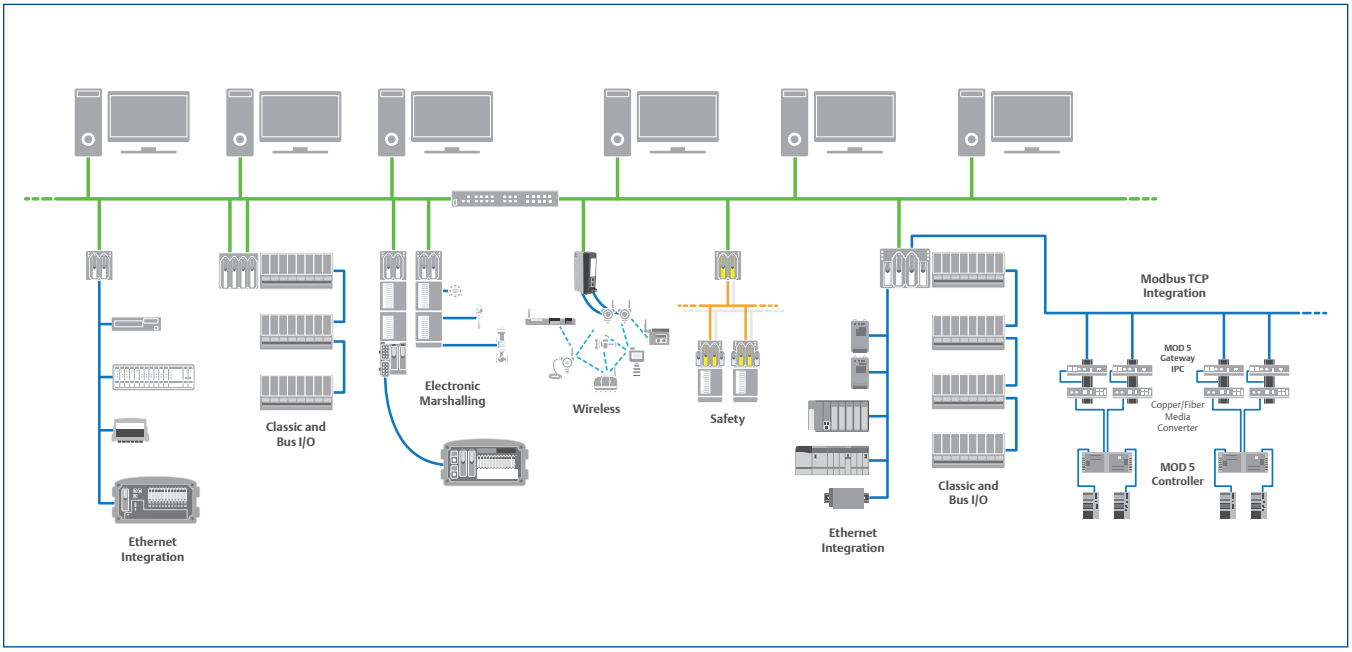
DeltaV™ IO.CONNECT for MOD 5 I/O



The DeltaV™ PK Controller provides a Modbus TCP connection between the DeltaV system and the MOD 5 I/O Gateway.

- Phased approach to complete migration of a legacy MOD 5 DCS to the modern DeltaV™ DCS
- Reduced operating expenses by eliminating cost of leasing MOD 5 system licenses
- Lowered capital expenses due to benefits of modern technologies
- Direct transition to a Smart Digital Plant

Introduction

The DeltaV™ IO.CONNECT for MOD 5 I/O is a proven interface which provides read and write integration between Dow Chemical's MOD 5 legacy system and the DeltaV DCS, resulting in a cost effective, time saving solution for MOD 5 modernization projects.

Benefits

Phased approach to complete migration of a legacy MOD 5 DCS to the modern DeltaV DCS. Spread out the capital expenditures (CAPEX) costs of migrating your legacy MOD 5 system by using a phased approach with the the DeltaV IO.CONNECT for MOD 5 I/O solution. This solution provides a modern interface to the existing MOD 5 controllers. Once the I/O Gateway solution is established, the MOD 5 I/O can be moved to DeltaV I/O over time. Expansion of the process areas / units is accomplished by simply adding DeltaV I/O.

Reduced operating expenses by eliminating cost of leasing MOD 5 system licenses. The MOD 5 I/O subsystems remain untouched with the use of the DeltaV IO.CONNECT for MOD 5 I/O solution. Once the MOD 5 controllers are removed from service, leasing MOD 5 software licenses are no longer required, significantly lowering your operating expenses (OPEX).

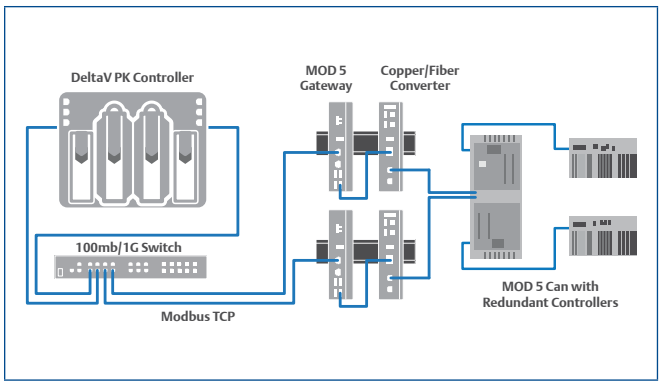
Lowered capital expenses due to benefits of modern technologies. Using the DeltaV IO.CONNECT for MOD 5 I/O solution allows the use of state-of-the-art DeltaV Live operator interface, one of the most adaptive and advanced graphic platforms available today. DeltaV configuration tools have an intuitive user interface with a library of graphical control strategies – making it easy to manage your system configuration.

