

GE  
Intelligent Platforms  
Programmable Control Products

# Series 90-70 to RX3i I/O Adapter IC695ACC651 Installation Manual

GFK-2793D  
May 2015





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GFL-002

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# Table of Contents

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Table of Contents.....	i
Table of Figures.....	v
<b>Chapter 1 Introduction.....</b>	<b>1</b>
1.1 Adapter Card Features.....	1
1.2 Related Documents.....	2
<b>Chapter 2 Installation and Set-Up.....</b>	<b>3</b>
2.1 I/O Adapter Card Installation.....	3
2.2 Removing an I/O Adapter Card.....	3
2.3 Wiring Procedures.....	4
2.4 Sample Wiring Harnesses.....	6
<b>Chapter 3 Modules Supported for Migration.....</b>	<b>9</b>
3.1 RX3i I/O Replacements for Series 90-70 I/O.....	10
3.2 IC695CRH001 – 90-70 MDL252 to RX3i MDL241 Harness Assembly.....	11
3.2.1 Discrete Input Modules.....	11
3.2.2 Specification Comparison.....	12
3.2.3 Pin Mapping.....	13
3.3 IC695CRH002 – 90-70 MDL253 to RX3i MDL241 Harness Assembly.....	14
3.3.1 Discrete Input Modules.....	14
3.3.2 Specification Comparison.....	15
3.3.3 Pin Mapping.....	16
3.4 IC695CRH003 – 90-70 MDL250 to RX3i MDL260 Harness Assembly.....	17
3.4.1 Discrete Input Modules.....	17
3.4.2 Specification Comparison.....	18
3.4.3 Pin Mapping.....	19
3.5 IC695CRH004 – 90-70 MDL240 to RX3i MDL250 Harness Assembly.....	20
3.5.1 Discrete Input Modules.....	20
3.5.2 Specification Comparison.....	21
3.5.3 Pin Mapping.....	22
3.6 IC695CRH005 – 90-70 MDL251 to RX3i MDL240 Harness Assembly.....	23
3.6.1 Discrete Input Modules.....	23
3.6.2 Specification Comparison.....	24
3.6.3 Pin Mapping.....	25
3.7 IC695CRH006 – 90-70 MDL251 to RX3i MDL250 Harness Assembly.....	26
3.7.1 Discrete Input Modules.....	26
3.7.2 Specification Comparison.....	27
3.7.3 Pin Mapping.....	28

# Contents

<b>3.8</b>	IC695CRH007 – 90-70 MDL241 to RX3i MDL231 Harness Assembly .....	29
<b>3.8.1</b>	Discrete Input Modules .....	29
<b>3.8.2</b>	Specification Comparison .....	30
<b>3.8.3</b>	Pin Mapping .....	31
<b>3.9</b>	IC695CRH008 – 90-70 MDL653 to RX3i MDL660 Harness Assembly .....	32
<b>3.9.1</b>	Discrete Input Modules .....	32
<b>3.9.2</b>	Specification Comparison .....	33
<b>3.9.3</b>	Pin Mapping .....	34
<b>3.10</b>	IC695CRH009 – 90-70 MDL652 to RX3i MDL654 Harness Assembly .....	35
<b>3.10.1</b>	Discrete Input Modules .....	35
<b>3.10.2</b>	Specification Comparison .....	36
<b>3.10.3</b>	Pin Mapping .....	37
<b>3.11</b>	IC695CRH010 – 90-70 MDL654 to RX3i MDL658 Harness Assembly .....	38
<b>3.11.1</b>	Discrete Input Modules .....	38
<b>3.11.2</b>	Specification Comparison .....	39
<b>3.11.3</b>	Pin Mapping .....	40
<b>3.12</b>	IC695CRH011 – 90-70 MDL640 to RX3i MDL632 Harness Assembly .....	41
<b>3.12.1</b>	Discrete Input Modules .....	41
<b>3.12.2</b>	Specification Comparison .....	42
<b>3.12.3</b>	Pin Mapping .....	43
<b>3.13</b>	IC695CRH013 – 90-70 MDL671 to RX3i MDL645 Harness Assembly .....	44
<b>3.13.1</b>	Discrete Input Modules .....	44
<b>3.13.2</b>	Specification Comparison .....	45
<b>3.13.3</b>	Pin Mapping .....	46
<b>3.14</b>	IC695CRH014 – 90-70 MDL350 to RX3i MDL340 Harness Assembly .....	47
<b>3.14.1</b>	Discrete Output Modules .....	47
<b>3.14.2</b>	Specification Comparison .....	48
<b>3.14.3</b>	Pin Mapping .....	49
<b>3.15</b>	IC695CRH015 – 90-70 MDL340 to RX3i MDL330 Harness Assembly .....	50
<b>3.15.1</b>	Discrete Output Modules .....	50
<b>3.15.2</b>	Specification Comparison .....	51
<b>3.15.3</b>	Pin Mapping .....	52
<b>3.16</b>	IC695CRH016 – 90-70 MDL340 to RX3i MDL350 Harness Assembly .....	53
<b>3.16.1</b>	Discrete Output Modules .....	53
<b>3.16.2</b>	Specification Comparison .....	54
<b>3.16.3</b>	Pin Mapping .....	55
<b>3.17</b>	IC695CRH017 – 90-70 MDL341 to RX3i MDL350 Harness Assembly .....	56
<b>3.17.1</b>	Discrete Output Modules .....	56
<b>3.17.2</b>	Specification Comparison .....	57
<b>3.17.3</b>	Pin Mapping .....	58
<b>3.18</b>	IC695CRH018 – 90-70 MDL341 to RX3i MDL390 Harness Assembly .....	59
<b>3.18.1</b>	Discrete Output Modules .....	59
<b>3.18.2</b>	Specification Comparison .....	60
<b>3.18.3</b>	Pin Mapping .....	61
<b>3.19</b>	IC695CRH019 – 90-70 MDL752 to RX3i MDL753 Harness Assembly .....	62
<b>3.19.1</b>	Discrete Output Modules .....	62
<b>3.19.2</b>	Specification Comparison .....	63
<b>3.19.3</b>	Pin Mapping .....	64

3.20	IC695CRH020 – 90-70 MDL750 to RX3i MDL753 Harness Assembly .....	65
3.20.1	Discrete Output Modules .....	65
3.20.2	Specification Comparison .....	66
3.20.3	Pin Mapping .....	67
3.21	IC695CRH022 – 90-70 MDL940 to RX3i MDL916 Harness Assembly .....	68
3.21.1	Discrete Output Modules .....	68
3.21.2	Specification Comparison .....	69
3.21.3	Pin Mapping .....	70
3.22	IC695CRH023 – 90-70 ALG230 to RX3i ALG616 Harness Assembly .....	71
3.22.1	Analog Input Modules.....	71
3.22.2	Specification Comparison .....	72
3.22.3	Pin Mapping .....	73
3.23	IC695CRH024 – 90-70 ALG230 to RX3i ALG220 Harness Assembly .....	74
3.23.1	<b>Analog Input Modules</b> .....	74
3.23.2	Specification Comparison .....	75
3.23.3	Pin Mapping .....	76
3.24	IC695CRH025 – 90-70 ALG230 to RX3i ALG221 Harness Assembly .....	77
3.24.1	Analog Input Modules.....	77
3.24.2	Specification Comparison .....	78
3.24.3	Pin Mapping .....	79
3.25	IC695CRH026 – 90-70 ALG230 to RX3i ALG222 Harness Assembly .....	80
3.25.1	Analog Input Modules.....	80
3.25.2	Specification Comparison .....	81
3.25.3	Pin Mapping .....	82
3.26	IC695CRH027 – 90-70 ALG230 to RX3i ALG232 Harness Assembly .....	83
3.26.1	Analog Input Modules.....	83
3.26.2	Specification Comparison .....	84
3.26.3	Pin Mapping .....	85
3.27	IC695CRH028 – 90-70 ALG440 to RX3i ALG616 Harness Assembly .....	86
3.27.1	Analog Input Modules.....	86
3.27.2	Specification Comparison .....	87
3.27.3	Pin Mapping .....	88
3.28	IC695CRH029 – 90-70 ALG440 to RX3i ALG220 Harness Assembly .....	89
3.28.1	Analog Input Modules.....	89
3.28.2	Specification Comparison .....	90
3.28.3	Pin Mapping .....	91
3.29	IC695CRH030 – 90-70 ALG440 to RX3i ALG221 Harness Assembly .....	92
3.29.1	Analog Input Modules.....	92
3.29.2	Specification Comparison .....	93
3.29.3	Pin Mapping .....	94
3.30	IC695CRH031 – 90-70 ALG441 to RX3i ALG616 Harness Assembly .....	95
3.30.1	Analog Input Modules.....	95
3.30.2	Specification Comparison .....	96
3.30.3	Pin Mapping .....	97
3.31	IC695CRH032 – 90-70 ALG441 to RX3i ALG220 Harness Assembly .....	98
3.31.1	Analog Input Modules.....	98
3.31.2	Specification Comparison .....	99
3.31.3	Pin Mapping .....	100

# Contents

---

<b>3.32</b>	IC695CRH033 – 90-70 ALG441 to RX3i ALG222 Harness Assembly .....	101
<b>3.32.1</b>	Analog Input Modules.....	101
<b>3.32.2</b>	Specification Comparison .....	102
<b>3.32.3</b>	Pin Mapping .....	103
<b>3.33</b>	IC695CRH034 – 90-70 ALG441 to RX3i ALG232 Harness Assembly .....	104
<b>3.33.1</b>	Analog Input Modules.....	104
<b>3.33.2</b>	Specification Comparison .....	105
<b>3.33.3</b>	Pin Mapping .....	106
<b>3.34</b>	IC695CRH035 – 90-70 ALG320 to RX3i ALG708 Harness Assembly .....	107
<b>3.34.1</b>	Analog Output Modules.....	107
<b>3.34.2</b>	Specification Comparison .....	108
<b>3.34.3</b>	Pin Mapping .....	109
<b>3.35</b>	IC695CRH036 – 90-70 ALG320 to RX3i ALG390 Harness Assembly .....	110
<b>3.35.1</b>	Analog Output Modules.....	110
<b>3.35.2</b>	Specification Comparison .....	111
<b>3.35.3</b>	Pin Mapping .....	112
<b>3.36</b>	IC695CRH037 – 90-70 ALG320 to RX3i ALG391 Harness Assembly .....	113
<b>3.36.1</b>	Analog Output Modules.....	113
<b>3.36.2</b>	Specification Comparison .....	114
<b>3.36.3</b>	Pin Mapping .....	115
<b>3.37</b>	IC695CRH038 – 90-70 MDL740 to RX3i MDL765 Harness Assembly .....	116
<b>3.37.1</b>	Discrete Output Modules .....	116
<b>3.37.2</b>	Specification Comparison .....	117
<b>3.37.3</b>	Pin Mapping .....	118
<b>3.38</b>	IC695CRH039 – 90-70 MDL753 to RX3i MDL752 Harness Assembly .....	119
<b>3.38.1</b>	Discrete Output Modules .....	119
<b>3.38.2</b>	Specification Comparison .....	120
<b>3.38.3</b>	Pin Mapping .....	121
<b>Chapter 4</b>	<b>Agency Approvals and Government Regulations .....</b>	<b>123</b>
<b>4.1</b>	Agency Approvals .....	123
<b>4.2</b>	Agency Warnings and Installation Guidelines .....	124
<b>4.2.1</b>	Installation Location.....	124
<b>4.2.2</b>	Installation in Hazardous Areas .....	124



## Table of Figures

Figure 1: Series 90-70 to RX3i I/O Adapter Card Front View	1
Figure 2: Series 90-70 to RX3i I/O Adapter Card Connector Detail	1
Figure 3: Series 90-70 I/O Terminal Board	5
Figure 4: Wiring Harness for Discrete Modules with One RX3i Terminal Block	6
Figure 5: Wiring Harness for Discrete Modules with Two RX3i Terminal Blocks	6
Figure 6: Wiring Harness for Discrete Modules with Fujitsu Connector	7
Figure 7: Wiring Harness for Analog Modules	7
Figure 8: 12 Vac 32-Point IC697MDL252	11
Figure 9: 124 Vac/dc, 16-Point Pos/Neg IC694MDL241	11
Figure 10: 24 Vac 32-Point IC697MDL253	14
Figure 11: 24 Vac/dc 16-Point Pos/Neg IC694MDL241	14
Figure 12: 120 Vac 32-Point IC697MDL250	17
Figure 13: 120 Vac 32-Point IC694MDL260	17
Figure 14: 120 Vac 16-Point IC697MDL240	20
Figure 15: 120 Vac 16-Point Isolated IC694MDL250	20
Figure 16: 120 Vac 16-Point IC697MDL251	23
Figure 17: 120 Vac 16-Point IC694MDL240	23
Figure 18: 120 Vac 16-Point IC697MDL251	26
Figure 19: 120 Vac 16-Point Isolated IC694MDL250	26
Figure 20: 240 Vac 16-Point Isolated IC697MDL241	29
Figure 21: 240 Vac 8-Point Isolated IC694MDL231	29
Figure 22: 24 Vdc Pos/Neg 32-Point IC697MDL653	32
Figure 23: 24 Vdc 32-Point Grouped IC694MDL660	32
Figure 24: 12 Vdc Pos/Neg 32-Point IC697MDL652	35
Figure 25: 5/12 Vdc Pos/Neg 32-Point IC694MDL654	35
Figure 26: 48 Vdc Pos/Neg 32-Point IC697MDL654	38
Figure 27: 48 Vdc Pos/Neg 32-Point IC694MDL658	38
Figure 28: 125 Vdc Pos/Neg 16-Point IC697MDL650	41
Figure 29: 125 Vdc Pos/Neg 8-Point IC694MDL632	41
Figure 30: 24 Vdc Pos/Neg 14-Point IC697MDL671	44
Figure 31: 24 Vdc Pos/Neg 16-Point IC694MDL645	44
Figure 32: 120 Vac 0.5A 32-Point IC697MDL350	47
Figure 33: 120 Vac 0.5A 16-Point IC694MDL340	47
Figure 34: 120 Vac 2A 16-Point IC697MDL340	50
Figure 35: 120/240 Vac 2A 8-Point Isolated IC694MDL330	50
Figure 36: 120 Vac 2A 16-Point IC697MDL340	53
Figure 37: 120/240 Vac 2A 16-Point Isolated IC694MDL350	53
Figure 38: 120/240 Vac 2A 12-Point Isolated IC697MDL341	56
Figure 39: 120/240 Vac 2A 16-Point Isolated IC694MDL350	56
Figure 40: 120/240 Vac 2A 12-Point Isolated IC697MDL341	59
Figure 41: 120/240 Vac 2A 5-Point Isolated IC694MDL390	59
Figure 42: 12 Vdc 0.5A 32-Point IC697MDL752	62
Figure 43: 12/24Vdc 0.5A Pos Logic 32-Point IC694MDL753	62
Figure 44: 24/48 Vdc 0.5A 32-Point IC697MDL750	65
Figure 45: 12/24Vdc 0.5A Pos Logic 32-Point IC694MDL753	65
Figure 46: Relay Output 16-Point IC697MDL940	68
Figure 47: Relay Output 4A 16-Point Isolated IC694MDL916	68
Figure 48: 8-Channel Base Converter IC697ALG230	71
Figure 49: 16-/8-Channel Analog Voltage/Current Input IC695ALG616	71

# Contents

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Figure 50: 8-Channel Base Converter IC697ALG230	74
Figure 51: 4-Channel Analog Input Voltage Differential IC694ALG220	74
Figure 52: 8-Channel Base Converter IC697ALG230	77
Figure 53: 4-Channel Analog Differential Current Input IC694ALG221	77
Figure 54: 8-Channel Base Converter IC697ALG230	80
Figure 55: 16-/8-Channel Analog Voltage Input IC694ALG222	80
Figure 56: 8-Channel Base Converter IC697ALG230	83
Figure 57: 16-/8-Channel Analog Voltage Input IC694ALG232	83
Figure 58: 16-Channel Current Expander IC697ALG440	86
Figure 59: 16-/8-Channel Analog Voltage/Current Input IC695ALG616	86
Figure 60: 16-Channel Current Expander IC697ALG440	89
Figure 61: 4-Channel Analog Voltage Differential Input IC694ALG220	89
Figure 62: 16-Channel Current Expander IC697ALG440	92
Figure 63: 4-Channel Analog Differential Current Input IC694ALG221	92
Figure 64: 16-Channel Voltage Expander IC697ALG441	95
Figure 65: 16-/8-Channel Analog Voltage/Current Input IC695ALG616	95
Figure 66: 16-Channel Voltage Expander IC697ALG441	98
Figure 67: 4-Channel Analog Voltage Differential Input IC694ALG220	98
Figure 68: 16-Channel Voltage Expander IC697ALG441	101
Figure 69: 16-/8-Channel Analog Voltage Input IC694ALG222	101
Figure 70: 16-Channel Voltage Expander IC697ALG441	104
Figure 71: 16-/8-Channel Analog Voltage Input IC694ALG232	104
Figure 72: 4-Channel Voltage / Current IC697ALG320	107
Figure 73: 4-/8-Channel Analog Voltage / Current Input IC695ALG704	107
Figure 74: 4-Channel Voltage / Current IC697ALG320	110
Figure 75: 2-Channel Analog Voltage Output IC694ALG390	110
Figure 76: 4-Channel Voltage / Current IC697ALG320	113
Figure 77: 2-Channel Analog Current Output IC694ALG391	113
Figure 78: 24/48 Vdc 2A 16-Point IC697MDL740	116
Figure 79: 24/125 Vdc 2A 16-Point Output IC695MDL765	116
Figure 80: 5/48 Vdc 0.5A Neg 32-Point IC697MDL753	119
Figure 81: 5/24 Vdc (TTL) 0.5A 32-Point Neg Logic Output IC694MDL752	119

# Chapter 1 Introduction

The Series 90-70 to RX3i I/O Adapter Card IC695ACC651 connects existing Series 90-70 field wiring to replacement RX3i I/O modules. It is used along with the S90-70 9-Slot Conversion Rack IC695ACC650 or the S90-70 5-Slot Conversion Rack IC695ACC652,

## 1.1 Adapter Card Features

- Compatible with Series 90-70 I/O terminal blocks
- Supports Series 90-70 Discrete I/O and Analog I/O Modules. Refer to the section, Supported Modules for Migration.
- Supports up to 240 V 8A connections to I/O modules.
- Surrounding Air Temperature Rating: 60°C (140 °F)



Figure 1: Series 90-70 to RX3i I/O Adapter Card Front View

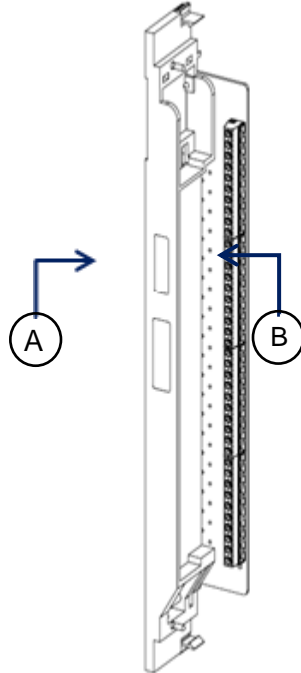


Figure 2: Series 90-70 to RX3i I/O Adapter Card Connector Detail

**A:** Connectors for Series 90-70 TB assembly  
**B:** Terminal block for connecting to RX3i module terminal header

### 1.2 Related Documents

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The following user manuals and other product documentation are available on the Support website [www.ge-ip.com/support](http://www.ge-ip.com/support):

*Series 90-70 to RX3i Conversion Rack Important Product Information*, GFK-2792

*PACSystems RX3i System Manual*, GFK-2314

*Series 90-70 Programmable Controller Data Sheet Manual*, GFK-0600

*Series 90-70 Programmable Controller Installation Manual*, GFK-0262

## Chapter 2 Installation and Set-Up

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The Series 90-70 I/O terminal block assembly, with field wiring retained from the existing Series 90-70 installation, should be plugged in to item A of the adapter card. Refer to Figure 2. The other side of the I/O adapter card has 5 mm (0.20 in) pitch terminal blocks. Item B in Figure 2 can be used to connect wires to the RX3i I/O module terminal headers. Refer to *Series 90-70 to RX3i Conversion Rack Important Product Information*, GFK-2792, for integration with either of the available conversion racks (IC695ACC650 or IC695ACC652).

### 2.1 I/O Adapter Card Installation

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The IC695ACC651 I/O Adapter Cards have molded latches that automatically snap onto the upper and lower rails of the conversion rack (IC695ACC650 or IC695ACC652) when the module is fully inserted. Use the included M2.5x11 collar screws to secure the adapter cards to the rack.

### 2.2 Removing an I/O Adapter Card

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#### Warning

Remove the power supply connected to the Series 90-70 rack before disconnecting terminal blocks or removing an Adapter card.

Even if the power supply is switched off, hazardous Voltages from user field wiring may still be present on the I/O terminal boards as well as on the power supply terminal board. Care should be taken when handling the power supply and I/O modules as well as any wiring connected to them to prevent personal injury.

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When removing an I/O Adapter Card from its slot in a rack adhere to the following instructions:

- If the series 90-70 I/O terminal block assembly is already connected to the I/O adapter card, first remove it by turning the jackscrew counterclockwise until it is completely disengaged.
- Gently pull the series 90-70 I/O terminal block assembly from the bottom of the conversion rack which is open.
- Unscrew the M2.5x11 collar screws on the I/O adapter card.
- Grasp the I/O adapter card firmly at the top and bottom of the board cover with your thumbs on the front of the cover and your fingers on the plastic clips on the back of the cover.
- Squeeze the rack clips on the back of the cover with your fingers to disengage the clip from the rack rail and pull the board firmly to remove it from the backplane connector.
- Slide the board along the card guide and remove it from the rack.
- Do not use the hinged door to remove the terminal board. The door could be damaged if this is done.

### 2.3 Wiring Procedures

The following procedures should be used when connecting the wiring between the terminal connectors on the adapter board and RX3i terminal block.

➤ **To connect the wiring**

1. Turn off power before wiring the terminal connectors.
2. Choose the appropriate RX3i terminal block or blocks. Refer to *GFK-2314, PACSystems RX3i System Manual*.
3. The terminal connector on the I/O adapter card (item B in Figure 2), accepts wire sizes from AWG #22 (0.36 mm<sup>2</sup>) through AWG #14 (2.10 mm<sup>2</sup>). When using AWG #14 (2.10 mm<sup>2</sup>) wire for wiring all points, do not exceed a max insulation diameter of 3.43 mm (0.135 in). To ensure proper connection, two wires may be terminated at one terminal only if both wires are the same size.
4. The torque recommended for the I/O terminal board connection screws and the I/O adapter card Terminal Block is as listed in the following table.

Connector	Description	Torque (min)	Torque (max)
44B740021-G01R01	RX3i 20PT Terminal Block	1.1 Nm (9.6 in-lbs)	1.3 Nm (11.5 in-lbs)
IC694TBB032/TBB132	RX3i 36PT Terminal Block	-	0.79 Nm (7 in-lbs)
42G8401-0067	CONN TB 1X10 5MM on I/O Adapter Card	0.5 Nm (4.4 in-lbs)	0.6 Nm (5.31 in-lbs)

5. For the ALG modules, to minimize capacitive loading and noise, all field connections should be wired using a good grade of twisted, shielded instrumentation cable. The shields should be connected to GND on the user terminal connector block.

Follow the wiring connections mapping provided in the following sections for each Series 90-70 I/O module to that of the equivalent RX3i I/O module.

6. After the wiring is completed from the I/O adapter card to the RX3i terminal strips, open the hinged RX3i mounting plate on the adapter rack, insert the adapter card in the rack and gently pull the RX3i terminals connected to the other side of the wire, from the bottom of the rack, which is open. To secure the I/O Adapter card, refer to the procedures in the section, [I/O Adapter Card Installation](#).
7. To connect the Series 90-70 I/O header assembly with field wiring to the I/O adapter card, open the hinged door on the rack, pull the Series 90-70 I/O terminal block assembly with field wiring from the bottom of the rack and insert into the I/O adapter card. Secure the Series 90-70 terminal block assembly by turning the jackscrew clockwise until it is engaged.
8. Close and secure the hinged RX3i mounting plate on the rack. Tighten the captive screws with a torque of 2.5 Nm (22.1 in-lbs).
9. Connect the RX3i terminal blocks to the RX3i modules.
10. Add tie wraps at base of the mounting bracket where holes are provided on the Conversion rack (IC695ACC650 or IC695ACC652) to hold the wire bundle intact from the RX3i module to the I/O adapter card. Add additional cable ties along the length of wire bundle.
11. After completing wiring connections to all modules in a rack, the wire bundle with field wiring must be secured. To ensure that the wire bundle is secured properly, it is recommended that a cable tie be wrapped around the wire bundle and tightly secured through the cable tie cleat at the bottom of the terminal board. For extremely large wire bundles, additional cable ties should be used.

