20 signal (+ IN / OUT)
C7	C20	CH20 return (- IN / OUT)
A8 Surge Return		
C8 N / C		
A9	A21	CH21 signal (+ IN / OUT)
C9	C21	CH21 return (- IN / OUT)
A10 Surge Return		
C10 N / C		
A11	A22	CH22 signal (+ IN / OUT)
C11	C22	CH22 return (- IN / OUT)
A12 Surge Return		
C12 N / C		
A13	A23	CH23 signal (+ IN / OUT)
C13	C23	CH23 return (- IN / OUT)
A14 Surge Return		
C14 N / C		
A15	A24	CH24 signal (+ IN / OUT)
C15	C24	CH24 return (- IN / OUT)
A16 Surge Return		
C16 N / C		
A17	A25	CH25 signal (+ IN / OUT)
C17	C25	CH25 return (- IN / OUT)
A18 Surge Return		
C18 N / C		
A19	A26	CH26 signal (+ IN / OUT)

Table 2-1 Pinout of the VMIACC-3441 Panel (Concluded)

Terminals going to Surge Panel P2 Terminal Block Pin	Output to VMIC board P3 Pin	Signal Name
C19	C26	CH26 return (- IN / OUT)
A20 Surge Return		
C20 N / C		
A21	A27	CH27 signal (+ IN / OUT)
C21	C27	CH27 return (- IN / OUT)
A22 Surge Return		
C22 N / C		
A23	A28	CH28 signal (+ IN / OUT)
C23	C28	CH28 return (- IN / OUT)
A24 Surge Return		
C24 N / C		
A25	A29	CH29 signal (+ IN / OUT)
C25	C29	CH29 return (- IN / OUT)
A26 Surge Return		
C26 N / C		
A27	A30	CH30 signal (+ IN / OUT)
C27	C30	CH30 return (- IN / OUT)
A28 Surge Return		
C28 N / C		
A29	A31	CH31 signal (+ IN / OUT)
C29	C31	CH31 return (- IN / OUT)
A30 Surge Return		
C30 N / C		
A31	A32	CH32 signal (+ IN / OUT)
C31	C32	CH32 return (- IN / OUT)
A32 Surge Return		
C32 N / C		

Table 2-2 Pinout of the VMIACC-3445 Panel

Terminals going to Surge Panel P1 Terminal Block pin	Output to the VMIC board P3 pin	Signal Name
A1	3	N.O. CH00
C1	1	N.C. CH00
A2 Surge Return		
C2	2	COMM CH00
A3	6	N.O. CH01
C3	4	N.C. CH01
A4 Surge Return		
C4	5	COMM CH01
A5	9	N.O. CH02
C5	7	N.C. CH02
A6 Surge Return		
C6	8	COMM CH02
A7	12	N.O. CH03
C7	10	N.C. CH03
A8 Surge Return		
C8	11	COMM CH03
A9	15	N.O. CH04
C9	13	N.C. CH04
A10 Surge Return		
C10	14	COMM CH04
A11	18	N.O. CH05
C11	16	N.C. CH05
A12 Surge Return		
C12	17	COMM CH05
A13	21	N.O. CH06
C13	19	N.C. CH06
A14 Surge Return		
C14	20	COMM CH06
A15	24	N.O. CH07
C15	22	N.C. CH07
A16 Surge Return		
C16	23	COMM CH07
	25	Not used

Table 2-2 Pinout of the VMIACC-3445 Panel (Continued)

Terminals going to Surge Panel P1 Terminal Block pin	Output to the VMIC board P3 Pin	Signal Name
A17	28	N.O. CH08
C17	26	N.C. CH08
A18 Surge Return		
C18	27	COMM CH08
A19	31	N.O. CH09
C19	29	N.C. CH09
A20 Surge Return		
C20	30	COMM CH09
A21	34	N.O. CH10
C21	32	N.C. CH10
A22 Surge Return		
C22	33	COMM CH10
A23	37	N.O. CH11
C23	35	N.C. CH11
A24 Surge Return		
C24	36	COMM CH11
A25	40	N.O. CH12
C25	38	N.C. CH12
A26 Surge Return		
C26	39	COMM CH12
A27	43	N.O. CH13
C27	41	N.C. CH13
A28 Surge Return		
C28	42	COMM CH13
A29	46	N.O. CH14
C29	44	N.C. CH14
A30 Surge Return		
C30	45	COMM H14
A31	49	N.O. CH15
C31	47	N.C. CH15
A32 Surge Return		
C32	48	COMM CH15
	50	Not used

Table 2-2 Pinout of the VMIACC-3445 Panel (Continued)

