DeltaV™ IO.Connect for Siemens® Remote I/O

- Reduce project capital and downtime by maintaining cabinets with Siemens Simatic® controllers, and field wiring
- Gain immediate benefit from the DeltaV™ system and begin integrating today's state of the art digital technologies like DeltaV PK Controller and DeltaV Live Operator Interface
- Low-risk, easy path to a smart digital plant
- Affordable DeltaV system support from Emerson

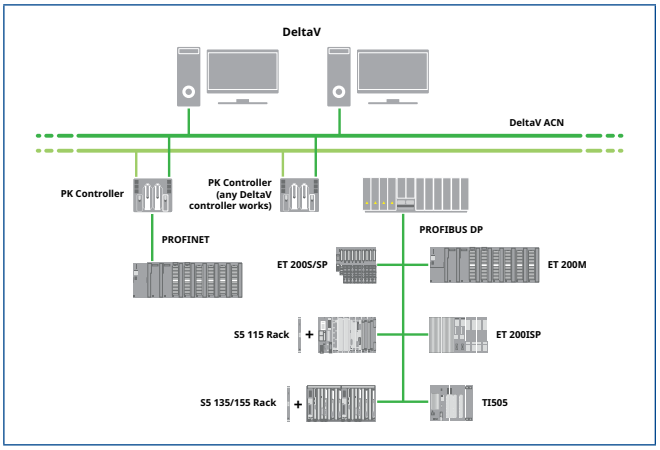


Figure 1. *DeltaV™ IO.Connect protects your I/O investment as you convert from Siemens® remote I/O to a DeltaV system.*

