ATEX Instruction Sheet
Part Number: D803065X012
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KJ3204X1-BA1 DO, 32-Channel, 24 VDC High-Side Series 2 Card

Hazardous Atmosphere

II 3 G

Nemko No. 02ATEX431U
EEx nL IIC T4

Power Specifications

LocalBus power rating	12 VDC at 150 mA
Bussed Field Power rating	24 VDC at 3.2 A card
Field circuit rating	24 VDC at 100 mA/channel

Environmental Specifications

Ambient Temperature	-40 to 70° C
Shock	10g ½ Sinewave for 11 msec
Vibration	1mm Peak to Peak from 5 to 16Hz; 0.5g from 16 to 150Hz
Airborne Contaminants	ISA-S71.04 –1985 Airborne Contaminants Class G3
Relative Humidity	5 to 95% Non-Condensing IP 20 Rating
Terminal block key position	B4

Note: Refer to the product label for serial number and location and date of manufacture. Refer also to the wiring diagram on the left side of the card.

Warning: This product has specific instructions for installation, removal and operation in hazardous areas. Refer to document 12P2046 *"DeltaV ™ Scalable Process System Zone 2 Installation Instructions".* Other installation instructions are available in the *"Installing Your DeltaV Automation System"* manual.

Removal and Insertion

Field power supplied to this device, either at the field terminal or as bussed field power through the carrier, must be removed before removing or connecting the device.

This unit may be removed or inserted while system power is energized under the following conditions: (**Note** Only one unit at a time may be removed with system power energized.)

- When used with KJ1501X1-BC1 System Dual DC/DC Power Supply operating on 24 VDC or 12 VDC input power. The primary circuit wiring inductance for input power must be less than 23 uH, or a certified supply with an open circuit voltage, Ui of 12.6 VDC and an Lo of less than 23 uH (including wire inductance).
- Non sparking field circuits MUST be de-energized before removing and inserting this product.

A rotary keying system ensures compatibility between I/O cards and terminal blocks after installation is complete. The terminal block must have the keys set for the I/O card with which it is to be used.

Maintenance and Adjustment

This unit contains no user serviceable parts and should not be disassembled for any reason. Calibration is not required.

Other Safety Approvals

FM APPROVED CL. I Div. 2 GP.A,B,C,D HAZ.LOC. TEMP. Rating T4

CE

SP LR87534

EMERSON Process Management

I/O Card Redundancy

Redundant I/O cards are available for critical applications. The same card can be used in simplex or redundant applications. When installed on a two-wide redundant terminal block, the cards are recognized as a redundant pair by the controller. The controller scans each card and determines which card is acting as the active interface. When a fault is detected, the system automatically switches to the standby I/O card.

DeltaV Control modules reference simplex and redundant I/O channels identically and there is no special configuration required to take advantage of redundancy.

Switchover of a redundant I/O card is completed within two scans of the I/O bus. Make-before-break contacts ensure digital field instruments remain powered and the process is undisturbed. Analog output signals are briefly driven by both cards for < 5 ms during switchover of the card.

Hardware Alerts automatically report hardware integrity errors for both the primary and secondary cards. Any event that causes a switchover is also reported automatically through the system hardware alerts and is logged in the Event Chronicle.

Events that can cause a switchover include:

- Hardware failure within the active card.
- Communications failure between the active card and the controller.
- Detection of a fault in the field wiring.

A switchover may also be initiated from the diagnostics explorer, and the health and status of both cards and their channels are available in the diagnostics explorer.

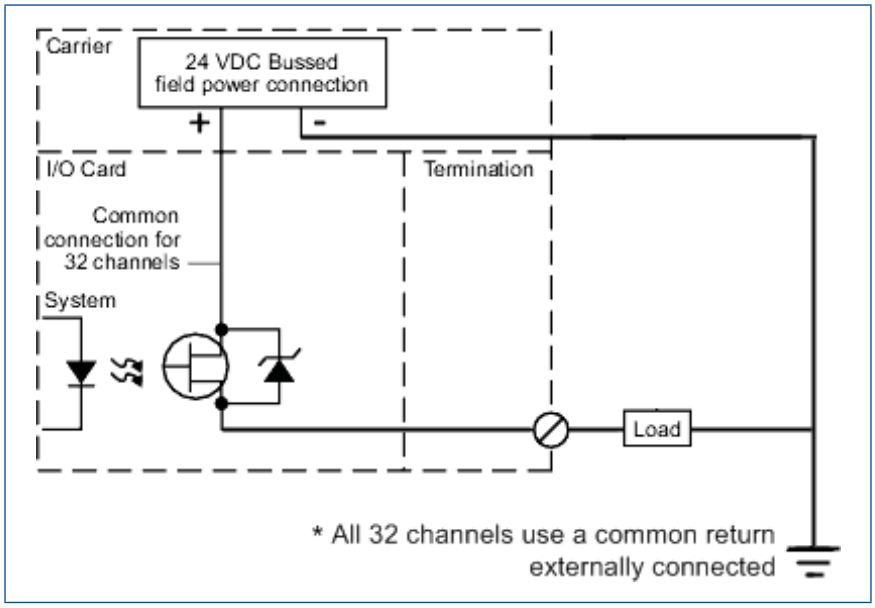
The system automatically commissions a new standby card. In safe areas, failed cards can be replaced under power. In hazardous areas, appropriate installation procedures must be followed.