Terminals going to Surge Panel P2 Terminal Block Pin	Output to the VMIC board P4 Pin	Signal Name
A1	3	N.O. CH16
C1	1	N.C. CH16
A2 Surge Return		
C2	2	COMM CH16
A3	6	N.O. CH17
C3	4	N.C. CH17
A4 Surge Return		
C4	5	COMM CH17
A5	9	N.O. CH18
C5	7	N.C. CH18
A6 Surge Return		
C6	8	COMM CH18
A7	12	N.O. CH19
C7	10	N.C. CH19
A8 Surge Return		
C8	11	COMM CH19
A9	15	N.O. CH20
C9	13	N.C. CH20
A10 Surge Return		
C10	14	COMM CH20
A11	18	N.O. CH21
C11	16	N.C. CH21
A12 Surge Return		
C12	17	COMM CH21
A13	21	N.O. CH22
C13	19	N.C. CH22
A14 Surge Return		
C14	20	COMM CH22
A15	24	N.O. CH23
C15	22	N.C. CH23
A16 Surge Return		
C16	23	COMM CH23
	25	Not used

Table 2-2 Pinout of the VMIACC-3445 Panel (Concluded)

Terminals going to Surge Panel P2 Terminal Block pin	Output to the VMIC board P4 pin	Signal Name
A17	28	N.O. CH24
C17	26	N.C. CH24
A18 Surge Return		
C18	27	COMM CH24
A19	31	N.O. CH25
C19	29	N.C. CH25
A20 Surge Return		
C20	30	COMM CH25
A21	34	N.O. CH26
C21	32	N.C. CH26
A22 Surge Return		
C22	33	COMM CH26
A23	37	N.O. CH27
C23	35	N.C. CH27
A24 Surge Return		
C24	36	COMM CH27
A25	40	N.O. CH28
C25	38	N.C. CH28
A26 Surge Return		
C26	39	COMM CH28
A27	43	N.O. CH29
C27	41	N.C. CH29
A28 Surge Return		
C28	42	COMM CH29
A29	46	N.O. CH30
C29	44	N.C. CH30
A30 Surge Return		
C30	45	COMM CH30
A31	49	N.O. CH31
C31	47	N.C. CH31
A32 Surge Return		
C32	48	COMM CH31
	50	Not used

Table 2-3 Pinout of the VMIACC-3446 Panel

Terminals going to Surge Panel P1 Terminal Block pin	Output to the VMIC board Connector	Signal Name	Board
A1	P3 - 1	OUT00	A
C1	P3 - 20	COMM00	
A2 Surge Return			
C2 Surge Return			
A3	P3 - 4	OUT01	A
C3	P3 - 23	COMM01	
A4	P3 - 7	OUT02	A
C4	P3 - 26	COMM02	
A5 Surge Return			
C5 Surge Return			
A6	P3 - 10	OUT03	A
C6	P3 - 29	COMM03	
A7	P3 - 13	OUT04	A
C7	P3 - 32	COMM04	
A8 Surge Return			
C8 Surge Return			
A9	P3 - 16	OUT05	A
C9	P3 - 35	COMM05	
A10	P4 - 1	OUT06	A
C10	P4 - 20	COMM06	
A11 Surge Return			
C11 Surge Return			
A12	P4 - 4	OUT07	A
C12	P4 - 23	COMM07	
A13	P4 - 7	OUT08	A
C13	P4 - 26	COMM08	
A14 Surge Return			
C14 Surge Return			
A15	P4 - 10	OUT09	A
C15	P4 - 29	COMM09	
A16	P4 - 13	OUT10	A
C16	P4 - 32	COMM10	

Table 2-3 Pinout of the VMIACC-3446 Panel (Continued)

Terminals going to Surge Panel P1 Terminal Block pin	Output to the VMIC board Connector	Signa Name	Board
A17 Surge Return			
C17 Surge Return			
A18	P4 - 16	OUT11	A
C18	P4 - 35	COMM11	
A19 Surge Return			
C19 Surge Return			
A20 Surge Return			
C20 Surge Return			
A21 Surge Return			
C21 Surge Return			
A22 Surge Return			
C22 Surge Return			
A23 Surge Return			
C23 Surge Return			
A24	P5 - 1	OUT00	B
C24	P5 - 20	COMM00	
A25 Surge Return			
C25 Surge Return			
A26	P5 - 4	OUT01	B
C26	P5 - 23	COMM01	
A27	P5 - 7	OUT02	B
C27	P5 - 26	COMM02	
A28 Surge Return			
C28 Surge Return			
A29	P5 - 10	OUT03	B
C29	P5 - 29	COMM03	
A30	P5 - 13	OUT04	B
C30	P5 - 32	COMM04	
A31 Surge Return			
C31 Surge Return			
A32	P5 - 16	OUT05	B
C32	P5 - 35	COMM05	

Table 2-3 Pinout of the VMIACC-3446 Panel (Continued)