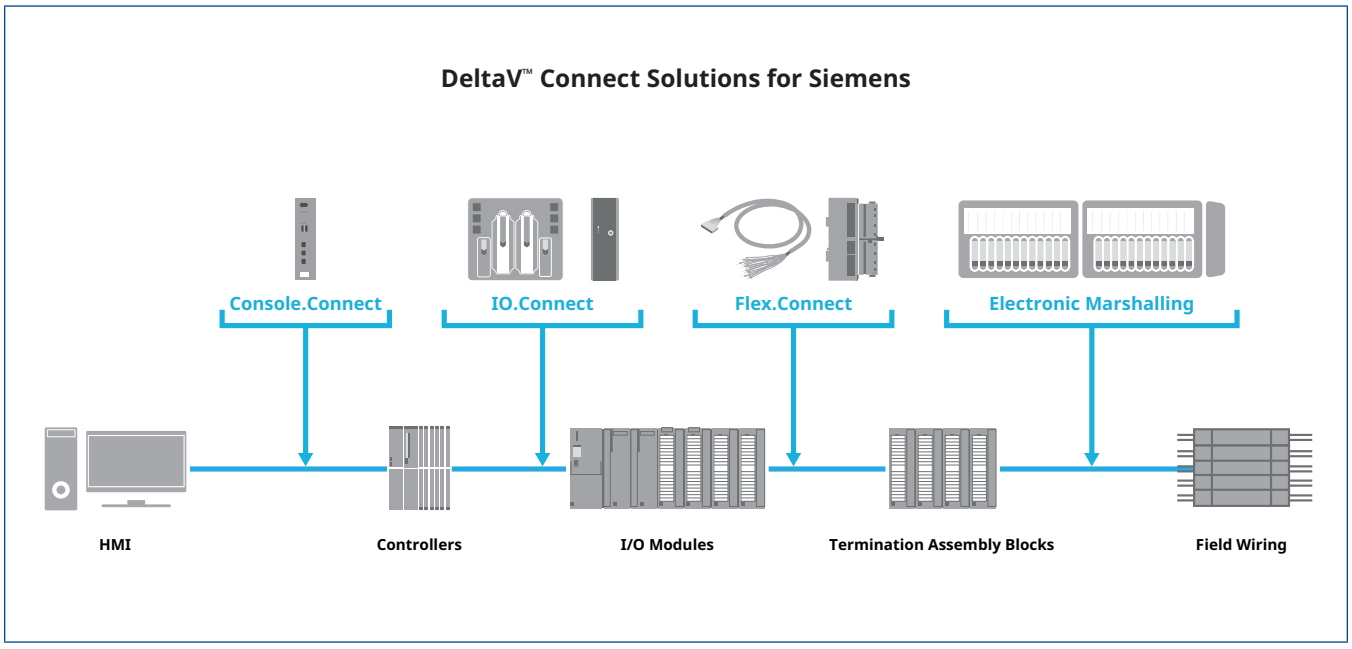


Figure 2. *DeltaV IO.Connect for Siemens remote I/O is part of Emerson's DeltaV Connect modernization solutions.*

Introduction

If you are currently running on a Siemens® system that contains either Siemens SIMATIC S7 ET 200M, ET 200S/SP, or SIMATIC S5 TI505 remote I/O and want to upgrade to a DeltaV™ system but face capital or downtime constraints, DeltaV IO.Connect offers an efficient modernization solution, allowing you to transition to a DeltaV system while preserving your existing legacy I/O and wiring.

A significant portion of the Distributed Control System (DCS) installed costs lie in I/O components, related documentation, and the labor required for de-termination and rewiring during system upgrades. DeltaV IO.Connect enables you to retain your investment in these components during the initial phase, offering the flexibility to gradually transition to DeltaV I/O over time. This minimizes both budgetary and production impacts.

The DeltaV IO.Connect system replaces SIMATIC S5 or S7 controllers by connecting directly to the remote interface cards for either PROFIBUS DP or PROFINET (ET 200 models only). DeltaV PROFIBUS DP cards or a PK Controller for PROFINET can be configured to handle the configuration, communication, and connections with supported Siemens remote interface cards.

Legacy analog and discrete data is then converted into DeltaV function blocks, and the SIMATIC S5/S7 control configuration is transitioned to DeltaV using Emerson's DeltaV Revamp configuration analysis and modernization software. This provides a seamless conversion process from legacy Siemens SIMATIC S5/S7 to a state-of-the art DeltaV system.

Once DeltaV is installed, users gain access to advanced technologies, including:

- Alarm management
- Embedded advanced control
- Self-diagnosing instrumentation
- On-the-fly scalability
- Wireless communications
- Plug-and-play business integration

These features deliver cutting-edge operational capabilities without the need for a complete system overhaul, preserving your investment while modernizing your operations.

Benefits

Reduce Business Risks by Minimizing Process Downtime. Reduce process downtime by preserving existing I/O and leaving wiring intact. This approach accelerates the transition to a new system by over 90%, enabling you to resume production quickly. When ready, I/O can be seamlessly migrated from IO.Connect to native DeltaV (M-series or CHARMs) without modifying control modules or operator displays. Wiring transitions can be scheduled at your convenience, ensuring minimal disruption.

Save 40% of the Capital Required vs a Full Rip and Replace. By eliminating the need for new device wiring, DeltaV IO.Connect significantly reduces costs and minimizes the risk of errors. In many cases, DeltaV IO.Connect hardware can fit within the existing ABB footprint, though further investigation may be required based on prior infrastructure.

State-of-the-art Operator Interface. Operators gain access to the latest DeltaV Operator Stations, offering advanced monitoring and control capabilities. Features include:

- HTML5 graphics with DeltaV™ Live
- Event reporting and history collection
- Enhanced alarming

Predefined faceplates are designed to simplify the transition for operators, ensuring a smooth adoption process.

Direct Transition to a Smart Digital Plant. DeltaV controllers can be added at any time, unlocking advanced technologies such as:

- Predictive field device intelligence
- Wireless I/O and network communications
- Integrated asset management

The DeltaV system supports seamless integration with FOUNDATION™ Fieldbus, HART®, PROFIBUS DP, PROFINET®, DeviceNet®, Modbus TCP®, and EtherNet/IP™.

