DeltaV™ Connect Solution for Siemens TELEPERM® M Systems

- Operate your process easily and intuitively from a state-of-the-art operator interface
- Integrate seamlessly with the Siemens TELEPERM M systems
- Install and commission with zero downtime
- Easily integrate today's state-of-the-art digital technologies
- Low-risk, easy path to a smart digital plant

For a pathway to today's digital technologies, easily connect enhanced DeltaV workstations to your TELEPERM M system

Introduction

Emerson's DeltaV Connect Solution for Siemens TELEPERM M Systems ("DeltaV Connect™") provides a pathway for Siemens TELEPERM M systems to easily transition to the Plantweb digital ecosystem with the DeltaV system.

TELEPERM M system users can take advantage of today's performance enhancing technologies such as digital busses, embedded advanced control, self-diagnosing instrumentation, on-the-fly scalability, wireless communications, electronic marshalling, and plug-and-play business integration, without completely starting from scratch.

DeltaV Connect upgrades TELEPERM M-based operator consoles while TELEPERM M controllers and I/O continue to run the process.

The TELEPERM M system's analog and discrete I/O, process control loops, and online tuning parameters are seamlessly viewed and operated from a state-of-the-art DeltaV operator interface. This integrated DeltaV and TELEPERM M operator interface provides a basis for a low-risk, easy transformation towards a smart digital plant.

Benefits

State-of-the-art operator interface: Operators can monitor and control both TELEPERM M and DeltaV systems from the latest DeltaV Operator Stations. Features include event reporting, history collection and enhanced alarming. Predefined faceplates are designed to ease the transition for operators. TELEPERM M operator stations (OS) can be replaced, or used in conjunction with, DeltaV Operator Stations.

Seamless integration: DeltaV Connect seamlessly integrates with TELEPERM M systems. The TELEPERM M system interface provides connectivity with TELEPERM M Automation Systems (AS) components and enables data communications between the TELEPERM M AS and DeltaV Operator Stations and DeltaV controllers. TELEPERM M system data is incorporated into DeltaV such that an installed TELEPERM M system becomes an extension of the DeltaV system.

Install and commission with no downtime: DeltaV Operator Stations can be added online and be used side-by-side with existing TELEPERM M consoles while the process continues to run.

Easy 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, Electronic Marshalling, and integrated asset management. FOUNDATION Fieldbus, HART, Profibus DP, DeviceNet, and AS-i can be easily integrated on the DeltaV system along with your TELEPERM M system.

Cost-effective, robust solution: DeltaV Connect provides an affordable and flexible solution that maximizes current system investments while opening up options for future smart digital plant upgrades.

Product Description

DeltaV Connect is an interface solution that provides the ability to operate both TELEPERM M equipment and DeltaV equipment from a common integrated DeltaV Operator Station.

The DeltaV Connect interface enables access to TELEPERM M based control and monitoring information within the DeltaV system. There are two TELEPERM M interfaces available. The TELEPERM M OS interface supports reading from and writing to the TELEPERM M AS components which provides all functions necessary to replace the TELEPERM M operator stations.

The TELEPERM M AS interface supports TELEPERM M analog and binary data cyclic data exchange as used by the TELEPERM M AS components for inter-controller communications.

The DeltaV Connect uses special-purpose TELEPERM M function blocks that mirror the equivalent function blocks running in a TELEPERM M system. The TELEPERM M function blocks run inside DeltaV control modules which execute in a DeltaV Application Station. The TELEPERM M function blocks make TELPERM M data reported to DeltaV workstations look as if it is coming from a standard DeltaV controller. This allows the TELEPERM M system interface to use standard DeltaV controller features such as event reporting, history collection, and enhanced alarming.

DeltaV Connect consists of both hardware and software. An ADC-Bridge PC hardware interface provides the physical connection between the DeltaV Application Station and the TELEPERM M CS 275 plant bus. Software components consist of the TELEPERM M scanner interface software, TELEPERM M function blocks, control module templates, faceplates, and detail displays running in the DeltaV system and the ADC-Bridge software running on the ADC-Bridge. TELEPERM M custom function blocks can easily be added to the solution after consultation and definition of the function block requirements.

Notes:

- DeltaV Connect interface data exchange is limited by the TELEPERM M CS 275 plant bus data handling capability. Note that if the CS 275 bus load is already considered “high”, Emerson will not consider adding DeltaV Connect interface to the CS 275 bus, unless the current CS 275 bus load is reduced. There are methods to perform this bus load reduction; contact your local Emerson sales office for more details.
- DeltaV Connect interface will add additional load to the CS 275 plant bus unless TELEPERM M OS are removed. TELEPERM M OS should be removed in a one-to-one relationship to the DeltaV Operator Stations being added.
- At least one TELEPERM M OS must be left on the TELEPERM M system for engineering and diagnostic functions.
- DeltaV Connect is foremost a ***temporary*** transition solution providing a method to bridge between a TELEPERM M system and a DeltaV system. It is expected that over time a full migration to DeltaV workstations and controllers will occur.