Terminals going to Surge Panel P2 Terminal Block pin	Output to the VMIC board Connector	Signal Name	Board
A1	P6 - 1	OUT06	B
C1	P6 - 20	COMM06	
A2 Surge Return			
C2 Surge Return			
A3	P6 - 4	OUT07	B
C3	P6 - 23	COMM07	
A4	P6 - 7	OUT08	B
C4	P6 - 26	COMM08	
A5 Surge Return			
C5 Surge Return			
A6	P6 - 10	OUT09	B
C6	P6 - 29	COMM09	
A7	P6 - 13	OUT10	B
C7	P6 - 32	COMM10	
A8 Surge Return			
C8 Surge Return			
A9	P6 - 16	OUT11	B
C9	P6 - 35	COMM11	
A10 Surge Return			
C10 Surge Return			
A11 Surge Return			
C11 Surge Return			
A12 Surge Return			
C12 Surge Return			
A13 Surge Return			
C13 Surge Return			
A14 Surge Return			
C14 Surge Return			
A15	P7 - 1	OUT00	C
C15	P7 - 20	COMM00	
A16 Surge Return			
C16 Surge Return			

Table 2-3 Pinout of the VMIACC-3446 Panel (Concluded)

Terminals going to Surge Panel P2 Terminal Block pin	Output to the VMIC board Connector	Signal Name	Board
A17	P7 - 4	OUT01	C
C17	P7 - 23	COMM01	
A18	P7 - 7	OUT02	C
C18	P7 - 26	COMM02	
A19 Surge Return			
C19 Surge Return			
A20	P7 - 10	OUT03	C
C20	P7 - 29	COMM03	
A21	P7 - 13	OUT04	C
C21	P7 - 32	COMM04	
A22 Surge Return			
C22 Surge Return			
A23	P7 - 16	OUT05	C
C23	P7 - 35	COMM05	
A24	P8 - 1	OUT06	C
C24	P8 - 20	COMM06	
A25 Surge Return			
C25 Surge Return			
A26	P8 - 4	OUT07	C
C26	P8 - 23	COMM07	
A27	P8 - 7	OUT08	C
C27	P8 - 26	COMM08	
A28 Surge Return			
C28 Surge Return			
A29	P8 - 10	OUT09	C
C29	P8 - 29	COMM09	
A30	P8 - 13	OUT10	C
C30	P8 - 32	COMM10	
A31 Surge Return			
C31 Surge Return			
A32	P8 - 16	OUT11	C
C32	P8 - 35	COMM11	

Table 2-4 Pinout of the VMIACC-3447 Panel

Terminal Screw Block P1	Output To VMIC board P3 Pin	Signal Name	Board
A1	A1	+ Input (HI)	
C1	C1	- Input (LO)	
A2	A2	N / C Surge Return	
C2	C2	Analog GND (COMM) CH01	A
A3	A3	+ Input (HI)	
C3	C3	- Input (LO)	
A4	A4	N / C Surge Return	
C4	C4	Analog GND (COMM) CH02	A
A5	A5	+ Input (HI)	
C5	C5	- Input (LO)	
A6	A6	N / C Surge Return	
C6	C6	Analog GND (COMM) CH03	A
A7	A7	+ Input (HI)	
C7	C7	- Input (LO)	
A8	A8	N / C Surge Return	
C8	C8	Analog GND (COMM) CH04	A
A9	A9	+ Input (HI)	
C9	C9	- Input (LO)	
A10	A10	N / C Surge Return	
C10	C10	Analog GND (COMM) CH05	A
A11	A11	+ Input (HI)	
C11	C11	- Input (LO)	
A12	A12	N / C Surge Return	
C12	C12	Analog GND (COMM) CH06	A
A13	A13	+ Input (HI)	
C13	C13	- Input (LO)	
A14	A14	N / C Surge Return	
C14	C14	Analog GND (COMM) CH07	A
A15	A15	+ Input (HI)	
C15	C15	- Input (LO)	
A16	A16	N / C Surge Return	
C16	C16	Analog GND (COMM) CH08	A

Table 2-4 Pinout of the VMIACC-3447 Panel (Continued)