High-Performance Hardware for Greater Uptime and Reliability. DeltaV IO.Connect is built with industrial-grade hardware, engineered for reliability in harsh environments. Key features include:

- Compact size and reduced maintenance
- Low power consumption
- High performance and ease of future upgrades

This robust solution enhances productivity while reducing the total cost of ownership.

Supported by Emerson. DeltaV IO.Connect is backed by Emerson's lifecycle services, ensuring long-term reliability and support. No ABB software is required to configure or maintain the I/O, simplifying system management and reducing complexity.

Product Description

DeltaV IO.Connect for Siemens offers two communication options, both of which replace Siemens SIMATIC S5/S7 controllers with a DeltaV Controller. The solution interfaces with Siemens remote I/O racks using either pre-existing PROFIBUS DP or PROFINET interface cards (ET 200 models only).

PROFIBUS DP Integration

For systems with existing PROFIBUS DP infrastructure, all connected devices can be integrated into DeltaV through the I/O Network using any DeltaV controller. Each interface card on the remote I/O rack functions as a PROFIBUS DP device in DeltaV, and each device contains slots that correspond to the I/O cards on that rack.

A .GSD (General Station Description) file is used to identify a PROFIBUS DP device. It contains data making it possible to have manufacturer-independent configuration tools. Typical information in a .GSD file includes:

- Vendor details
- Supported baud rates
- Timing information
- Options and features
- Available I/O signals

PROFINET Integration

For systems with PROFINET interface cards, devices can be integrated into DeltaV using a PK Controller (v15.FP1 or later for simplex; v15.FP3 or later for redundancy). The PK Controller connects directly to the Siemens remote I/O via its PROFINET port. Each interface card on the remote I/O rack is configured as a device in DeltaV.

Alternatively, for earlier DeltaV versions, a DeltaV M-series Virtual I/O Module 2 (VIM2) can be used for simplex data integration by emulating a PROFIBUS DP card. This requires a PROFINET driver and VIMNet Explorer™ for configuration.

A GSDML file is used to identify PROFINET devices for both the PK Controller and VIM2 options. Similar to a GSD file, it contains the necessary data for manufacturer-independent configuration and can be imported into the DeltaV system.

I/O Conversion, System Blocks, and Module Templates

The existing Siemens' analog and discrete I/O point data is converted to DeltaV function blocks, and the control configuration from the Siemens' legacy DCS or PLC system is transitioned to DeltaV configuration using Emerson's Revamp configuration analysis and modernization software. This includes a PCS 7 CFC tool and a S7 ladder logic tool to help convert from the legacy Siemens system to a state-of-the art DeltaV system.

HMI Replacement

All existing Siemens native or third-party HMIs are replaced with state-of-the-art DeltaV Live operator interface, and can use Emerson's high-performance standardized GEMs, faceplates, and detailed displays with no updates required. When you are ready to transition to DeltaV native I/O, the same graphic screens and GEMs can be used without further updates required.