Hardware Specifications

Common Environmental Specifications for all I/O Interfaces	
Category	**Specifications**
Operating Temperature*	-40 to 70°C (-40 to 158°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 to 95%, non-condensing
Airborne Contaminants	ISA-S71.04-1985 Airborne Contaminants Class G3 Conformal coating
Protection Rating	IP 20
Shock	10 g ½-sine wave for 11 ms
Vibration	1 mm peak-to-peak from 5 to 16 Hz; 0.5 g from 16 to 150 Hz
Dimensions	H 10.7 cm (4.2 in.) W 4.1 cm (1.6 in.) Depth 10.5 cm (4.1 in.)

*Operating any electronics at the higher end of its temperature range for long periods of time will shorten its expected lifetime, see **Effects of Heat and Airflow Inside an Enclosure** White Paper for more information.

Specifications for DO (plus) Card, 32-channel, 24V DC, High-Side	
Number of Channels	32
Output Rating	100 mA per channel
Output Range	24V DC ±10%
Off-State Leakage	0.1 mA maximum
Local Bus Current (12V DC Nominal)	100 mA typical, 150 mA maximum
Field Circuit Power per Card	3.2 A @ 24V DC (+20%/-15%)
Isolation	Each channel is optically isolated from the system and factory tested to 1500V DC



Simplified circuit and connection diagram for simplex DO (Plus) Card, 32-channel, 24V DC, High-Side.

Certifications

The following certifications are available for M-series Traditional I/O (see actual certificates for exact certifications for each product):

- **CE**

  EMC: EN 61326-1

- **FM**

  FM 3600

  FM 3611

- **CSA**

  CSA C22.2 No. 213

  CSA C22.2 No. 1010-1

- **ATEX**

  EN60079-0

  IEC60079-7

  EN60079-15

- **IEC-Ex**

  IEC60079-0

  IEC60079-7

  IEC60079-15

- **Marine Certifications:** IACS E10

  ABS Certificate of Design Assessment

  DNV Marine Certificate

Hazardous Area/Location

M-series Traditional I/O Cards can be installed and used based on the following standards (see actual certificates for exact product markings for each product):

- **FM (USA)**

  Class I, Division 2, Groups A, B, C, D, T4

- **cFM (Canada)**

  Class I, Division 2, Groups A, B, C, D, T4

- **ATEX**

  II 3G Ex ec IIC T4 Gc

  II 3G Ex ec [ic] IIC T4 Gc

  II 3G Ex nA nC IIC T4 Gc

- **IEC-Ex**

  II 3G Ex ec IIC T4 Gc

  II 3G Ex ec ic IIC T4 Gc

  II 3G Ex nA nC IIC T4 Gc

Regarding the Installation instructions please refer to the following Documents:

Class 1 Division 2 Installation Instructions DeltaV™ M-series	12P1293
Zone 2 Installation Instructions DeltaV M-series	12P2046

Discrete Output Cards and Termination Blocks	
Description	**Model Number**
Discrete Output Card: 8 Channels 24V DC, Isolated	
Standard I/O Termination Block	VE4002S1T1B1
Fused I/O Termination Block	VE4002S1T1B2
16-Pin Mass Termination Block	VE4002S1T1B3
Discrete Output Card: 8 Channels 24V DC, High-Side	
Standard I/O Termination Block	VE4002S1T2B1
Redundant Standard I/O Termination Block	VE4032S1T2B1
Fused I/O Termination Block	VE4002S1T2B2
16-Pin Mass Termination Block	VE4002S1T2B3
10-Pin Mass Termination Block	VE4002S1T2B4
Discrete Output Plus Card: 32 Channels, 24 V DC, High-Side	
32-Channel DO Terminal Block for Series 2 Plus	VE4002S2T2B8
Redundant 32-Channel DO Terminal Block for Series 2 Plus	VE4032S2T2B8
40-pin DO Mass Termination Block for Series 2 Plus (to be used with DeltaV Signal Conditioning Cards for PLC-5 DO, or P+F HiC IS barriers and terminal boards for DeltaV DCS)	VE4002S1T2B8
40-pin DO Mass Termination Block for Series 2 Plus including 4 x 8-channel DO Mass Connection Boards*	VE4052S1T2B8
Redundant 40-pin DO Mass Termination Block for Series 2 Plus (to be used with DeltaV Signal Conditioning Cards for PLC-5 DO, or P+F HiC IS barriers and terminal boards for DeltaV DCS)	VE4032S1T2B8
Redundant 40-pin DO Mass Termination Block for Series 2 Plus including 4 x 8-channel DO Mass Connection Boards*	VE4082S1T2B8
Discrete Output Card: 8 Channels 115/230V AC, Isolated	
Standard I/O Termination Block	VE4002S2T1B1
Fused I/O Termination Block	VE4002S2T1B2
Discrete Output Card: 8 Channels 115/230V AC, High-Side	
Standard I/O Termination Block	VE4002S2T2B1
Fused I/O Termination Block	VE4002S2T2B2

*For more details on the Mass Connection Boards and connection cables, please refer to the **M-series Mass Connection Solutions** PDS.