Architecture

DeltaV Connect consists of the DeltaV system software (TELEPERM M function blocks, control modules, faceplates, and detail displays) and the TELEPERM M scanner application running on a DeltaV Application Station and an ADC-Bridge, the PC hardware interface to the TELEPERM M system CS 275 plant bus. The DeltaV Application Station is connected to the ADC-Bridge using standard Ethernet cabling. The DeltaV Application Station and the ADC-Bridge can be simplex or redundant. See Figure 1 for an example DeltaV Connect system with one redundant TELEPERM M AS interface and one redundant TELEPERM M OS interface.

After creating DeltaV control modules containing the TELEPERM M function blocks, the control modules are downloaded to a DeltaV Application Station for execution. The download creates shared memory areas on the DeltaV Application Station called "scanner tables" and the scanner tables are populated with the parameter data for each instance of a DeltaV Connect function block. The scanner tables are updated periodically by the DeltaV system to indicate what data needs to be read and written between the DeltaV and the TELEPERM M systems. The TELEPERM M scanner application monitors all read and write requests from the scanner tables and handles the data communications between the DeltaV system and the ADC-Bridge.

The DeltaV ProfessionalPLUS Station maintains the configuration database while the DeltaV Operator Stations are the nodes used to monitor and perform operator interactions with the TELEPERM M system.

The TELEPERM M system interface can be implemented in a redundant architecture, which adds a second DeltaV Application Station with application redundancy software and a second ADC-Bridge.

