KJ2005X1-MQ2 MQ Controller

Hazardous Atmosphere

II 3G Ex ec IIC Gc
FM19ATEX0173U
IECEx FMG 19.0019U
FM21UKEX0017U

CL. I Div. 2 GP. A,B,C,D
CL. I Zone 2 AEx/Ex ec IIC Gc
FM17CA0145U
FM17US0286U

Power Specifications

Local Bus Power	+5 VDC at 1.4 A

Environmental Specifications

Ambient Temperature	-40°C to +70°C
Shock	10g ½ Sinewave for 11msec
Vibration	1mm Peak to Peak from 2 to 13.2Hz; 0.7g from 13.2 to 150Hz
Airborne Contaminants	ISA-S71.04 –1985 Airborne Contaminants Class G3
Relative Humidity	5 to 95% Non-Condensing

Note: Refer to the product label for serial number and location and date of manufacture.

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 *"DeltaV™ M-Series Hardware Installation and Reference"* manual.

The communications network connected to the DeltaV Remote Interface Unit must not be connected to a source that generates or contains under normal conditions a potential in excess of 60 VAC or 75 VDC.

Removal and Insertion

This unit cannot be removed or inserted with system power energized unless the area is known to be non-hazardous.

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

LR87534

DeltaV™ MQ Controller

- Increases productivity
- Easy to use
- Has the flexibility to meet your needs



The DeltaV™ MQ Controller and the DeltaV I/O subsystem make rapid installation easy.

Introduction

The MQ Controller provides communication and control between the field devices and the other nodes on the control network. Control strategies and system configurations created on earlier DeltaV™ systems can be used with this powerful controller. The MQ Controller provides all the features and functions of the MD Plus Controller, with the same amount of memory.

The control languages executed in the controllers are described in the Configuration Software Suite product data sheet.

Benefits

Increases productivity

The MQ Controller is as quick as the MD Plus Controller and provides the same configurable memory as the MD Plus Controller. The Ethernet ports are full duplex, 100MB/second maximum throughput. The results are lower CPU utilization and higher capacity for control strategies.

Self-addressing. The DeltaV controller is unique in its ability to automatically identify itself to the DeltaV control network. When the controller is powered up, it is automatically assigned a unique address — no dip switches, no configuring — *just plug and play!*

Self-locating. A controller's physical location is easy to find. LEDs on the face of the controller can be made to flash, providing a strong visual clue.

Automatic I/O detection. The controller can identify all I/O interface channels located on the subsystem. As soon as an I/O interface is plugged in, the controller knows the general characteristics of the field devices managed by that I/O interface. This reduces the no value engineering associated with configuration — *easy!*

Connect to Electronic Marshalling. Starting in DeltaV v14.3, CHARMs and wireless devices connected through CHARM I/O Cards (CIOC) can be assigned to the MQ Controller. This makes it easier than ever to add I/O to an existing controller by simply adding a CIOC to the DeltaV Area Control Network.

Easy to use

Total control. The controller manages all control activities for the I/O interface channels. It also manages all communication functions for the communications network. Time stamping, alarming, and trend objects are also managed within the controller. The controller executes all control strategy with execution speeds up to every 100 ms.

Data protection. All online changes made to control parameters are automatically stored for later upload into the engineering database. This way, the system always retains a complete record of all the data that has been changed online.

Cold restart. This feature provides automatic restart of the controller in case of a power failure. The restart is completely autonomous because the entire control strategy is stored in NVM RAM of the controller for this purpose. Simply set the restart state of the controller to current conditions.

Has the flexibility to meet your needs

Advanced operations. The MQ Controller is equipped to handle the DeltaV Batch option, as well as advanced control functions.

You can also use advanced control function such as Neural and Model Predictive Control on the MQ Controller.

Data pass-through. The controller is equipped with the ability to pass smart HART® information from field devices to any workstation node in the control network. This means you can take advantage of applications, such as Asset Management Solutions AMS Device Manager, that enable you to remotely manage the HART information contained in your HART or FOUNDATION Fieldbus equipped devices.

Prepares you for the future. As your system grows, you can expand your software license to increase the number of device signal tags (DSTs) allocated to the DeltaV controller. Begin with 50 and expand to 750 DSTs. Control strategy complexity and control module scan rates determine overall controller performance and application size. A redundant controller may be added to back up an MQ Controller online. The standby controller comes online automatically, with a bumpless transition. For more information, refer to the I/O Redundancy product data sheet.

Mounting. This plug-and-play system structure provides modular system growth with a single controller and can be mounted in a Class 1, Div 2 or ATEX Zone 2 environment. Refer to the System Power Supplies and I/O Subsystem Carriers product data sheets for additional information.