Model	Ref. Fig. 1	Description	Removal or Insertion with System Power Energized	Key Pos.	Field Circuit Class For Definitions please refer to Item 10.
KJ3001X1 - CA1	G	DI Card, 32 Ch. 24VDC, Dry Contact (0°C to +60°C)	YES[1,2]	B 3	NON-SPARKING
KJ3001X1 - CB1	G	DO Card, 32 Ch. 24VDC, High Side (0°C to +60°C)	YES[1,2]	B 4	NON-SPARKING
KJ3002X1 - BA1	G	AI Card, 8 Ch., 4-20mA., HART (0°C to +60°C) 2-Wire	YES[1]	A 1	Energy limited field circuits Uo = 28.7V, Io = 33mA, Po = 607mW Co=.17uF, Lo=11mH
		4-Wire	YES[1,2]		NON-SPARKING
KJ3002X1 – BF1	G	RTD Card 8 Ch. (0°C to +60°C)	YES[1]	C 1	Energy limited field circuits Uo = 5.5, Io = 0.6mA/Ch, 4.8 mA/Card Po = 0.4mW Co=1000µF, Lo=1000mH
KJ3002X1 - BG2	G	Thermocouple Card 8 Ch. (0°C to +60°C)	YES[1]	C 1	Energy limited field circuits Uo = 5.5, Io = 0.3mA/Ch, 0.3 mA/Card Po = 0.8mW Co=1000µF, Lo=1000mH
KJ3003X1 - BA1	H	Serial Interface Card (0°C to +60°C)	NO	D 4	NON-SPARKING
KJ3003X1 - EA1	C	Serial Interface Terminal Block	N/A		N/A
KJ3004X1 - BA1	H	Fieldbus H1 Card (0°C to +60°C)	NO	D 6	NON-SPARKING
KJ3004X1 - EA1	C	Fieldbus H1 Card Terminal Block	N/A		N/A
KJ3005X1 - BA1	H	Actuator-Sensor Interface Card (0°C to +60°C)	NO	D 1	NON-SPARKING
KJ3006X1 - BA1	H	Multifunction Card (0°C to +60°C)	NO	C 6	NON-SPARKING
KJ3007X1 - BA1	H	Profibus DP Card (0°C to +55°C)	NO	D 3	NON-SPARKING
KJ3007X1 - EA1	C	Profibus Terminal Block	N/A		N/A
KJ3008X1 - BA1	G	Sequence Of Events Card (0°C to +60°C)	YES[1,2]	C 5	NON-SPARKING
KJ3009X1 - BA1	H	DeviceNet Card (0°C to +55°C)	NO	D 5	NON-SPARKING
KJ3201X1 - BA1	G	Discrete Input Card, Series-2, 24VDC Dry Contact Note, This card's field power may be lowered to a nominal 12VDC.	YES[1]	B 1	Energy limited field circuits Uo = 18V, Io = 3.6mA, Po = 16mW Co=.7uF, Lo=1000mH Uo = 12.6V, Io = 2.5mA, Po = 8mW Co =3.4uF, Lo =1000mH
KJ3201X1 - EA1	C	Redundant Discrete Terminal Block	N/A		N/A
KJ3202X1 - BA1	G	Discrete Output Card, Series-2, 24VDC High-side	YES[1,2]	B 6	NON-SPARKING
KJ3203X1 - BA1	G	DI Card, 32 Ch. 24VDC, Dry Contact, Series-2	YES[1,2]	B 3	NON-SPARKING
KJ3204X1 - BA1	G	DO Card, 32 Ch. 24VDC, High Side, Series-2	YES[1,2]	B 4	NON-SPARKING
KJ3206X1 - BA1	G	DI Card, 8 Ch. 24VDC, Isolated, Series-2	YES[1,2]	B 2	NON-SPARKING
KJ3208X1 - BA1	G	DO Card, 8 Ch. 24VDC, Isolated, Series-2	YES[1,2]	B 5	NON-SPARKING
KJ3211X1 - BA1	G	Sequence of Events Card, Series-2	YES[1,2]	C 5	NON-SPARKING
KJ3212X1 - BA1	H	Multifunction Card, Series-2	NO	C 6	NON-SPARKING
KJ3221X1 - BA1	G	Analog Output Card with HART, Series-2	YES[1]	A 4	Energy limited field circuits Uo = 28.7V, Io = 33mA, Po = 607mW Co=.17uF, Lo=11mH
KJ3221X1 - EA1	C	Redundant Analog Output Terminal Block	N/A		N/A