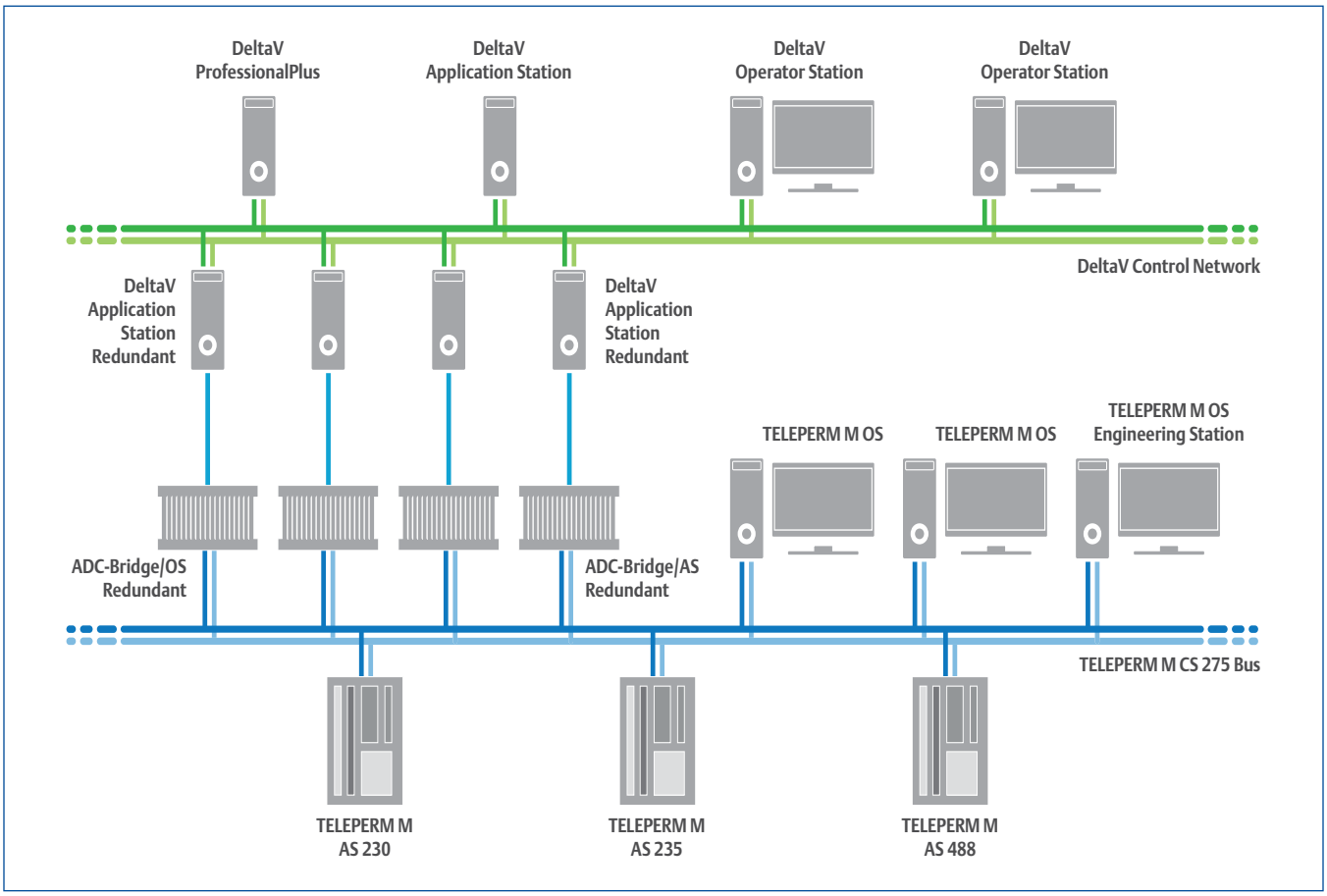

Figure 1 — *The DeltaV Connect architecture.*

ADC-Bridge

The ADC-Bridge is an industrial PC connected to the TELEPERM M CS 275 plant bus of the TELEPERM M system that contains a Siemens N-PCI card (Nahbus-Anschaltbaugruppe N-PCI). There are two types of ADC-Bridge PCs, an ADC-Bridge/OS and an ADC-Bridge/AS. Different sets of TELEPERM M function blocks are supported in each ADC-Bridge PC type. A DeltaV Connect may have one or more ADC-Bridge/OS and ADC-Bridge/AS as required for data connectivity and throughput requirements. The ADC-Bridge/OS and ADC-Bridge/AS can be redundant to provide improved robustness and reliability.

The ADC-Bridge/OS is used for replacing TELPERM M Operator Stations (OS) with DeltaV Operator Stations. The ADC-Bridge/OS acts on the TELEPERM M CS 275 plant bus as a TELEPERM M OS and provides the same communication on the CS 275 bus as a TELPERM M OS. The ADC-Bridge/OS supports data polling for DeltaV operator graphics and operator initiated data writes as they occur, by example, when an operator changes mode, set points etc. The ADC-Bridge/OS does not support periodic cyclic writing of data as is needed for control strategy communications (e.g. interlock condition monitored and transferred between controllers) or history collection.

The ADC-Bridge/OS supports the following functions:

- Reading and writing of data on request / response
- Receiving of periodically sent data (AKE and BKE)
- Receiving and acknowledgement of data sent on events (/ MKE; Function Block State, Klartext)

The ADC-Bridge/OS provides the following features:

- Optimization and packing of data request telegrams to TELEPERM M AS components
- Option to limit the load on the CS 275 plant bus as created by the ADC-Bridge
- 10 channels for synchronous reading
- 2 high priority channels for asynchronous writing

The ADC-Bridge/AS is used for inter-controller communication between the DeltaV system and TELEPERM M AS components. A TELEPERM M AS provides similar functionality in the TELEPERM M system as a DeltaV controller and I/O provides in a DeltaV system. The ADC-Bridge/AS acts on the TELEPERM M CS 275 plant bus as a TELEPERM M AS and provides the same functionality of inter-controller communication that is used by the TELEPERM M system. This allows periodic data exchange in a defined cyclic time (sending and receiving) between the DeltaV workstations and TELEPERM M AS or between DeltaV controllers and TELEPERM M AS. The ADC-Bridge/AS supports periodic cyclic writing of data as is needed for control strategy communications (e.g. interlocks, permissives, status transferred between controllers) or history collection of TELEPERM M data in the DeltaV system.