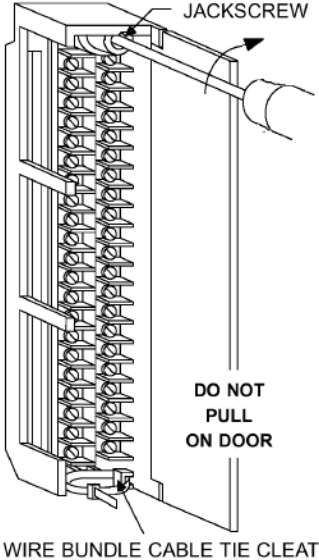


Figure 3: Series 90-70 I/O Terminal Board

2.4 Sample Wiring Harnesses

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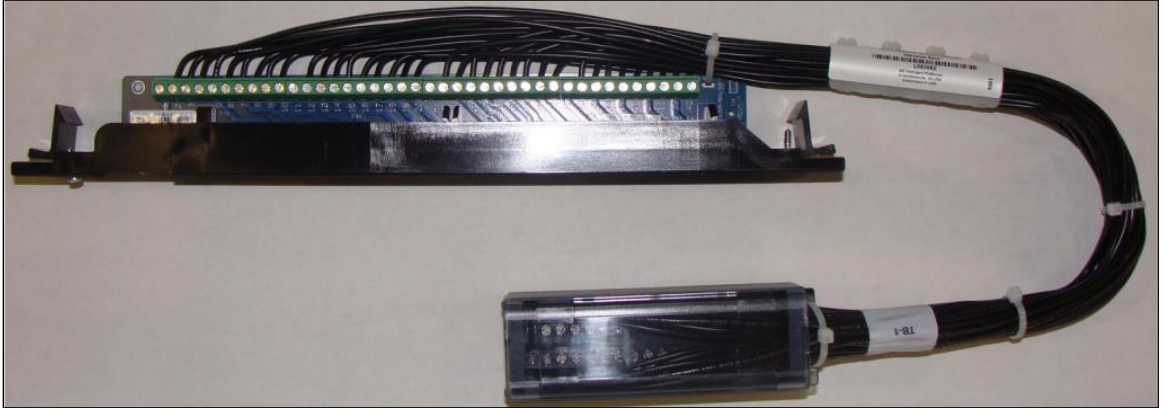


Figure 4: Wiring Harness for Discrete Modules with One RX3i Terminal Block

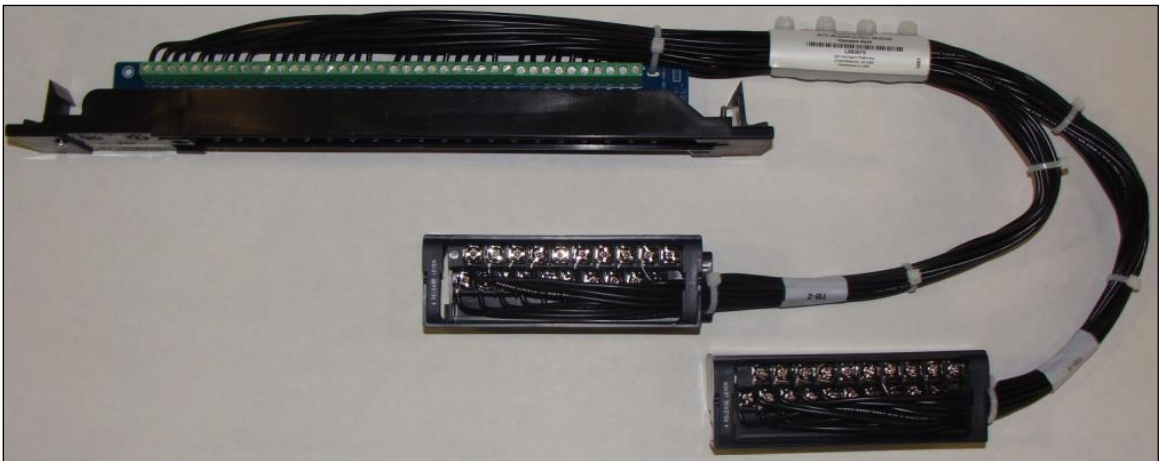


Figure 5: Wiring Harness for Discrete Modules with Two RX3i Terminal Blocks



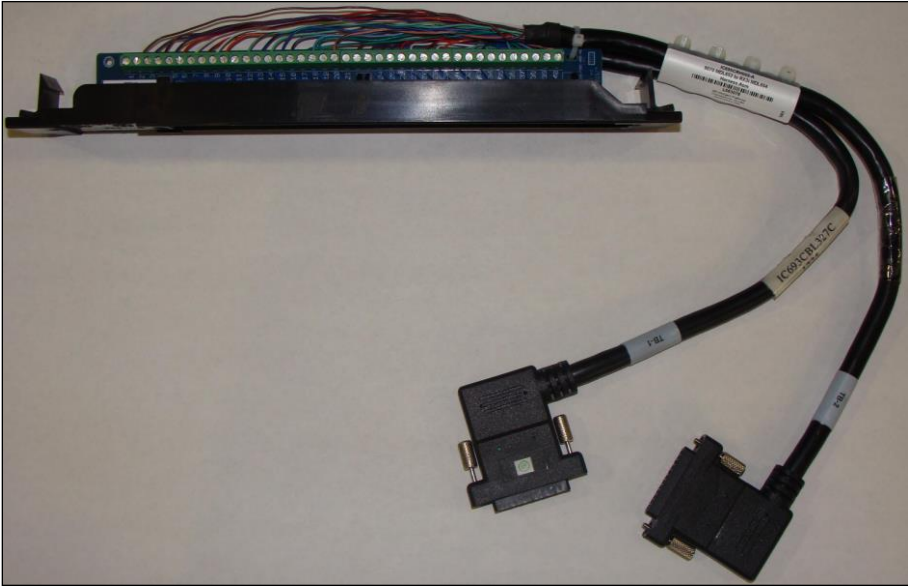


Figure 6: Wiring Harness for Discrete Modules with Fujitsu Connector

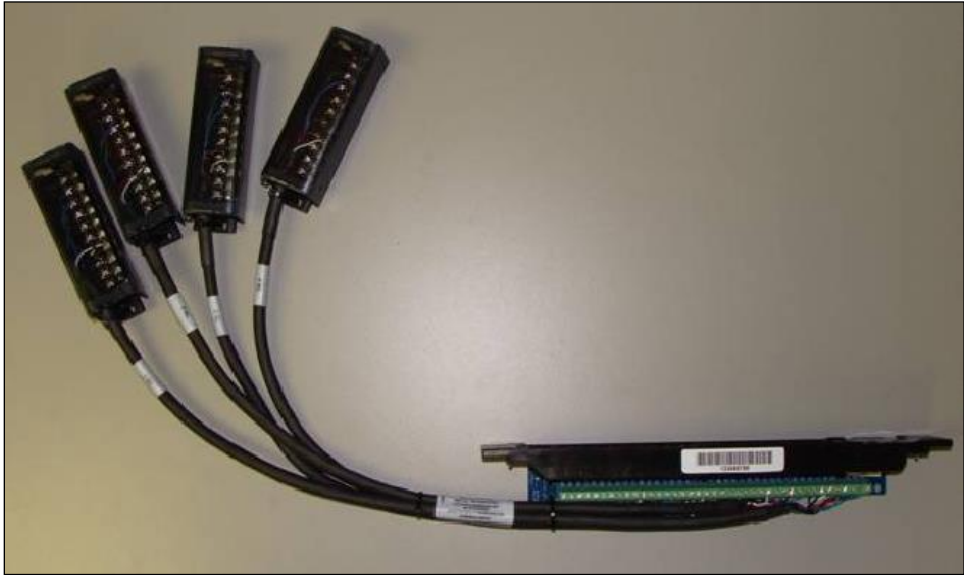


Figure 7: Wiring Harness for Analog Modules

**Note:** All IC695CRHxxx wire harness catalog numbers contain the IC695ACC651 I/O Adapter card and applicable RX3i terminal. At customer discretion, IC695ACC651 may be ordered for hand-wired applications.



## Chapter 3 Modules Supported for Migration

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This chapter provides connector pin mapping and specifications for each combination of Series 90-70 I/O and RX3i I/O modules. For Series 90-70 I/O modules, where multiple options of wiring harnesses are offered, refer to the section, *Modules Supported for Migration*, for the appropriate RX3i I/O module.

### Notes:

- The module mappings provided are the most optimal recommended solutions and apply to installations that conform to those provided in *GFK-0262, Series 90-70 Programmable Controller Installation Manual*, and *GFK-0600, Series 90-70 Programmable Controller Data Sheet Manual*. It is the customer's responsibility to validate their installation for compliance to agency requirements.
- It is recommended to review the isolation specifications for discrete modules and Form A and C applications for relay modules when configuring the RX3i system.
- Some applications require more than one RX3i module to transfer the Series 90-70 I/O. In these cases, adjustments must be made in the user's program.

3.1 RX3i I/O Replacements for Series 90-70 I/O

Series 90-70 I/O Module	Module Type	RX3i I/O Module	Wiring Harness	Section
IC697ALG230	Analog Input	IC694ALG220	IC695CRH024	3.23
		IC694ALG221	IC695CRH025	3.24
		IC694ALG222	IC695CRH026	3.25
		IC694ALG232	IC695CRH027	3.26
		IC695ALG616	IC695CRH023	3.22
IC697ALG320	Analog Output	IC694ALG390	IC695CRH036	3.35
		IC694ALG391	IC695CRH037	3.36
		IC695ALG708	IC695CRH035	3.34
IC697ALG440	Analog Input	IC694ALG220	IC695CRH029	3.28
		IC694ALG221	IC695CRH030	3.29
		IC695ALG616	IC695CRH028	3.27
IC697ALG441	Analog Input	IC694ALG220	IC695CRH032	3.31
		IC694ALG222	IC695CRH033	3.32
		IC694ALG232	IC695CRH034	3.33
		IC695ALG616	IC695CRH031	3.30
IC697MDL240	Discrete Input	IC694MDL250	IC695CRH004	3.5
IC697MDL241	Discrete Input	IC694MDL231	IC695CRH007	3.8
IC697MDL250	Discrete Input	IC694MDL260	IC695CRH003	3.4
IC697MDL251	Discrete Input	IC694MDL240	IC695CRH005	3.6
		IC694MDL250	IC695CRH006	3.7
IC697MDL252	Discrete Input	IC694MDL241	IC695CRH001	3.2
IC697MDL253	Discrete Input	IC694MDL241	IC695CRH002	3.3
IC697MDL340	Discrete Output	IC694MDL330	IC695CRH015	3.15
		IC694MDL350	IC695CRH016	3.16
IC697MDL341	Discrete Output	IC694MDL350	IC695CRH017	3.17
		IC694MDL390	IC695CRH018	3.18
IC697MDL350	Discrete Output	IC694MDL340	IC695CRH014	3.14
IC697MDL640	Discrete Input	IC694MDL632	IC695CRH011	3.12
IC697MDL652	Discrete Input	IC694MDL654	IC695CRH009	3.10
IC697MDL653	Discrete Input	IC694MDL660	IC695CRH008	3.9
IC697MDL654	Discrete Input	IC694MDL658	IC695CRH010	3.11
IC697MDL671	Discrete Input	IC694MDL645	IC695CRH013	3.13
IC697MDL740	Discrete Output	IC695MDL765	IC695CRH038	3.37
IC697MDL750	Discrete Input	IC694MDL753	IC695CRH020	3.20
IC697MDL752	Discrete Output	IC694MDL753	IC695CRH019	3.19
IC697MDL753	Discrete Output	IC694MDL752	IC695CRH039	3.38
IC697MDL940	Discrete Output	IC694MDL916	IC695CRH022	3.21

**Note:** The number of RX3i Modules required to replace the respective Series 90-70 I/O module is indicated in the Pin Mapping tables as RX3i Module1, RX3i Module 2, and such. Similarly, the Terminal Blocks (TBs) for the RX3i modules in the Pin Mapping table are identified with suffixes that indicate the corresponding RX3i module.

**Note:** All IC695CRHxxx wire harness catalog numbers contain the IC695ACC651 I/O Adapter card and applicable RX3i terminal. At customer discretion, IC695ACC651 may be ordered for hand wired applications.

## 3.2 IC695CRH001 – 90-70 MDL252 to RX3i MDL241 Harness Assembly

### 3.2.1 Discrete Input Modules

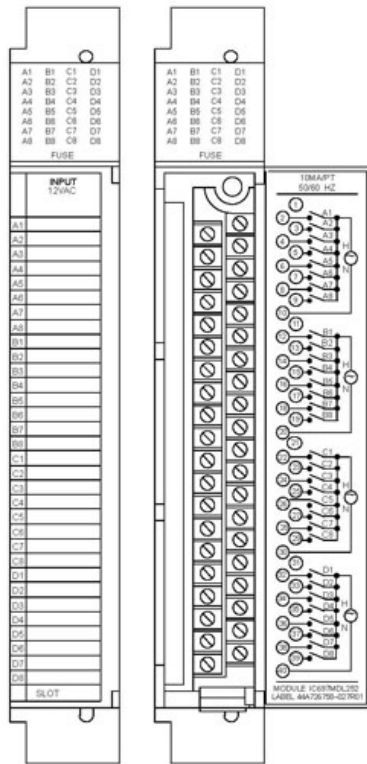


Figure 8: 12 Vac 32-Point IC697MDL252

The 12 Vac 32 Point Input Module, IC697MDL252, provides 32 input points in four isolated groups of eight points each. This allows each group of eight points to be used on a different phase of the ac supply.

The input is resistive with current-Voltage characteristics which meet IEC standard (type 1). The input characteristics are compatible with a large range of available proximity switches.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.



Figure 9: 124 Vac/dc, 16-Point Pos/Neg IC694MDL241

The 24 Vac/dc 16 Point C Positive/Negative Logic Input Module, IC694MDL241, provides 16 input points in one group with a common power input terminal. This module can be used with ac or dc field inputs. In dc mode, it can be wired for either positive or negative logic. Input characteristics are compatible with a wide range of input devices, such as push-buttons, limit switches, and electronic proximity switches.

Current into an input point results in a logic 1 in the input status table (%I). Power to operate ac input devices must be supplied by the user. DC inputs can be powered by the backplane 24 V supply.

3.2.2 Specification Comparison

Item	IC697MDL252	IC694MDL241	Notes
Rated Voltage	12 Vac, 47 to 63 Hz Sinusoidal	24 Vac or 24 Vdc <b>(Input Voltage Range: 0 to +30 Vdc or 0 - +30 Vac, 50/60 Hz)</b>	
Inputs per Module	32 (four groups of eight inputs each)	16 (one group with a single common)	The 4 input groups must have the same power supply.
Isolation	1500 V RMS any input to backplane 500 V RMS between input groups	250 Vac continuous 1500 Vac for one minute	2 Module Replacement
Input Current	10 mA (typical) at rated Voltage	7 mA (typical) at rated Voltage	
Input Impedance	1.12 k $\Omega$ typical Input		
<b>Input Characteristics</b>			
On-state Voltage	7.5 to 15 V RMS, 47 - 63 Hz Sinusoidal	1.5 - 30 Vac or dc	Correct operation of the replacement card requires the input Voltage of 12-30 Vac.
Off-state Voltage	0 to 2.5 V RMS, 47 - 63 Hz Sinusoidal	0 to +4 Vac or dc	
On-state Current	6 mA to 15 mA	3.2 mA min	
Off-state Current	0 - 2.5 mA (2 mA min at 2.5 V input)	1 mA max	
Filter Delay Time	20 ms typical	12 ms typical 28 ms typical	
Power Consumption	5 V, 0.3 A	5 V, 80 mA (all inputs on) from 5 V bus on backplane  125 mA from the Isolated 24 V backplane bus or from user supplied power	
VME	System designed to support the VME standard C.1		

## 3.2.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697MDL252		IC694MDL241		IC694MDL241	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	NC				
2	A1	2	I1		
3	A2	3	I2		
4	A3	4	I3		
5	A4	5	I4		
6	A5	6	I5		
7	A6	7	I6		
8	A7	8	I7		
9	A8	9	I8		
10	N	1	COM		
11	NC				
12	B1	10	I9		
13	B2	11	I10		
14	B3	12	I11		
15	B4	13	I12		
16	B5	14	I13		
17	B6	15	I14		
18	B7	16	I15		
19	B8	17	I16		
20	N	1	COM		
21	NC				
22	C1			2	I1
23	C2			3	I2
24	C3			4	I3
25	C4			5	I4
26	C5			6	I5
27	C6			7	I6
28	C7			8	I7
29	C8			9	I8
30	N			1	COM
31	NC				
32	D1			10	I9
33	D2			11	I10
34	D3			12	I11
35	D4			13	I12
36	D5			14	I13
37	D6			15	I14
38	D7			16	I15
39	D8			17	I16
40	N			1	COM

### 3.3 IC695CRH002 – 90-70 MDL253 to RX3i MDL241 Harness Assembly

#### 3.3.1 Discrete Input Modules

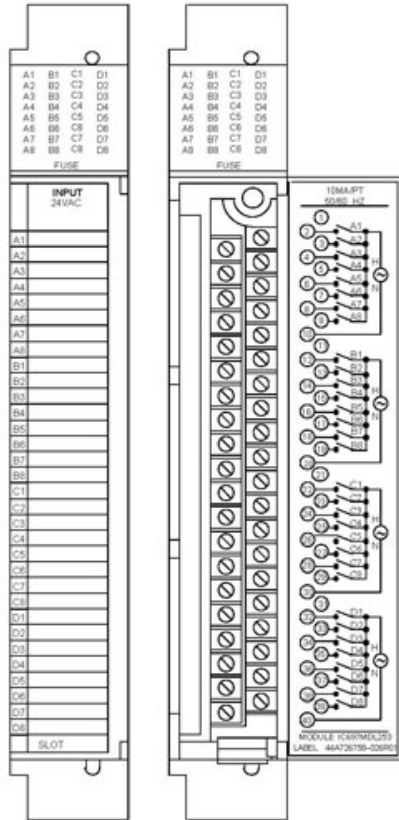


Figure 10: 24 Vac 32-Point IC697MDL253

The 24 Vac Input module, IC697MDL253, provides 32 input points in four isolated groups of eight points each. This allows each group of eight points to be used on a different phase of the AC supply.

The input is resistive with current-Voltage characteristics which meet IEC standard (type 1). The input characteristics are compatible with a large range of available proximity switches.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.



Figure 11: 24 Vac/dc 16-Point Pos/Neg IC694MDL241

The 24 Vac/dc 16-Point C Positive/Negative Logic Input module, IC694MDL241, provides 16 input points in one group with a common power input terminal. This module can be used with ac or dc field inputs. In dc mode, it can be wired for either positive or negative logic. Input characteristics are compatible with a wide range of input devices, such as push-buttons, limit switches, and electronic proximity switches.

Current into an input point results in a logic 1 in the input status table (%I). Power to operate ac input devices must be supplied by the user. DC Inputs can be powered by the backplane 24 V supply.



## 3.3.2 Specification Comparison

Item	IC697MDL253	IC694MDL241	Notes
Rated Voltage	24 Vac, 47 - 63 Hz Sinusoidal	24 Vac or 24 Vdc	
Inputs per Module	32 (four groups of eight inputs each)	16 (one group with a single common)	2 Module Replacement
Isolation	1500 V RMS any input to backplane 500 V RMS between input groups	250 Vac continuous  1500 Vac for one minute	
Input Current	10 mA (typical) at rated Voltage	7 mA (typical) at rated Voltage	
Input Impedance	2.6 k $\Omega$ typical Input		
<b>Input Characteristics</b>			
On-state Voltage	13.5 - 30 V RMS, 47 - 63 Hz Sinusoidal	1.5 to 30 Vac or dc	
Off-state Voltage	0 to 5 V RMS, 47 - 63 Hz Sinusoidal	0 to +4 Vac or dc	
On-state Current	6 - 15 mA	3.2 mA min	
Off-state Current	0 - 2 mA (2 mA min at 5 V input)	1 mA max	
Filter Delay Time	20 ms typical	12 ms typical 28 ms typical	
Power Consumption	5 V, 0.3 A	5 V, 80 mA (all inputs on) from 5 V bus on backplane  5 V, 125 mA from the Isolated 24 V backplane bus or from user supplied power	
VME	System designed to support the VME standard C.1		

3.3.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697MDL253		IC694MDL241		IC694MDL241	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	NC				
2	A1	2	I1		
3	A2	3	I2		
4	A3	4	I3		
5	A4	5	I4		
6	A5	6	I5		
7	A6	7	I6		
8	A7	8	I7		
9	A8	9	I8		
10	N	1	COM		
11	NC				
12	B1	10	I9		
13	B2	11	I10		
14	B3	12	I11		
15	B4	13	I12		
16	B5	14	I13		
17	B6	15	I14		
18	B7	16	I15		
19	B8	17	I16		
20	N	1	COM		
21	NC				
22	C1			2	I1
23	C2			3	I2
24	C3			4	I3
25	C4			5	I4
26	C5			6	I5
27	C6			7	I6
28	C7			8	I7
29	C8			9	I8
30	N			1	COM
31	NC				
32	D1			10	I9
33	D2			11	I10
34	D3			12	I11
35	D4			13	I12
36	D5			14	I13
37	D6			15	I14
38	D7			16	I15
39	D8			17	I16
40	N			1	COM

### 3.4 IC695CRH003 – 90-70 MDL250 to RX3i MDL260 Harness Assembly

#### 3.4.1 Discrete Input Modules

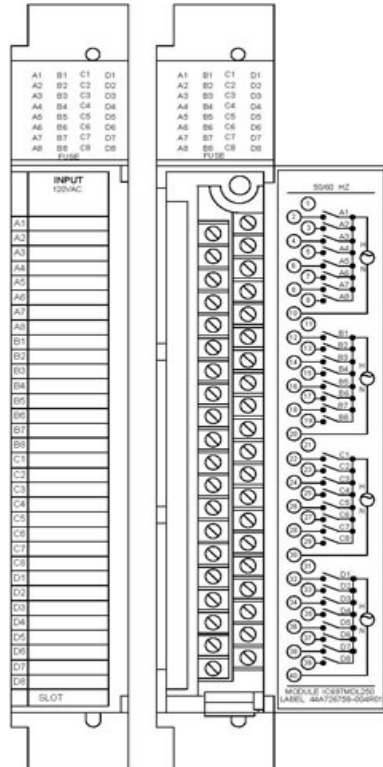


Figure 12: 120 Vac 32-Point IC697MDL250

The 120 Vac Input module, IC697MDL250, for the programmable controller provides 32 input points in four isolated groups of eight points each. This allows each group of eight points to be used on a different phase of the ac supply.

The input is reactive (resistor/capacitor input) with current-Voltage characteristics which meet IEC standard (type 2). The input characteristics are compatible with a large range of available proximity switches.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.



Figure 13: 120 Vac 32-Point IC694MDL260

The 120 Vac Grouped Input module, IC694MDL260, provides 32 discrete input points. The inputs are arranged in four isolated groups of eight. Isolation is provided between the four groups of inputs, however all inputs within a group are referenced to the same user common connection.

Input filter times can be set from the programmer using the module's assigned output data references.

3.4.2 Specification Comparison

Item	IC697MDL250	IC694MDL260	Notes
Rated Voltage	120 Vac, 47 to 63 Hz Sinusoidal	120 Vac	
Inputs per Module	32 (four groups of eight inputs each)	32 (four isolated groups of 8 inputs)	
Isolation		20 to 2540 ms in 20 ms increments. Sent from CPU.	
Input Current	1500 V RMS any input to backplane 500 V RMS between input groups	264 Vac continuous;  1500 Vac for one minute	
<b>Input Characteristics</b>			
On-state Voltage	75 to 132 Vac, 47 to 63 Hz Sinusoidal	70 to 132 Vac	RX3i programmable filter
Off-state Voltage	0 to 25 Vac, 47 to 63 Hz Sinusoidal	0 to 20 Vac	
On-state Current	6 mA to 15 mA	5 mA min	
Off-state Current	0 to 3 mA (2.2 min at 25 V input)	2.5 mA max	
Filter Delay Time	20 ms typical	+0-1 AC cycles filter up to 840 ms +1-2 AC cycles filter 840 to 1600 ms +2-3 AC cycles filter 1600 to 1920 ms +3-4 AC cycles filter 1920 ms or more	
Power Consumption	5 V, 0.35 A	5 V, 220 mA with all inputs on	
VME	System designed to support the VME standard C.1		

## 3.4.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697MDL250		IC694MDL260	
Terminals		Terminals (TB1)	
1	NC		
2	A1	1	I1
3	A2	2	I2
4	A3	3	I3
5	A4	4	I4
6	A5	5	I5
7	A6	6	I6
8	A7	7	I7
9	A8	8	I8
10	N	9	COM
11	NC		
12	B1	10	I9
13	B2	11	I10
14	B3	12	I11
15	B4	13	I12
16	B5	14	I13
17	B6	15	I14
18	B7	16	I15
19	B8	17	I16
20	N	18	COM
21	NC		
22	C1	19	I17
23	C2	20	I18
24	C3	21	I19
25	C4	22	I20
26	C5	23	I21
27	C6	24	I22
28	C7	25	I23
29	C8	26	I24
30	N	27	COM
31	NC		
32	D1	28	I25
33	D2	29	I26
34	D3	30	I27
35	D4	31	I28
36	D5	32	I29
37	D6	33	I30
38	D7	34	I31
39	D8	35	I32
40	N	36	COM

3.5 IC695CRH004 – 90-70 MDL240 to RX3i MDL250 Harness Assembly

3.5.1 Discrete Input Modules

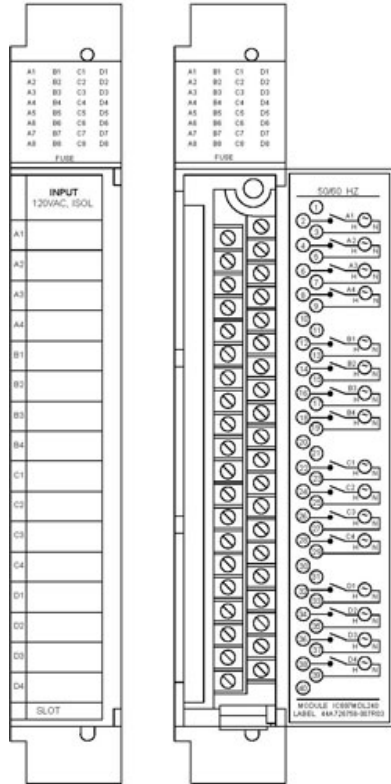


Figure 14: 120 Vac 16-Point IC697MDL240

The 120 Vac Isolated Input Module, IC697MDL240, provides 16 input points which are isolated. This allows each point to be used on a different phase of the ac supply.

The input is reactive (resistor/capacitor input) with current-Voltage characteristics which meet IEC standard (type 2). The input characteristics are compatible with a large range of available proximity switches.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.



Figure 15: 120 Vac 16-Point Isolated IC694MDL250

The 120Vac 16-Point Isolated Input module, IC694MDL250, provides 16 isolated input points. Input points can be used on different phases of the ac supply or powered from the same supply. An RC snubber protects each input against transient electrical noise on the power line.

The module's input filtering time can be changed during system operation by the application program. No DIP switch settings are required.