Terminal Screw Block P1	Output To VMIC board P3 Pin	Signal Name	Board
A17	A17	+ Input (HI)	
C17	C17	- Input (LO)	
A18	A18	N / C Surge Return	
C18	C18	Analog GND (COMM) CH09	A
A19	A19	+ Input (HI)	
C19	C19	- Input (LO)	
A20	A20	N / C Surge Return	
C20	C20	Analog GND (COMM) CH10	A
A21	A21	+ Input (HI)	
C21	C21	- Input (LO)	
A22	A22	N / C Surge Return	
C22	C22	Analog GND (COMM) CH11	A
A23	A23	+ Input (HI)	
C23	C23	- Input (LO)	
A24	A24	N / C Surge Return	
C24	C24	Analog GND (COMM) CH12	A
A25	A25	+ Input (HI)	
C25	C25	- Input (LO)	
A26	A26	N / C Surge Return	
C26	C26	Analog GND (COMM) CH13	A
A27	A27	+ Input (HI)	
C27	C27	- Input (LO)	
A28	A28	N / C Surge Return	
C28	C28	Analog GND (COMM) CH14	A
A29	A29	+ Input (HI)	
C29	C29	- Input (LO)	
A30	A30	N / C Surge Return	
C30	C30	Analog GND (COMM) CH15	A
A31	A31	+ Input (HI)	
C31	C31	- Input (LO)	
A32	A32	N / C Surge Return	
C32	C32	Analog GND (COMM) CH16	A

Table 2-4 Pinout of the VMIACC-3447 Panel (Continued)

Terminal Screw Block P2	Output To VMIC board P4 Pin	Signal Name	Board
A1	A1	+ Input (HI)	
C1	C1	- Input (LO)	
A2	A2	N / C Surge Return	
C2	C2	Analog GND (COMM) CH01	B
A3	A3	+ Input (HI)	
C3	C3	- Input (LO)	
A4	A4	N / C Surge Return	
C4	C4	Analog GND (COMM) CH02	B
A5	A5	+ Input (HI)	
C5	C5	- Input (LO)	
A6	A6	N / C Surge Return	
C6	C6	Analog GND (COMM) CH03	B
A7	A7	+ Input (HI)	
C7	C7	- Input (LO)	
A8	A8	N / C Surge Return	
C8	C8	Analog GND (COMM) CH04	B
A9	A9	+ Input (HI)	
C9	C9	- Input (LO)	
A10	A10	N / C Surge Return	
C10	C10	Analog GND (COMM) CH05	B
A11	A11	+ Input (HI)	
C11	C11	- Input (LO)	
A12	A12	N / C Surge Return	
C12	C12	Analog GND (COMM) CH06	B
A13	A13	+ Input (HI)	
C13	C13	- Input (LO)	
A14	A14	N / C Surge Return	
C14	C14	Analog GND (COMM) CH07	B
A15	A15	+ Input (HI)	
C15	C15	- Input (LO)	
A16	A16	N / C Surge Return	
C16	C16	Analog GND (COMM) CH08	B

Table 2-4 Pinout of the VMIACC-3447 Panel (Concluded)

Terminal Screw Block P2	Output To VMIC board P4 Pin	Signal Name	Board
A17	A17	+ Input (HI)	
C17	C17	- Input (LO)	
A18	A18	N/C Surge Return	
C18	C18	Analog GND (COMM) CH09	B
A19	A19	+ Input (HI)	
C19	C19	- Input (LO)	
A20	A20	N/C Surge Return	
C20	C20	Analog GND (COMM) CH10	B
A21	A21	+ Input (HI)	
C21	C21	- Input (LO)	
A22	A22	N/C Surge Return	
C22	C22	Analog GND (COMM) CH11	B
A23	A23	+ Input (HI)	
C23	C23	- Input (LO)	
A24	A24	N/C Surge Return	
C24	C24	Analog GND (COMM) CH12	B
A25	A25	+ Input (HI)	
C25	C25	- Input (LO)	
A26	A26	N/C Surge Return	
C26	C26	Analog GND (COMM) CH13	B
A27	A27	+ Input (HI)	
C27	C27	- Input (LO)	
A28	A28	N/C Surge Return	
C28	C28	Analog GND (COMM) CH14	B
A29	A29	+ Input (HI)	
C29	C29	- Input (LO)	
A30	A30	N/C Surge Return	
C30	C30	Analog GND (COMM) CH15	B
A31	A31	+ Input (HI)	
C31	C31	- Input (LO)	
A32	A32	N/C Surge Return	
C32	C32	Analog GND(COMM) CH16	B