The ADC-Bridge/AS supports the following functions:

- Sending and Receiving of periodically sent data (AKS/AKE, BKS/BKE and MKS/MKE)

The ADC-Bridge/AS provides the following features:

- Optimization and packing of data request telegrams to TELEPERM M AS components
- Option to limit the load on the CS 275 plant bus as created by the ADC-Bridge

Scalable, Flexible Architecture

DeltaV Connect provides the ability to have more than one real-time TELEPERM M interface per DeltaV system. The number of interfaces is limited by the maximum number of Application Stations recommended for a DeltaV system and the number of free node addresses on the CS 275 bus. This allows the flexibility of having multiple DeltaV Application Stations for interfacing to a TELEPERM M CS 275 plant bus to segregate data flow paths.

Also, one DeltaV system can be the integration platform for multiple, independent TELEPERM M systems. When connecting multiple TELEPERM M systems, the DeltaV system would have at least one DeltaV Application Station with the TELEPERM M interface and ADC-Bridge for each TELEPERM M system. Each TELEPERM M interface requires the purchase of a DeltaV Connect function block license from Emerson, an ADC-Bridge, and Siemens N-PCI card.

The smallest DeltaV Connect would consist of a DeltaV ProfessionalPLUS Station, a DeltaV Application Station, the TELEPERM M interface software, and an ADC-Bridge. The system can be expanded by adding one or more DeltaV Operator Stations, DeltaV Application Stations, DeltaV controllers, DeltaV SIS, and ADC-Bridges.

Configuration

The DeltaV Connect interface is configured, maintained, and can be operated from the DeltaV ProfessionalPLUS Station. The DeltaV engineering environment provides a standard set of TELEPERM M function blocks and control module templates for drag-and-drop configuration. To add a TELEPERM M control strategy in the DeltaV system, simply drag the control module template corresponding to the TELEPERM M control strategy to a plant area in DeltaV Explorer.