## 3.5.2 Specification Comparison

Item	IC697MDL240	IC694MDL250	Notes
Rated Voltage	120 Vac, 60 Hz sinusoidal	120 Vac	
Inputs per Module	16 individually isolated	16 isolated	
Input Filter Times		20 to 2540 ms in 20 ms increments. Sent from CPU.	
Isolation	1500 V RMS any input to backplane 500 V RMS between input groups	250 Vac continuous  1500 Vac for one minute	
Input Current	10 mA (typical) at rated Voltage (reactive)	7.0 mA per point (typical) at rated Voltage	
<b>Input Characteristics</b>			
On-state Voltage	75 to 132 V, 60 Hz sinusoidal	70 to 132 Vac	RX3i programmable filter
Off-state Voltage	0 to 20 V, 60 Hz sinusoidal	0 to 20 Vac	
On-state Current:	8 to 15 mA	5 mA min	
Off-state Current	0 to 4 mA (2.2 min at 25 V input)	2.5 mA max	
Filter Delay Time	20 ms typical	+0-1 Vac cycles filter up to 840 ms +1-2 Vac cycles filter 840 to 1600 ms +2-3 Vac cycles filter 1600 to 1920 ms +3-4 Vac cycles filter 1920 ms or more	
Power Consumption	5 V, 0.25 A	5 V, 220 mA with all inputs on	
VME	System designed to support the VME standard C.1		

3.5.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697MDL240		IC694MDL250	
Terminals		Terminals (TB1)	
1	NC		
2	A1	1	I1
3	N	2	I1RTN
4	A2	3	I2
5	N	4	I2RTN
6	A3	5	I3
7	N	6	I3RTN
8	A4	7	I4
9	N	8	I4RTN
10	NC		
11	NC		
12	B1	9	I5
13	N	10	I5RTN
14	B2	11	I6
15	N	12	I6RTN
16	B3	13	I7
17	N	14	I7RTN
18	B4	15	I8
19	N	16	I8RTN
20	NC		
21	NC		
22	C1	19	I9
23	N	20	I9RTN
24	C2	21	I10
25	N	22	I10RTN
26	C3	23	I11
27	N	24	I11RTN
28	C4	25	I12
29	N	26	I12RTN
30	NC		
31	NC		
32	D1	27	I13
33	N	28	I13RTN
34	D2	29	I14
35	N	30	I14RTN
36	D3	31	I15
37	N	32	I15RTN
38	D4	33	I16
39	N	34	I16RTN
40	NC		



### 3.6 IC695CRH005 – 90-70 MDL251 to RX3i MDL240 Harness Assembly

#### 3.6.1 Discrete Input Modules

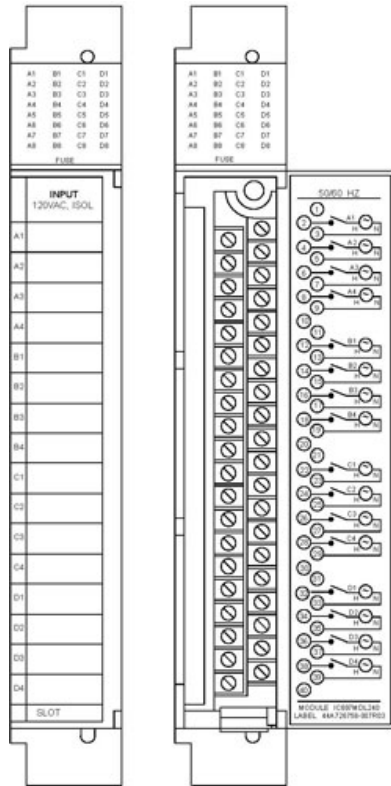


Figure 16: 120 Vac 16-Point IC697MDL251

This 120 Vac Input module, IC697MDL251, provides 16 input points in four isolated groups of four points each. This allows each group of four points to be used on a different phase of the ac supply.

The input is reactive (resistor/capacitor input) with current-voltage characteristics which meet IEC standard (type 2). The input characteristics are compatible with a large range of available proximity switches.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.



Figure 17: 120 Vac 16-Point IC694MDL240

The 120 Vac Input module, IC694MDL240, provides 16 input points with one common power input terminal. The input circuits are reactive (resistor/capacitor) inputs. Current into an input point results in a logic 1 in the input status table (%I). Input characteristics are compatible with a wide range of input devices, such as push-buttons, limit switches, and electronic proximity switches.

Power to operate the field devices must be supplied by the user. This module requires an ac power source; it cannot be used with a dc power source.

3.6.2 Specification Comparison

Item	IC697MDL251	IC694MDL240	Notes
Rated Voltage	120 Vac, 47 to 63 Hz Sinusoidal	120 Vac	
Inputs per Module	16 (four groups of four inputs each)	16 (one group with a single common)	All on Single Common
Input Filter Times		20 to 2540 ms in 20 ms increments. Sent from CPU.	
Isolation	1500 V RMS any input to backplane 500 V RMS between input groups	250 Vac continuous; 1500 Vac for one minute	
Input Current	10 mA (typical) at rated Voltage (reactive)	12 mA (typical) at rated Voltage	
<b>Input Characteristics</b>			
On-state Voltage	75 to 132 Vac, 47 to 63 Hz Sinusoidal	74 to 132 Vac 0 to 20 Vac	
Off-state Voltage	0 to 25 Vac, 47 to 63 Hz Sinusoidal 6 mA to 15 mA	6 mA min 2.2 mA max	
On-state Current	0 to 3 mA (2.2 min at 25 V input)	30 ms max	
Off-state Current	20 ms typical	45 ms max	
Power Consumption	5 V, 0.35 A	5 V, 90 mA with all inputs on	
VME	System designed to support the VME standard C.1		

## 3.6.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697MDL251		IC694MDL240	
Terminals		Terminals (TB1)	
1	NC		
2	A1	1	I1
3	A2	2	I2
4	A3	3	I3
5	A4	4	I4
6	NC		
7	NC		
8	NC		
9	NC		
10	N	19	N
11	NC		
12	B1	5	I5
13	B2	6	I6
14	B3	7	I7
15	B4	8	I8
16	NC		
17	NC		
18	NC		
19	NC		
20	N	19	N
21	NC		
22	C1	9	I9
23	C2	10	I10
24	C3	11	I11
25	C4	12	I12
26	NC		
27	NC		
28	NC		
29	NC		
30	N	19	N
31	NC		
32	D1	I3	I13
33	D2	I4	I14
34	D3	I5	I15
35	D4	I6	I16
36	NC		
37	NC		
38	NC		
39	NC		
40	N	19	N

### 3.7 IC695CRH006 – 90-70 MDL251 to RX3i MDL250 Harness Assembly

#### 3.7.1 Discrete Input Modules

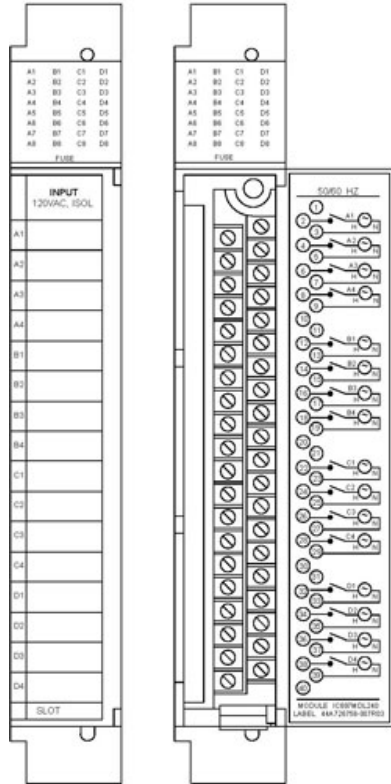


Figure 18: 120 Vac 16-Point IC697MDL251

The 120 Vac Isolated Input Module, IC697MDL251, provides 16 input points which are isolated. This allows each point to be used on a different phase of the ac supply.

The input is reactive (resistor/capacitor input) with current-Voltage characteristics which meet IEC standard (type 2). The input characteristics are compatible with a large range of available proximity switches.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

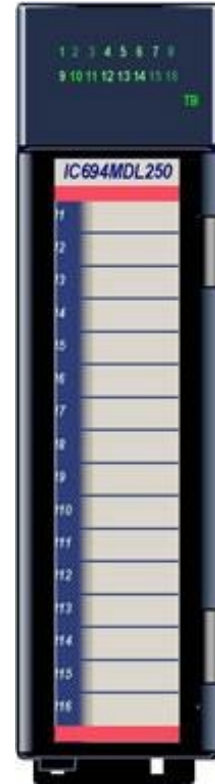


Figure 19: 120 Vac 16-Point Isolated IC694MDL250

The 120 Vac 16-Point Isolated Input module, IC694MDL250, provides 16 isolated input points. Input points can be used on different phases of the ac supply or powered from the same supply. An RC snubber protects each input against transient electrical noise on the power line.

The module's input filtering time can be changed during system operation by the application program. No DIP switch settings are required.

## 3.7.2 Specification Comparison

Item	IC697MDL251	IC694MDL250	Notes
Rated Voltage	120 Vac, 47 to 63 Hz Sinusoidal	120 Vac	
Inputs per Module	16 (four groups of four inputs each)	16 isolated	
Input Filter Times		20 to 2540 ms in 20 ms increments. Sent from CPU.	
Isolation	1500 V RMS any input to backplane 500 V RMS between input groups	250 Vac continuous;  1500 Vac for one minute	
Input Current	10 mA (typical) at rated Voltage (reactive)	7.0 mA per point (typical) at rated Voltage	
<b>Input Characteristics</b>			
On-state Voltage	75 to 132 Vac, 47 to 63 Hz Sinusoidal	70 to 132 Vac	
Off-state Voltage	0 to 25 Vac, 47 to 63 Hz Sinusoidal	0 to 20 Vac	
On-state Current	6 to 15 mA	5 mA min	
Off-state Current	0 to 3 mA (2.2 min at 25 V input)	2.5 mA max	
Filter Delay Time	20 ms typical	+0-1 Vac cycles filter up to 840 ms +1-2 Vac cycles filter 840 to 1600 ms +2-3 Vac cycles filter 1600 to 1920 ms +3-4 Vac cycles filter 1920 ms or more	
Power Consumption	5 V 0.35 A	5 V, 220 mA with all inputs on	
VME	System designed to support the VME standard C.1		

3.7.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697MDL251		IC694MDL250	
Terminals		Terminals (TB1)	
1	NC		
2	A1	1	I1
3	A2	3	I2
4	A3	5	I3
5	A4	7	I4
6	NC		
7	NC		
8	NC		
9	NC		
10	N	2	I1RTN
		4	I2RTN
		6	I3RTN
		8	I4RTN
11	NC		
12	B1	9	I5
13	B2	11	I6
14	B3	13	I7
15	B4	15	I8
16	NC		
17	NC		
18	NC		
19	NC		
20	N	10	I5RTN
		12	I6RTN
		14	I7RTN
		16	I8RTN
21	NC		
22	C1	19	I9
23	C2	21	I10
24	C3	23	I11
25	C4	25	I12
26	NC		
27	NC		
28	NC		
29	NC		
30	N	20	9RTN
		22	10RTN
		24	11RTN
		26	I2RTN
31	NC		
32	D1	27	I13
33	D2	29	I14
34	D3	31	I15
35	D4	33	I16
36	NC		
37	NC		
38	NC		
39	NC		
40	N	28	I13RTN
		30	I14RTN
		32	I15RTN
		34	I16RTN

### 3.8 IC695CRH007 – 90-70 MDL241 to RX3i MDL231 Harness Assembly

#### 3.8.1 Discrete Input Modules

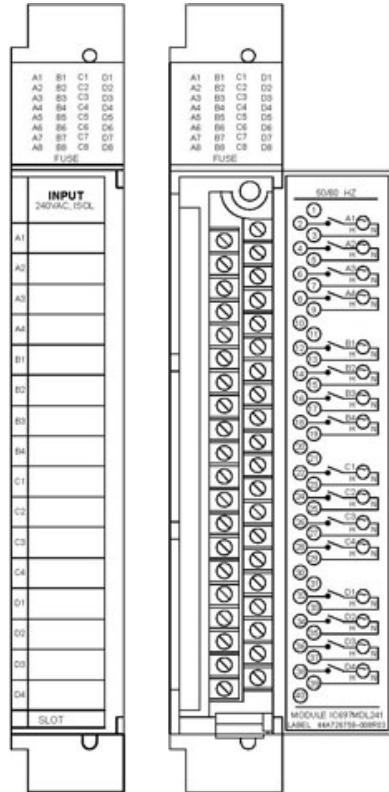


Figure 20: 240 Vac 16-Point Isolated IC697MDL241

The 240 Vac Isolated Input module, IC697MDL241, is used with a Programmable Logic Controller (PLC) and provides 16 isolated input points. This allows each point to be used on a different phase of the ac supply.

The input is reactive (resistor/capacitor input) with current-Voltage characteristics which meet IEC standard (type 2). The input characteristics are compatible with a large range of available proximity switches.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.



Figure 21: 240 Vac 8-Point Isolated IC694MDL231

The 240 Vac Isolated Input module, IC694MDL231, provides 8 isolated input points, each with a common power input terminal. The input circuits are reactive (resistor/capacitor) inputs. Current into an input point results in a logic 1 in the input status table (%). Input characteristics are compatible with a wide range of input devices, such as push-buttons, limit switches, and electronic proximity switches.

Because the inputs are isolated, each input can be powered by a separate ac power source. Power to operate the field devices must be supplied by the user. This module requires an ac power source.

3.8.2 Specification Comparison

Specification	IC697MDL241	IC694MDL231	Notes
Rated Voltage	240 Vac, 60 Hz Sinusoidal	240 Vac, 50/60 Hz	
Inputs per Module	16 individually isolated	8 (each input point has a separate common)	2 Module Replacement
Isolation	1500 V RMS any input to backplane 500 V RMS between input groups	250 Vac continuous  1500 Vac for one minute	
Input Current	20 mA (typical) at rated Voltage (reactive)	15 mA (typical) at rated Voltage	
<b>Input Characteristics</b>			
On-state Voltage	160 to 264 Vac, 60 Hz Sinusoidal 0 to 40 Vac, 60 Hz Sinusoidal	148 to 264 Vac	
Off-state Voltage	10 to 15 mA	0 to 40 Vac	
On-state Current	0 to 5 mA (2.2 min at 40 V input)	6 mA min	
Off-state Current	20 ms typical	2.2 mA max	
On response Time		30 ms typical	
Off response Time		45 ms typical	
Power Consumption	5 V, 0.25 A	5 V, 60 mA (all inputs on) from 5 V bus on backplane	
VME	System designed to support the VME standard C.1		



3.8.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697MDL241		IC694MDL231		IC694MDL231	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	NC				
2	A1	2	I1		
3	N	3	N		
4	A2	4	I2		
5	N	5	N		
6	A3	6	I3		
7	N	7	N		
8	A4	8	I4		
9	N	9	N		
10	NC				
11	NC				
12	B1	12	I5		
13	N	13	N		
14	B2	14	I6		
15	N	15	N		
16	B3	16	I7		
17	N	17	N		
18	B4	18	I8		
19	N	19	N		
20	NC				
21	NC				
22	C1			2	I1
23	N			3	N
24	C2			4	I2
25	N			5	N
26	C3			6	I3
27	N			7	N
28	C4			8	I4
29	N			9	N
30	NC				
31	NC				
32	D1			12	I5
33	N			13	N
34	D2			14	I6
35	N			15	N
36	D3			16	I7
37	N			17	N
38	D4			18	I8
39	N			19	N
40	NC				

### 3.9 IC695CRH008 – 90-70 MDL653 to RX3i MDL660 Harness Assembly

#### 3.9.1 Discrete Input Modules

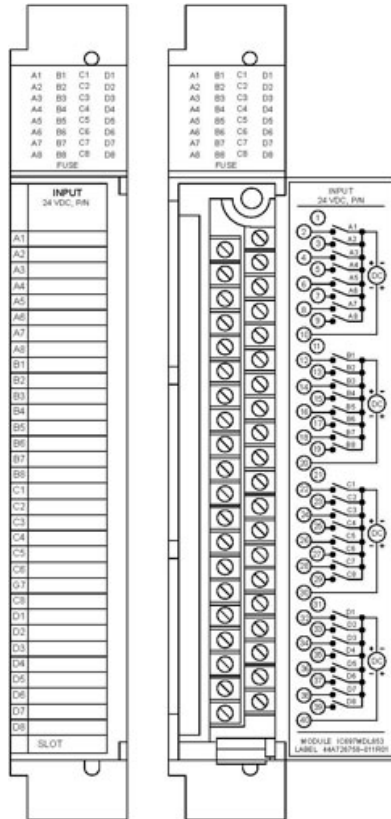


Figure 22: 24 Vdc Pos/Neg 32-Point IC697MDL653

The 24 Vdc Positive/Negative Logic Input Module, IC697MDL653, provides 32 input points in four isolated groups of eight points each. The input current-Voltage characteristics meet IEC standard (type 1) specifications.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

The module is mechanically keyed to ensure correct replacement with a similar type in the field. I/O references are user configurable without the use of jumpers or DIP switches on the module.



Figure 23: 24 Vdc 32-Point Grouped IC694MDL660

The 24 Vdc Positive/Negative Logic Input module, IC694MDL660, provides 32 discrete input points. The inputs are positive or negative logic inputs and will operate at levels up to 30 V.

The inputs are arranged in four isolated groups of eight; each group has its own common. Isolation is provided between the four groups of inputs; however each group of eight inputs is referenced to the same user common connection.

## 3.9.2 Specification Comparison

Specification	IC697MDL653	IC694MDL660	Notes
Rated Voltage	24 Vdc	24 Vdc	
Inputs per Module	32 (four groups of eight inputs each)	32 (four isolated groups of 8 inputs)	
Input Filter Times		0.5 ms, 1.0 ms, 2.0 ms, 5 ms, 10 ms, 50 ms and 100 ms, selectable per module	
Isolation	1500 V - any input to backplane 500 V between input groups	250 Vac continuous; 1500 Vac for one minute	
Input Current	10 mA (typical) at rated Voltage (reactive)	7.0 mA per point (typical) at rated Voltage	
Input Impedance	2.6 k $\Omega$ , typical		
<b>Input Characteristics</b>			
On-state Voltage	13.5 to 30 V	11.5 to 30 Vdc	
Off-state Voltage	0 to 5 V	0 to 5 Vdc	
On-state Current	6 to 15 mA	3.2 mA min	
Off-state Current	0 to 2mA (2mA min at 5 V input)	1.1 mA max	
Filter Delay Time	1mS or 10mS configurable	0.5 ms, 1.0 ms, 2.0 ms, 5 ms, 10 ms, 50.0 ms and 100.0ms (as per filter setting)	
Power Consumption	5 V, 0.3 A	5 V, 300 mA with all inputs on	
VME	System designed to support the VME standard C.1		

3.9.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697MDL653		IC694MDL660	
Terminals		Terminals (TB1)	
1	NC		
2	A1	1	I1
3	A2	2	I2
4	A3	3	I3
5	A4	4	I4
6	A5	5	I5
7	A6	6	I6
8	A7	7	I7
9	A8	8	I8
10	N	9	COM
11	NC		
12	B1	10	I9
13	B2	11	I10
14	B3	12	I11
15	B4	13	I12
16	B5	14	I13
17	B6	15	I14
18	B7	16	I15
19	B8	17	I16
20	N	18	COM
21	NC		
22	C1	19	I17
23	C2	20	I18
24	C3	21	I19
25	C4	22	I20
26	C5	23	I21
27	C6	24	I22
28	C7	25	I23
29	C8	26	I24
30	N	27	COM
31	NC		
32	D1	28	I25
33	D2	29	I26
34	D3	30	I27
35	D4	31	I28
36	D5	32	I29
37	D6	33	I30
38	D7	34	I31
39	D8	35	I32
40	N	36	COM

### 3.10 IC695CRH009 – 90-70 MDL652 to RX3i MDL654 Harness Assembly

#### 3.10.1 Discrete Input Modules

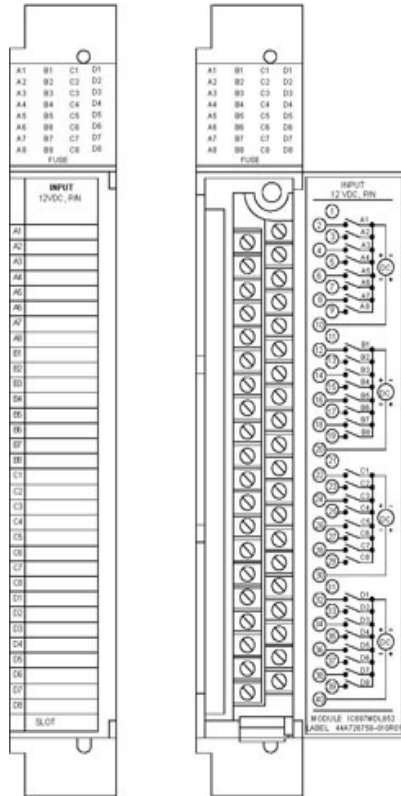


Figure 24: 12 Vdc Pos/Neg 32-Point IC697MDL652

The 12 Vdc Positive/Negative Logic Input Module, IC697MDL652, provides 32 input points in four isolated groups of eight points each. The input current- Voltage characteristics meet IEC standard (type 1) specifications.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

The module is mechanically keyed to ensure correct replacement with a similar type in the field. I/O references are user configurable without the use of jumpers or DIP switches on the module.



Figure 25: 5/12 Vdc Pos/Neg 32-Point IC694MDL654

The 5/12 Vdc (TTL) 32 Point Positive/Negative Logic Input module, IC694MDL654 provides 32 discrete TTL Voltage threshold input points. The inputs are arranged in four isolated groups of eight. Each group has its own common. The inputs are positive or negative logic inputs that operate at levels up to 15 V.

A single, regulated +5 V supply is available through the I/O connectors on the front of the module. Its power input comes from the +5 V logic supply on the PLC backplane. By installing jumpers on the I/O connector, you can choose to power the inputs from this internal supply instead of powering them with an external user provided supply.

3.10.2 Specification Comparison

Specification	IC697MDL652	IC694MDL654	Notes
Rated Voltage	12 Vdc, 47 to 63 Hz Sinusoidal	5 to 12 Vdc, Pos or Neg Logic	
Inputs per Module	32 (four groups of eight inputs each)	32 (four groups of eight inputs each)	2 - IC693CBxxxx cables
Isolation	1500 V RMS any input to backplane 500 V RMS between input groups	250 Vac continuous;  1500 Vac for one minute	
Input Current	10 mA (typical) at rated Voltage	3.0mA (typical ON current at 5 Vdc) 8.5mA (typical ON current at 12 Vdc)	
Input Impedance	1.12 k $\Omega$ typical		
<b>Input Characteristics</b>			
On-state Voltage	7.5 to 15 V RMS, 47 to 63 Hz Sinusoidal	4.2 to 15 Vdc	
Off-state Voltage	0 to 2.5 V RMS, 47 to 63 Hz Sinusoidal	0 to 2.6 Vdc	
On-state Current	6 to 15 mA	2.5 mA min	
Off-state Current	0 to 2.5mA (2mA min at 2.5 V input) 20 ms typical	1.2 mA max	
Filter Delay Time		1 ms max 1 ms max	
Power Consumption	5 V, 0.3 A	+5 Vdc $\pm$ 5%	
VME	System designed to support the VME standard C.1		

## 3.10.3

## Pin Mapping

IC695ACC651		RX3i Module 1		RX3i Module 1	
IC697MDL654		IC694MDL654		IC694MDL654	
Terminals		Left Side Terminals(TB1)		Right Side Terminals(TB2)	
1	NC			A6	NC
2	A1			A1	I1
3	A2			B1	I2
4	A3			A2	I3
5	A4			B2	I4
6	A5			A3	I5
7	A6			B3	I6
8	A7			A4	I7
9	A8			B4	I8
10	N			A5	N
11	NC			B7	NC
12	B1			B12	I9
13	B2			A12	I10
14	B3			B11	I11
15	B4			A11	I12
16	B5			B10	I13
17	B6			A10	I14
18	B7			B9	I15
19	B8			A9	I16
20	N			B8	N
21	NC	A6	NC		
22	C1	A1	I17		
23	C2	B1	I18		
24	C3	A2	I19		
25	C4	B2	I20		
26	C5	A3	I21		
27	C6	B3	I22		
28	C7	A4	I23		
29	C8	B4	I24		
30	N	A5	N		
31	NC	B7	NC		
32	D1	B12	I25		
33	D2	A12	I26		
34	D3	B11	I27		
35	D4	A11	I28		
36	D5	B10	I29		
37	D6	A10	I30		
38	D7	B9	I31		
39	D8	A9	I32		
40	N	B8	N		

3.11 IC695CRH010 – 90-70 MDL654 to RX3i MDL658 Harness Assembly

3.11.1 Discrete Input Modules

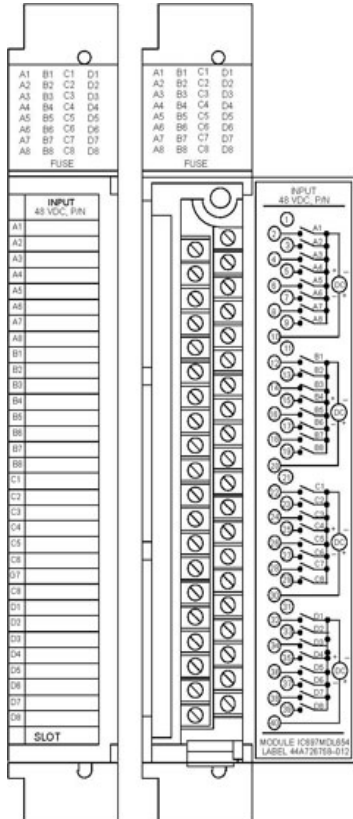


Figure 26: 48 Vdc Pos/Neg 32-Point IC697MDL654

The 48 Vdc Pos/Neg Input Module, IC697MDL654, provides 32 input points in four isolated groups of eight points each. The input current-Voltage characteristics meet IEC standard (type 1) specifications.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

The module is mechanically keyed to ensure correct replacement with a similar type in the field. I/O references are user configurable without the use of jumpers or DIP switches on the module.



Figure 27: 48 Vdc Pos/Neg 32-Point IC694MDL658

PACSystems RX3i 32-Point Positive/Negative Logic input modules provide 32 positive or negative logic input points in four isolated groups of eight. Each group is referenced to its own common connection.

The 48 Vdc 32 Point Positive/Negative Logic Input module, IC694MDL658, provides 32 discrete input points that operate at levels up to 60 V. Power to operate field devices must be provided using an external supply.