Table 2-5 Pinout of the VMIACC-3448 Panel

Terminal Screw Block P1	Output To VMIC board P3 Pin	Signal Name	Board
A1	A1	+ Input (HI)	
C1	C1	- Input (LO)	
A2	A2	+ Ext (HI)	
C2	C2	- Ext (LO)	
A3	A3	+ Sense (HI)	
C3	C3	- Sense (LO)	
A4	A4	N / C (Surge Return)	
C4	C4	Analog GND (Comm) CH00	A
A5	A5	+ Input (HI)	
C5	C5	- Input (LO)	
A6	A6	+ Ext (HI)	
C6	C6	- Ext (LO)	
A7	A7	+ Sense (HI)	
C7	C7	- Sense (LO)	
A8	A8	N / C (Surge Return)	
C8	C8	Analog GND (Comm) CH01	A
A9	A9	+ Input (HI)	
C9	C9	- Input (LO)	
A10	A10	+ Ext (HI)	
C10	C10	- Ext (LO)	
A11	A11	+ Sense (HI)	
C11	C11	- Sense (LO)	
A12	A12	N / C (Surge Return)	
C12	C12	Analog GND (Comm) CH02	A
A13	A13	+ Input (HI)	
C13	C13	- Input (LO)	
A14	A14	+ Ext (HI)	
C14	C14	- Ext (LO)	
A15	A15	+ Sense (HI)	
C15	C15	- Sense (LO)	
A16	A16	N / C (Surge Return)	
C16	C16	Analog GND (Comm) CH03	A

Table 2-5 Pinout of the VMIACC-3448 Panel (Continued)

Terminal Screw Block P1	Output To VMIC board P3 Pin	Signal Name	Board
A17	A17	+ Input (HI)	
C17	C17	- Input (LO)	
A18	A18	+ Ext (HI)	
C18	C18	- Ext (LO)	
A19	A19	+ Sense (HI)	
C19	C19	- Sense (LO)	
A20	A20	N / C (Surge Return)	
C20	C20	Analog GND (Comm) CH04	A
A21	A21	+ Input (HI)	
C21	C21	- Input (LO)	
A22	A22	+ Ext (HI)	
C22	C22	- Ext (LO)	
A23	A23	+ Sense (HI)	
C23	C23	- Sense (LO)	
A24	A24	N / C (Surge Return)	
C24	C24	Analog GND (Comm) CH05	A
A25	A25	+ Input (HI)	
C25	C25	- Input (LO)	
A26	A26	+ Ext (HI)	
C26	C26	- Ext (LO)	
A27	A27	+ Sense (HI)	
C27	C27	- Sense (LO)	
A28	A28	N / C (Surge Return)	
C28	C28	Analog GND (Comm) CH06	A
A29	A29	+ Input (HI)	
C29	C29	- Input (LO)	
A30	A30	+ Ext (HI)	
C30	C30	- Ext (LO)	
A31	A31	+ Sense (HI)	
C31	C31	- Sense (LO)	
A32	A32	N / C (Surge Return)	
C32	C32	Analog GND (Comm) CH07	A

Table 2-5 Pinout of the VMIACC-3448 Panel (Continued)

Terminal Screw Block P2	Output To VMIC board P4 Pin	Signal Name	Board
A1	A1	+ Input (HI)	
C1	C1	- Input (LO)	
A2	A2	+ Ext (HI)	
C2	C2	- Ext (LO)	
A3	A3	+ Sense (HI)	
C3	C3	- Sense (LO)	
A4	A4	N / C (Surge Return)	
C4	C4	Analog GND (Comm) CH00	B
A5	A5	+ Input (HI)	
C5	C5	- Input (LO)	
A6	A6	+ Ext (HI)	
C6	C6	- Ext (LO)	
A7	A7	+ Sense (HI)	
C7	C7	- Sense (LO)	
A8	A8	N / C (Surge Return)	
C8	C8	Analog GND (Comm) CH01	B
A9	A9	+ Input (HI)	
C9	C9	- Input (LO)	
A10	A10	+ Ext (HI)	
C10	C10	- Ext (LO)	
A11	A11	+ Sense (HI)	
C11	C11	- Sense (LO)	
A12	A12	N / C (Surge Return)	
C12	C12	Analog GND (Comm) CH02	B
A13	A13	+ Input (HI)	
C13	C13	- Input (LO)	
A14	A14	+ Ext (HI)	
C14	C14	- Ext (LO)	
A15	A15	+ Sense (HI)	
C15	C15	- Sense (LO)	
A16	A16	N / C (Surge Return)	
C16	C16	Analog GND (Comm) CH03	B

Table 2-5 Pinout of the VMIACC-3448 Panel (Concluded)

Terminal Screw Block P2	Output To VMIC board P4 Pin	Signal Name	Board
A17	A17	+ Input (HI)	
C17	C17	- Input (LO)	
A18	A18	+ Ext (HI)	
C18	C18	- Ext (LO)	
A19	A19	+ Sense (HI)	
C19	C19	- Sense (LO)	
A20	A20	N / C (Surge Return)	
C20	C20	Analog GND (Comm) CH04	B
A21	A21	+ Input (HI)	
C21	C21	- Input (LO)	
A22	A22	+ Ext (HI)	
C22	C22	- Ext (LO)	
A23	A23	+ Sense (HI)	
C23	C23	- Sense (LO)	
A24	A24	N / C (Surge Return)	
C24	C24	Analog GND (Comm) CH05	B
A25	A25	+ Input (HI)	
C25	C25	- Input (LO)	
A26	A26	+ Ext (HI)	
C26	C26	- Ext (LO)	
A27	A27	+ Sense (HI)	
C27	C27	- Sense (LO)	
A28	A28	N / C (Surge Return)	
C28	C28	Analog GND (Comm) CH06	B
A29	A29	+ Input (HI)	
C29	C29	- Input (LO)	
A30	A30	+ Ext (HI)	
C30	C30	- Ext (LO)	
A31	A31	+ Sense (HI)	
C31	C31	- Sense (LO)	
A32	A32	N / C (Surge Return)	
C32	C32	Analog GND (Comm) CH07	B