The TELEPERM M control module templates contain the appropriate TELEPERM M function blocks and preconfigured alarms and conditions to align with the TELEPERM M control strategies. The control module templates are also preconfigured to call up of the correct faceplate and detailed display on a DeltaV Operator Station.

User defined control modules can also be created by using the library of standard TELEPERM M function blocks in DeltaV Control Studio. For user-defined control modules, the preconfigured faceplates and detail displays used for the control module templates are easily modified.

Each function block contains data transferred via the interface and associated configuration data that is not transferred through the interface. The control module configuration can also be modified with the standard DeltaV bulk edit functionality.

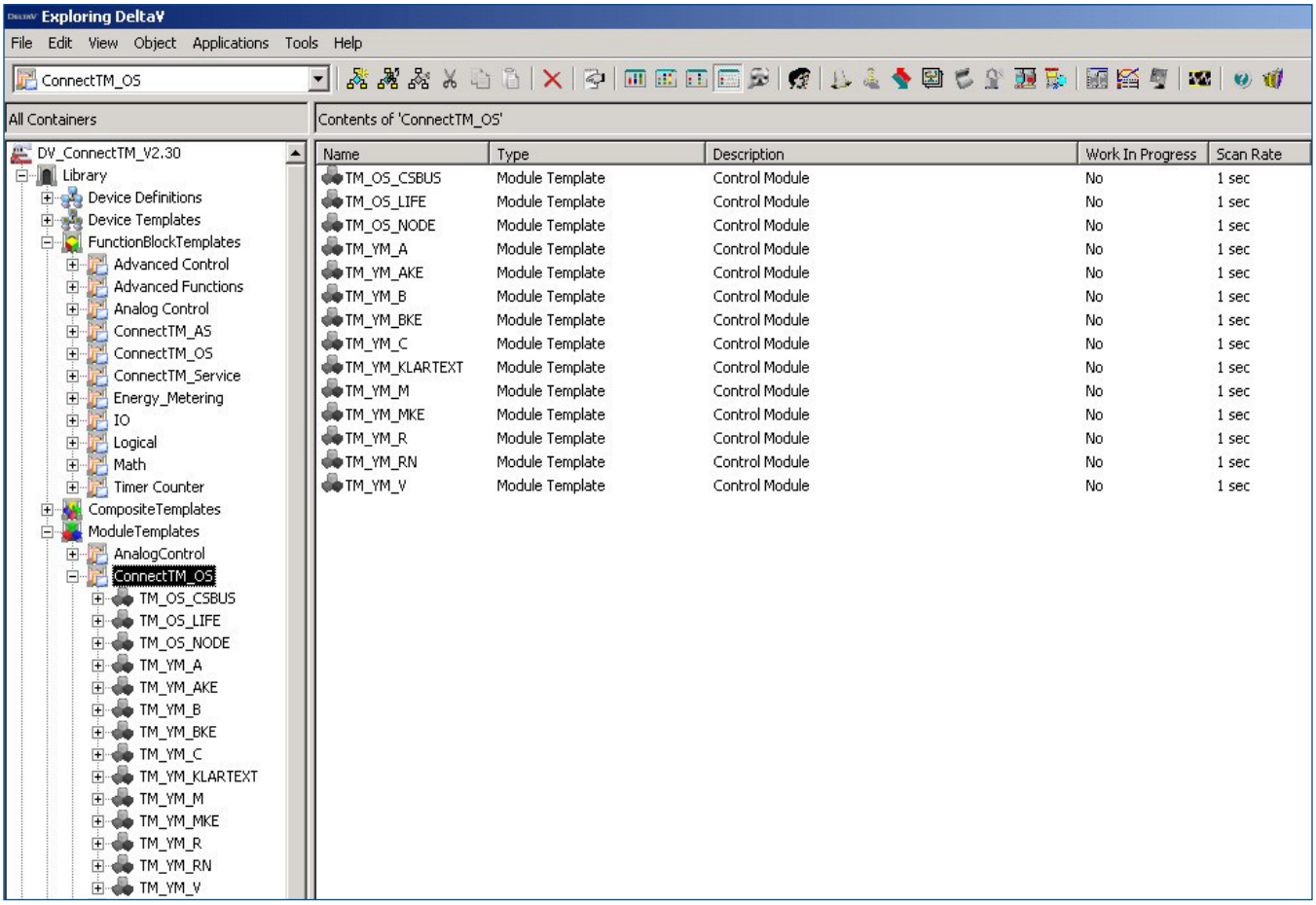

Figure 2 — *DeltaV Explorer view of DeltaV Connect control module templates.*

DeltaV Connect Solution for TELEPERM M System Function Blocks

The DeltaV Connect Solution for TELEPERM M System provides three types of TELEPERM M function blocks. Two standard function block types for TELEPERM M OS and AS data communications and a custom function block type.

