

ROConnect Interface



The ROConnect interface provides native integration of the ROC809 controller with the DeltaV system.

- Native DeltaV system integration
- Flexible communication network connectivity
- Intuitive configuration utility
- Automatic generation of DeltaV system configuration
- Additional OPC connectivity

Introduction

The ROConnect interface provides native integration of the DeltaV system with the Emerson Remote Automation Solution's ROC809 Series Controllers. ROConnect allows seamless integration of process plants controlled by the DeltaV system with wellhead, pipelines, tank farms or other widely distributed installations controlled with the ROC809. Use the ROConnect interface to easily monitor these remote sites from the DeltaV system.

The ROConnect interface provides a complete integration solution that includes an easy-to-use graphical configuration utility that allows you to quickly identify the ROC data of interest and automatically generate the DeltaV system configuration.



Benefits

Native DeltaV system integration. The ROConnect interface provides integration of ROC809 point data into DeltaV function blocks. The DeltaV system and the ROC809 integrate natively, meaning it is not an OPC or other generic connection, but a direct interface, with no data mapping required. Data is transferred directly from the ROC809 controller to DeltaV function blocks running in the DeltaV workstation. ROConnect provides a complete solution for integration of ROC Point, and Electronic Flow Measurement History data.

Flexible communication network connectivity. The ROConnect interface allows various physical network communications between the DeltaV system and the ROC809 controller. The network connection can be hard-wired, wireless, or dialup. The DeltaV system connects to the ROC network using the ROCPlus protocol. Choose the right physical network connectivity to meet your specific requirements.

Intuitive configuration utility. The ROConnect interface includes an intuitive configuration utility that allows you to browse ROC809 data and select points or values that will be integrated with DeltaV.

Automatic generation of DeltaV system configuration. The ROConnect Utility enables automatic generation of DeltaV function block configuration using the utility's FHX file generation capability. Export the FHX file from the utility and import it into the DeltaV system and your DeltaV system configuration is complete!

Additional OPC connectivity. The ROConnect interface includes an OPC Data Access server for additional access to the ROC809 data. With the exception of history data, all ROC points and corresponding parameters are exposed for full read/write access via OPC. Use the ROConnect OPC server to integrate ROC data with other 3rd party applications.

Product Description

The ROConnect interface provides native integration of ROC809 point data into the DeltaV system via function blocks running in the DeltaV workstation. The ROConnect interface and the ROC function blocks may run in a DeltaV ProfessionalPlus or Application Station. Typically, the DeltaV ProfessionalPlus is used for smaller system

integration where the Application Station is used for larger system integration.

The ROConnect interface includes the following components and functionality.

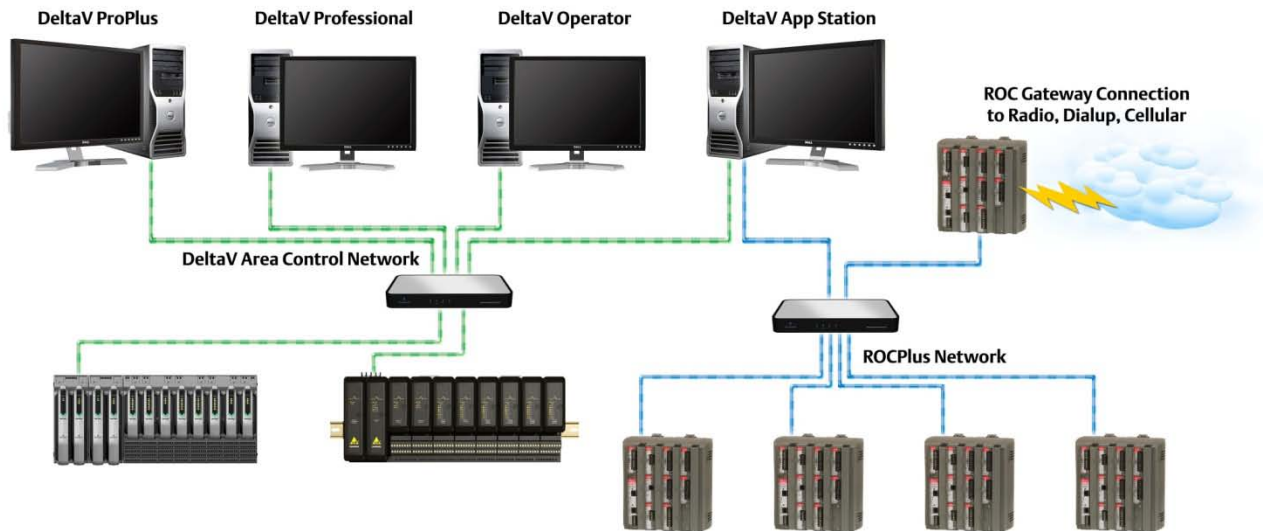
- The ROConnect configuration utility is used to browse ROC809 data and select points or values that will be integrated with DeltaV.
- Auto-generation of DeltaV function block configuration.
- Scheduling, and storing of ROC Electronic Flow Measurement (EFM) files for custody transfer applications. Conversion of EFM data to Coastal Flow and P-Gas files can also be automatically scheduled.
- Time synchronization control of the ROCs with the DeltaV host time clock.
- Supports HART pass-through for AMS interfaces.
- ROC809 OPC Data Access server for full read/write access to ROC points and parameters.