Table 2-6 Pinout of the VMIACC-3449 Panel

Terminals going to Screw Block P1	Output To VMIC board P3 pin	Signal Name	
A1	A1	N.O.	
C1	B1	N.C.	CH01
A2 Surge Return			
C2	C1	Comm	
A3	A2	N.O.	
C3	B2	N.C.	CH02
A4 Surge Return			
C4	C2	Comm	
A5	A3	N.O.	
C5	B3	N.C.	CH03
A6 Surge Return			
C6	C3	Comm	
A7	A4	N.O.	
C7	B4	N.C.	CH04
A8 Surge Return			
C8	C4	Comm	
A9	A5	N.O.	
C9	B5	N.C.	CH05
A10 Surge Return			
C10	C5	Comm	
A11	A6	N.O.	
C11	B6	N.C.	CH06
A12 Surge Return			
C12	C6	Comm	
A13	A7	N.O.	
C13	B7	N.C.	CH07
A14 Surge Return			
C14	C7	Comm	
A15	A8	N.O.	
C15	B8	N.C.	CH08
A16 Surge Return			
C16	C8	Comm	

Table 2-6 Pinout of the 3449 Panel (Continued)

Terminals going to Screw Block P1	Output To VMIC board P3 pin	Signal Name	
A17	A9	N.O.	
C17	B9	N.C.	CH09
A18 Surge Return			
C18	C9	Comm	
A19	A10	N.O.	
C19	B10	N.C.	CH10
A20 Surge Return			
C20	C10	Comm	
A21	A11	N.O.	
C21	B11	N.C.	CH11
A22 Surge Return			
C22	C11	Comm	
A23	A12	N.O.	
C23	B12	N.C.	CH12
A24 Surge Return			
C24	C12	Comm	
A25	A13	N.O.	
C25	B13	N.C.	CH13
A26 Surge Return			
C26	C13	Comm	
A27	A14	N.O.	
C27	B14	N.C.	CH14
A28 Surge Return			
C28	C14	Comm	
A29	A15	N.O.	
C29	B15	N.C.	CH15
A30 Surge Return			
C30	C15	Comm	
A31	A16	N.O.	
C31	B16	N.C.	CH16
A32 Surge Return			
C32	C16	Comm	

Table 2-6 Pinout of the VMIACC-3449 Panel (Continued)

Terminals going to Screw Block P2	Output To VMIC board P3 pin	Signal Name	
A1	A17	N.O.	
C1	B17	N.C.	CH17
A2 Surge Return			
C2	C17	Comm	
A3	A18	N.O.	
C3	B18	N.C.	CH18
A4 Surge Return			
C4	C18	Comm	
A5	A19	N.O.	
C5	B19	N.C.	CH19
A6 Surge Return			
C6	C19	Comm	
A7	A20	N.O.	
C7	B20	N.C.	CH20
A8 Surge Return			
C8	C20	Comm	
A9	A21	N.O.	
C9	B21	N.C.	CH21
A10 Surge Return			
C10	C21	Comm	
A11	A22	N.O.	
C11	B22	N.C.	CH22
A12 Surge Return			
C12	C22	Comm	
A13	A23	N.O.	
C13	B23	N.C.	CH23
A14 Surge Return			
C14	C23	Comm	
A15	A24	N.O.	
C15	B24	N.C.	CH24
A16 Surge Return			
C16	C24	Comm	

Table 2-6 Pinout of the VMIACC-3449 Panel (Concluded)

Terminals going to Screw Block P2	Output To VMIC board P3 pin	Signal Name	
A17	A25	N.O.	
C17	B25	N.C.	CH25
A18 Surge Return			
C18	C25	Comm	
A19	A26	N.O.	
C19	B26	N.C.	CH26
A20 Surge Return			
C20	C26	Comm	
A21	A27	N.O.	
C21	B27	N.C.	CH27
A22 Surge Return			
C22	C27	Comm	
A23	A28	N.O.	
C23	B28	N.C.	CH28
A24 Surge Return			
C24	C28	Comm	
A25	A29	N.O.	
C25	B29	N.C.	CH29
A26 Surge Return			
C26	C29	Comm	
A27	A30	N.O.	
C27	B30	N.C.	CH30
A28 Surge Return			
C28	C30	Comm	
A29	A31	N.O.	
C29	B31	N.C.	CH31
A30 Surge Return			
C30	C31	Comm	
A31	A32	N.O.	
C31	B32	N.C.	CH32
A32 Surge Return			
C32	C32	Comm	