## 3.11.2 Specification Comparison

Item	IC697MDL654	IC694MDL658	Notes
Rated Voltage	48 Vdc	48 Vdc	
Inputs per Module	32 (four groups of eight inputs each)	32 (four groups of eight inputs each)	2 - IC693CBxxxx cables
Isolation	1500 V RMS any input to backplane 500 V RMS between input groups	250 Vac continuous; 1500 Vac for one minute	
Input Current	4.7 mA (typical) at rated Voltage	1.7 mA at 48 V	Customer validation required: If the input current requirement >1.7 mA, this is not a recommended solution.
Input Impedance	10.3 k $\Omega$ , typical		
<b>Input Characteristics</b>			
On-state Voltage	33 to 56 V	34 to 60 Vdc	
Off-state Voltage	0 to 10 V	0 to 10 Vdc	
On-state Current	3 to 7mA	$\geq 1.0$ mA min	
Off-state Current	0 to 2 mA (2mA min at 5 V input)	$\leq 0.4$ mA max	
Filter Delay Time	1 ms or 10 ms configurable	2 ms max	
Power Consumption	5 V, 0.3 A	+5 Vdc $\pm 5\%$	
VME	System designed to support the VME standard C.1		

3.11.3 Pin Mapping

IC695ACC651		RX3i Module 1		RX3i Module 1	
IC697MDL654		IC694MDL658		IC694MDL658	
Terminals		Left Side Terminals(TB1)		Right Side Terminals(TB2)	
1	NC			A6	NC
2	A1			A1	I1
3	A2			B1	I2
4	A3			A2	I3
5	A4			B2	I4
6	A5			A3	I5
7	A6			B3	I6
8	A7			A4	I7
9	A8			B4	I8
10	N			A5	N
11	NC			B7	NC
12	B1			B12	I9
13	B2			A12	I10
14	B3			B11	I11
15	B4			A11	I12
16	B5			B10	I13
17	B6			A10	I14
18	B7			B9	I15
19	B8			A9	I16
20	N			B8	N
21	NC	A6	NC		
22	C1	A1	I17		
23	C2	B1	I18		
24	C3	A2	I19		
25	C4	B2	I20		
26	C5	A3	I21		
27	C6	B3	I22		
28	C7	A4	I23		
29	C8	B4	I24		
30	N	A5	N		
31	NC	B7	NC		
32	D1	B12	I25		
33	D2	A12	I26		
34	D3	B11	I27		
35	D4	A11	I28		
36	D5	B10	I29		
37	D6	A10	I30		
38	D7	B9	I31		
39	D8	A9	I32		
40	N	B8	N		

### 3.12 IC695CRH011 – 90-70 MDL640 to RX3i MDL632 Harness Assembly

#### 3.12.1 Discrete Input Modules

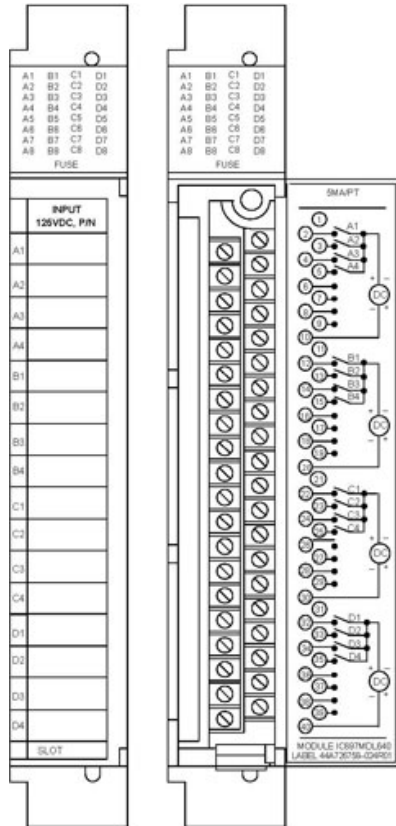


Figure 28: 125 Vdc Pos/Neg 16-Point IC697MDL650

The 125 Vdc Positive/Negative Input Module, IC697MDL650, provides 16 input points in four isolated groups of four points each. The input current-voltage characteristics meet IEC standard (type 1) specifications.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

The module is mechanically keyed to ensure correct replacement with a similar type in the field. I/O references are user configurable without the use of jumpers or DIP switches on the module.



Figure 29: 125 Vdc Pos/Neg 8-Point IC694MDL632

The 125 Vdc Positive/Negative Logic Input module, IC694MDL632, provides 8 input points in two isolated groups with four points in each group.

Each group has a separate common (the two commons are not tied together inside the module). Each group can be wired for either positive or negative logic. Current into an input point results in a logic 1 in the input status table (%I). Input characteristics are compatible with a wide range of input devices, such as push-buttons, limit switches, and electronic proximity switches. Power to operate field devices must be supplied by the user.

3.12.2 Specification Comparison

Item	IC697MDL640	IC694MDL632	Notes
Rated Voltage	125 Vdc	125 Vdc (Pos or Neg Logic)	
Inputs per Module	16 (four groups of four inputs each)	8 (two groups of four inputs)	2 Module Replacement
Isolation	1500 V RMS any input to backplane 500 V RMS between input groups	250 Vac continuous  1500 Vac for one minute	
Input Current	5 mA (typical) at rated Voltage	4.5 mA typical	
Input Impedance	24.5 k $\Omega$ , typical		
<b>Input Characteristics</b>			
On-state Voltage	Positive: 90 to 145 V Negative: -20 to $V_s$ -90 V	90 to 150 Vdc	Customer Validation required: The RX3i module must be used in accordance with the RX3i specifications.
Off-state Voltage	Positive: -35 to +35 V Negative: $V_s$ -35 to 56 V	0 to 30 Vdc	
On-state Current	3 to 7mA	3.1 mA	
Off-state Current	0 to 40 Vac, 60 Hz Sinusoidal	1.1 mA maxi	
On response Time	10 to 15 mA	7 ms typical	
Off response Time	0 to 2 mA (2 mA min at 125 V input)	7 ms typical	
Filter Delay Time	1 ms or 10 ms configurable		
Power Consumption	5 V, 0.30 A	5 V , 40 mA from the 5 V bus on the backplane 36 mA (typical) from user input supply (all inputs ON)	
VME	System designed to support the VME standard C.1		

## 3.12.3

## Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697MDL640		IC694MDL632		IC694MDL632	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	NC				
2	A1	2	I1		
3	A2	4	I2		
4	A3	6	I3		
5	A4	8	I4		
6	NC				
7	NC				
8	NC				
9	NC				
10	COM	10	COM		
11	NC				
12	B1	12	I5		
13	B2	14	I6		
14	B3	16	I7		
15	B4	18	I8		
16	NC				
17	NC				
18	NC				
19	NC				
20	COM	20	COM		
21	NC				
22	C1			2	I1
23	C2			4	I2
24	C3			6	I3
25	C4			8	I4
26	NC				
27	NC				
28	NC				
29	NC				
30	COM			10	COM
31	NC				
32	D1			12	I5
33	D2			14	I6
34	D3			16	I7
35	D4			18	I8
36	NC				
37	NC				
38	NC				
39	NC				
40	COM			20	COM

3.13 IC695CRH013 – 90-70 MDL671 to RX3i MDL645 Harness Assembly

3.13.1 Discrete Input Modules

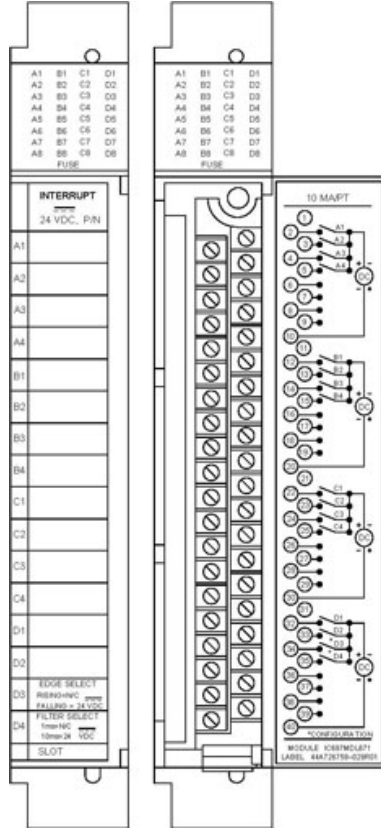


Figure 30: 24 Vdc Pos/Neg 14-Point IC697MDL671

The 24 Vdc Positive/Negative Logic Interrupt Input Module, IC697MDL671, provides 16 points total in four isolated groups of four points each. The first fourteen points (A1 through D2) are interrupt inputs and the last two, D3 and D4 are configuration inputs. The input current- Voltage characteristics meet IEC standard (type 1) specifications. LED indicators which give the ON-OFF status of each point are located at the top of the module.



Figure 31: 24 Vdc Pos/Neg 16-Point IC694MDL645

The 24 Vdc Positive/Negative Logic Input module, IC694MDL645, provides 16 input points in one group with a common power input terminal. This input module can be wired for either positive logic or negative logic. Input characteristics are compatible with a wide range of input devices, such as push-buttons, limit switches, and electronic proximity switches. Current into an input point results in a logic 1 in the input status table (%I). Field devices can be powered from an external supply. Depending on their requirements, some input devices can be powered from the module's +24 V OUT and 0 V OUT terminals.

## 3.13.2 Specification Comparison

Item	IC697MDL671	IC694MDL645	Notes
Rated Voltage	24 Vdc	24 Vdc	
Input Voltage Range	-3 to +30 Vdc	0 to +30 Vdc	
Inputs per Module	14 interrupts (total of 16 inputs with four groups of four inputs each)	16 (one group with a single common)	<b>Customer Validation Required:</b> -IC694MDL645 does not support interrupts. -Out of 16 inputs, IC697MDL671 supports with four groups of four inputs each, whereas RX3i module supports one group of 16 inputs with single common, this will affect group to group isolation in case of RX3i module.
Isolation	1500 V - any input to backplane 500 V between input groups	250 Vac continuous; 1500 Vac for one minute	
Input Current	10 mA (typical) at rated Voltage	7 mA (typical) at rated Voltage	
Input Impedance	2.6 k $\Omega$ , typical		
<b>Input Characteristics</b>			
On-state Voltage	Positive: 13.5 to 30 V Negative: -3 V to Vs -13.5 V	11.5 to 30 Vdc	<b>Customer Validation required:</b> The RX3i module must be used in accordance with the RX3i specifications
Off-state Voltage	Positive: -3 to 5 V Negative: Vs -5 V to 30 V 1.7mA (typical) at rated Voltage 6 to 15mA	0 to +5 Vdc	
On-state Current	0 to 2mA (2 mA min at 5 V input)	3.2 mA min	
Off-state Current	1 ms or 10 ms configurable	1.1 mA max	
On response Time Off response Time		7 ms max 7 ms max	
Power Consumption	5 V, 0.53 A	5 V, 80 mA (all inputs on) from 5 V bus on backplane	
Power Consumption	24 V	24 V, 125 mA from the Isolated 24 V backplane bus or from user supplied power	
VME	System designed to support the VME standard C.1		

3.13.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697MDL671		IC694MDL645	
Terminals		Terminals (TB1)	
1	NC		
2	A1	2	I1
3	A2	3	I2
4	A3	4	I3
5	A4	5	I4
6	NC		
7	NC		
8	NC		
9	NC		
10	COM	1	COM
11	NC		
12	B1	6	I5
13	B2	7	I6
14	B3	8	I7
15	B4	9	I8
16	NC		
17	NC		
18	NC		
19	NC		
20	COM	1	COM
21	NC		
22	C1	10	I9
23	C2	11	I10
24	C3	12	I11
25	C4	13	I12
26	NC		
27	NC		
28	NC		
29	NC		
30	COM	1	COM
31	NC		
32	D1	14	I13
33	D2	15	I14
34	D3	16	I15
35	D4	17	I16
36	NC		
37	NC		
38	NC		
39	NC		
40	COM	1	COM



### 3.14 IC695CRH014 – 90-70 MDL350 to RX3i MDL340 Harness Assembly

#### 3.14.1 Discrete Output Modules

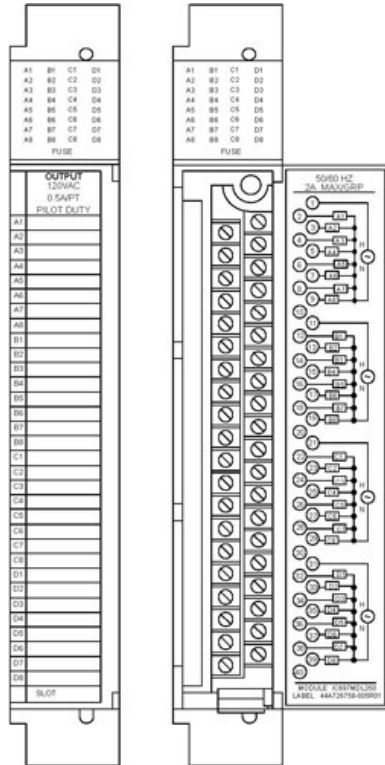


Figure 32: 120 Vac 0.5A 32-Point IC697MDL350

The 120 Vac 0.5A Output Module, IC697MDL350, provides 32 output points in four isolated groups of 8 points each. This allows each group of 8 points to be used on a different phase of the ac supply. Each group of 8 outputs is individually fused with a 5A fuse. The module provides a high degree of inrush current which makes the outputs suitable for a wide range of inductive and incandescent loads. The module will pick up most size 2 contactors.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuits as well as an LED to indicate the status of the fuses are located together at the top of the module.



Figure 33: 120 Vac 0.5A 16-Point IC694MDL340

The 120 Vac, 0.5A Output module, IC694MDL340, provides 16 output points in two isolated groups of eight points. Each group has a separate common. The two commons are not tied together inside the module. The groups can be used on different phases of the AC supply or powered from the same supply. Each group is protected with a 3A fuse. An RC snubber protects each output against transient electrical noise on the power line.

This module provides a high degree of inrush current; so the outputs can control a wide range of inductive and incandescent loads. AC Power to operate loads connected to outputs must be supplied by the user. This module requires an ac power source.

3.14.2 Specification Comparison

Item	IC697MDL350	IC694MDL340	Notes
Rated Voltage	120 Vac	120 Vac	
Output Voltage Range	85 to 132 V, 47 to 63 Hz	85 to 132 Vac, 50/60 Hz	
Outputs per Module	32 (four groups of 8 outputs each)	16 (two groups of eight outputs each)	2 Module Replacement
Isolation	1500 V - any output to backplane 500 V between groups	250 Vac continuous 1500 Vac for one minute	
Output Current	0.5A max per point 2A max per group	0.5A max per point 3A max per group	
<b>Output Characteristics</b>			
Inrush Current Min	10A max per point for one cycle	20A max for one cycle 50 mA	
Load Current Output	3 V max	1.5 V max	
Voltage Drop	1 ms max	1 ms max	
On Response Time	1/2 cycle	1/2 cycle max	
Off Response Time	1.5 mA max	2 mA max at 120 Vac	
Output Leakage			
Power Consumption	5 V, 0.5A	5 V, 315 mA (all outputs ON) from 5 V bus on backplane	
VME	System designed to support the VME standard C.1		

## 3.14.3

## Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697MDL350		IC694MDL340		IC694MDL340	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	COM	9	COM		
2	A1	1	Q1		
3	A2	2	Q2		
4	A3	3	Q3		
5	A4	4	Q4		
6	A5	5	Q5		
7	A6	6	Q6		
8	A7	7	Q7		
9	A8	8	Q8		
10	NC				
11	COM	19	COM		
12	B1	11	Q9		
13	B2	12	Q10		
14	B3	13	Q11		
15	B4	14	Q12		
16	B5	15	Q13		
17	B6	16	Q14		
18	B7	17	Q15		
19	B8	18	Q16		
20	NC				
21	COM			9	COM
22	C1			1	Q1
23	C2			2	Q2
24	C3			3	Q3
25	C4			4	Q4
26	C5			5	Q5
27	C6			6	Q6
28	C7			7	Q7
29	C8			8	Q8
30	NC				
31	COM			19	COM
32	D1			11	Q9
33	D2			12	Q10
34	D3			13	Q11
35	D4			14	Q12
36	D5			15	Q13
37	D6			16	Q14
38	D7			17	Q15
39	D8			18	Q16
40	NC				

3.15 IC695CRH015 – 90-70 MDL340 to RX3i MDL330 Harness Assembly

3.15.1 Discrete Output Modules

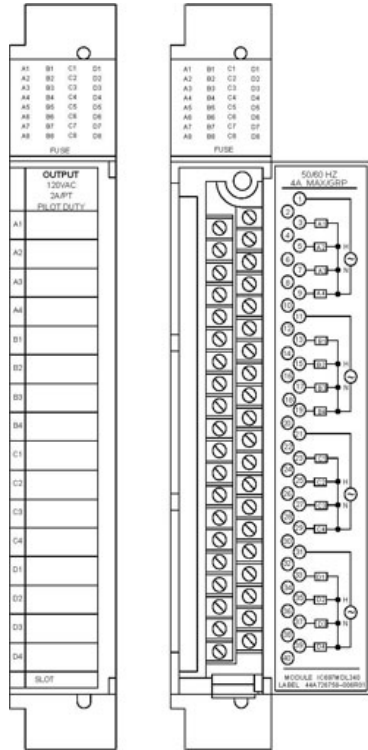


Figure 34: 120 Vac 2A 16-Point IC697MDL340

The 120 Vac 2A Output Module, IC697MDL340, provides 16 output points in four isolated groups of four points each. This allows each group of four points to be used on different phases of the ac supply. Each group of four outputs is individually fused with a 10A fuse. The module provides a high degree of inrush current which makes the outputs suitable for a wide range of inductive and incandescent loads. The module will pick up most size 4 contactors.

LED indicators which give the ON/OFF status of each point on the logic (PLC) side of the circuit as well as an LED to indicate the status of the fuses are located together at the top of the module.



Figure 35: 120/240 Vac 2A 8-Point Isolated IC694MDL330

The 120/240 Vac, 2A Output module, IC694MDL330, provides eight output points in two isolated groups of four points. Each group has a separate common. The two commons are not tied together inside the module. The groups can be used on different phases of the ac supply or powered from the same supply. AC power to operate loads connected to outputs must be user supplied.

This module requires an ac power source; it cannot be used with a dc power source

## 3.15.2 Specification Comparison

Item	IC697MDL340	IC694MDL330	Notes
Rated Voltage	120 Vac	120/240 Vac	
Output Voltage Range	85 to 132 V, 47-63 Hz	85 to 264 Vac, 50/60 Hz	
Outputs per Module	16 (four groups of four outputs each)	8 (two groups of four outputs each)	2 Module Replacement
Isolation	1500 V - any output to backplane 500 V between groups	250 Vac continuous 1500 Vac for one minute	
Output Current	2A max per point 4A max per group	2A max per point 4A max per group	
<b>Output Characteristics</b>			
Inrush Current Min	20A max per point for one cycle	20A max for one cycle 100 mA	
Load Current Output		1.5 V max	
Voltage Drop	3 V max	1 ms max	
On response Time	1 ms max	1/2 cycle max	
Off response Time	1/2 cycle	3 mA max at 120 Vac	
Output Leakage	1.5 mA max	6 mA max at 240 Vac	
Power Consumption: 5 V	0.25A	160 mA (all outputs on) from 5 V bus on backplane	
VME	System designed to support the VME standard C.1		

3.15.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697MDL340		IC694MDL330		IC694MDL330	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	COM	10	COM		
2	NC				
3	A1	2	Q1		
4	NC				
5	A2	4	Q2		
6	NC				
7	A3	6	Q3		
8	NC				
9	A4	8	Q4		
10	NC				
11	COM	20	COM		
12	NC				
13	B1	12	Q5		
14	NC				
15	B2	14	Q6		
16	NC				
17	B3	16	Q7		
18	NC				
19	B4	18	Q7		
20	NC				
21	COM			10	COM
22	NC				
23	C1			2	Q1
24	NC				
25	C2			4	Q2
26	NC				
27	C3			6	Q3
28	NC				
29	C4			8	Q4
30	NC				
31	COM			20	COM
32	NC				
33	D1			12	Q5
34	NC				
35	D2			14	Q6
36	NC				
37	D3			16	Q7
38	NC				
39	D4			18	Q8
40	NC				

### 3.16 IC695CRH016 – 90-70 MDL340 to RX3i MDL350 Harness Assembly

#### 3.16.1 Discrete Output Modules

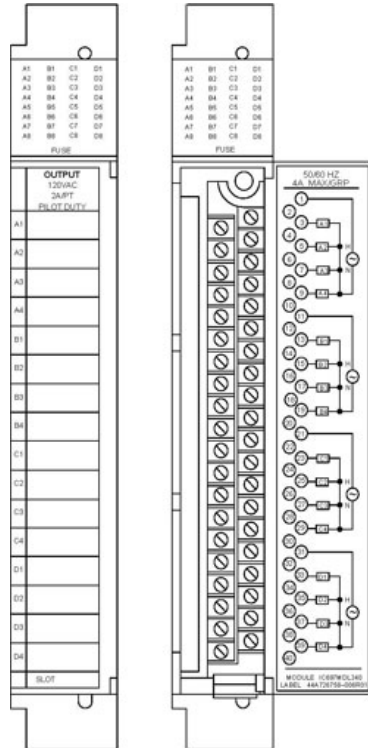


Figure 36: 120 Vac 2A 16-Point IC697MDL340

The 120 Vac 2A Output Module, IC697MDL340, provides 16 output points in four isolated groups of four points each. This allows each group of four points to be used on different phases of the ac supply. Each group of four outputs is individually fused with a 10A fuse. The module provides a high degree of inrush current which makes the outputs suitable for a wide range of inductive and incandescent loads. The module will pick up most size 4 contactors.

LED indicators which give the ON/OFF status of each point on the logic (PLC) side of the circuit as well as an LED to indicate the status of the fuses are located together at the top of the module.



Figure 37: 120/240 Vac 2A 16-Point Isolated IC694MDL350

The 120/240 Vac 16-Point Isolated Output module, IC694MDL350, provides 16 individually-isolated output points. A high level of noise immunity minimizes the need for external snubbers to protect the outputs against transient electrical noise on the power line. The outputs can control a wide range of inductive and incandescent loads. Power to operate the output loads must be provided with an external ac power supply.

A DIP switch on back of the module is used to select the default mode for the outputs: Force Off or Hold Last State. The module must be removed from the backplane to set this switch.

3.16.2 Specification Comparison

Item	IC697MDL340	IC694MDL350	Notes
Rated Voltage	120 Vac	120/240 Vac	
Output Voltage Range	85 to 132 V, 47 to 63 Hz	74 – 265 Vac (47 to 63 Hz), 120/240 Vac nominal	
Outputs per Module	16 (four groups of four outputs each)	16 isolated	Customer validation required: Customer must verify for this spec before using IC694MDL350.
Isolation	1500 V - any output to backplane 500 V between groups	250 Vac continuous; 1500 Vac for one minute	
Output Current	2A max per point 4A max per group	Per Point 2A max at 30°C (86 °F), 1A max at 60°C (86 °F), Per Module 5A max at 30°C (86 °F), 4A max at 60°C (140 °F),	Output fusing must be added for each output to replace the 3.15A internal output fuse.
<b>Output Characteristics</b>			
Inrush Current	20A max per point for one cycle	20A max for one cycle	
Min Load Current Output	3 V max	10 mA per point 1.5 V max	
Voltage Drop	1 ms max	1/2 cycle max	
On response Time	1/2 cycle	1/2 cycle max	
Off response Time	1.5 mA max	2 mA max	
Output Leakage			
Power Consumption	5 V, 0.25 A	5 V, 315 mA (with all outputs ON)	
VME	System designed to support the VME standard C.1		



## 3.16.3

## Pin Mapping

IC695ACC651		RX3i Module1	
IC697MDL340		IC694MDL350	
Terminals		Terminals (TB1)	
1	COM	2, 4	H
		6, 8	
2	NC		
3	A1	1	Q1
4	NC		
5	A2	3	Q2
6	NC		
7	A3	5	Q3
8	NC		
9	A4	7	Q4
10	NC		
11	COM	10, 12	H
		14, 16	
12	NC		
13	B1	9	Q5
14	NC		
15	B2	11	Q6
16	NC		
17	B3	13	Q7
18	NC		
19	B4	15	Q8
20	NC		
21	COM	20, 22	H
		24, 26	
22	NC		
23	C1	19	Q9
24	NC		
25	C2	21	Q10
26	NC		
27	C3	23	Q11
28	NC		
29	C4	25	Q12
30	NC		
31	COM	28, 30	H
		32, 34	
32	NC		
33	D1	27	Q13
34	NC		
35	D2	29	Q14
36	NC		
37	D3	31	Q15
38	NC		
39	D4	33	Q16
40	NC		

3.17 IC695CRH017 – 90-70 MDL341 to RX3i MDL350 Harness Assembly

3.17.1 Discrete Output Modules

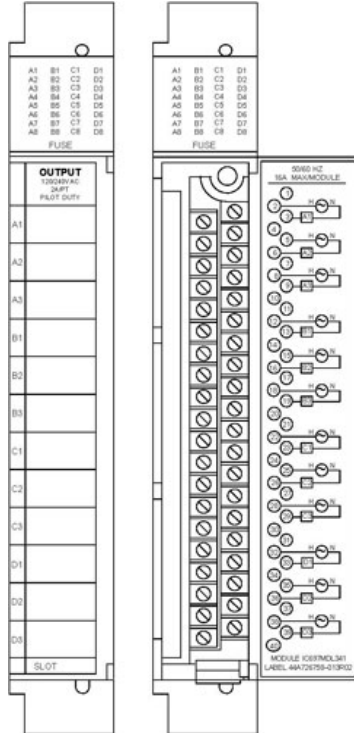


Figure 38: 120/240 Vac 2A 12-Point Isolated IC697MDL341

The 120/240 Vac 2A Isolated Output Module, IC697MDL341, for use with a Programmable Logic Controller (PLC) provides 12 isolated output points. This allows each point to be used on different phases of the AC supply. Each output point is individually fused with a 3.15A replaceable fuse.

The module provides a high degree of inrush current which makes the outputs suitable for a wide range of inductive and incandescent loads. The module will operate most size 4 contactors.



Figure 39: 120/240 Vac 2A 16-Point Isolated IC694MDL350

The 120/240 Vac 16-Point Isolated Output module, IC694MDL350, provides 16 individually-isolated output points. A high level of noise immunity minimizes the need for external snubbers to protect the outputs against transient electrical noise on the power line. The outputs can control a wide range of inductive and incandescent loads. Power to operate the output loads must be provided with an external ac power supply.

A DIP switch on back of the module is used to select the default mode for the outputs: Force Off or Hold Last State. The module must be removed from the backplane to set this switch.

## 3.17.2 Specification Comparison

Item	IC697MDL341	IC694MDL350	Notes
Rated Voltage	120/240 Vac	120/240 Vac	
Output Voltage Range	85 to 264 Vac, 47-63 Hz	74 – 265 Vac (47 to 63 Hz), 120/240 Vac nominal	
Outputs per Module	12 individually isolated	16 isolated	
Isolation	1500 V - any input to backplane 500 V between input groups	250 VAC continuous; 1500 VAC for one minute	
Output Current	2A max per point 16A max per module	Per Point 2A max at 30°C, 1A max at 60°C Per Module 5A max at 30°C, 4A max at 60°C	Output fusing must be added for each output to replace the 3.15A internal output fuse.
<b>Output Characteristics</b>			
Inrush Current	20A max for one cycle 1.5 V max	20A max for one cycle 10 mA per point 1.5 V max	
Min Load Current Output	1 ms max	1/2 cycle max	
Voltage Drop	1/2 cycle max	1/2 cycle max	
On response Time	3 mA max at 120 Vac	2 mA max	
Off response Time	6 mA max at 240 Vac		
Output Leakage			
Power Consumption	5 V, 0.25 A	5 V, 315 mA (with all outputs ON)	
VME	System designed to support the VME standard C.1		

3.17.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697MDL341		IC694MDL350	
Terminals		Terminals (TB1)	
1	NC		
2	H	2	H
3	A1	1	Q1
4	NC		
5	H	4	H
6	A2	3	Q2
7	NC		
8	H	6	H
9	A3	5	Q3
10	NC		
11	NC		
12	H	8	H
13	B1	7	Q4
14	NC		
15	H	10	H
16	B2	9	Q5
17	NC		
18	H	12	H
19	B3	11	Q6
20	NC		
21	NC		
22	H	14	H
23	C1	13	Q7
24	NC		
25	H	16	H
26	C2	15	Q8
27	NC		
28	H	20	H
29	C3	19	Q9
30	NC		
31	NC		
32	H	22	H
33	D1	21	Q10
34	NC		
35	H	24	H
36	D2	23	Q11
37	NC		
38	H	26	H
39	D3	25	Q12
40	NC		

### 3.18 IC695CRH018 – 90-70 MDL341 to RX3i MDL390 Harness Assembly

#### 3.18.1 Discrete Output Modules

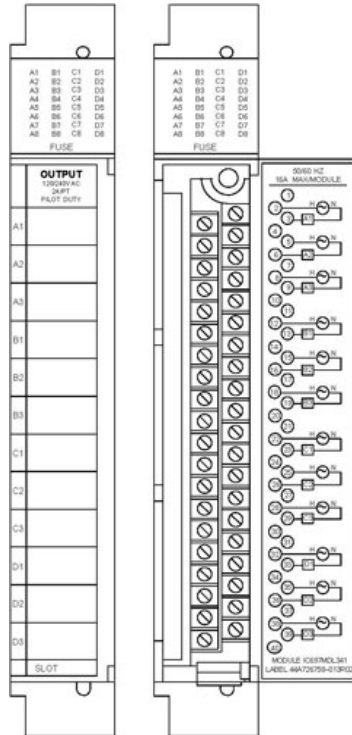


Figure 40: 120/240 Vac 2A 12-Point Isolated IC697MDL341

The 120/240 Vac 2A Isolated Output Module, IC697MDL341, for use with a Programmable Logic Controller (PLC) provides 12 isolated output points. This allows each point to be used on different phases of the ac supply. Each output point is individually fused with a 3.15A replaceable fuse.

