KJ3002X1-BA1 2-Wire AI, 8-Channel, 4-20 mA, HART 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 300 mA
Field circuit rating	24 VDC at 32 mA

Environmental Specifications

Ambient Temperature	0 to 60° 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	A1

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.

An I/O loop assessment must be complete on all energy limited nodes.

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).

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.

A terminal block fuse may NOT be removed with field power energized for non-sparking circuits.

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

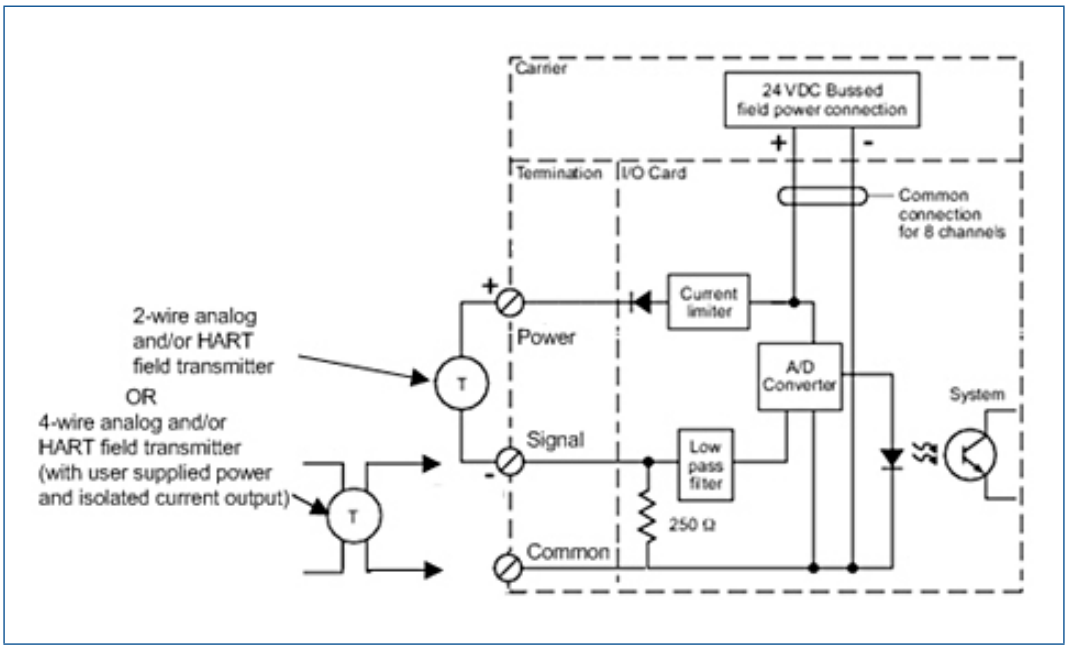
CE

LR87534

EMERSON Process Management

Analog Input I/O Cards

Specifications for HART AI-Card, 8-channel, 4 to 20 mA	
Number of Channels	Eight
Isolation	Each channel is optically isolated from the system and factory tested to 1500V DC
Nominal Signal Range (span)	4 to 20 mA
Full Signal Range	1 to 22.5 mA, with over range checking
LocalBus Current (12V DC nominal) per Card	Simplex: 120 mA typical, 150 mA maximum Redundant: 175 mA typical, 250 mA maximum (per card)
Field Circuit Power per Card	300 mA maximum at 24V DC (+10%)
Accuracy Over Temperature Range	0.1% of span
Resolution	16-bits A/D converter
Repeatability	0.05% of span
Roll-off Frequency	-3 dB at 2.7 Hz, -20.5 dB at ½ the sampling frequency
Calibration	None required
Optional Fuse	2.0 A
Communications Support	HART pass-through for AMS Device Manager Field device variable and status reporting for control functions
Hart Scan Time	600 – 800 ms (typical) per enabled channel



Simplified Circuit and Connection Diagram for Simplex AI Card, 8-channel, 4 to 20 mA, HART.

In addition to standard signal wiring, some cards may also be ordered with Mass Terminal blocks that allow these cards to be connected to the M-series Mass Connection Solutions or third party wiring solutions from Phoenix or if IS Barriers are required from Pepperl and Fuchs, mounted in an adjacent cabinet to meet special signal conditioning or for optimizing field wiring solutions. Please refer to the Alliance Program website for details on approved third-party products.

- 10-pin Mass Termination Block (simplex only)
- 16-pin Mass Termination Block (simplex only)
- 24-pin Mass Termination Block (simplex only)
- 40-pin Mass Termination Block (simplex and redundant)
- 48-pin Mass Termination Block (simplex and redundant)

Traditional I/O and Terminal Block Compatibility

I/O Card	I/O Card Keying	Traditional I/O Terminal Blocks	Mass Termination Blocks
AI, 8-Channel, 4–20 mA, HART	A1	I/O terminal block Fused I/O terminal block 4-wire I/O terminal block	16-pin Mass termination block (Supports 2-wire Devices) 24-pin Mass termination block (Supports 4-wire Devices)
AI Plus, 16-Channel, 4-20 mA, HART	A6	16-Channel 2-Wire AI terminal block for Series 2 Plus 16-Channel 4-Wire AI terminal block for Series 2 Plus Redundant 2- & 4-Wire terminal block	48-pin AI Mass termination block for Series 2 Plus Redundant 48-pin AI Mass termination block for Series 2 Plus
AO, 8-Channel, 4–20 mA, HART	A4	I/O terminal block Fused terminal block	16-pin Mass termination block
AO Plus, 16-Channel, 4-20 mA, HART	A5	16-Channel AO terminal block for Series 2 Plus Redundant 16-Channel AO terminal block for Series 2 Plus	48-pin AO Mass termination block for Series 2 Plus Redundant 48-pin AO Mass termination block for Series 2 Plus
Thermocouple, mV	C1	I/O terminal block Cold Junction Compensated (CJC) terminal block	NA
RTD, 8-Channel	C3	Resistant Temperature Device (RTD) terminal block	NA
DI, 8-Channel, 24V DC, Dry Contact	B1	I/O terminal block Fused terminal block	16-pin Mass termination block
DI, 8-Channel, 24V DC, Isolated	B2	I/O terminal block Fused terminal block	16-pin Mass termination block
DI, 32-Channel, 24V DC, Dry Contact	B3	32-Channel terminal block	40-pin Mass termination block
DI Plus, 32-Channel, 24V DC, Dry Contact	E3	32-Channel DI terminal block for Series 2 Plus Redundant 32-Channel DI terminal block for Series 2 Plus	40-pin DI Mass termination block for Series 2 Plus Redundant 40-pin DI Mass termination block for Series 2 Plus

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

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