Direct transition to a Smart Digital Plant. DeltaV controllers can be added at any time to take advantage of technologies such as predictive field device intelligence, wireless I/O and network communications, and integrated asset management. Electronic Marshalling – CHARMs, FOUNDATION™ Fieldbus, HART®, Profibus DP, DeviceNet, Modbus TCP and EtherNet/IP can be easily integrated on DeltaV alongside your MOD 5 system data.

Operation

The MOD 5 protocol enables peer-to-peer communications between the MOD 5 process control system CPUs. The DeltaV IO.CONNECT for MOD 5 I/O solution implements this protocol in a standalone Industrial PC (IPC), allowing DeltaV and MOD 5 CPUs to exchange data between the two systems. In this architecture, the IPC (and DeltaV) behave as another MOD 5 CPU in the process control system.

MOD 5 systems are Active/Active redundant, comprising of a left CPU and a right CPU. In DeltaV, two simplex IPCs running in parallel with identical configurations are used.



With the DeltaV IO.CONNECT for MOD 5 I/O solution architecture, the IPCs may also be considered as left and right, matching the MOD 5 CPU left and right designation. DeltaV Control Modules use the incoming redundant status to select data from the active CPU.

In DeltaV, the data exchanged is organized as follows:

- Outgoing data, i.e., Publish lists of DeltaV data sent to MOD 5.
- Incoming data, i.e., Data lists of data received from MOD 5.
  - A maximum of 3 Publish and Data lists each may be configured.
  - Each list comprises a maximum of 100 16-bit registers.

I/O Gateway Configuration

A Web App user interface is supplied in the I/O Gateway to configure the communication IP address, list of MOD 5 registers to read/write and corresponding Modbus TCP register mapping.

The MOD 5 configuration is specified as a user defined text file which is uploaded into the I/O Gateway via the Web App. The text file defines the Publish and Data lists. The Publish and Data lists specification is automatically converted to a file that is the equivalent to the DeltaV PK Controller (or other DeltaV hardware as specified below) configuration – ready for import into the DeltaV system. No tedious manual data marshalling or mapping process is required!

On power-up, the I/O Gateway reads its configuration file and creates a communication mapping for Modbus TCP. Thereafter, communications between the connected DeltaV PK Controller and MOD 5 I/O Gateway automatically commence.

System Specifications

DeltaV IO.CONNECT for MOD 5 I/O Specifications	
Protocol Compatibility	Communications with the MOD 5 CPU are based on the following document: 'MOD to MOD Communications Protocol Specification, v3.2, August 16, 2018' Data throughput capacity is 100 16-bit registers per second per connection. Each second, data for 100 registers are sent to MOD 5, and data for 100 registers are received from MOD 5. A maximum of 300 registers may be transferred in both directions over a complete 3 second scan cycle.
DeltaV Software Requirements	DeltaV System Software (Release v14.LTS or later) installed on a hardware-appropriate Windows workstation configured as a Professional Plus for the DeltaV system.
DeltaV Hardware Requirements	PK Controller (as shown in the above architecture on page 1), or EIOC, or MX or SX Controller with two System Power Supplies, two 2-wide controller carriers and a VIM2 Start with a 100 DST PK Controller and scale-up as more DSTs are required. The number of I/O gateways on a PK Controller is limited to the following: ■ PK100; 2 fully loaded redundant I/O gateway pairs ■ PK300; 4 fully loaded redundant I/O gateway pairs ■ PK750; 8 fully loaded redundant I/O gateway pairs ■ PK1500; 16 fully loaded redundant I/O gateway pairs
Gateway Hardware Requirements	Two I/O Gateway IPCs with preinstalled MOD 5 I/O Gateway software v1.0 or later for a redundant Gateway I/O solution. This solution can be simplex and is supported by Emerson, however, we recommend a redundant I/O Gateway solution. Each MOD 5 Controller is connected through an I/O Gateway to the DeltaV system
Other Hardware Requirements	Two Copper/Fiber Optic media converters are utilized to connect the I/O Gateway, RS-422 4-wire, serial ports to each MOD 5 CPU pair. The system was tested with MOXA converters. MOXA part number is ICF-1150-M-ST. Any other suitable Copper/Fiber converter may be used. Two 4-conductor copper DB9F to flying-lead "Y" cables are utilized to connect the I/O Gateways to Copper/Fiber Optic converters. Two Fiber optic cables are utilized, ST/ST connectors, 62.5/125-micron, Multimode, duplex, 10 meters minimum, are required for each MOD 5 CPU pair. These cables are used to connect from the Copper/Fiber Optic media converters to the MOD 5 Controller fiber optic connection points.
Power Requirements	I/O Gateway IPC: ■ Input Voltage: 110-240 VAC, 1.5A, 50-60Hz ■ Output Voltage: 9-24 VDC, 3.33A. The power supply is included in package. MOXA Media Converter: ■ Input Voltage: 12-48 VDC; Input Current 156mA @ 12 VDC. The power supply is not included in package.
Dimensions – MOXA ICF-1150 Copper/ Fiber Optic Converter	DIN-rail mount; 30.3 X 70 X 115 mm (W X D X H)
Dimensions – I/O Gateway IPC	DIN-rail mount; 44.0 X 106.60 X 166 mm (W X D X H)

Ordering Information

Contact your local Emerson sales office for a bundled quotation on this DeltaV IO.CONNECT for MOD 5 I/O solution which includes the driver noted below.

Description	Model Number
DeltaV IO.CONNECT for MOD 5 I/O	IOD-4118

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