The module provides a high degree of inrush current which makes the outputs suitable for a wide range of inductive and incandescent loads. The module will operate most size 4 contactors.



Figure 41: 120/240 Vac 2A 5-Point Isolated IC694MDL390

The 120/240 Vac, 2A Isolated Output module, IC694MDL390, provides five isolated output points, each with a separate common. Each output circuit is isolated from the others relative to the ac power source. The commons are not tied together inside the module. The output circuits can be used on different phases of the ac supply or powered from the same supply. AC Power to operate the loads connected to the outputs must be supplied by the user. This module requires an ac power source; it cannot be used with a dc power source.

3.18.2 Specification Comparison

Item	IC697MDL341	IC694MDL390	Notes
Rated Voltage	120/240 Vac	120/240 Vac	
Output Voltage Range	85 to 264 Vac, 47-63 Hz	85 to 264 Vac, 50/60 Hz	
Outputs per Module	12 individually isolated	5 (each output isolated from the others)	3 Module Replacement
Isolation	1500 V - any input to backplane 500 V between input groups	250 Vac continuous; 1500 Vac for one minute	
Output Current	2A max per point 16A max per module	2A max per point 5A max per module at 45°C (113 °F) 2A max per module at 60°C (140 °F)	
<b>Output Characteristics</b>			
Inrush Current	20A max for one cycle 1.5 V max	25A max for one cycle 100 mA	
Min Load Current Output		1.5 V max	
Voltage Drop	1 ms max	1 ms max	
On response Time	1/2 cycle max	1/2 cycle max	
Off response Time	3 mA max at 120 Vac	3mA max at 120 Vac	
Output Leakage	6 mA max at 240 Vac	6mA max at 240 Vac	
Power Consumption	5 V, .025 A	5 V, 110 mA (with all outputs ON)	
VME	System designed to support the VME standard C.1		

3.18.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2		RX3i Module3	
IC697MDL341		IC694MDL390		IC694MDL390		IC694MDL390	
Terminals		Terminals (TB1)		Terminals (TB2)		Terminals (TB3)	
1	NC						
2	H	2	H				
3	A1	4	Q1				
4	NC						
5	H	6	H				
6	A2	8	Q2				
7	NC						
8	H	10	H				
9	A3	12	Q3				
10	NC						
11	NC						
12	H	14	H				
13	B1	16	Q4				
14	NC						
15	H	18	H				
16	B2	20	Q5				
17	NC						
18	H			2	H		
19	B3			4	Q1		
20	NC						
21	NC						
22	H			6	H		
23	C1			8	Q2		
24	NC						
25	H			10	H		
26	C2			12	Q3		
27	NC						
28	H			14	H		
29	C3			16	Q4		
30	NC						
31	NC						
32	H			18	H		
33	D1			20	Q5		
34	NC						
35	H					2	H
36	D2					4	Q1
37	NC						
38	H					6	H
39	D3					8	Q2
40	NC						

3.19 IC695CRH019 – 90-70 MDL752 to RX3i MDL753 Harness Assembly

3.19.1 Discrete Output Modules

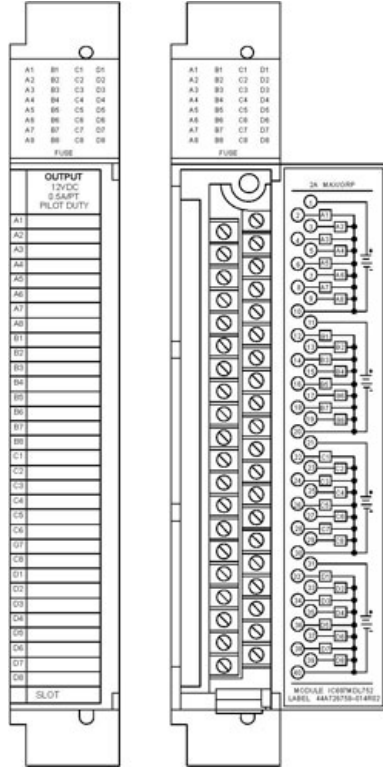


Figure 42: 12 Vdc 0.5A 32-Point IC697MDL752

The 12 Vdc 0.5A Output Module, IC697MDL752, provides 32 output points in four isolated groups of 8 points each.

The module provides a high degree of inrush current which makes the outputs suitable for a wide range of loads which have such characteristics.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are located together at the top of the module.



Figure 43: 12/24Vdc 0.5A Pos Logic 32-Point IC694MDL753

The 12/24 Vdc, 0.5A Positive Logic Output module, IC694MDL753, provides 32 discrete outputs in four isolated groups of eight. Each group has its own common. The outputs are positive logic or sourcing type outputs; they switch the loads on the positive side of the power supply, and supply current to the load. The outputs can switch user loads over the range of +12 to +24 Vdc (+20%, -15%) and can source a maximum current of 0.5A per point. There are two pins on the I/O connectors for each group common. Each pin has a current handling capacity of 3 A.



## 3.19.2 Specification Comparison

Item	IC697MDL752	IC694MDL753	Notes
Rated Voltage	12 Vdc	12 through 24 Vdc, positive logic	
Output Voltage Range	10 to 15 V	10.2 to 28.8 Vdc	
Outputs per Module	32 (four groups of 8 outputs each)	32 (four groups of eight outputs each)	2 - IC693CBxxxx cables
Isolation	1500 V - any input to backplane 500 V between input groups	250 Vac continuous; 1500 Vac for one minute	
Output Current	0.5A max per point 2A max per group	0.5A per point with 4A max per group and 3A max per group common pin	
<b>Output Characteristics</b>			
Inrush Current	10A max for 20 ms 1 V (2 $\Omega$ ) max	5.4A for 10 ms	Customer validation required: Customer must verify that the inrush current is not greater than 5.4mA before using IC694MDL753.
Min Load Current Output	1 ms max	0.3 Vdc	
Voltage Drop	1 ms max	0.5 ms max	
On response Time	1 mA max	0.5 ms max	
Off response Time Output Leakage		0.1 mA max	
Power Consumption	5 V, 0.25 A	5 V, 260 mA (with all outputs ON)	
VME	System designed to support the VME standard C.1		

3.19.3 Pin Mapping

IC695ACC651		RX3i Module 1		RX3i Module 1	
IC697MDL752		IC694MDL753		IC694MDL753	
Terminals		Left Side Terminals(TB1)		Right Side Terminals(TB2)	
1	(+)			A6	(+)
2	A1			A1	Q1
3	A2			B1	Q2
4	A3			A2	Q3
5	A4			B2	Q4
6	A5			A3	Q5
7	A6			B3	Q6
8	A7			A4	Q7
9	A8			B4	Q8
10	(-)			A5	(-)
11	(+)			B7	(+)
12	B1			B12	Q9
13	B2			A12	Q10
14	B3			B11	Q11
15	B4			A11	Q12
16	B5			B10	Q13
17	B6			A10	Q14
18	B7			B9	Q15
19	B8			A9	Q16
20	(-)			B8	(-)
21	(+)	A6	(+)		
22	C1	A1	Q17		
23	C2	B1	Q18		
24	C3	A2	Q19		
25	C4	B2	Q20		
26	C5	A3	Q21		
27	C6	B3	Q22		
28	C7	A4	Q23		
29	C8	B4	Q24		
30	(-)	A5	(-)		
31	(+)	B7	(+)		
32	D1	B12	Q25		
33	D2	A12	Q26		
34	D3	B11	Q27		
35	D4	A11	Q28		
36	D5	B10	Q29		
37	D6	A10	Q30		
38	D7	B9	Q31		
39	D8	A9	Q32		
40	(-)	B8	(-)		

## 3.20 IC695CRH020 – 90-70 MDL750 to RX3i MDL753 Harness Assembly

## 3.20.1 Discrete Output Modules

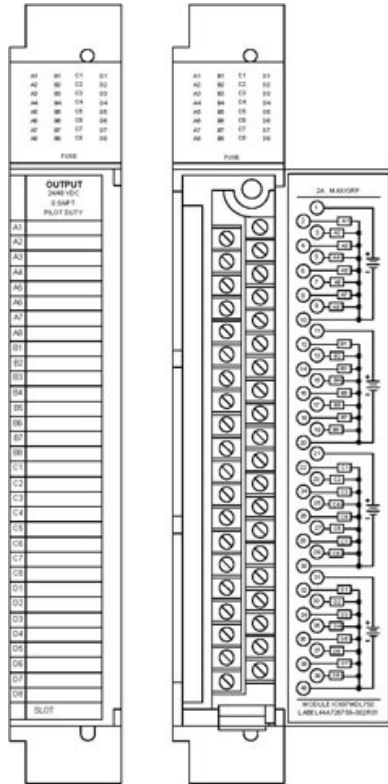


Figure 44: 24/48 Vdc 0.5A 32-Point IC697MDL750

The 24/48 Vdc 0.5A Output Module, IC697MDL750, for the Programmable Logic Controller (PLC) provides 32 output points in four isolated groups of 8 points each.

This output module provides a high degree of inrush current which makes the outputs suitable for a wide range of loads which have such characteristics.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are located together at the top of the module.

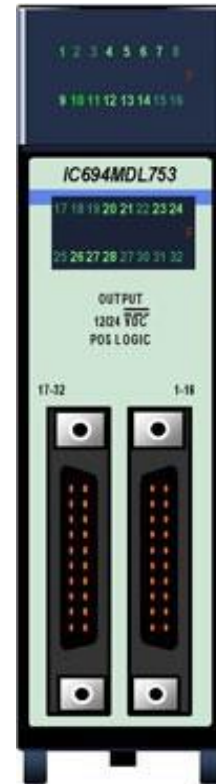


Figure 45: 12/24Vdc 0.5A Pos Logic 32-Point IC694MDL753

The 12/24 Vdc, 0.5A Positive Logic Output module, IC694MDL753, provides 32 discrete outputs in four isolated groups of eight. Each group has its own common. The outputs are positive logic or sourcing type outputs; they switch the loads on the positive side of the power supply, and supply current to the load. The outputs can switch user loads over the range of +12 to +24 Vdc (+20%, -15%) and can source a maximum current of 0.5A per point. There are two pins on the I/O connectors for each group common. Each pin has a current handling capacity of 3 A.

3.20.2 Specification Comparison

Item	IC697MDL750	IC694MDL753	Notes
Rated Voltage	24 or 48 Vdc	12 through 24 Vdc, positive logic	
Output Voltage Range	20 to 60 V	10.2 to 28.8 Vdc	
Outputs per Module	32 (four groups of 8 outputs each)	32 (four groups of eight outputs each)	2 - IC693CBxxxx cables
Isolation	1500 V - any input to backplane 500 V between input groups	250 Vac continuous; 1500 Vac for one minute	
Output Current	0.5A max per point 2A max per group	0.5A per point with 4A max per group and 3A max per group common pin	
<b>Output Characteristics</b>			
Inrush Current	10A max for 20 ms	5.4A for 10 ms	
Min Load Current Output	1 V (2 $\Omega$ ) max	0.3 Vdc	
Voltage Drop			
On response Time	1 ms max	0.5 ms max	
Off response Time Output	1 ms max	0.5 ms max	
Leakage	1 mA max	0.1 mA max	
Power Consumption	5 V, 0.25A	5 V, 260 mA (with all outputs ON)	
VME	System designed to support the VME standard C.1		

## 3.20.3

## Pin Mapping

IC695ACC651		RX3i Module 1		RX3i Module 1	
IC697MDL750		IC694MDL753		IC694MDL753	
Terminals		Left Side Terminals(TB1)		Right Side Terminals(TB2)	
1	(+)			A6	(+)
2	A1			A1	Q1
3	A2			B1	Q2
4	A3			A2	Q3
5	A4			B2	Q4
6	A5			A3	Q5
7	A6			B3	Q6
8	A7			A4	Q7
9	A8			B4	Q8
10	(-)			A5	(-)
11	(+)			B7	(+)
12	B1			B12	Q9
13	B2			A12	Q10
14	B3			B11	Q11
15	B4			A11	Q12
16	B5			B10	Q13
17	B6			A10	Q14
18	B7			B9	Q15
19	B8			A9	Q16
20	(-)			B8	(-)
21	(+)	A6	(+)		
22	C1	A1	Q17		
23	C2	B1	Q18		
24	C3	A2	Q19		
25	C4	B2	Q20		
26	C5	A3	Q21		
27	C6	B3	Q22		
28	C7	A4	Q23		
29	C8	B4	Q24		
30	(-)	A5	(-)		
31	(+)	B7	(+)		
32	D1	B12	Q25		
33	D2	A12	Q26		
34	D3	B11	Q27		
35	D4	A11	Q28		
36	D5	B10	Q29		
37	D6	A10	Q30		
38	D7	B9	Q31		
39	D8	A9	Q32		
40	(-)	B8	(-)		

3.21 IC695CRH022 – 90-70 MDL940 to RX3i MDL916 Harness Assembly

3.21.1 Discrete Output Modules

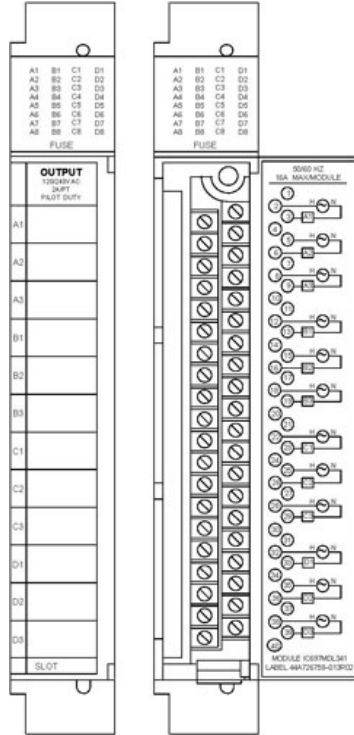


Figure 46: Relay Output 16-Point IC697MDL940

The 120/240 Vac 2A Isolated Output Module, IC697MDL940, for use with a Programmable Logic Controller (PLC) provides 12 isolated output points. This allows each point to be used on different phases of the ac supply. Each output point is individually fused with a 3.15A replaceable fuse.

The module provides a high degree of inrush current which makes the outputs suitable for a wide range of inductive and incandescent loads. The module will operate most size 4 contactors.

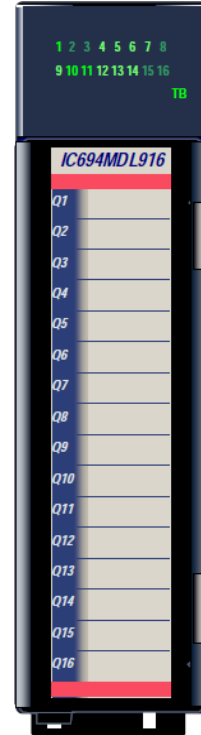


Figure 47: Relay Output 4A 16-Point Isolated IC694MDL916

The 4A 16-Point Relay Output module, IC694MDL916, provides 16 Form A relays for controlling output loads. The max output switching capacity of each circuit is 4A. Each output point is isolated from the other points, and each point has a separate common power output terminal. Outputs provide a high degree of noise immunity, minimizing the need to add external snubbers.

## 3.21.2 Specification Comparison

Item	IC697MDL940	IC694MDL916	Notes
Rated Voltage	120/240 Vac or 5/24/125 Vdc	120 Vdc/240 Vac	
Outputs per Module	16 8 points - Form C (isolated) 8 points - Form A (2 groups of 4)	16 isolated Form A relay outputs	Customer Validation required: IC694MDL916 only supports Form A applications.
Isolation	1500 V - any output to backplane 500 V between input groups	250 Vac continuous; 1500 Vac for one minute	
Output Current	2.0 A, 5 to 265 Vac, 47 to 63 Hz 2.0 A, 5 to 30 Vdc 0.2A, 31 to 125 Vdc 0.2A, 31 to 150 Vdc Form A only	10 mA per point min 4A for 5 to 250 Vac max (resistive or general purpose) 4A for 5 to 30 Vdc max (resistive) 200 mA for 125 Vdc (max resistive) 2A pilot duty per output (5 to 30 Vdc, 5 to 250 Vac)	
<b>Output Characteristics</b>			
Min Load Current	10 mA	10 mA	
Output Leakage	1 mA at 120 Vac	Not Applicable (open contact)	
Response Time ON	10 msec max	10 ms max	
Response Time OFF	10 msec max	10 ms max	
Switching Frequency	20 cycles/minute (inductive load)	20 cycles per minute max	
Power Consumption	5 V, 0.75A	5 V, 0.3A	
VME	System designed to support the VME standard C.1		

3.21.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697MDL940		IC694MDL916	
Terminals		Terminals (TB1)	
1	A1 NO	1	NO
2	(+)	2	RTN
3	A1 NC		
4	A2 NO	3	NO
5	(+)	4	RTN
6	A2 NC		
7	A3 NO	5	NO
8	(+)	6	RTN
9	A3 NC		
10	A4 NO	7	NO
11	(+)	8	RTN
12	A4 NC		
13	NC		
14	B1 NO	9	NO
15	(+)	10	RTN
16	B1 NC		
17	B2 NO	11	NO
18	(+)	12	RTN
19	B2 NC		
20	B3 NO	14	NO
21	(+)	15	RTN
22	B3 NC		
23	B4 NO	17	NO
24	(+)	18	RTN
25	B4 NC		
26			
27			
28	C1 NO	19	NO
29	C2 NO	21	NO
30	C3 NO	23	NO
31	C4 NO	25	NO
32	(+)	20,22,	RTN
33	(+)	24,26	RTN
34	NC		
35	D1 NO	27	NO
36	D2 NO	29	NO
37	D3 NO	32	NO
38	D4 NO	35	NO
39	(+)	28,30	RTN
40	(+)	33,36	RTN



## 3.22 IC695CRH023 – 90-70 ALG230 to RX3i ALG616 Harness Assembly

### 3.22.1 Analog Input Modules

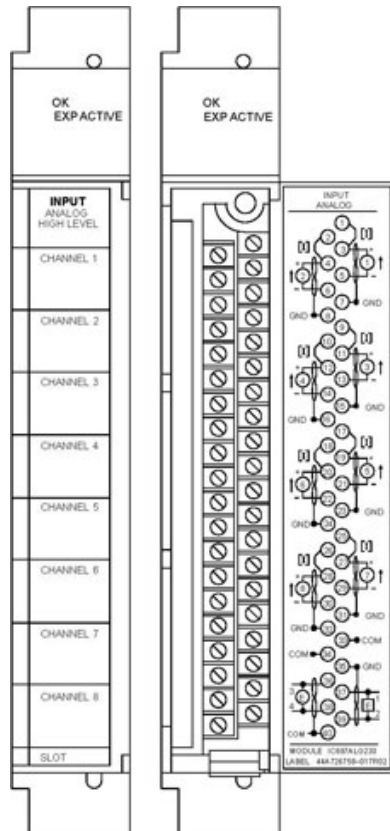


Figure 48: 8-Channel Base Converter IC697ALG230

This module has eight differential inputs and an expansion port. Each input can be individually configured for either Voltage or current. Each of the input channels also has individual user scaling. On-board load resistors are included for normal input current ranges up to 40 mA. If other current ranges or different resolution is required, external resistors may be used.

Standard system configurations for 10 V and 4 to 20 mA are available. These, and other lower input ranges, can be scaled to engineering units with the user scaling feature.



Figure 49: 16-/8-Channel Analog Voltage/Current Input IC695ALG616

Non-Isolated Differential Analog Voltage/Current Input module, IC695ALG616, provides 16 single-ended or 8 differential input channels. Analog input channels can be configured for these ranges:

- Current: 0 to 20 mA, 4 to 20 mA,  $\pm 20$  mA
- Voltage:  $\pm 10$ V, 0 to 10V,  $\pm 5$  V, 0 to 5V, 1 to 5V

This module must be located in an RX3i Universal Backplane. It requires an RX3i CPU with firmware version 3.0 or later. Machine Edition Version 5.0 SP3 Logic Developer-PLC or later must be used for configuration.

3.22.2 Specification Comparison

Item	IC697ALG230	IC695ALG616	Notes
Input Range Current Voltage	4 to 20 mA ±10 V, 0 to 10 V, ±5 V, 0 to 5 V	0 to 20 mA, 4 to 20 mA, ±20 mA ±10 V, 0 to 10 V, ±5 V, 0 to 5 V, 1 to 5 V	
Calibration	Factory set at full scale = 10 V ±2 mV	12 months typical to meet accuracy specifications over time. Offset can be applied as a periodic calibration adjustment.	
Resolution	Default Scaling (16 bit) 312.5 µV per LSB step on Voltage 0.5 µA per LSB step on 4 to 20 mA No missing codes over 16 bits on Voltage No missing codes over 14 bits on current	24 bit ADC converted to Floating Point or Integer	
Absolute Accuracy	±.02% of full scale over entire negative to positive range	0 to 10 V, 0 to 5 V, 1 to 5 V: 0.2% 0 to 20 mA: 0.25% 4 to 20 mA: 0.3125% ±5 V, ±10 V: 0.1% ±20 mA: 0.125% at 0°C – 60°C with 8 Hz, 12 Hz and 16 Hz filter	Customer validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance: Voltage Inputs  Current Inputs	> 10 MΩ at dc/ac impedance, 20 kΩ in series with 0.47 µF capacitor. 250 Ω, 0.1% precision shunt	>100 kΩ Voltage inputs  249 Ω ±1%	
Isolation	120 Vac or 125 Vdc for 1 minute	250 Vac continuous 1500 Vac for 1 minute	
Power Consumption	0.8A (4 W) max at 5.0 V	450 mA max at 5.0 V +5% / -2.5%, 600 mA max at 3.3 V +5% / -3%	

## 3.22.3

## Pin Mapping

IC695ACC651		RX3i Module1	
IC697ALG230		IC695ALG616	
Terminals		Terminals (TB1)	
1	I1 (CJ)		
2	I2 (CJ)		
3	I1 (+)	1	I1 (+)
4	I2 (+)	3	I2 (+)
5	I1 (-)	2	I1 (-)
6	I2 (-)	4	I2 (-)
7	I1 GND	5	GND
8	I2 GND	5	GND
9	I3 (CJ)		
10	I4 (CJ)		
11	I3 (+)	6	I3 (+)
12	I4 (+)	8	I4 (+)
13	I3 (-)	7	I3 (-)
14	I4 (-)	9	I4 (-)
15	I3 GND	5	GND
16	I4 GND	5	GND
17	I5 (CJ)		
18	I6 (CJ)		
19	I5 (+)	10	I5 (+)
20	I6 (+)	12	I6 (+)
21	I5 (-)	11	I5 (-)
22	I6 (-)	13	I6 (-)
23	I5 GND	14	GND
24	I6 GND	14	GND
25	I7 (CJ)		
26	I8 (CJ)		
27	I7 (+)	15	I7 (+)
28	I8 (+)	17	I8 (+)
29	I7 (-)	16	I7 (-)
30	I8 (-)	18	I8 (-)
31	I7 GND	14	GND
32	I8 GND	14	GND
33	COM		
34	COM		
35	GND		
36	3E		
37	1E		
38	4E		
39	2E		
40	COM		

For Current Inputs	
Input	Jumper Terminals
1	2-19
2	4-21
3	7-24
4	9-26
5	11-28
6	13-30
7	16-33
8	18-35

3.23 IC695CRH024 – 90-70 ALG230 to RX3i ALG220 Harness Assembly

3.23.1 Analog Input Modules

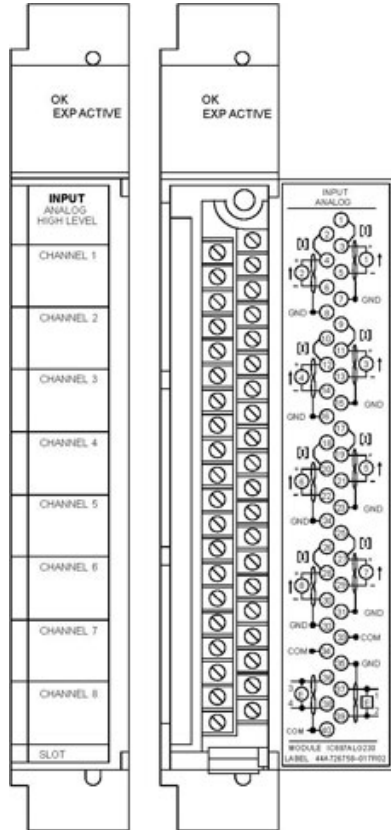


Figure 50: 8-Channel Base Converter IC697ALG230

This module has eight differential inputs and an expansion port. Each input can be individually configured for either Voltage or current. Each of the input channels also has individual user scaling.

On-board load resistors are included for normal input current ranges up to 40 mA. If other current ranges or different resolution is required, external resistors may be used.

Standard system configurations for 10 V and 4 to 20 mA are available. These, and other lower input ranges, can be scaled to engineering units with the user scaling feature.



Figure 51: 4-Channel Analog Input Voltage Differential IC694ALG220

The four-channel Analog Voltage Input module, IC694ALG220, provides four analog input channels. This module accepts inputs in the range of -10 to +10 V. Individual channels can be used with 4 to 20 mA inputs by jumpering the input terminals.

Conversion speed for each of the four channels is 1 ms. This provides an update rate of 4 ms for any given channel.

This module can be installed in any I/O slot of an RX3i PLC.