The ROConnect interface can read ROC EFM data for storage and conversion to Coastal Flow and PGAS custody transfer file formats. Additionally, the ROConnect Application supports all ROC809 point types, data tables, and user-defined data types. Data from custom ROC firmware applications (like the Danload 8000) can also be integrated with DeltaV using the ROConnect application.

Applications. ROConnect allows seamless integration of process plants controlled by the DeltaV system with wellhead, pipelines, tank farms and other remote installations controlled by the ROC809. ROConnect allows connectivity of Inside Battery Limit (ISBL) Systems with Outside Battery Limit (OSBL) Controllers.

With the tight integration between the DeltaV system and the ROC809, ROConnect may provide an alternative to remote monitoring and control applications traditionally served with PLCs. ROConnect integrates the DeltaV system with the ROC809 natively, using DeltaV function blocks, so there is no OPC mapping as you might find in a PLC integration solution.

The ROConnect interface uses a third network interface card in a DeltaV ProfessionalPlus or Application Station to connect the DeltaV system with the ROCPlus network. The ROConnect interface may be used in systems with or without DeltaV Controllers.



Easy and flexible integration of the DeltaV system and the ROC809.

Implementation. The ROConnect interface has three functional parts: the ROConnect Communication Suite, the ROConnect Configuration Utility and the DeltaV System Module Templates.

ROConnect Communication Suite. The ROConnect Communication Suite uses the ROCPlus Protocol, handles polling of individual scan threads, and passes data to DeltaV system modules and to the ROConnect OPC Server. The application reads EFM Reports and saves them in their native form on the ROConnect workstation. It converts EFM data to Coastal Flow and PGAS report formats. It allows for time synchronization of ROCs with DeltaV Systems.

ROConnect Configuration Utility. The ROConnect Configuration Utility allows you to configure all DeltaV Modules. It reads ROCLink 800 databases or reads directly from the ROCs via the ROCPlus network. With the configuration utility, you can browse to data of interest and configure scan threads. You can export DeltaV function block definitions to .FHX files. You can also schedule network time synchronization. Configuration files are saved in an XML file format.