Transition Architecture

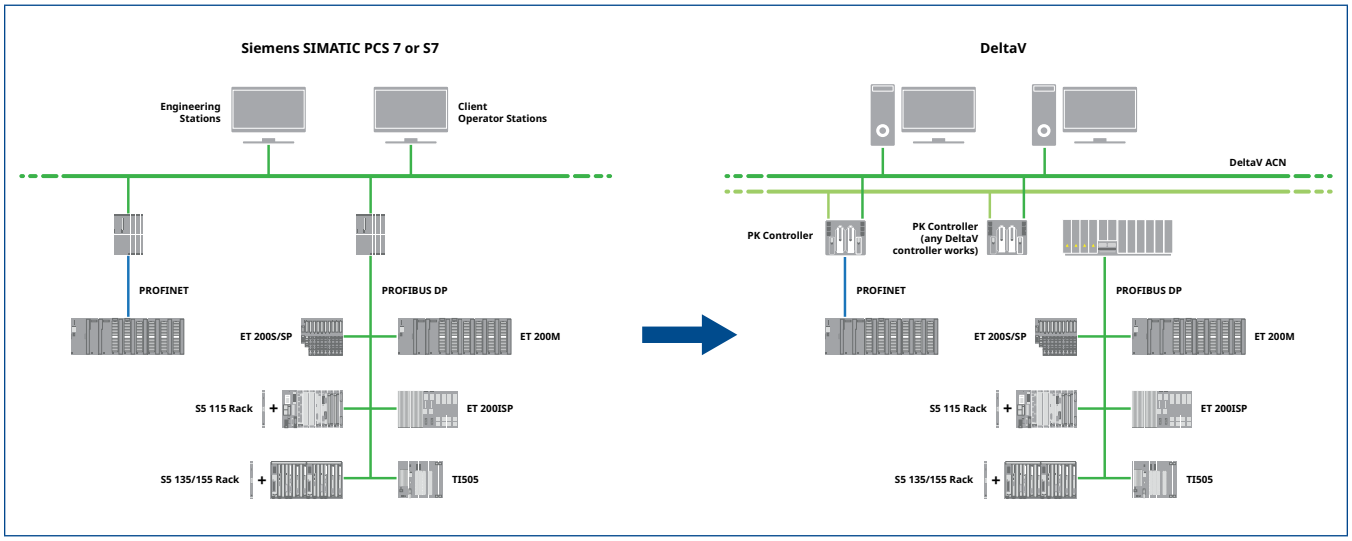


Figure 3. *Once DeltaV IO.Connect is installed, all Siemens controllers and HMIs are removed.*

Scalable, Flexible Architecture

DeltaV offers flexibility for situations where operational or economic constraints require modernizing only a part of your plant. For example, if a facility has five remote I/O racks, a single rack can be moved to DeltaV IO.Connect independently.

- **Console.Connect:** For phased modernizations where some Siemens S7 processors remain active, Console.Connect integrates DeltaV Live over the S7 processor, creating a hybrid operating scenario. Communication is achieved using OPC UA.
- **Flex.Connect:** If you wish to remove remote I/O cards in addition to controllers, the Flex.Connect solution for ET 200M and TI505 models uses interface components that connect directly to field wiring, allowing connection to native DeltaV I/O without rewiring.

Emerson Modernization Consultants are available to discuss these options in detail. Please contact your Emerson sales representative to schedule a consultation.

Sizing and Performance

For the PROFIBUS DP option, each interface card on the remote I/O rack counts as a device (or node) coming into DeltaV, with each I/O card on that node coming in as a slot. Depending on the I/O card type, there may be numerous signals on each slot for PV, outputs and statuses.

In DeltaV v12 and later, each node will consume 1 DST for the first 16 signal references, and 1 DST for each additional signal reference beyond the 16th signal reference.

For the PROFINET option, each interface card on the remote I/O rack counts as a device in DeltaV and each device will contain a PROFINET slot that aligns to each I/O card found on the remote I/O rack.

In DeltaV v15.FP1 and FP2, if the device only has 1 or 2 physical slots defined in the GSDML file, then the device will consume 1 DST for the first 16 signal references, and 1 DST for each additional signal reference beyond the 16th signal reference. If the device has more than 2 physical slots defined in the GSDML file (most likely for IO.Connect), then each signal reference will be charged as a DST.

In DeltaV v15.FP3 and later, for a remote I/O device, it will consume one DST of the most expensive type used for the first 16 signals and each additional signal will require one DST of the correspondent I/O type (AO, AI, DO, DI).

When sizing a system, the Siemens I/O module count is kept within the PK Controller DST size limit (ie. 100, 300, 750, 1,500). However, in terms of IO.Connect performance, a direct connection to Siemens hard-wired I/O modules share a similar load as DeltaV I/O. Thus, a signal count of greater than 1,500 channels will require an additional PK Controller. If using PROFINET, also note the maximum number of devices allowed per PK Size. Recall that the device is based on the interface card on the rack, not the I/O cards.