## 3.23.2 Specification Comparison

Item	IC697ALG230	IC694ALG220	Notes
Input Range Current Voltage	4 to 20 mA ±10 V, 0 to 10 V, ±5 V, 0 to 5 V	4 to 20 mA -10 to +10 V	2 Module Replacement
Calibration	Factory set at full scale = 10V ±2mV	Factory calibrated	
Resolution	Default Scaling (16 bit) 312.5 µV per LSB step on Voltage 0.5 µA per LSB step on 4 to 20 mA No missing codes over 16 bits on Voltage No missing codes over 14 bits on current	5 mV/20 µA, (1 LSB = 5 mV)	
Absolute Accuracy	±0.02% of full scale over entire negative to positive range	±10 mV/40 µA (typical) ±30 mV/160 µA max	Customer validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance: Voltage Inputs  Current Inputs	> 10 MΩ at dc/ac impedance, 20 kΩ in series with .47 µF capacitor. 250 Ω, 0.1% precision shunt	> 9 MΩ  250 Ω	
Isolation Voltage terminal block to backplane/chassis	120 Vac or 125 Vdc for 1 minute	250 Vac continuous 1500 Vac for 1 minute	
Power Consumption:	0.8A (4 W) max at 5.0 V	27 mA at 5.0 V	

3.23.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG230		IC694ALG220		IC694ALG220	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 (CJ)				
2	I2 (CJ)				
3	I1 (+)	3	I1 (+)		
4	I2 (+)	4	I2 (+)		
5	I1 (-)	5	I1 (-)		
6	I2 (-)	6	I2 (-)		
7	I1 GND	9	I1 GND		
8	I2 GND	10	I2 GND		
9	I3 (CJ)				
10	I4 (CJ)				
11	I3 (+)	13	I3 (+)		
12	I4 (+)	14	I4 (+)		
13	I3 (-)	15	I3 (-)		
14	I4 (-)	16	I4 (-)		
15	I3 GND	19	I3 GND		
16	I4 GND	20	I4 GND		
17	I5 (CJ)				
18	I6 (CJ)				
19	I5 (+)			3	I1 (+)
20	I6 (+)			4	I2 (+)
21	I5 (-)			5	I1 (-)
22	I6 (-)			6	I2 (-)
23	I5 GND			9	I1 GND
24	I6 GND			10	I2 GND
25	I7 (CJ)				
26	I8 (CJ)				
27	I7 (+)			13	I3 (+)
28	I8 (+)			14	I4 (+)
29	I7 (-)			15	I3 (-)
30	I8 (-)			16	I4 (-)
31	I7 GND			19	I3 GND
32	I8 GND			20	I4 GND
33	COM				
34	COM				
35	GND				
36	3E				
37	1E				
38	4E				
39	2E				
40	COM				

For Current Inputs		
Input	Jumper Terminals RX3i Module 1 (A)	Jumper Terminals RX3i Module 2 (B)
1	1-3	1-3
2	2-4	2-4
3	11-13	11-13
4	12-14	12-14

## 3.24 IC695CRH025 – 90-70 ALG230 to RX3i ALG221 Harness Assembly

## 3.24.1 Analog Input Modules

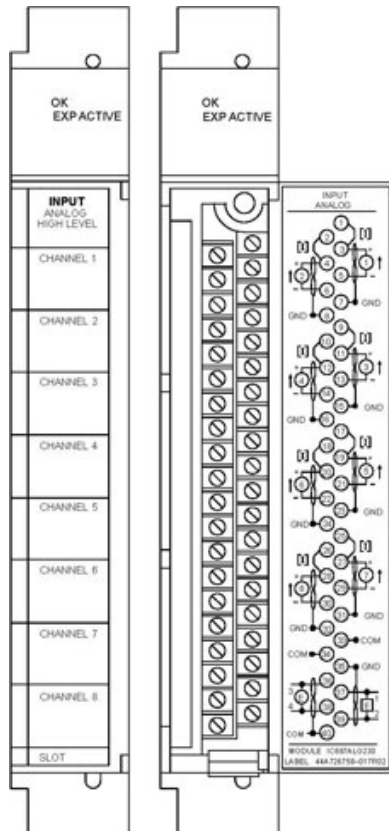


Figure 52: 8-Channel Base Converter IC697ALG230

This module has eight differential inputs and an expansion port. Each input can be individually configured for either Voltage or current. Each of the input channels also has individual user scaling.

On-board load resistors are included for normal input current ranges up to 40 mA. If other current ranges or different resolution is required, external resistors may be used.

Standard system configurations for 10 V and 4 to 20 mA are available. These, and other lower input ranges, can be scaled to engineering units with the user scaling feature.



Figure 53: 4-Channel Analog Differential Current Input IC694ALG221

The 4-Channel Analog Current Input module, IC694ALG221, provides four analog input channels. This module has two possible input ranges:

- 4 to 20 mA
- 0 to 20 mA

Conversion speed for each of the four channels is 0.5 ms. This provides an update rate of 2 ms for any given channel. Resolution of the converted signal is 12 bits binary (1 part in 4096) over either range.

This module can be installed in any I/O slot of an RX3i system.

3.24.2 Specification Comparison

Item	IC697ALG230	IC694ALG221	Notes
Input Range Current Voltage	4 to 20 mA ±10 V, 0 to 10 V, ±5 V, 0 to 5 V	4 to 20 mA and 0 to 20 mA	2 Module Replacement Current Only
Calibration	Factory set at full scale = 10 V ±2 mV	Factory calibrated to 4 µA per count	
Resolution	Default Scaling (16 bit) 312.5 µV per LSB step on Voltage 0.5 µA per LSB step on 4 to 20 mA No missing codes over 16 bits on Voltage No missing codes over 14 bits on current	4 µA (1 LSB = 4 µA) at 4 to 20 mA 5 µA (1 LSB = 5 µA) at 0 to 20 mA	
Absolute Accuracy	±.02% of full scale over entire negative to positive range	0.1% full scale + 0.1% reading	Customer validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance: Voltage Inputs  Current Inputs	>10 MΩ at dc/ac impedance, 20 kΩ in series with 0.47 µF capacitor. 250 Ω, 0.1% precision shunt	  250 Ω	
Isolation Voltage terminal block to backplane/chassis	120 Vac or 125 Vdc for 1 minute	250 Vac continuous 1500 Vac for 1 minute	
Power Consumption	0.8A (4 W) max at 5.0 V	25 mA max at 5.0 V	



## 3.24.3

## Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG230		IC694ALG221		IC694ALG221	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 (CJ)				
2	I2 (CJ)				
3	I1 (+)	3	I1 (+)		
4	I2 (+)	4	I2 (+)		
5	I1 (-)	5	I1 (-)		
6	I2 (-)	6	I2 (-)		
7	I1 GND	7	I1 GND		
8	I2 GND	8	I2 GND		
9	I3 (CJ)				
10	I4 (CJ)				
11	I3 (+)	13	I3 (+)		
12	I4 (+)	14	I4 (+)		
13	I3 (-)	15	I3 (-)		
14	I4 (-)	16	I4 (-)		
15	I3 GND	17	I3 GND		
16	I4 GND	18	I4 GND		
17	I5 (CJ)				
18	I6 (CJ)				
19	I5 (+)			3	I1 (+)
20	I6 (+)			4	I2 (+)
21	I5 (-)			5	I1 (-)
22	I6 (-)			6	I2 (-)
23	I5 GND			7	I5 GND
24	I6 GND			8	I6 GND
25	I7 (CJ)				
26	I8 (CJ)				
27	I7 (+)			13	I3 (+)
28	I8 (+)			14	I4 (+)
29	I7 (-)			15	I3 (-)
30	I8 (-)			16	I4 (-)
31	I7 GND			17	I7 GND
32	I8 GND			18	I8 GND
33	COM				
34	COM				
35	GND				
36	3E				
37	1E				
38	4E				
39	2E				
40	COM				

3.25 IC695CRH026 – 90-70 ALG230 to RX3i ALG222 Harness Assembly

3.25.1 Analog Input Modules

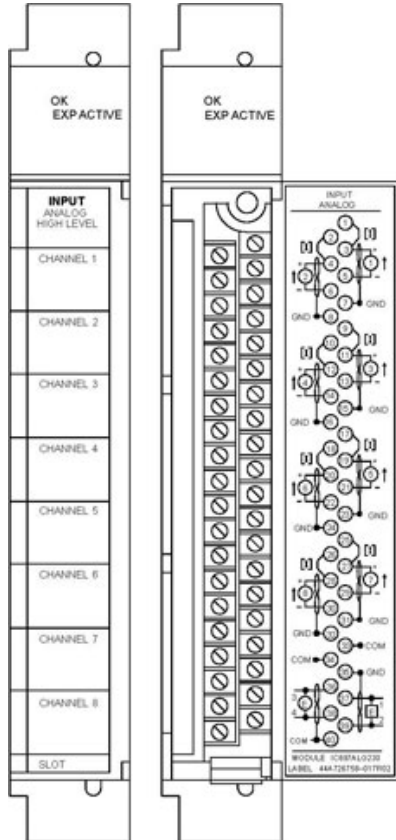


Figure 54: 8-Channel Base Converter IC697ALG230

This module has eight differential inputs and an expansion port. Each input can be individually configured for either Voltage or current. Each of the input channels also has individual user scaling. On-board load resistors are included for normal input current ranges up to 40 mA. If other current ranges or different resolution is required, external resistors may be used. Standard system configurations for 10 V and 4 to 20 mA are available. These, and other lower input ranges, can be scaled to engineering units with the user scaling feature.



Figure 55: 16-/8-Channel Analog Voltage Input IC694ALG222

The 16-Channel Analog Voltage Input module, IC694ALG222, provides 16 single-ended or eight differential input channels. Each channel can be configured using the configuration software for either of two input ranges:

- 0 to 10 V (unipolar), default
- -10 to +10 V (bipolar)

High and Low alarm limits can be configured for both ranges.

This module can be installed in any I/O slot of anRX3i system.

## 3.25.2 Specification Comparison

Item	IC697ALG230	IC694ALG222	Notes
Input Ranges Current Voltage	4 to 20 mA $\pm 10$ V, 0 to 10 V, $\pm 5$ V, 0 to 5 V	0 V to +10 V (unipolar) or -10 V to +10 V (bipolar); selectable each channel	Voltage Only
Calibration	Factory set at full scale = 10 V $\pm 2$ mV	Factory calibrated to: 2.5 mV per count on 0 V to +10 V (unipolar) range 5 mV per count on -10 to +10 V (bipolar) range	
Resolution	Default Scaling (16 bit) 312.5 $\mu$ V per LSB step on Voltage 0.5 $\mu$ A per LSB step on 4 to 20 mA No missing codes over 16 bits on Voltage No missing codes over 14 bits on current	5 mV (1 LSB = 5 mV)	
Absolute Accuracy	$\pm 0.2\%$ of full scale over entire negative to positive range	$\pm 10.25\%$ of full scale at 25°C (77 °F)	
Input Impedance: Voltage Inputs  Current Inputs	>10 M $\Omega$ at dc/ac impedance, 20 k $\Omega$ in series with .47 $\mu$ F capacitor. 250 $\Omega$ , 0.1% precision shunt	>1 M $\Omega$	
Isolation Voltage terminal block to backplane/chassis	120 Vac or 125 Vdc for 1 minute	250 Vac continuous 1500 Vac for 1 minute	
Power Consumption	0.8A (4 W) max at 5.0 V	112 mA max at 5.0 V	

3.25.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697ALG230		IC694ALG222	
Terminals		Terminals (TB1)	
1	I1 (CJ)		
2	I2 (CJ)		
3	I1 (+)	3	I1 (+)
4	I2 (+)	5	I2 (+)
5	I1 (-)	4	I1 (-)
6	I2 (-)	6	I2 (-)
7	I1 GND	20	GND
8	I2 GND	20	GND
9	I3 (CJ)		
10	I4 (CJ)		
11	I3 (+)	7	I3 (+)
12	I4 (+)	9	I4 (+)
13	I3 (-)	8	I3 (-)
14	I4 (-)	10	I4 (-)
15	I3 GND	20	GND
16	I4 GND	20	GND
17	I5 (CJ)		
18	I6 (CJ)		
19	I5 (+)	11	I5 (+)
20	I6 (+)	13	I6 (+)
21	I5 (-)	12	I5 (-)
22	I6 (-)	14	I6(-)
23	I5 GND	20	GND
24	I6 GND	20	GND
25	I7 (CJ)		
26	I8 (CJ)		
27	I7 (+)	15	I7 (+)
28	I8 (+)	17	I8 (+)
29	I7 (-)	16	I7 (-)
30	I8 (-)	18	I8 (-)
31	I7 GND	20	GND
32	I8 GND	20	GND
33	COM		
34	COM		
35	GND		
36	3E		
37	1E		
38	4E		
39	2E		
40	COM		

### 3.26 IC695CRH027 – 90-70 ALG230 to RX3i ALG232 Harness Assembly

#### 3.26.1 Analog Input Modules

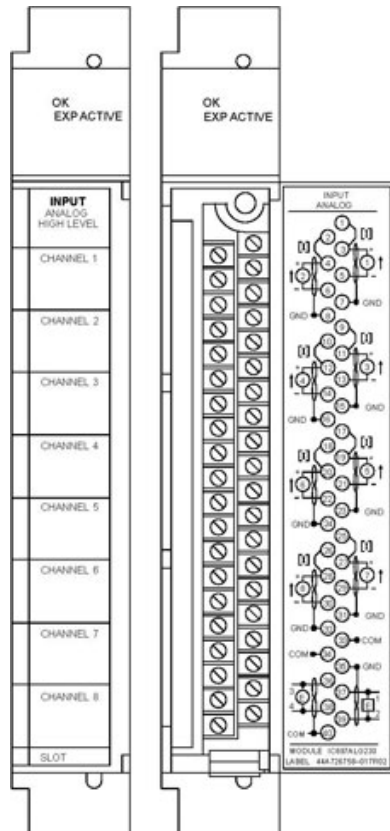


Figure 56: 8-Channel Base Converter IC697ALG230

This module has eight differential inputs and an expansion port. Each input can be individually configured for either Voltage or current. Each of the input channels also has individual user scaling. On-board load resistors are included for normal input current ranges up to  $\pm 40$  mA. If other current ranges or different resolution is required, external resistors may be used.

Standard system configurations for  $\pm 10$  V and 4 to 20 mA are available. These, and other lower input ranges, can be scaled to engineering units with the user scaling feature.



Figure 57: 16-/8-Channel Analog Voltage Input IC694ALG232

The PACSystems RX3i 16-Channel Analog Voltage Input module provides 16 single-ended or 8 differential input channels. Each channel can be configured for either of two input ranges:

- 0 to 10 V (unipolar), default
- -10 to +10 V (bipolar)

High and Low alarm limits can be configured for both ranges.

This module can be installed in any I/O slot that has a serial connector in an RX3i system.

3.26.2 Specification Comparison

Item	IC697ALG230	IC694ALG232	Notes
Input Range Current Voltage	4 to 20 mA ±10 V, 0 to 10 V, ±5 V, 0 to 5 V	0 V to +10 V (unipolar) or -10 V to +10 V (bipolar) selectable each channel	Customer validation required: IC694ALG232 is Voltage Only module.
Calibration	Factory set at full scale = 10 V ±2 mV	Factory calibrated to: 0.3125 mV per count on 0 V to +10 V (unipolar) range 0.3125 mV per count on -10 to +10 V (bipolar) range	
Resolution	Default Scaling (16 bit) 312.5 µV per LSB step on Voltage 0.5 µA per LSB step on 4 to 20 mA No missing codes over 16 bits on Voltage No missing codes over 14 bits on current	1 LSB = 0.3125 mV	
Absolute Accuracy	±0.2% of full scale over entire negative to positive range	±0.25% of full scale at 25°C (77°F) ±0.5% of full scale over specified operating temperature range	Customer validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance: Voltage Inputs  Current Inputs	> 10 MΩ at dc/ac impedance, 20 kΩ in series with .47 µF capacitor. 250 Ω, 0.1% precision shunt	>500 kΩ (single-ended mode)  >1 MΩ (differential mode)	
Isolation Voltage terminal block to backplane/chassis	120 Vac or 125 Vdc for 1 minute	250 Vac continuous 1500 Vac for 1 minute	
Power Consumption	0.8A (4 W) max at 5.0 V	112 mA max at 5.0 V	

## 3.26.3

## Pin Mapping

IC695ACC651		RX3i Module1	
IC697ALG230		IC694ALG232	
Terminals		Terminals (TB1)	
1	I1 (CJ)		
2	I2 (CJ)		
3	I1 (+)	3	I1 (+)
4	I2 (+)	5	I2 (+)
5	I1 (-)	4	I1 (-)
6	I2 (-)	6	I2 (-)
7	I1 GND	20	GND
8	I2 GND	20	GND
9	I3 (CJ)		
10	I4 (CJ)		
11	I3 (+)	7	I3 (+)
12	I4 (+)	9	I4 (+)
13	I3 (-)	8	I3 (-)
14	I4 (-)	10	I4 (-)
15	I3 GND	20	GND
16	I4 GND	20	GND
17	I5 (CJ)		
18	I6 (CJ)		
19	I5 (+)	11	I5 (+)
20	I6 (+)	13	I6 (+)
21	I5 (-)	12	I5 (-)
22	I6 (-)	14	I6(-)
23	I5 GND	20	GND
24	I6 GND	20	GND
25	I7 (CJ)		
26	I8 (CJ)		
27	I7 (+)	15	I7 (+)
28	I8 (+)	17	I8 (+)
29	I7 (-)	16	I7 (-)
30	I8 (-)	18	I8 (-)
31	I7 GND	20	GND
32	I8 GND	20	GND
33	COM		
34	COM		
35	GND		
36	3E		
37	1E		
38	4E		
39	2E		
40	COM		

3.27 IC695CRH028 – 90-70 ALG440 to RX3i ALG616 Harness Assembly

3.27.1 Analog Input Modules

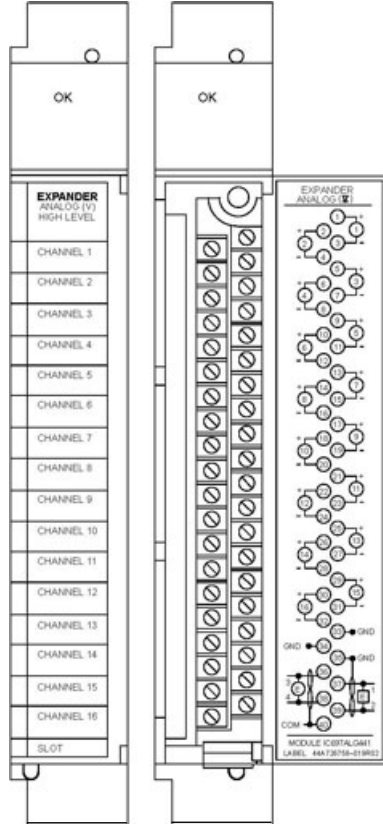


Figure 58: 16-Channel Current Expander IC697ALG440



Figure 59: 16-/8-Channel Analog Voltage/Current Input IC695ALG616

The Current Expander module has 16 current inputs each accepting up to  $\pm 20$  mA.

Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120.

The Base Converter module accepts any mix of the two Expander module types.

A common user scaling factor applies to all inputs on each Expander module; however each Expander module may be individually scaled as required.

Non-Isolated Differential Analog Voltage/Current Input module, IC695ALG616, provides 16 single-ended or 8 differential input channels.

Analog input channels can be configured for these ranges:

- Current: 0 to 20 mA, 4 to 20 mA,  $\pm 20$  mA
- Voltage:  $\pm 10$ V, 0 to 10V,  $\pm 5$ V, 0 to 5V, 1 to 5V

This module must be located in an RX3i Universal Backplane. They require an RX3i CPU with firmware version 3.0 or later. Machine Edition Version 5.0 SP3 Logic Developer-PLC or later must be used for configuration.



## 3.27.2 Specification Comparison

Item	IC697ALG440	IC695ALG616	Notes
Input Range Current Voltage	4 to 20mA	0 to 20 mA, 4 to 20 mA, $\pm 20$ mA $\pm 10$ V, 0 to 10 V, $\pm 5$ V, 0 to 5 V, 1 to 5 V	2 module replacement
Calibration	Factory set at full scale = 10 V $\pm 2$ mV	12 months typical to meet accurate specifications over time. Offset can be applied as a periodic calibration adjustment.	
Resolution	Default Scaling (16 bit) 0.5 $\mu$ A per LSB step on 4 to 20 mA. No missing codes over 14 bits on current	24 bit ADC converted to Floating Point or Integer	
Absolute Accuracy	$\pm 0.02\%$ of full scale over entire negative to positive range	0 to 20 mA: 0.25% 4 to 20 mA: 0.3125% $\pm 20$ mA: 0.125%	
Input Impedance: Current Inputs	250 $\Omega$ , 0.1% precision shunt	249 $\Omega \pm 1\%$	Customer Validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Isolation	120 Vac or 125 Vdc for 1 minute	250 Vac continuous 1500 Vac for 1 minute	
Power Consumption	0.8A (4 W) max at 5.0 V	450 mA max at 5.0 V +5% / -2.5% 600 mA max at 3.3V +5% / -3%	

3.27.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG440		IC695ALG616		IC695ALG616	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 (+)	1	I1 (+)		
2	I2 (+)	3	I2 (+)		
3	I1 (-)	2	I1 (-)		
4	I2 (-)	4	I2 (-)		
5	I3 (+)	6	I3 (+)		
6	I4 (+)	8	I4 (+)		
7	I3 (-)	7	I3 (-)		
8	I4 (-)	9	I4 (-)		
9	I5 (+)	10	I5 (+)		
10	I6 (+)	12	I6 (+)		
11	I5 (-)	11	I5 (-)		
12	I6 (-)	13	I6 (-)		
13	I7 (+)	15	I7 (+)		
14	I8 (+)	17	I8 (+)		
15	I7 (-)	16	I7 (-)		
16	I8 (-)	18	I8 (-)		
17	I9 (+)			1	I1 (+)
18	I10 (+)			3	I2 (+)
19	I9 (-)			2	I1 (-)
20	I10 (-)			4	I2 (-)
21	I11 (+)			6	I3 (+)
22	I12 (+)			8	I4 (+)
23	I11 (-)			7	I3 (-)
24	I12 (-)			9	I4 (-)
25	I13 (+)			10	I5 (+)
26	I14 (+)			12	I6 (+)
27	I13 (-)			11	I5 (-)
28	I14 (-)			13	I6 (-)
29	I15 (+)			15	I7 (+)
30	I16 (+)			17	I8 (+)
31	I15 (-)			16	I7 (-)
32	I16 (-)			18	I8 (-)
33	GND				
34	GND				
35	GND				
36	3E				
37	1E				
38	4E				
39	2E				
40	COM				

For Current Inputs		
Input	Jumper Terminals RX3i Module1	Jumper Terminals RX3i Module2
1	2 - 19	2 - 19
2	4 - 21	4 - 21
3	7 - 24	7 - 24
4	9 - 26	9 - 26
5	11 - 28	11 - 28
6	13 - 30	13 - 30
7	16 - 33	16 - 33
8	18 - 35	18 - 35

## 3.28 IC695CRH029 – 90-70 ALG440 to RX3i ALG220 Harness Assembly

## 3.28.1 Analog Input Modules

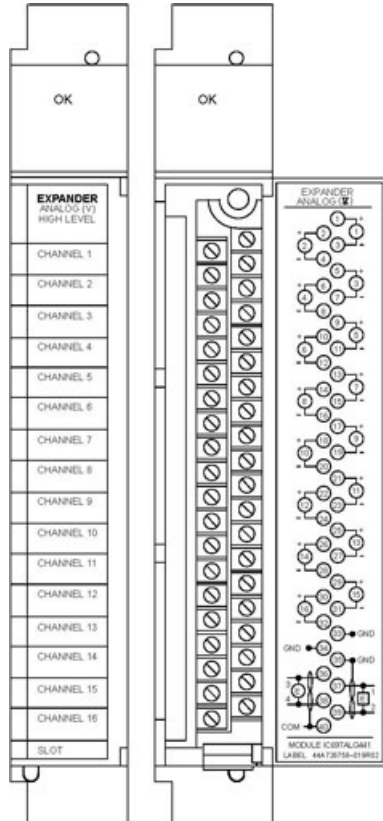


Figure 60: 16-Channel Current Expander IC697ALG440

The Current Expander module has 16 current inputs each accepting up to  $\pm 20$  mA.

Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120.

The Base Converter module accepts any mix of the two Expander module types.

A common user scaling factor applies to all inputs on each Expander module; however each Expander module may be individually scaled as required.

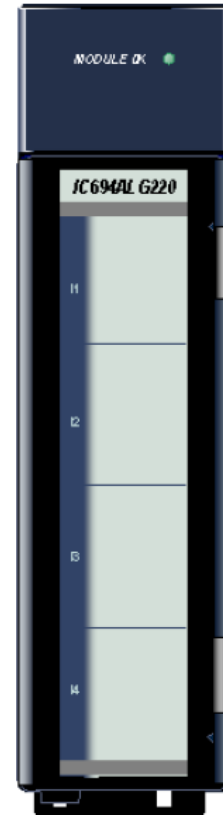


Figure 61: 4-Channel Analog Voltage Differential Input IC694ALG220

The 4-Channel Analog Voltage Input module, IC694ALG220, provides four analog input channels. This module accepts inputs in the range of  $-10$  to  $+10$  V. Individual channels can be used with 4 to 20 mA inputs by jumpering the input terminals.

Conversion speed for each of the four channels is 1 ms. This provides an update rate of 4 ms for any given channel.

This module can be installed in any I/O slot of an RX3i PLC.