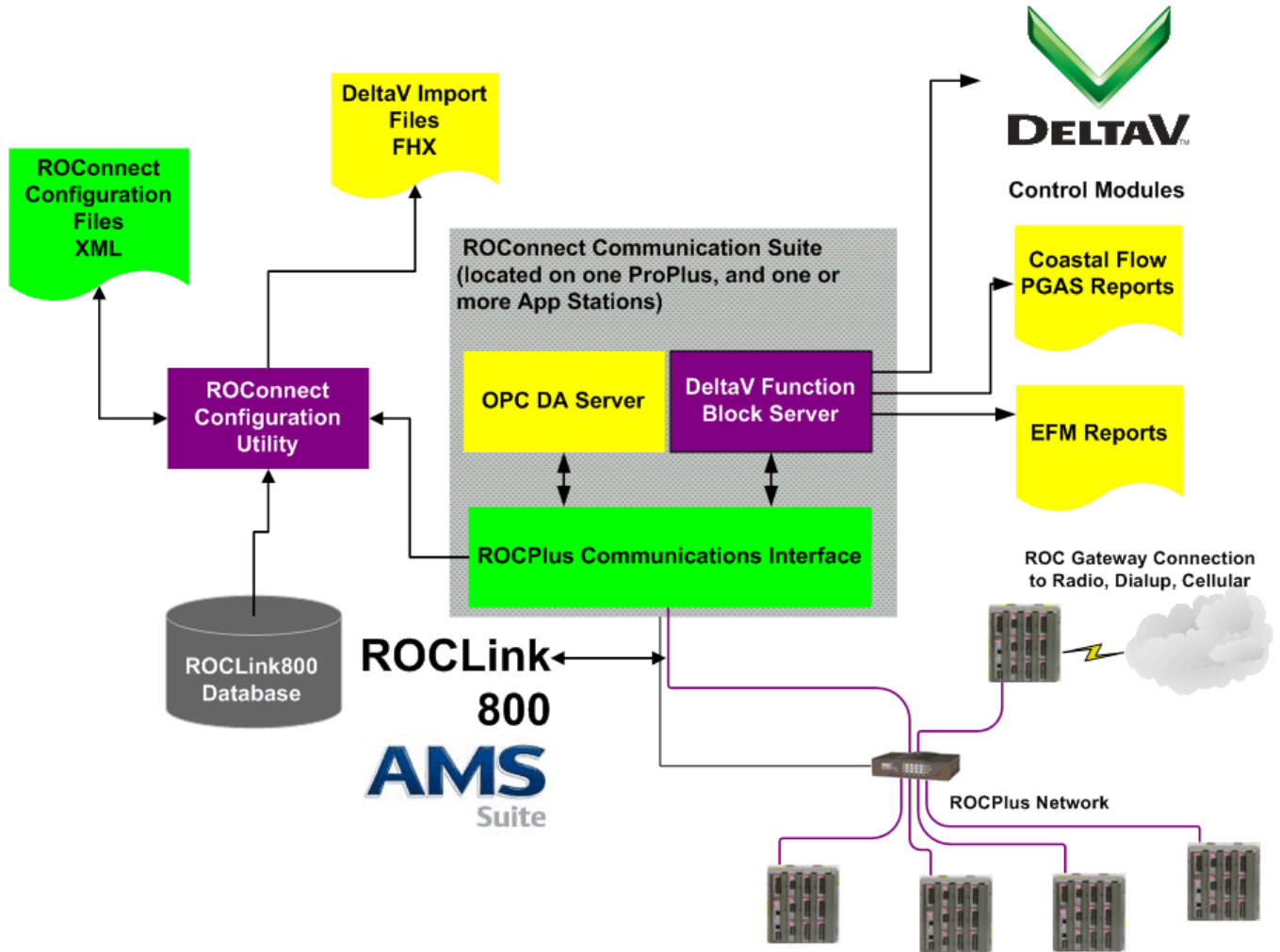
DeltaV System Module Templates. DeltaV System Module Templates are provided to allow custom modules for integration of ROC data. This provides secure, tight integration with the ROC809.

ROC809 Remote Operations Controller. The ROC809 Remote Operations Controller is a microprocessor-based flow computer that also provides the functions required for a variety of field automation applications. The ROC809 monitors, measures, and controls equipment in a remote environment. The ROC809 is ideal for any applications requiring flow computation; Proportional, Integral, and Derivative (PID) control loops; logic sequencing control; and up to 12 meter runs.

The ROC809 controller is highly innovative and versatile. It has a backplane to which the Central Processing Unit (CPU), power input module, Input/Output (I/O) modules, and communication modules connect. The ROC809 unit has nine slots for modules: the first three slots are for either communication or I/O modules, and the remaining six slots are for I/O modules only.

The ROC809 has the following features:

- Rugged, reduced-maintenance hardware.
- High isolation, surge and short circuit protection.
- Low power consumption.
- Wide operation temperature –40 to 75°C.
- Up to 9 easily installed modular I/O cards.
- Versatile serial and Ethernet communications.
- Class I, Div. 2 & Zone 2 hazardous location approval.
- Metering station support up to 12 runs.
- Large, configurable history storage.
- Easy-to-use ROCLINK-800 configuration software.
- Custom programming with Function Sequence Tables or DS800 IEC 61131-3 development suite.



ROConnect interface architecture and applications.

Function Block Definitions

ROC_NETWORK_CFG. This function block defines which adapter to use to access the ROC network, and global network configuration information.

Name	Data Type	Use
NETWORK_NAME	DT_WCHAR_PTR	A descriptive name for the network.
NETWORK_ID	DT_UNSIGNED8	The numeric ID for the network.
GROUP	DT_UNSIGNED8	The ROC group number for the host computer.
UNIT	DT_UNSIGNED8	The ROC unit number for the host computer.
IP_ADDRESS	DT_WCHAR_PTR	The IP address of the adapter to use for communication.
SYNC_SCAN_ID	DT_UNSIGNED8	The ID of the scan thread to use for time synchronization.
SYNC_ENABLE	DT_UNSIGNED8	A global enable flag for time synchronization. Set to zero to disable time sync.
SYNC_TRIGGER	DT_UNSIGNED8	A manual trigger for time synchronization. Write a one to this attribute to trigger time sync.
SYNC_MAX_ERROR	DT_UNSIGNED32	The maximum allowed difference between host and ROC times (in milliseconds) for time synchronization to be declared a success.
MAX_SYNC_LATENCY	DT_UNSIGNED16	The maximum average network latency permitted for time synchronization to occur
MAX_SYNC_STD_DEV	DT_UNSIGNED16	The maximum standard deviation in network latency permitted for time synchronization to occur
CPU_LOAD	DT_UNSIGNED8	The percentage of system processor time consumed by the scanner service over the past second.
LIVE_TIME	DT_UNSIGNED32	This timestamp is continually updated to provide a means of verifying, from DeltaV, that the scanner is still running.