CHAPTER
3

Cabling

Contents

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Cable Model Numbers

The cable connectors on these surge protection panels can be used with either discrete wire or mass terminated cables. When cabling from the surge protection panels to the VMEbus boards, keep the cables short. The length of the cable influences how much force it will exert on the panels, unless a strain relief is provided. Long unsupported cables may exert too much force and damage or break the surge protection panel. Table 3-1 below lists the cables used with the various VMIC products.

Table 3-1 Cables

PROTECTION PANEL	CABLE GOING TO	VMEbus I/O BOARD	COMMENTS
VMIACC-3441	VMIVME-000-64-XXX 1 per panel	VMIVME-1150 VMIVME-1160A VMIVME-2170A	2 - 3441s are needed to protect all 64 I/O channels of these boards
VMIACC-3445	VMICBL-000-50-XXX 2 per panel	VMIVME-2232	1 - VMIACC-3445 can support one VMIVME-2232 board
VMIACC-3446	VMICBL-000-37-XXX 6 per panel	VMIVME-4150	1 - VMIACC-3446 can support three VMIVME-4150s
VMIACC-3447	VMIVME-000-64-XXX 2 per panel	VMIVME-3417A	1 - VMIACC-3447 can support two VMIVME-3417As
VMIACC-3448	VMIVME-000-64-XXX 2 per panel	VMIVME-3418	1 - VMIACC-3448 can support two VMIVME-3418s
VMIACC-3449	VMICBL-000-96-XXX 1 per panel	VMIVME-2210	1 - VMIVME-2210 can use two VMIACC-3449s
NOTE: *The -XXX in the table above is the length of the cable in feet. For example, a -025 option is a cable 25 feet long.			

Connector Diagrams

The following figures show the connector layout for each of the panels in the 344x family. Some of these panels have many connectors on them (such as the 3448), for these panels a second figure is drawn to show the connector locations on the panel. All of the drawings are a backview, except for Figure 3-3 on page 55, which is a top view.