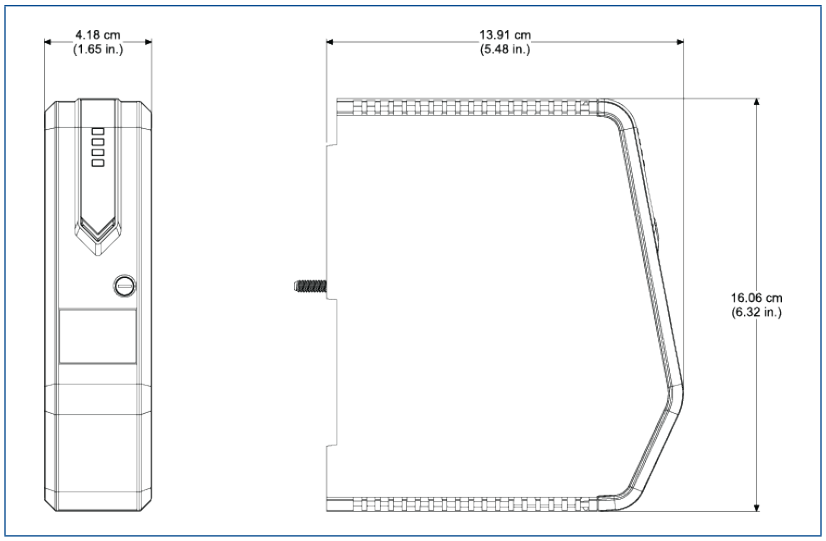
The MQ Controller.

Designed to support legacy migration

Advanced operations. The MQ Controller provides the DeltaV platform to migrate PROVOX and RS3 controllers, and also supports the PROVOX and RS3 Migration I/O interfaces.

The existing PROVOX I/O remains in place using the migration I/O interface to PROVOX with support of up to 750 real I/O signals. Serial datasets are migrated to DeltaV serial cards and all virtual I/O are no longer required due to the direct module references possible in the DeltaV system.

RS3 system migrations to the DeltaV system are fully supported with MQ Controllers and the migration I/O interface for RS3.



DeltaV MQ Controller hardware dimensions.

Specifications

Power, Mounting, and Memory	
Power Requirement	Supplied by System Power Supply through 2-wide Power/Controller Carrier
Fuse Protection	3.0 A, non-replaceable fuses
Power Dissipation	5.0 W typical, 7.0 W maximum
Mounting	On right slot of Power/Controller Carrier
User Memory	48 MB
Primary Control Network	8-pin RJ-45 connector
Redundant Control Network	8-pin RJ-45 connector
LED Indicators (ON Status)	
Green – Power	Indicates DC power is applied
Red – Error	Indicates an error condition
Green – Active	Indicates that the controller is operating as the primary controller
Green – Standby	Indicates that the controller is operating as a backup controller (reserved for future use)
Yellow Flashing – Pri. CN	Indicates valid primary control network communication
Yellow Flashing – Sec. CN	Indicates valid secondary control network communication
All except Power flashing	Visual identification of controller initiated from user interface software by ping command
All except Power flashing, alternating even and odd	Firmware upgrade in progress

Environmental	
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
Shock (normal operating conditions)	10 g ½-sine wave for 11 ms
Vibration (operative limit)	1 mm peak-to-peak from 5 Hz to 16 Hz, 0.5 g from 16 Hz to 150 Hz

*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.

Certifications

The following certifications are available on the MQ Controller (see actual certificates for exact certifications):

- **CE**

  EMC- EN 61326-1

- **FM**

  FM 3600

  FM 3611

- **CSA**

  CSA C22.2 No. 213

  CSA C22.2 No. 61010-1

- **ATEX**

  EN 60079-0

  EN 60079-7

- **IEC Ex**

  IEC60079-0

  IEC60079-7

- **Marine Certifications:** IACS E10

  ABS Certificate of Design Assessment

  DNV Type Approval Certificate

- **Wurldtech**

  Achilles Communications Certification Level 2

Hazardous Area/Location

The MQ Controller can be installed and used based on the following Standards (see actual certificates for exact product markings):

- **FM (USA)**

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

- **cFM (Canada)**

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

- **ATEX**

  II 3G Ex ec IIC T4 Gc

- **IEC Ex**

  Installation:
  II 3G Ex ec 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

Ordering Information

Description	Model Number
MQ Controller	VE3008

Spare Part Ordering Information

Description	Model Number
Controller Module Hold-down Screw; box of 20	KJ4010X1-BP3

Prerequisites

- For each controller you will need to select the mounting carrier. Please refer to M-series I/O Subsystem Carriers product data sheets for details.
- Each controller requires a dedicated system power supply. Please refer to the M-series System Power Supply product data sheet for details.
- The MQ Controller requires DeltaV v10.3.1 or later.
- Assigning CHARMs to the MQ Controller requires DeltaV v14.3 and later software, but is not supported on M-series Controller Interfaces to PROVOX and RS3.
- Electronic Marshalling requires use of DeltaV Smart Switches between controllers and CIOCs, please refer to Network Considerations for M-series with Electronic Marshalling White Paper.

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