PK Size	No. of DSTs	No. of PROFINET Devices (PN1) v15.FP1/FP2	No. of PROFINET Devices (PN1) v15.FP3 or later
PK100	100	50	100
PK300	300	100	250
PK750	750	150	250
PK1500	1500	250	250

Supported I/O Families

DeltaV IO.Connect is compatible with the several Siemens remote I/O families. If there are I/O present, but not as a remote rack for S7-300, S7-400, S7-1200, or S7-1500, these would require conversion to a remote I/O rack first with the proper PROFIBUS DP or PROFINET interface card.

Siemens® I/O Family Type	CPU Family	PROFIBUS DP Capable	PROFINET Capable
ET 200M	S7	X	X
ET 200S	S7	X	X
ET 200SP	S7	X	X
ET 200ISP (Intrinsically safe version)	S7	X	X
TI505	S7	X	
115*	S5	X	
135*	S5	X	
155*	S5	X	

*Requires a rack expansion card to convert the rack into remote I/O.

Modernizing to DeltaV™ I/O

Once you are ready to switch to DeltaV I/O, modernizing can occur with minimal interruption. As the wiring is moved over, the requirement to make the switch might include:

- Completing the wiring cutover
- Remapping the I/O in DeltaV
- Downloading the I/O
- Downloading the control module

System Compatibility

- **DeltaV IO.Connect using PROFIBUS DP:** Compatible with DeltaV v14.LTS[1] and is designed to work with M- and S-series PROFIBUS DP cards interfacing to any DeltaV Controller and DeltaV Live operator interface.
- **DeltaV IO.Connect using PROFINET:** Compatible with DeltaV v15.FP1 and later. It is designed to work with DeltaV PK Controllers and DeltaV Live operator interface.

[1]IO.Connect is not officially supported or tested on versions earlier than v14. LTS as of 2025.

Prerequisites

- **DeltaV ProfessionalPLUS PC** and **DeltaV ProfessionalPLUS Software Suite**
- One or more **DeltaV Operator Station PC** and corresponding software suite licenses
- **DeltaV v15.FP1** or later software (PROFINET option)
- **DeltaV PK Controller** (PROFINET option)

Related Products

- **Flex.Connect for Siemens®.** A modernization solution that removes the I/O cards while retaining termination and wiring, offering another efficient upgrade path.
- **Console.Connect for Siemens.** A modernization solutions to bring in Siemens tags but without removing the existing controller. Available for S7 processors.
- **DeltaV PK Controller.** A powerful, scalable controller for distributed control applications.
- **DeltaV ProfessionalPLUS Station Software Suite.** Centralized operations, engineering, configuration database, and diagnostics on a DeltaV workstation.

- **DeltaV Application Station Software Suite.** Integrate your DeltaV system with third party systems and applications on a DeltaV workstation. Includes a scalable DeltaV Continuous Historian and DeltaV OPC Data Access server.
- **DeltaV Operator Station Software Suite.** Centralized operations and diagnostics on a DeltaV workstation.

Services

For help in planning, justifying, or implementing your system migration, contact your local Emerson representative. Expert consultants are willing and able to advise you on a variety of concerns, including safety system design, implementation and standards compliance, digital buses, wireless applications, control performance, and process optimization.

Inquiries

For inquiries and detailed quotation, please contact your local Emerson sales office.

Ordering Information

PROFIBUS DP Option	Model Number
Simplex M-series PROFIBUS DP Interface Card (includes 1 Interface Card and a simplex Terminal Block)	VE4022

The PROFIBUS DP order information does not include controller ordering details since it is not specific.

PROFINET Option	Model Number
DeltaV™ PK Controller or DeltaV PK Flex Controller	*
PK Controller PROFINET Interface License	VE4108PS01
Ethernet connected I/O (EIOC and PK): XXX Physical Device (1 per Ethernet rack adapter)	VE4109SXXX
X-Year Product Support for One System up to XXXX DST	VE9041SXXXX

*Refer to the **DeltaV™ PK Controller** or **DeltaV PK Flex Controller** Product Data Sheet for ordering information.

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