Figure 3 shows a DeltaV Explorer view of the standard TELEPERM M OS function blocks which are typically used to monitor and operate a TELEPERM M system via TELEPERM M OS interface.

Figure 4 shows a DeltaV Explorer view of the standard TELEPERM M AS function blocks which are used for periodic communication between TELEPERM M AS components for process control or to send operational data to a TELEPERM M OS. In case of a stepwise transition from TELEPERM M to DeltaV where one portion of the control strategies are running in DeltaV controllers and the other portion is still running in TELEPERM M AS, the AS function blocks can be used for inter-controller communications between DeltaV controllers and TELEPERM M AS and for history collection of TELEPERM M data in the DeltaV system.

With the TELEPERM M system it was possible to create custom function blocks to address specific data or functional requirements not available in the standard AS function blocks. If needed for a project, Emerson will create the necessary custom function blocks to meet the customer's specification.

Figure 5 shows a DeltaV Explorer View of an example of TELEPERM M custom function blocks.

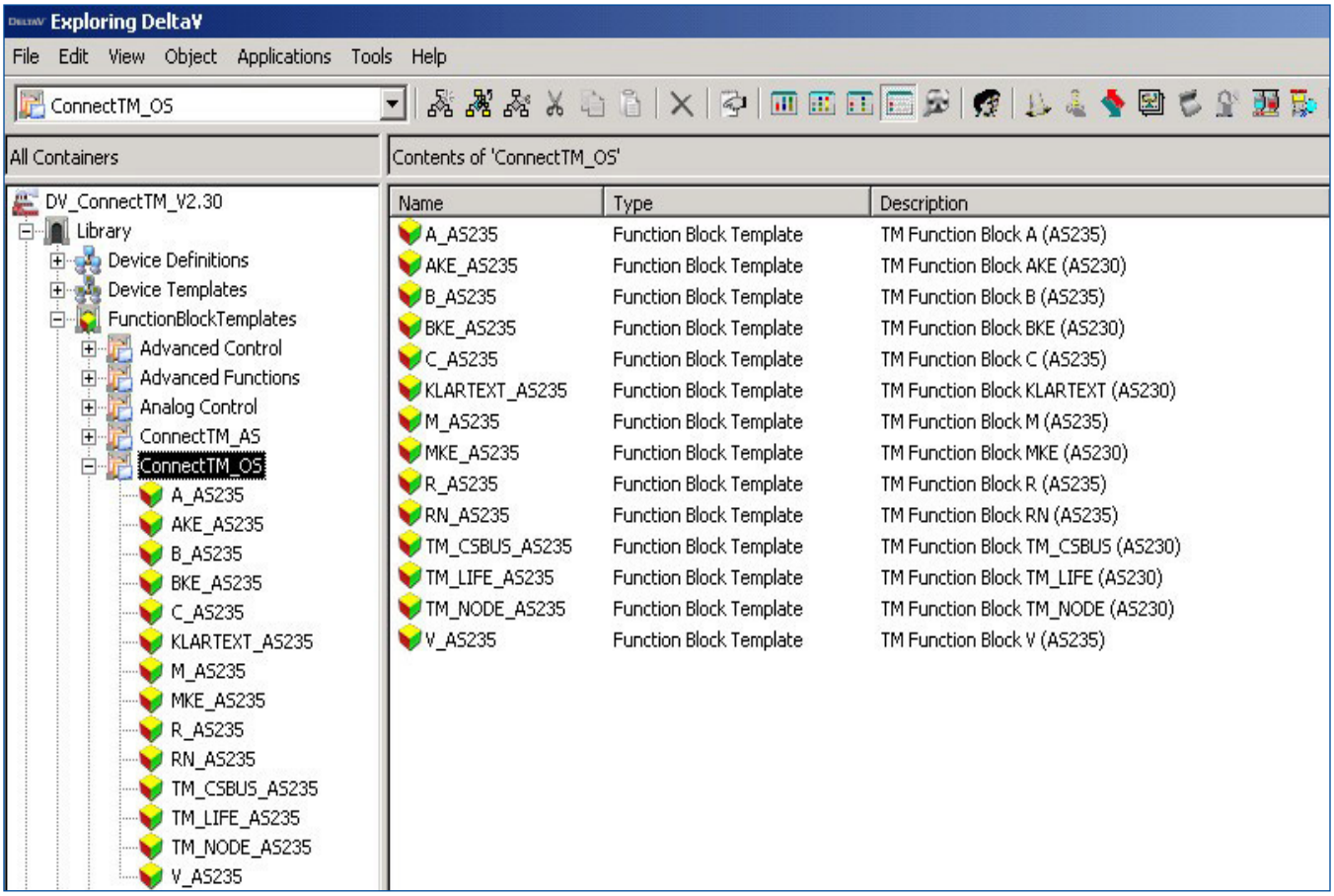

Figure 3 — *DeltaV Connect Solution for TELEPERM M systems OS function blocks.*

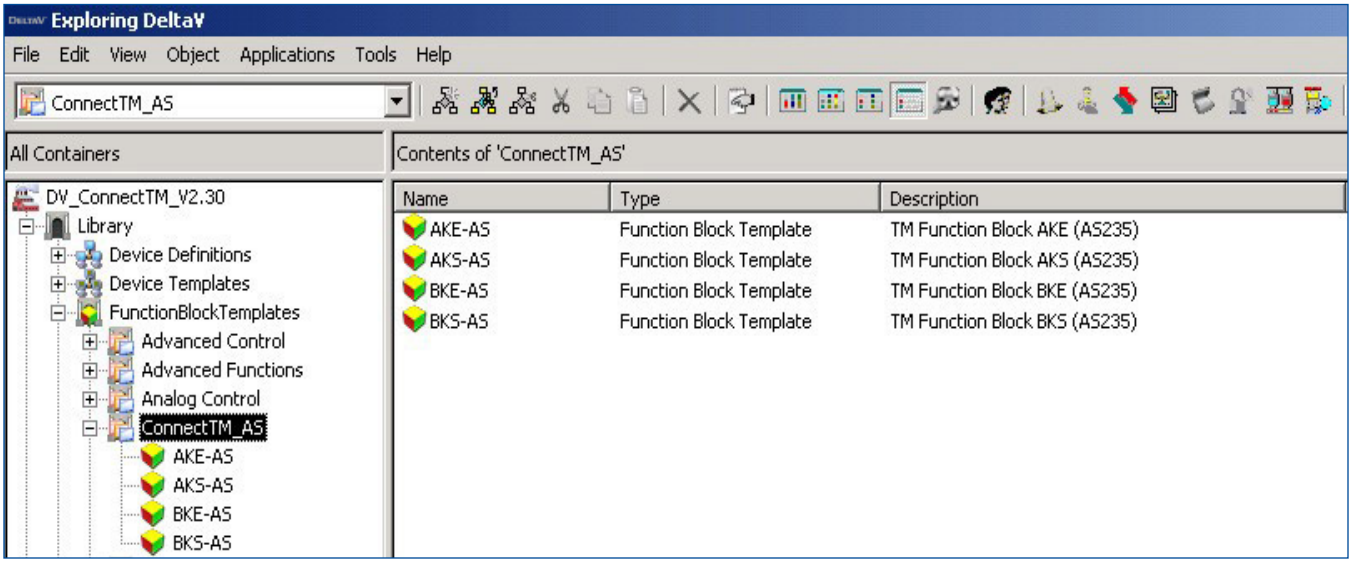

Figure 4 — *DeltaV Connect Solution for TELEPERM M systems AS function blocks.*

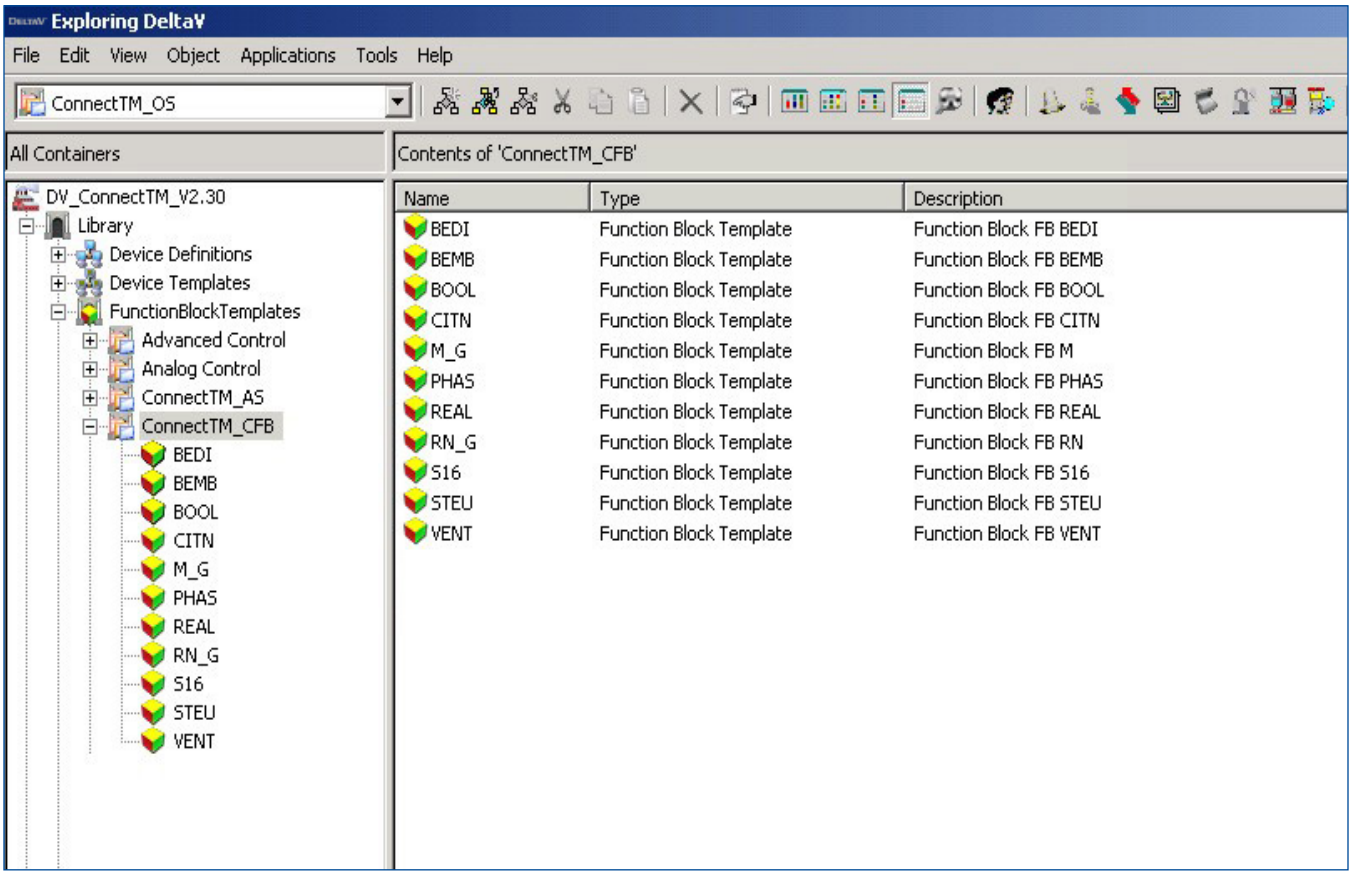

Figure 5 — *DeltaV Connect Solution for TELEPERM M systems example custom function blocks.*

Predefined Operator Faceplates and Detail Windows

The DeltaV Connect module templates are preconfigured to call up the associated faceplate and detailed display (where applicable) on a DeltaV Operator Station.

These faceplates and detail displays are designed to reduce the transition time in the ability to operate TELEPERM M sourced data on the DeltaV system. The design and layout of the faceplates and detail displays provide operators with data views similar to the data presented on a TELEPERM M OS. Additionally, descriptors for the data use familiar wording which operators are accustomed to on the TELEPERM M OS. This enables operators to ease and accelerate their transition to the new solution with little re-learning.

Figure 6 shows an example DeltaV faceplate and detail display for a TELEPERM M PID function block.