3.28.2 Specification Comparison

Item	IC697ALG440	IC694ALG220	Notes
Input Range Current Voltage	4 to 20 mA	4 to 20 mA -10 to +10 V	4 Module Replacement
Calibration	Factory set at full scale = 10 V $\pm$ 2 mV	Factory calibrated	
Resolution	Default Scaling (16 bit) 0.5 $\mu$ A per LSB step on 4 to 20 mA No missing codes over 14 bits on current	5 mV/20 $\mu$ A, (1 LSB = 5 mV)	
Absolute Accuracy	$\pm$ 0.2% of full scale over entire negative to positive range	$\pm$ 10 mV/40 $\mu$ A (typical) $\pm$ 30 mV/160 $\mu$ A max	Customer validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance: Current Inputs	250 $\Omega$ , 0.1% precision shunt	> 9 M $\Omega$ 250 $\Omega$	
Isolation	120 Vac or 125 Vdc for 1 minute	250 Vac continuous 1500 Vac for 1 minute	
Power Consumption:	0.8A (4 W) max at 5.0 V	27 mA at 5.0 V	

3.28.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2		RX3i Module3		RX3i Module4	
IC697ALG440		IC694ALG220		IC694ALG220		IC694ALG220		IC694ALG220	
Terminals		Terminals (TB1)		Terminals (TB2)		Terminals (TB3)		Terminals (TB4)	
1	I1 (+)	3	I1 (+)						
2	I2 (+)	4	I2 (+)						
3	I1 (-)	5	I1 (-)						
4	I2 (-)	6	I2 (-)						
5	I3 (+)	13	I3 (+)						
6	I4 (+)	14	I4 (+)						
7	I3 (-)	15	I3 (-)						
8	I4 (-)	16	I4 (-)						
9	I5 (+)			3	I1 (+)				
10	I6 (+)			4	I2 (+)				
11	I5 (-)			5	I1 (-)				
12	I6 (-)			6	I2 (-)				
13	I7 (+)			13	I3 (+)				
14	I8 (+)			14	I4 (+)				
15	I7 (-)			15	I3 (-)				
16	I8 (-)			16	I4 (-)				
17	I9 (+)					3	I1 (+)		
18	I10 (+)					4	I2 (+)		
19	I9 (-)					5	I1 (-)		
20	I10 (-)					6	I2 (-)		
21	I11 (+)					13	I3 (+)		
22	I12 (+)					14	I4 (+)		
23	I11 (-)					15	I3 (-)		
24	I12 (-)					16	I4 (-)		
25	I13 (+)							3	I1 (+)
26	I14 (+)							4	I2 (+)
27	I13 (-)							5	I1 (-)
28	I14 (-)							6	I2 (-)
29	I15 (+)							13	I3 (+)
30	I16 (+)							14	I4 (+)
31	I15 (-)							15	I3 (-)
32	I16 (-)							16	I4 (-)
33	GND								
34	GND								
35	GND								
36	3E								
37	1E								
38	4E								
39	2E								
40	COM								

For Current Inputs	
Input	Jumper
RX3i Module 1 (A)	
1	1-3
2	2-4
3	11-13
4	12-14
RX3i Module 2 (B)	
1	1-3
2	2-4
3	11-13
4	12-14
RX3i Module3 (C)	
1	1-3
2	2-4
3	11-13
4	12-14
RX3i Module4 (D)	
1	1-3
2	2-4
3	11-13
4	12-14

### 3.29 IC695CRH030 – 90-70 ALG440 to RX3i ALG221 Harness Assembly

#### 3.29.1 Analog Input Modules

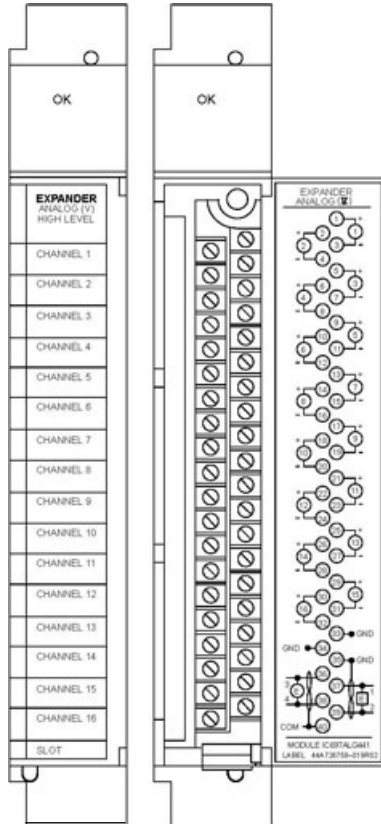


Figure 62: 16-Channel Current Expander IC697ALG440

The Current Expander module has 16 current inputs each accepting up to  $\pm 20$  mA.

Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120.

The Base Converter module accepts any mix of the two Expander module types.

A common user scaling factor applies to all inputs on each Expander module; however each Expander module may be individually scaled as required.



Figure 63: 4-Channel Analog Differential Current Input IC694ALG221

The 4-Channel Analog Current Input module, IC694ALG221, provides four analog input channels. This module has two possible input ranges:

- 4 to 20 mA
- 0 to 20 mA

Conversion speed for each of the four channels is 0.5 ms. This provides an update rate of 2 ms for any given channel. Resolution of the converted signal is 12 bits binary (1 part in 4096) over either range.

This module can be installed in any I/O slot of an RX3i system.

## 3.29.2 Specification Comparison

Item	IC697ALG440	IC694ALG221	Notes
Input Range Current Voltage	4 to 20mA -10 V to +10 V	4 to 20 mA and 0 to 20 mA	4 Module Replacement
Calibration	Factory set at full scale = 10 V $\pm$ 2 mV	Factory calibrated to 4 $\mu$ A per count	
Resolution	Default Scaling (16 bit) 0.5 $\mu$ A per LSB step on 4 to 20 mA No missing codes over 14 bits on current	4 $\mu$ A (1 LSB = 4 $\mu$ A) at 4 - 20mA 5 $\mu$ A (1 LSB = 5 $\mu$ A) at 0 - 20mA	
Absolute Accuracy	$\pm$ 0.02% of full scale over entire negative to positive range	0.1% full scale + 0.1% reading	Customer Validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance: Current Inputs	250 $\Omega$ , 0.1% precision shunt	250 $\Omega$	
Isolation	120 Vac or 125 Vdc for 1 minute	250 Vac continuous 1500 Vac for 1 minute	
Power Consumption	0.8A (4 W) max at 5.0 V	25 mA max at 5.0 V	

3.29.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2		RX3i Module3		RX3i Module4	
IC697ALG440		IC694ALG221		IC694ALG221		IC694ALG221		IC694ALG221	
Terminals		Terminals (TB1)		Terminals (TB2)		Terminals (TB3)		Terminals (TB4)	
1	I1 (+)	3	I1 (+)						
2	I2 (+)	4	I2 (+)						
3	I1 (-)	5	I1 (-)						
4	I2 (-)	6	I2 (-)						
5	I3 (+)	13	I3 (+)						
6	I4 (+)	14	I4 (+)						
7	I3 (-)	15	I3 (-)						
8	I4 (-)	16	I4 (-)						
9	I5 (+)			3	I1 (+)				
10	I6 (+)			4	I2 (+)				
11	I5 (-)			5	I1 (-)				
12	I6 (-)			6	I2 (-)				
13	I7 (+)			13	I3 (+)				
14	I8 (+)			14	I4 (+)				
15	I7 (-)			15	I3 (-)				
16	I8 (-)			16	I4 (-)				
17	I9 (+)					3	I1 (+)		
18	I10 (+)					4	I2 (+)		
19	I9 (-)					5	I1 (-)		
20	I10 (-)					6	I2 (-)		
21	I11 (+)					13	I3 (+)		
22	I12 (+)					14	I4 (+)		
23	I11 (-)					15	I3 (-)		
24	I12 (-)					16	I4 (-)		
25	I13 (+)							3	I1 (+)
26	I14 (+)							4	I2 (+)
27	I13 (-)							5	I1 (-)
28	I14 (-)							6	I2 (-)
29	I15 (+)							13	I3 (+)
30	I16 (+)							14	I4 (+)
31	I15 (-)							15	I3 (-)
32	I16 (-)							16	I4 (-)
33	GND								
34	GND								
35	GND								
36	3E								
37	1E								
38	4E								
39	2E								
40	COM								

For 0-20 mA	
Input	Jumper Terminals
<b>RX3i Module 1 (A)</b>	
1, 2	1-2
3, 4	11-12
<b>RX3i Module 2 (B)</b>	
1, 2	1-2
3, 4	11-12
<b>RX3i Module3 (TB3)</b>	
1, 2	1-2
3, 4	11-12
<b>RX3i Module4 (TB4)</b>	
1, 2	1-2
3, 4	11-12



### 3.30 IC695CRH031 – 90-70 ALG441 to RX3i ALG616 Harness Assembly

#### 3.30.1 Analog Input Modules

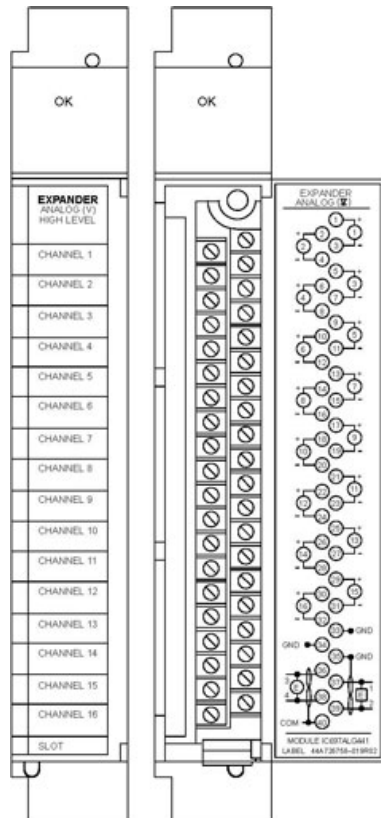


Figure 64: 16-Channel Voltage Expander IC697ALG441

The Voltage Expander module has 16 differential Voltage inputs each accepting up to  $\pm 10$  V signals.

Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120.

The Base Converter module accepts any mix of the two Expander module types.

A common user scaling factor applies to all inputs on each Expander module; however each Expander module may be individually scaled as required.



Figure 65: 16-/8-Channel Analog Voltage/Current Input IC695ALG616

Non-Isolated Differential Analog Voltage/Current Input module, IC695ALG616, provides 16 single-ended or 8 differential input channels.

Analog input channels can be configured for these ranges:

- Current: 0 to 20 mA, 4 to 20 mA,
- $\pm 20$  mA
- Voltage:  $\pm 10$ V, 0 to 10V,  $\pm 5$ V, 0 to 5V, 1 to 5V

This module must be located in an RX3i Universal Backplane. They require an RX3i CPU with firmware version 3.0 or later. Machine Edition Version 5.0 SP3 Logic Developer-PLC or later must be used for configuration.

3.30.2 Specification Comparison

Item	IC697ALG441	IC695ALG616	Notes
Input Range Current Voltage	$\pm 10\text{ V}$ , 0 to 10 V, $\pm 5\text{ V}$ , 0 to 5 V	0 to 20 mA, 4 to 20 mA, $\pm 20\text{ mA}$ $\pm 10\text{ V}$ , 0 to 10 V, $\pm 5\text{ V}$ , 0 to 5 V, 1 to 5 V	2 Module Replacement
Calibration	Factory set at full scale = 10 V $\pm 2\text{ mV}$	12 months typical to meet accuracy specifications over time. Offset can be applied as a periodic calibration adjustment.	
Resolution	Default Scaling (16 bit) 312.5 $\mu\text{V}$ per LSB step on Voltage No missing codes over 16 bits on voltage	24 bit ADC converted to Floating Point or Integer	
Absolute Accuracy	$\pm 0.02\%$ of full scale over entire negative to positive range	0 to 20 mA: 0.25% 4 to 20 mA: 0.3125% $\pm 20\text{ mA}$ : 0.125%	Customer validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance: Current Inputs	> 10 M $\Omega$ at dc/ac impedance, 20 k $\Omega$ in series with .47 $\mu\text{F}$ capacitor. 250 $\Omega$ , 0.1% precision shunt	249 $\Omega$ $\pm 1\%$	
Isolation	120 Vac or 125 Vdc for 1 minute	250 Vac continuous 1500 Vac for 1 minute	
Power Consumption:	0.8A (4 W) max at 5.0 V	450 mA max at 5.0 V +5% / -2.5%, 600 mA max at 3.3V +5% / -3%	

## 3.30.3

## Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG441		IC695ALG616		IC695ALG616	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 (+)	1	I1 (+)		
2	I2 (+)	3	I2 (+)		
3	I1 (-)	2	I1 (-)		
4	I2 (-)	4	I2 (-)		
5	I3 (+)	6	I3 (+)		
6	I4 (+)	8	I4 (+)		
7	I3 (-)	7	I3 (-)		
8	I4 (-)	9	I4 (-)		
9	I5 (+)	10	I5 (+)		
10	I6 (+)	12	I6 (+)		
11	I5 (-)	11	I5 (-)		
12	I6 (-)	13	I6 (-)		
13	I7 (+)	15	I7 (+)		
14	I8 (+)	17	I8 (+)		
15	I7 (-)	16	I7 (-)		
16	I8 (-)	18	I8 (-)		
17	I9 (+)			1	I1 (+)
18	I10 (+)			3	I2 (+)
19	I9 (-)			2	I1 (-)
20	I10 (-)			4	I2 (-)
21	I11 (+)			6	I3 (+)
22	I12 (+)			8	I4 (+)
23	I11 (-)			7	I3 (-)
24	I12 (-)			9	I4 (-)
25	I13 (+)			10	I5 (+)
26	I14 (+)			12	I6 (+)
27	I13 (-)			11	I5 (-)
28	I14 (-)			13	I6 (-)
29	I15 (+)			15	I7 (+)
30	I16 (+)			17	I8 (+)
31	I15 (-)			16	I7 (-)
32	I16 (-)			18	I8 (-)
33	GND				
34	GND				
35	GND				
36	3E				
37	1E				
38	4E				
39	2E				
40	COM				

3.31 IC695CRH032 – 90-70 ALG441 to RX3i ALG220 Harness Assembly

3.31.1 Analog Input Modules

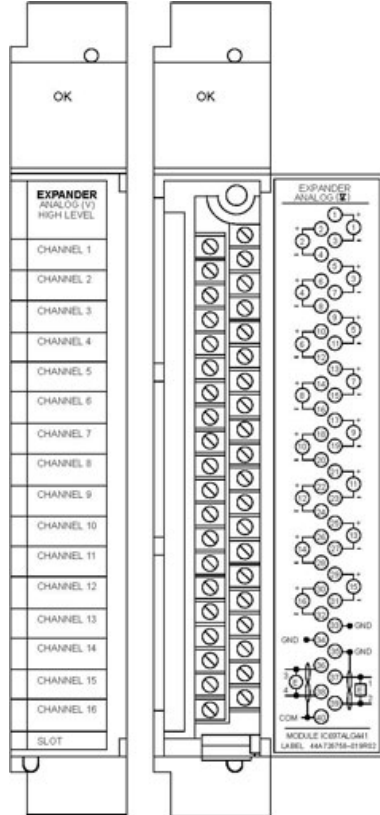


Figure 66: 16-Channel Voltage Expander IC697ALG441

The Voltage Expander module has 16 differential Voltage inputs each accepting up to  $\pm 10$  V signals. Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120. The Base Converter module accepts any mix of the two Expander module types. A common user scaling factor applies to all inputs on each Expander module; however each Expander module may be individually scaled as required.



Figure 67: 4-Channel Analog Voltage Differential Input IC694ALG220

The 4-Channel Analog Voltage Input module, IC694ALG220, provides four analog input channels. This module accepts inputs in the range of  $-10$  to  $+10$  V. Individual channels can be used with 4 to 20 mA inputs by jumpering the input terminals.

Conversion speed for each of the four channels is 1 ms. This provides an update rate of 4 ms for any given channel.

This module can be installed in any I/O slot of an RX3i PLC.

## 3.31.2 Specification Comparison

Item	IC697ALG441	IC694ALG220	Notes
Input Range Current Voltage	$\pm 10$ V, 0 to 10 V, $\pm 5$ V, 0 to 5 V	4 to 20 mA -10 to +10 V	4 Module Replacement
Calibration	Factory set at full scale = 10 V $\pm 2$ mV	Factory calibrated	
Resolution	Default Scaling (16 bit) 312.5 $\mu$ V per LSB step on Voltage No missing codes over 16 bits on Voltage	5 mV/20 $\mu$ A, (1 LSB = 5 mV)	
Absolute Accuracy	$\pm 0.02\%$ of full scale over entire negative to positive range	$\pm 10$ mV/40 $\mu$ A (typical) $\pm 30$ mV/160 $\mu$ A max	Customer Validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance: Current Inputs	> 10 M $\Omega$ at dc/ac impedance, 20 k $\Omega$ in series with 0.47 $\mu$ F capacitor. 250 $\Omega$ , 0.1% precision shunt	> 9 M $\Omega$  250 $\Omega$	
Isolation	120 Vac or 125 Vdc for 1 minute	250 Vac continuous 1500 Vac for 1 minute	
Power Consumption:	0.8A (4 W) max at 5.0 V	27 mA at 5.0 V	

3.31.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2		RX3i Module3		RX3i Module4	
IC697ALG441		IC694ALG220		IC694ALG220		IC694ALG220		IC694ALG220	
Terminals		Terminals (TB1)		Terminals (TB2)		Terminals (TB3)		Terminals (TB4)	
1	I1 (+)	3	I1 (+)						
2	I2 (+)	4	I2 (+)						
3	I1 (-)	5	I1 (-)						
4	I2 (-)	6	I2 (-)						
5	I3 (+)	13	I3 (+)						
6	I4 (+)	14	I4 (+)						
7	I3 (-)	15	I3 (-)						
8	I4 (-)	16	I4 (-)						
9	I5 (+)			3	I1 (+)				
10	I6 (+)			4	I2 (+)				
11	I5 (-)			5	I1 (-)				
12	I6 (-)			6	I2 (-)				
13	I7 (+)			13	I3 (+)				
14	I8 (+)			14	I4 (+)				
15	I7 (-)			15	I3 (-)				
16	I8 (-)			16	I4 (-)				
17	I9 (+)					3	I1 (+)		
18	I10 (+)					4	I2 (+)		
19	I9 (-)					5	I1 (-)		
20	I10 (-)					6	I2 (-)		
21	I11 (+)					13	I3 (+)		
22	I12 (+)					14	I4 (+)		
23	I11 (-)					15	I3 (-)		
24	I12 (-)					16	I4 (-)		
25	I13 (+)					3	I1 (+)		
26	I14 (+)					4	I2 (+)		
27	I13 (-)					5	I1 (-)		
28	I14 (-)					6	I2 (-)		
29	I15 (+)					13	I3 (+)		
30	I16 (+)					14	I4 (+)		
31	I15 (-)					15	I3 (-)		
32	I16 (-)					16	I4 (-)		
33	GND								
34	GND								
35	GND								
36	3E								
37	1E								
38	4E								
39	2E								
40	COM								

## 3.32 IC695CRH033 – 90-70 ALG441 to RX3i ALG222 Harness Assembly

## 3.32.1 Analog Input Modules

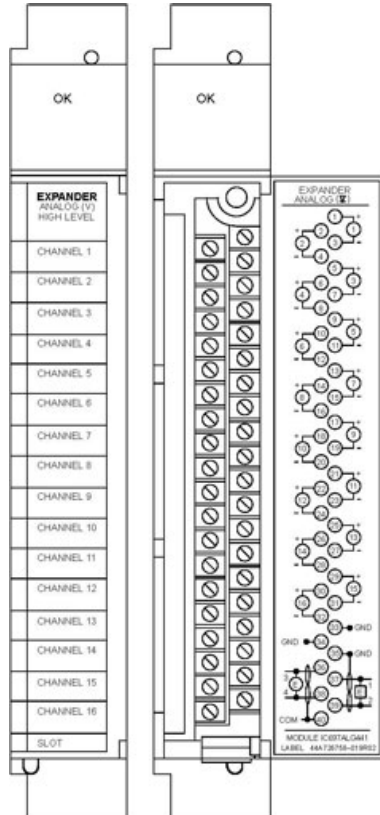


Figure 68: 16-Channel Voltage Expander IC697ALG441

The Voltage Expander module has 16 differential Voltage inputs each accepting up to  $\pm 10$  V signals. Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120. The Base Converter module accepts any mix of the two Expander module types. A common user scaling factor applies to all inputs on each Expander module; however each Expander module may be individually scaled as required.



Figure 69: 16-/8-Channel Analog Voltage Input IC694ALG222

The 16-Channel Analog Voltage Input module, IC694ALG222, provides 16 single-ended or eight differential input channels.

Each channel can be configured using the configuration software for either of two input ranges:

- 0 to 10 V (unipolar), default
- -10 to +10 V (bipolar)

High and Low alarm limits can be configured for both ranges.

This module can be installed in any I/O slot of an RX3i system.

3.32.2 Specification Comparison

Item	IC697ALG441	IC694ALG222	Notes
Input Range Current Voltage	4, 20 mA ±10 V, 0 to 10 V, ±5 V, 0 to 5 V	-10 V to +10 V	2 Card Replacement
Calibration	Factory set at full scale = 10 V ±2 mV	Factory calibrated to 5 mV per count on -10 to +10 V	
Resolution	Default Scaling (16 bit) 312.5 µV per LSB step on Voltage No missing codes over 16 bits on Voltage	5 mV (1 LSB = 5 mV)	
Absolute Accuracy	±.02% of full scale over entire negative to positive range	±10.25% of full scale at 25°C (77 °F)	Customer validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance: Current Inputs	>10 MΩ at dc/ac impedance, 20 kΩ in series with .47 µF capacitor. 250 Ω, 0.1% precision shunt	>1 MΩ	
Isolation	120 Vac or 125 Vdc for 1 minute	250 Vac continuous 1500 Vac for 1 minute	
Power Consumption	0.8A (4 W) max at 5.0 V	112 mA max at 5.0 V	



## 3.32.3

## Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG441		IC694ALG222		IC694ALG222	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 (+)	3	I1 (+)		
2	I2 (+)	5	I2 (+)		
3	I1 (-)	4	I1 (-)		
4	I2 (-)	6	I2 (-)		
5	I3 (+)	7	I3 (+)		
6	I4 (+)	9	I4 (+)		
7	I3 (-)	8	I3 (-)		
8	I4 (-)	10	I4 (-)		
9	I5 (+)	11	I5 (+)		
10	I6 (+)	13	I6 (+)		
11	I5 (-)	12	I5 (-)		
12	I6 (-)	14	I6 (-)		
13	I7 (+)	15	I7 (+)		
14	I8 (+)	17	I8 (+)		
15	I7 (-)	16	I7 (-)		
16	I8 (-)	18	I8 (-)		
17	I9 (+)			3	I1 (+)
18	I10 (+)			5	I2 (+)
19	I9 (-)			4	I1 (-)
20	I10 (-)			6	I2 (-)
21	I11 (+)			7	I3 (+)
22	I12 (+)			9	I4 (+)
23	I11 (-)			8	I3 (-)
24	I12 (-)			10	I4 (-)
25	I13 (+)			11	I5 (+)
26	I14 (+)			13	I6 (+)
27	I13 (-)			12	I5 (-)
28	I14 (-)			14	I6 (-)
29	I15 (+)			15	I7 (+)
30	I16 (+)			17	I8 (+)
31	I15 (-)			16	I7 (-)
32	I16 (-)			18	I8 (-)
33	GND				
34	GND				
35	GND				
36	3E				
37	1E				
38	4E				
39	2E				
40	COM				

3.33 IC695CRH034 – 90-70 ALG441 to RX3i ALG232 Harness Assembly

3.33.1 Analog Input Modules

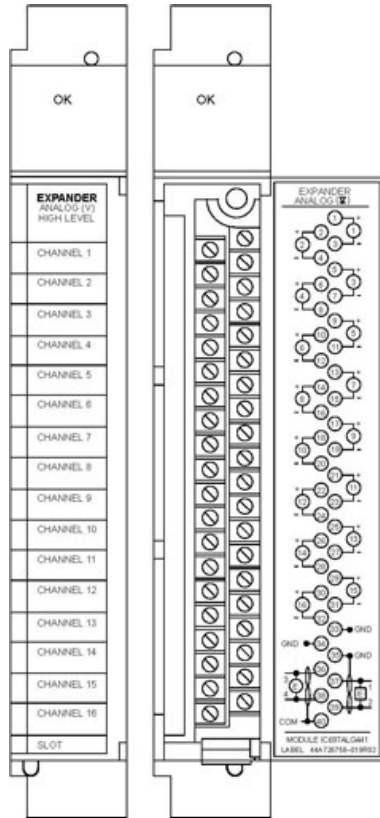


Figure 70: 16-Channel Voltage Expander IC697ALG441



Figure 71: 16-/8-Channel Analog Voltage Input IC694ALG232

The Voltage Expander module has 16 differential Voltage inputs each accepting up to  $\pm 10$  V signals. Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120. The Base Converter module accepts any mix of the two Expander module types. A common user scaling factor applies to all inputs on each Expander module; however each Expander module may be individually scaled as required.

The PAC Systems RX3i 16-Channel Analog Voltage Input module provides 16 single-ended or 8 differential input channels. Each channel can be configured for either of two input ranges:

- 0 to 10 V (unipolar), default
- -10 to +10 V (bipolar)

High and Low alarm limits can be configured for both ranges.

This module can be installed in any I/O slot that has a serial connector in an RX3i system.

## 3.33.2 Specification Comparison

Item	IC697ALG441	IC694ALG232	Notes
Input Range Current Voltage	4, 20 mA $\pm 10$ V, 0 to 10 V, $\pm 5$ V, 0 to 5 V	0 V to +10 V (unipolar) or -10 V to +10 V (bipolar) selectable each channel	2 Module Replacement
Calibration	Factory set at full scale = 10 V $\pm 2$ mV	Factory calibrated to: 0.3125 mV per count on 0 V to +10 V (unipolar) range 0.3125 mV per count on -10 to +10 V (bipolar) range	
Resolution	Default Scaling (16 bit) 312.5 $\mu$ V per LSB step on Voltage No missing codes over 16 bits on Voltage	1 LSB = 0.3125 mV	
Absolute Accuracy	$\pm 0.2\%$ of full scale over entire negative to positive range	$\pm 0.25\%$ of full scale at 25°C (77°F) $\pm 0.5\%$ of full scale over specified operating temperature range	Customer validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance Current Inputs:	>10 M $\Omega$ at dc/ac impedance, 20 k $\Omega$ in series with .47 $\mu$ F capacitor. 250 $\Omega$ , 0.1% precision shunt	>500 k $\Omega$ (single-ended mode) >1 M $\Omega$ (differential mode)	
Isolation	120 Vac or 125 Vdc for 1 minute	250 Vac continuous 1500 Vac for 1 minute	
Power Consumption	0.8A (4 W) max at 5.0 V	112 mA max at 5.0 V	

3.33.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG441		IC694ALG232		IC694ALG232	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 (+)	3	I1 (+)		
2	I2 (+)	5	I2 (+)		
3	I1 (-)	4	I1 (-)		
4	I2 (-)	6	I2 (-)		
5	I3 (+)	7	I3 (+)		
6	I4 (+)	9	I4 (+)		
7	I3 (-)	8	I3 (-)		
8	I4 (-)	10	I4 (-)		
9	I5 (+)	11	I5 (+)		
10	I6 (+)	13	I6 (+)		
11	I5 (-)	12	I5 (-)		
12	I6 (-)	14	I6 (-)		
13	I7 (+)	15	I7 (+)		
14	I8 (+)	17	I8 (+)		
15	I7 (-)	16	I7 (-)		
16	I8 (-)	18	I8 (-)		
17	I9 (+)			3	I1 (+)
18	I10 (+)			5	I2 (+)
19	I9 (-)			4	I1 (-)
20	I10 (-)			6	I2 (-)
21	I11 (+)			7	I3 (+)
22	I12 (+)			9	I4 (+)
23	I11 (-)			8	I3 (-)
24	I12 (-)			10	I4 (-)
25	I13 (+)			11	I5 (+)
26	I14 (+)			13	I6 (+)
27	I13 (-)			12	I5 (-)
28	I14 (-)			14	I6 (-)
29	I15 (+)			15	I7 (+)
30	I16 (+)			17	I8 (+)
31	I15 (-)			16	I7 (-)
32	I16 (-)			18	I8 (-)
33	GND				
34	GND				
35	GND				
36	3E				
37	1E				
38	4E				
39	2E				
40	COM				

## 3.34 IC695CRH035 – 90-70 ALG320 to RX3i ALG708 Harness Assembly

## 3.34.1 Analog Output Modules

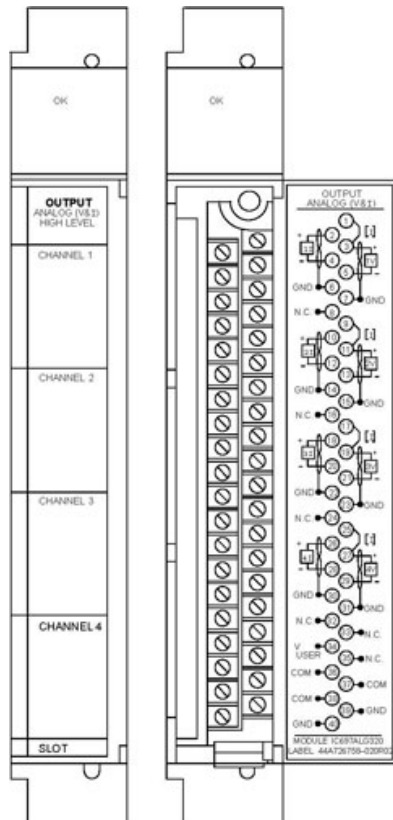


Figure 72: 4-Channel Voltage / Current IC697ALG320



Figure 73: 4-/8-Channel Analog Voltage / Current Input IC695ALG704

The Voltage Expander module has 16 differential Voltage inputs each accepting up to  $\pm 10$  V signals. Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120. The Base Converter module accepts any mix of the two Expander module types. A common user scaling factor applies to all inputs on each Expander module; however each Expander module may be individually scaled as required.