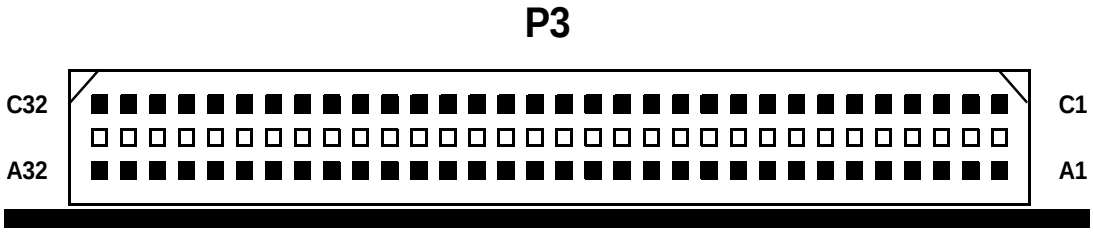

Figure 3-1 VMIACC-3441 Connector

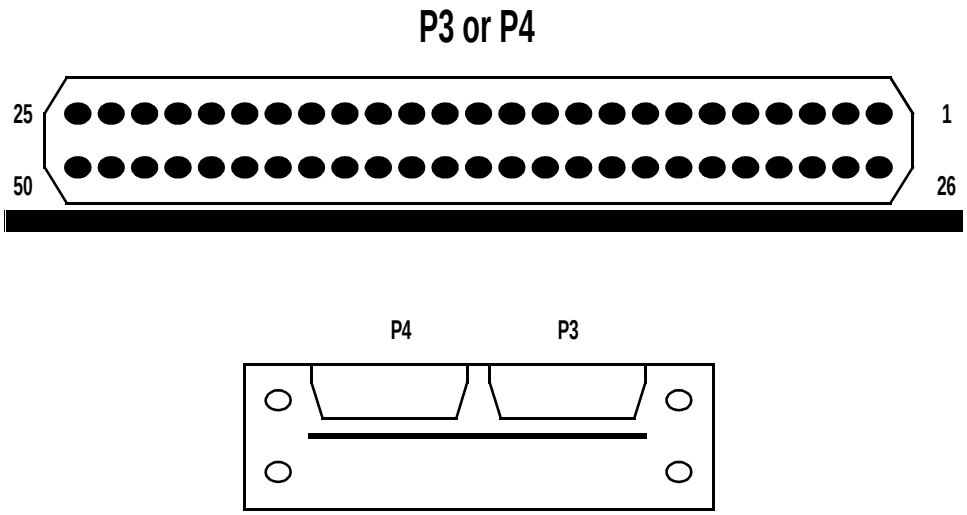

Figure 3-2 VMIACC-3445 Connectors

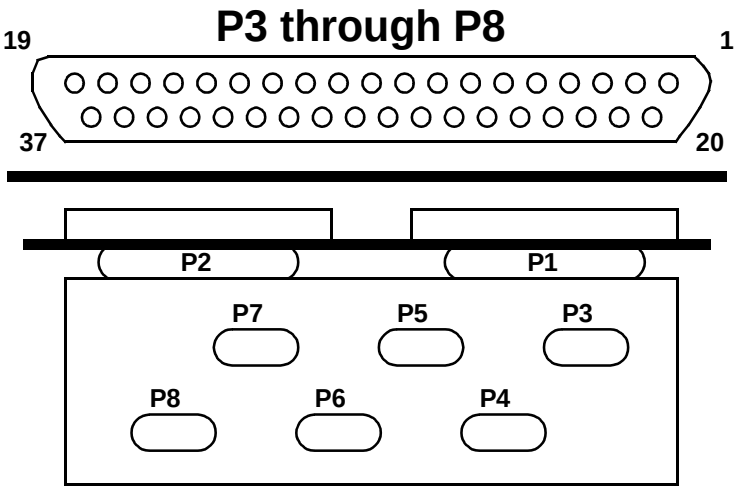

Figure 3-3 VMIACC-3446 Connectors

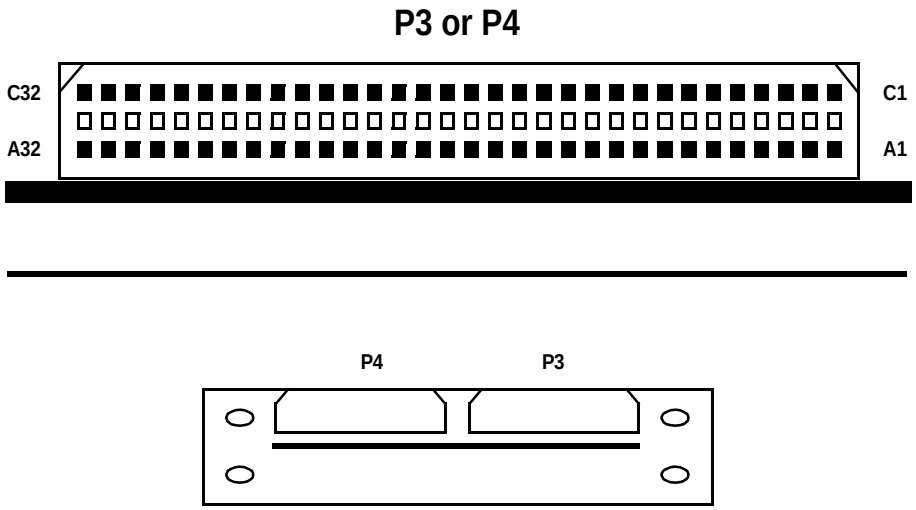

Figure 3-4 VMIACC-3447 or -3448 Connectors

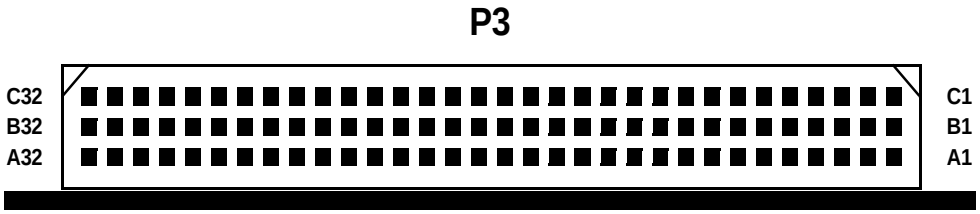

Figure 3-5 VMIACC-3449 Connector

Maintenance

Maintenance

This section provides information relative to the care and maintenance of VMIC's products. If the product malfunctions, verify the following:

- System power
- Software
- System configuration
- Electrical connections
- Jumper or configuration options
- Boards are fully inserted into their proper connector location
- Connector pins are clean and free from contamination
- No components of adjacent boards are disturbed when inserting or removing the board from the chassis
- Quality of cables and I/O connections

If products must be returned, contact VMIC for a Return Material Authorization (RMA) Number. **This RMA Number must be obtained prior to any return**.

Contact VMIC Customer Service at 1-800-240-7782, or
E-mail: customer.service@vmic.com

Maintenance Prints

User level repairs are not recommended. The drawings and tables in this manual are for reference purposes only.