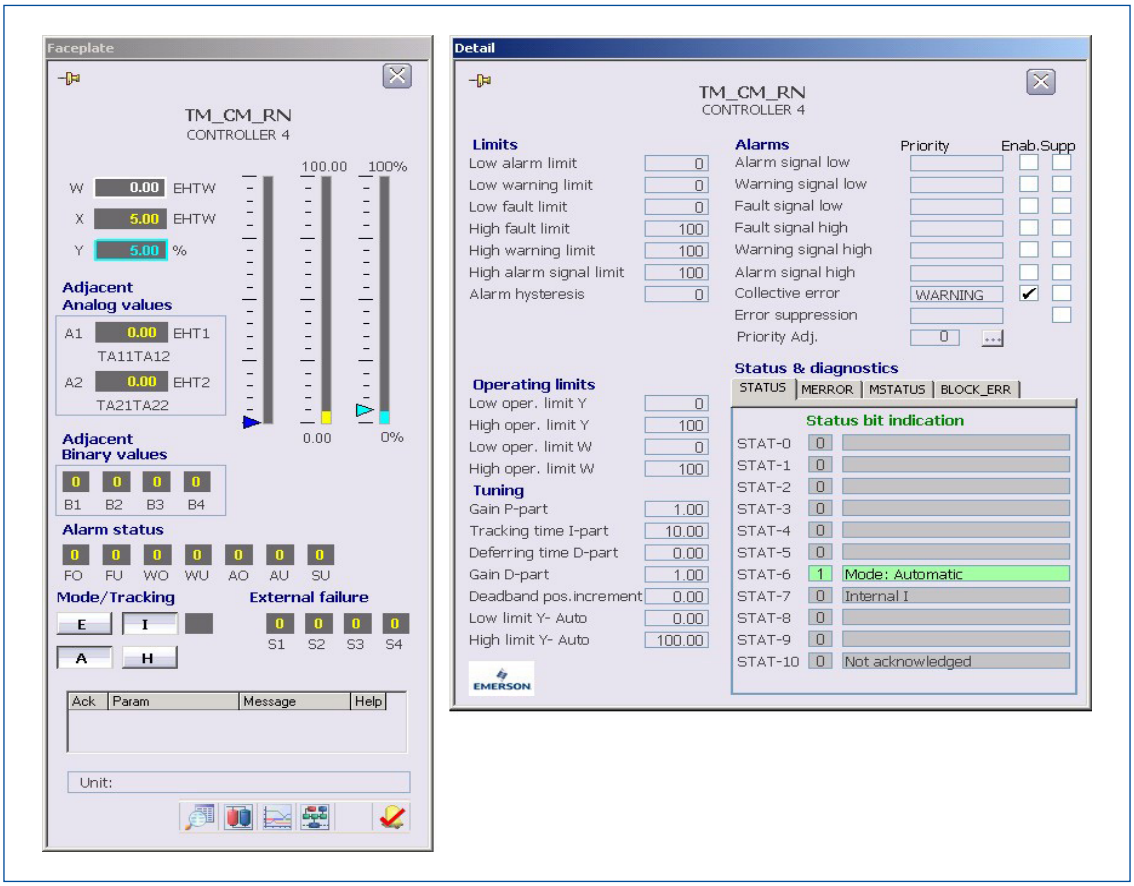

Figure 6 — *DeltaV Connect Solution for TELEPERM M System PID faceplate and detail display.*

System Compatibility

DeltaV Connect is compatible with the DeltaV system version and ADC-Bridge version as shown in Table 1. DeltaV Connect may be simplex or redundant (see Table 1).

DeltaV Connect license(s) provides for the use of the standard TELEPERM M function blocks. Other DeltaV system items are required for the interface to be operational, for example a DeltaV ProfessionalPLUS Station, DeltaV Application Station, and associated workstation suite licenses. The ADC-Bridge PC hardware, ADC-Bridge software, and Siemens N-PCI card hardware are also required for the complete solution. Please contact your local Emerson sales office for details.

DeltaV Connect	DeltaV System			ADC-Bridge/OS	ADC-Bridge/ AS	Simplex Interface	Redundant Interface
v2.3.2	v12.3.1	v13.3.1*	v14.3.1	v8.5.6	V2.6.2	Yes	Yes

**v13.3.1 does not supports Windows 10 and Server 2016, but they are supported in v14.3.1.*

Table 1 — *DeltaV Connect version Compatibility.*

The DeltaV system hardware and software requirements depend on the implementation of the DeltaV Connect as simplex or redundant (see Table 2). Each TELEPERM M interface requires an ADC-Bridge PC, ADC-Bridge software, and Siemens N-PCI card.

The following models of the Siemens N-PCI card are compatible with DeltaV Connect Solution for TELEPERM M System v2.3.1:

- 6DS1220 or 6DS1222 or 6DS1224 (old versions)
- 6DP1724 (new version)

DeltaV Connect Interface Requirements	Simplex Interface[1,3]	Redundant Interface[2,3]
DeltaV ProfessionalPLUS software suite license	One	One
DeltaV ProfessionalPLUS PC hardware	One	One
DeltaV Application Station software suite license	One	One
DeltaV Application Station server hardware	One	Two
DeltaV Connect function block license	One	One
DeltaV Connect redundancy license	N/A	One
ADC-Bridge PC hardware and software	One	Two
Siemens N-PCI card	One	Two

Table 2 — *DeltaV items required to for a DeltaV Connect Interface.*

[1] *Each simplex DeltaV Connect system interface requires one ProfessionalPlus PC, one ProfessionalPlus software suite license (25 DST), one Application Station PC, one Application Station software suite license (250 data values), one DeltaV Connect function block license, one ADC-Bridge PC and software, and one Siemens N-PCI card.*

[2] *Each redundant TELEPERM M system interface requires one ProfessionalPlus PC, one ProfessionalPlus software suite license (25 DST), two Application Station PCs, one Application Station software suite license (250 data values), one DeltaV Connect function block license, one DeltaV Connect redundancy license, two ADC-Bridge PCs and software, and two Siemens N-PCI cards.*

[3] *To add DeltaV Operator Stations to a simplex or redundant DeltaV Connect solution, add one PC and one DeltaV Operate software suite license for each Operator Station.*

Services

For help in planning, justifying or implementing your TELEPERM M 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 and Ordering Information

For inquiries and new DeltaV Connect sales, please contact your local Emerson sales office.

To scale up the function block license capacity on existing DeltaV Connect systems, see below.

Description	Model Number
DeltaV Connect Solution for Siemens Teleperm M Systems, 1000 Block Scaleup	VE22UPS0XX

Related Products

- **DeltaV ProfessionalPLUS Station Software Suite:** Centralized operations, engineering, configuration database and diagnostics on a DeltaV workstation.
- **DeltaV Operator Station Software Suite:** Centralized operations and diagnostics on a DeltaV workstation.
- **DeltaV Application Station Software Suite:** Integrate your DeltaV system with 3rd party systems and applications on a DeltaV workstation. Includes a scalable DeltaV Continuous Historian and DeltaV OPC Data Access server.

Prerequisites

- DeltaV system software. See Table 1 for DeltaV system version compatibility.
- One DeltaV ProfessionalPLUS Station PC and DeltaV ProfessionalPLUS Station software suite.
- One or more DeltaV Application Station server(s) and DeltaV Application Station software suite licenses, as required.
- One or more DeltaV Operator Station PC(s) and DeltaV Operator Station software suite, as required.

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