Non-Isolated Analog Voltage/Current Output module IC695ALG704 provides 4 configurable Voltage or current output channels. Analog channels can be configured for these output ranges:

- Current: 0 to 20 mA, 4 to 20 mA
- Voltage:  $\pm 10$  V, 0 to 10 V

This module must be located in an RX3i Universal Backplane. They require an RX3i CPU with firmware version 3.0 or later. Machine Edition Version 5.0 SP3 Logic Developer-PLC or later must be used for configuration.

3.34.2 Specification Comparison

Item	IC697ALG320	IC695ALG708	Notes
Output Ranges	Current: 0 to 22.5 mA, 4 to 20 mA Voltage: $\pm 10$ V, 0 to 10 V	Current: 0 to 20 mA, 4 to 20 mA Voltage: $\pm 10$ V, 0 to 10 V	
Calibration	Voltage: Factory set at full scale = 10 V $\pm 2.5$ mV. Current: Factory set at 4.0 mA $\pm 5$ mA and 20 mA $\pm 5$ mA. Full Scale, with 24.0 Vdc field side Voltage.	Accurate to within 0.15% of full scale at 25°C (77 °F) Accurate to within 0.30% of full scale at 60°C	
Resolution	16 bit with 14 bit monotonicity 312.5 $\mu$ V per LSB step on Voltage 0.5 $\mu$ A per LSB step on 4 to 20 mA No missing codes over 16 bits on Voltage. No missing codes over 15 bits on current.	$\pm 10$ V: 15.9 bits, 0 to 10 V: 14.9 bits, 0 to 20 mA: 15.9 bits, 4 to 20 mA : 15.6 bits	
Response times: Voltage Current	5.0% 0.5 milliseconds 0.1% 2.0 milliseconds 5.0% 1.0 milliseconds 0.1% 5.0 milliseconds	8 milliseconds	RX3i is four times slower for Voltage output.
Isolation		2550 Vdc for one second	
Power Consumption	1.66A (8.3 W) max at 5.0 V	375 mA max at 3.3V	

## 3.34.3

## Pin Mapping

IC695ACC651		RX3i Module1	
IC697ALG320		IC695ALG708	
Terminals		Terminals (TB1)	
1	I1 REF		
2	I1 (+)	20	I1 (+)
3	V1 (+)	19	V1 (+)
4	I1 (-)	21	1 COM
5	V1 (-)	21	1 COM
6	I GND		
7	V GND		
8	NC		
9	I2 REF		
10	I2 (+)	2	I2 (+)
11	V2 (+)	1	V2 (+)
12	I2 (-)	3	2 COM
13	V2 (-)	3	2 COM
14	I GND		
15	V GND		
16	NC		
17	I3 REF		
18	I3 (+)	23	I3 (+)
19	V3 (+)	22	V3 (+)
20	I3 (-)	24	3 COM
21	V3 (-)	24	3 COM
22	I GND		
23	V GND		
24	NC		
25	I4 REF		
26	I4 (+)	5	I4 (+)
27	V4 (+)	4	V4 (+)
28	I4 (-)	6	4 COM
29	V4 (-)	6	4 COM
30	I GND		
31	V GND		
32	NC		
33	NC		
34	PWR +	36	+24V
35	NC		
36	PWR -	18	-24V
37	PWR -		
38	PWR -		
39	GND		
40	GND		

3.35 IC695CRH036 – 90-70 ALG320 to RX3i ALG390 Harness Assembly

3.35.1 Analog Output Modules

4 Channel Voltage / Current

IC697ALG320

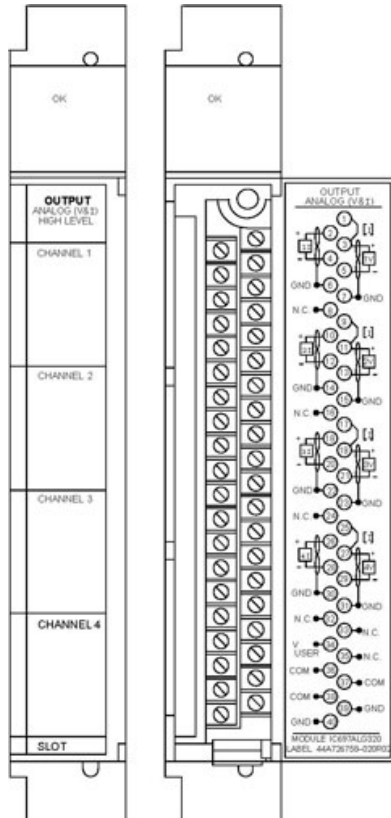


Figure 74: 4-Channel Voltage / Current IC697ALG320

The Voltage Expander module has 16 differential Voltage inputs each accepting up to  $\pm 10$  V signals. Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120. The Base Converter module accepts any mix of the two Expander module types.

A common user scaling factor applies to all inputs on each Expander module; however each Expander module may be individually scaled as required.

2 Channel Voltage

IC694ALG390



Figure 75: 2-Channel Analog Voltage Output IC694ALG390

The 2-Channel Analog Voltage Output module, IC694ALG390, has two output channels, each capable of converting 13 bits of binary (digital) data to an analog output signal for field devices. The module provides outputs in the range of -10 V to +10 V.

The module's outputs can be set up to either Default to 0 V or Hold-Last-State if the CPU goes to the Stop mode or Reset. Selection of the output default state is made by a jumper on the module. If the jumper is not installed, the outputs Hold Last State.

This module can be installed in any I/O slot in anRX3i system.



## 3.35.2 Specification Comparison

Item	IC697ALG320	IC694ALG390	Notes
Output Ranges	Current: 0 to 22.5 mA, 4 to 20 mA Voltage: $\pm 10$ V, 0 to 10 V	-10 to +10 V	2 Module Replacement Voltage Only
Calibration	Voltage: Factory set at full scale = 10 V $\pm 2.5$ mV. Current: Factory set at 4.0 mA $\pm 5$ mA and 20 mA $\pm 5$ mA. Full Scale, with 24.0 Vdc field side Voltage.	Factory calibrated to 2.5 mV per count	
Resolution	16 bit with 14 bit monotonicity 312.5 $\mu$ V per LSB step on Voltage 0.5 $\mu$ A per LSB step on 4 to 20 mA No missing codes over 16 bits on Voltage. No missing codes over 15 bits on current.	2.5 mV (1 LSB = 2.5 mV)	
Response times: Voltage Current	5.0% 0.5 milliseconds 0.1% 2.0 milliseconds 5.0% 1.0 milliseconds 0.1% 5.0 milliseconds	5 milliseconds	Customer validation required to verify that the response time is adequate.
Isolation		250 Vac continuous 1500 Vac for 1 minute	
Power Consumption	1.66A (8.3 W) max at 5.0 V	32 mA from +5 Vdc supply	

3.35.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG320		IC694ALG390		IC694ALG390	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 REF				
2	I1 (+)				
3	V1 (+)	3	V1 (+)		
4	I1 (-)				
5	V1 (-)	5	1 COM		
6	I GND				
7	V GND				
8	NC				
9	I2 REF				
10	I2 (+)				
11	V2 (+)	4	V2 (+)		
12	I2 (-)				
13	V2 (-)	6	2 COM		
14	I GND				
15	V GND				
16	NC				
17	I3 REF				
18	I3 (+)				
19	V3 (+)			3	V1 (+)
20	I3 (-)				
21	V3 (-)			5	1 COM
22	I GND				
23	V GND				
24	NC				
25	I4 REF				
26	I4 (+)				
27	V4 (+)			4	V2 (+)
28	I4 (-)				
29	V4 (-)			6	2 COM
30	I GND				
31	V GND				
32	NC				
33	NC				
34	PWR +	17	+24V	17	+24V
35	NC				
36	PWR -	19	-24V	19	-24V
37	PWR -				
38	PWR -				
39	GND				
40	GND				

## 3.36 IC695CRH037 – 90-70 ALG320 to RX3i ALG391 Harness Assembly

## 3.36.1 Analog Output Modules

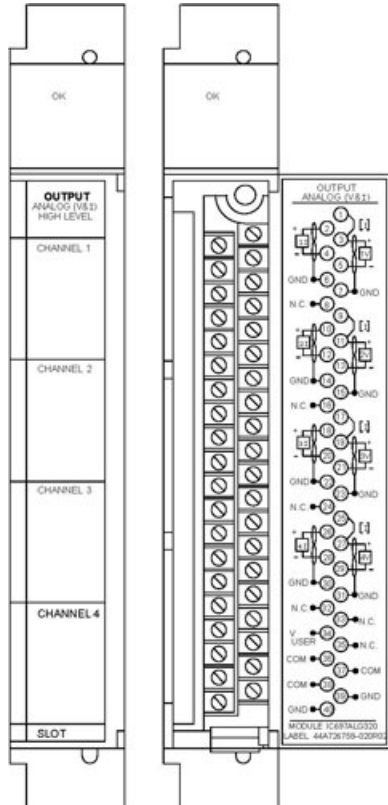


Figure 76: 4-Channel Voltage / Current IC697ALG320

The Voltage Expander module has 16 differential Voltage inputs each accepting up to  $\pm 10$  V signals. Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120. The Base Converter module accepts any mix of the two Expander module types. A common user scaling factor applies to all inputs on each Expander module; however each Expander module may be individually scaled as required.



Figure 77: 2-Channel Analog Current Output IC694ALG391

The 2-Channel Analog Current Output module, IC694ALG391, has two output channels, each capable of converting 12 bits of binary (digital) data to an analog output signal for field devices. Each output can be set using a jumper on the module to produce output signals in one of two ranges:

- 0 to 20 mA
- 4 to 20 mA

Each output may also be set up as a less accurate Voltage source. The selection of current or Voltage output is made with a jumper or resistor on the module terminals. Both channels are updated on every scan. This module can be installed in any I/O slot in an RX3i system.

3.36.2 Specification Comparison

Item	IC697ALG320	IC694ALG391	Notes
Output Ranges	Current: 0 to 22.5 mA, 4 to 20 mA Voltage: $\pm 10$ V, 0 to 10 V	Current: 0 to 20 mA, 4 to 20 mA Voltage: 0 to 5 V, 1 to 5 V	2 Card replacement RX3i 5 V Limit
Calibration	Voltage: Factory set at full scale = 10 V $\pm 2.5$ mV. Current: Factory set at 4.0 mA $\pm 5$ mA and 20 mA $\pm 5$ mA. Full Scale, with 24.0 Vdc field side Voltage.	Factory calibrated to 4 $\mu$ A per count	
Resolution	16 bit with 14 bit monotonicity 312.5 $\mu$ V per LSB step on Voltage 0.5 $\mu$ A per LSB step on 4 to 20 mA No missing codes over 16 bits on Voltage. No missing codes over 15 bits on current.	4 $\mu$ A (1 LSB = 4 $\mu$ A) at 4 to 20mA 5 $\mu$ A (1 LSB = 5 $\mu$ A) at 0 to 20mA 1 mV (1 LSB = 1 mV) at 1 to 5 V 1.25 mV (1 LSB = 1.25 mV) at 0 to 5 V	
Response times: Voltage Current	5.0% 0.5 milliseconds 0.1% 2.0 milliseconds 5.0% 1.0 milliseconds 0.1% 5.0 milliseconds	5 milliseconds	Customer validation required to verify that the response time is adequate.
Isolation		250 Vac continuous 1500 Vac for 1 minute	
Power Consumption	1.66A (8.3 W) max at 5.0 V	30 mA from +5 Vdc supply	

## 3.36.3

## Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG320		IC694ALG391		IC694ALG391	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 REF				
2	I1 (+)	3	I1 (+)		
3	V1 (+)	1	V1 (+)		
4	I1 (-)	5	RTN1		
5	V1 (-)	5	RTN1		
6	I GND	7	1 GND		
7	V GND	7	1 GND		
8	NC				
9	I2 REF				
10	I2 (+)	4	I2 (+)		
11	V2 (+)	2	V2 (+)		
12	I2 (-)	6	RTN2		
13	V2 (-)	6	RTN2		
14	I GND	8	2 GND		
15	V GND	8	2 GND		
16	NC				
17	I3 REF				
18	I3 (+)			3	I1 (+)
19	V3 (+)			1	V1 (+)
20	I3 (-)			5	RTN1
21	V3 (-)			5	RTN1
22	I GND			7	1 GND
23	V GND			7	1 GND
24	NC				
25	I4 REF				
26	I4 (+)			4	I2 (+)
27	V4 (+)			2	V2 (+)
28	I4 (-)			6	RTN2
29	V4 (-)			6	RTN2
30	I GND			8	2 GND
31	V GND			8	2 GND
32	NC				
33	NC				
34	PWR +	17	+24V	17	+24V
35	NC				
36	PWR -	19	-24V	19	-24V
37	PWR -				
38	PWR -				
39	GND				
40	GND				

For 0-20 mA	
Input	Jumper
<b>RX3i Module 1 (A)</b>	
1	3-9
2	4-10
<b>RX3i Module 2 (B)</b>	
1	3-9
2	4-10

3.37 IC695CRH038 – 90-70 MDL740 to RX3i MDL765 Harness Assembly

3.37.1 Discrete Output Modules

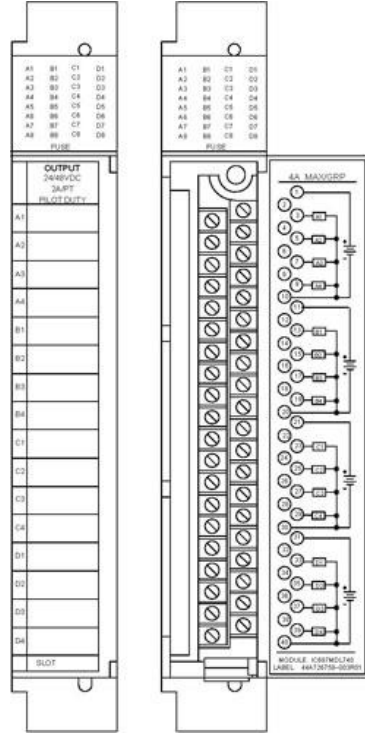


Figure 78: 24/48 Vdc 2A 16-Point IC697MDL740

The 24/48 Vdc 2A Output Module provides 16 output points in four isolated groups of 4 points each. Each group of four outputs is individually fused with a 10A fuse. The module provides a high degree of inrush current which makes the outputs suitable for a wide range of loads which have such characteristics. LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit as well as an LED to indicate the status of the fuse are located together at the top of the module.



Figure 79: 24/125 Vdc 2A 16-Point Output IC695MDL765

The 24/125 Vdc 2A Smart Digital Output module, IC695MDL765, provides 16 discrete outputs in two isolated groups of 8 outputs. Each group of 8 outputs is referenced to an isolated common, providing group-to-group isolation. The module uses 24 Vdc or 125 Vdc. These modules must be located in an RX3i Universal Backplane. They require an RX3i CPU with firmware version 3.0 or later. Machine Edition Version 5.0 SP3 Logic Developer-PLC or later must be used for configuration.

## 3.37.2 Specification Comparison

Item	IC697MDL740	IC695MDL765	Notes
Rated Voltage	24 or 48 Vdc	18 to 30Vdc 105 to 132 Vdc	Customer validation required: IC695MDL765 does not support Voltages above 30 V.
Output Voltage Range	20 to 60 V		
Outputs per Module	16 (four groups of 4 outputs each)	16 (two isolated groups of 8 outputs each)	
Isolation	1500 V - any input to backplane 500 V between input groups	250 Vac 1500 Vac	
Output Current	2A max per point 4A max per group		
<b>Output Characteristics</b>			
Inrush Current	20A max for 20 ms	10A supplied for 10ms without ESCP trip	
Output Voltage Drop	0.8 V (0.4 $\Omega$ ) max		
Response Time ON	2 ms max	1ms max	
Response Time OFF	2 ms max	1ms max	
Output leakage	1 mA max	1mA max	
Power Consumption	0.15A at 5 V	125 mA at 3.3 V 540 mA at 5.1 V	
VME	System designed to support the VME standard C.1		

3.37.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697MDL740		IC695MDL765	
Terminals		Terminals (TB1)	
1	(+)	17	DC+
2	NC		
3	A1	1	Output 1
4	NC		
5	A2	3	Output 2
6	NC		
7	A3	5	Output 3
8	NC		
9	A4	7	Output 4
10	(-)	18	DC-
11	(+)	17	DC+
12	NC		
13	B1	9	Output 5
14	NC		
15	B2	11	Output 6
16	NC		
17	B3	13	Output 7
18	NC		
19	B4	15	Output 8
20	(-)	18	DC-
21	(+)	35	DC+
22	NC		
23	C1	19	Output 9
24	NC		
25	C2	21	Output 10
26	NC		
27	C3	23	Output 11
28	NC		
29	C4	25	Output 12
30	(-)	36	DC-
31	(+)	35	DC+
32	NC		
33	D1	27	Output 13
34	NC		
35	D2	29	Output 14
36	NC		
37	D3	31	Output 15
38	NC		
39	D4	33	Output 16
40	(-)	36	DC-



### 3.38 IC695CRH039 – 90-70 MDL753 to RX3i MDL752 Harness Assembly

#### 3.38.1 Discrete Output Modules

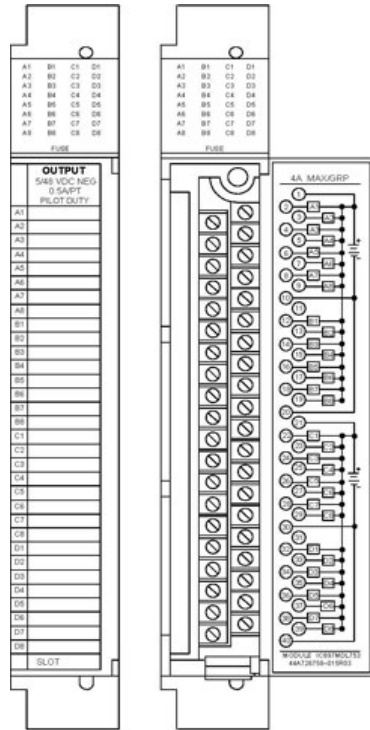


Figure 80: 5/48 Vdc 0.5A Neg 32-Point IC697MDL753

The 5/48 Vdc 0.5A Negative Logic Output Module provides 32 output points in two isolated groups with 16 points in each group.

This is a wide range module in that the rated Voltage can be 5 Vdc or 10 to 60 Vdc. It provides a high degree of inrush current at 10 V to 60 V which makes the outputs suitable for a wide range of loads which have such characteristics. It also operates at TTL levels.

LED indicators which give the ON - OFF status of each point on the logic (PLC) side of the circuit are located at the top of the module.

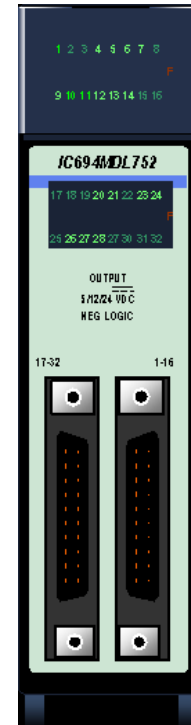


Figure 81: 5/24 Vdc (TTL) 0.5A 32-Point Neg Logic Output IC694MDL752

The 5/24 Vdc (TTL) Negative Logic Output module, IC694MDL752, provides 32 discrete outputs arranged in four isolated groups of eight. Each group has its own common. The outputs are negative logic or sinking-type outputs (the ON state for a point results in an active low output).

The module has two modes of operation. In TTL mode, the outputs can switch loads across +5 Vdc ( $\pm 5\%$ ) and are capable of sinking a maximum current of 25 mA per point. In 12/24V mode, the outputs can switch loads over the range of +12 to -24 Vdc (+20%, -15%) and are capable of sinking a maximum current of 0.5A per point.

3.38.2 Specification Comparison

Item	IC697MDL753	IC694MDL752	Notes
Rated Voltage	5 Vdc ( $\pm 5\%$ ) 10 to 60 Vdc	5, and 12 through 24 Vdc, negative logic (active low)	Customer validation required: IC694MDL752 can support applications for 5 V and from 12 to 24 Vdc only.
Output Voltage Range	5 V or 10 to 60 V	4.75 to 5.25 Vdc (TTL mode) 10.2 to 28.8 Vdc (12/24V mode)	Customer validation required: IC694MDL752 can support applications for 5 V and from 12 to 24 Vdc only.
Outputs per Module	32 (two groups of 16 outputs each)	32 (4 groups of 8 outputs each)	
Isolation	1500 V - any output to backplane 500 V between input groups	250 Vac Continuous 1500 Vac for 1 minute (frame to ground) 50 Vac continuous; 500 Vac for 1 minute	Customer validation required.
Output Current: 5 Vdc 10 to 60 Vdc	16 mA max per point 0.5A max per point 4A max per group	25mA per point (max in TTL mode) 0.5A per point (max in 12/24V mode); 4A max per group and 3A max per group common pin	Customer validation required.
<b>Output Characteristics</b>			
Inrush Current: 10 to 60 Vdc Output Voltage Drop: 5 Vdc 10 to 60 Vdc On response Time Off response Time Output Leakage: 5 Vdc 10 to 60 Vdc	5A max for 20 ms  0.5 V max (16 mA) 1 V (2 $\Omega$ ) max 1 ms typical 1 ms typical 250 mA max 1 mA max	4.6A for 10ms  0.4 V 0.24 V 0.5ms max 0.5ms max  0.1 mA max	Customer validation required.
Power Consumption:	0.25A at 5 V	260 mA max from 5 V bus on backplane; (13 mA + 3 mA/point ON + 4.7 mA/LED)	
VME	System designed to support the VME standard C.1		

## 3.38.3




## Pin Mapping

IC695ACC651		RX3i Module 1		RX3i Module 1	
IC697MDL753		IC694MDL752		IC694MDL752	
Terminals		Left Side Terminals(TB1)		Right Side Terminals(TB2)	
1	(+)			A6, B7	(+)
2	A1			A1	Q1
3	A2			B1	Q2
4	A3			A2	Q3
5	A4			B2	Q4
6	A5			A3	Q5
7	A6			B3	Q6
8	A7			A4	Q7
9	A8			B4	Q8
10	(-)			A5	(-)
11	NC			NC	NC
12	B1			B12	Q9
13	B2			A12	Q10
14	B3			B11	Q11
15	B4			A11	Q12
16	B5			B10	Q13
17	B6			A10	Q14
18	B7			B9	Q15
19	B8			A9	Q16
20	(-)			B8	(-)
21	(+)	A6, B7	(+)		
22	C1	A1	Q17		
23	C2	B1	Q18		
24	C3	A2	Q19		
25	C4	B2	Q20		
26	C5	A3	Q21		
27	C6	B3	Q22		
28	C7	A4	Q23		
29	C8	B4	Q24		
30	(-)	A5	(-)		
31	NC	NC	NC		
32	D1	B12	Q25		
33	D2	A12	Q26		
34	D3	B11	Q27		
35	D4	A11	Q28		
36	D5	B10	Q29		
37	D6	A10	Q30		
38	D7	B9	Q31		
39	D8	A9	Q32		
40	(-)	B8	(-)		



# Chapter 4 Agency Approvals and Government Regulations

## 4.1 Agency Approvals

Description	Agency Standard or Marking	Comments
N.A. Safety for Industrial Control Equipment for use in Hazardous Areas Class 1 Div. 2 Groups ABCD	UL508 17 <sup>th</sup> Ed. CSA C22.2 No 142-M1987 ANSI/ISA 12.12.01 CSA C22.2 No 213-M1987	Certification by Underwriter's Laboratories as a "Listed Accessory". This product will be referenced as an accessory on the RX3i product listing card file E157515.
Low Voltage Directive European Safety for Industrial Control Equipment		Self-Declaration in accordance with European LVD Directive 2006/95/EC; Independent 3rd party assessment
Electromagnetic Compatibility Directive European EMC for Industrial Control Equipment		Self-Declaration in accordance with European EMC Directive 2004/108/EC; Independent 3rd party assessment
Explosive Atmospheres Directive European Safety for Hazardous Locations Equipment Group II, Category 3, Gas Group IIC		Self-Declaration in accordance with ATEX Directive 94/9/EC; Independent 3rd party assessment

**Note:** A product's approval should be verified by the marking on the unit or by the Agency listing card.

### 4.2 Agency Warnings and Installation Guidelines

#### 4.2.1 Installation Location

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This product is intended for use with the RX3i system. Its components are considered open equipment (having live electrical parts that may be accessible to users) and must be installed in an ultimate enclosure that is manufactured to provide safety. At a minimum, the enclosure shall provide a degree of protection against solid objects as small as 12mm (fingers, for example). This equates to a NEMA/UL Type 1 enclosure or an IEC60529 IP20 rating providing at least a pollution degree 2 environment. For details about installing RX3i rack systems, refer to *PACSystems RX3i System Manual*, GFK-2314.

#### 4.2.2 Installation in Hazardous Areas

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The following information is for products bearing the UL marking for Hazardous Areas or ATEX marking for explosive atmospheres:

##### **CLASS 1 DIVISION 2 GROUPS ABCD**

- This equipment is an open-type device and is meant to be installed in an enclosure suitable for the environment that is only accessible with the use of a tool.
- Suitable for use in Class I, Division 2, Groups A, B, C and D Hazardous Locations, or nonhazardous locations only.



**Warning** – EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.



**Warning** – WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES.

##### **ATEX Zone 2**

This module must be mounted in an enclosure certified in accordance with EN60079-15 for use in Zone 2, Group IIC and rated IP54. The enclosure shall only be able to be opened with the use of a tool.



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