Table 1. ROC_NETWORK_CFG Function Block.

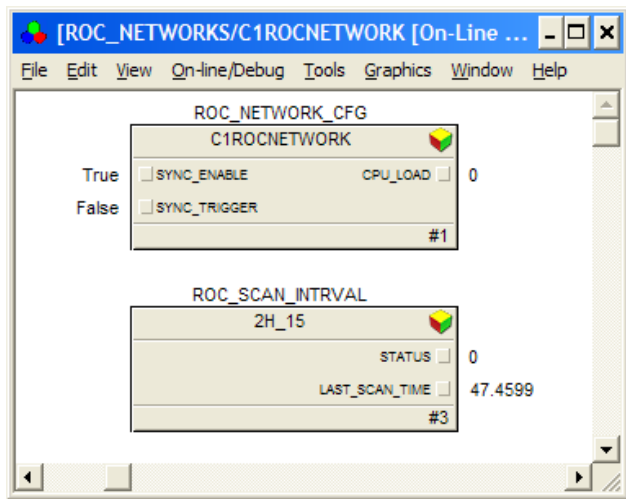
ROC_SCAN_INTRVAL. This function block defines a scan thread.

Name	Data Type	Use
SCAN_ID	DT_UNSIGNED8	The numeric ID for the scan thread.
SCAN_TYPE	DT_UNSIGNED8	The type of interval: 0: 100ms 1: Seconds 2: Hours 3: Days 4: Aperiodic
SCAN_TIME1	DT_UNSIGNED8	The base interval multiplier1
SCAN_TIME2	DT_UNSIGNED8	The scheduled time2
SEC_INTERVAL	DT_UNSIGNED8	The secondary scan time in seconds
LAST_SCAN_TIME	DT_FLOAT	The amount of time required to complete the last scan, in milliseconds.
LAST_TIME	DT_UNSIGNED32	The timestamp when the last scan began.
STATUS	DT_UNSIGNED8	The status of the thread: 0: The thread is running 1: The thread terminated unexpectedly

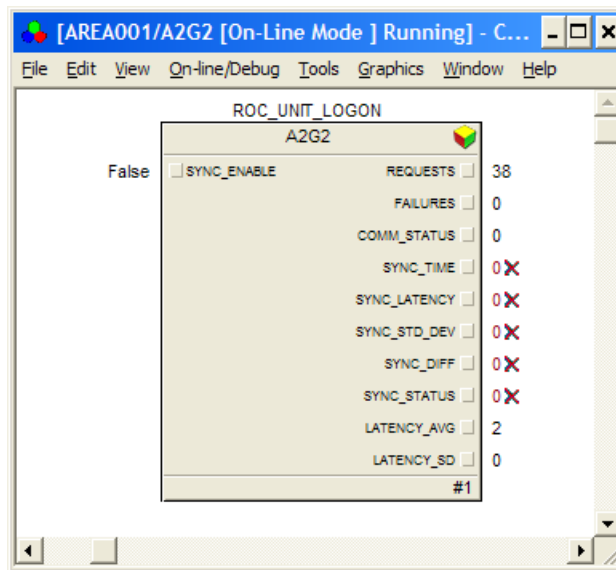
Table 2. ROC_SCAN_INTRVAL Function Block.

Example: SCAN_TYPE = 1, SCAN_TIME1 = 5; the thread will run every 5 Seconds.

Example: SCAN_TYPE = 2, SCAN_TIME1 = 6, SCAN_TIME2 = 15; the thread will run every 6 hours at 15 minutes past.



ROC_SCAN_INTRVAL function block.



ROC_UNIT_LOGON function block.

ROC_CONNECTION. This function block specifies the connection information for a ROC.

Name	Data Type	Use
CONNECTION_NAME	DT_WCHAR_PTR	A descriptive ROC name.
NETWORK_ID	DT_UNSIGNED8	The ID of the network to which the ROC belongs
IP_ADDRESS	DT_WCHAR_PTR	The IP address of the ROC
PORT	DT_UNSIGNED16	The port on the ROC to connect to
GROUP	DT_UNSIGNED8	The ROC's group number
UNIT	DT_UNSIGNED8	The ROC's unit number
RETRIES	DT_UNSIGNED8	The number of times to retry a failed operation
RETRY_INTERVAL	DT_UNSIGNED16	The base interval at which retries are triggered ¹
REQUESTS	DT_UNSIGNED32	A cumulative count of requests sent to the ROC since the scanner was started
FAILURES	DT_UNSIGNED32	A cumulative count of failed requests since the scanner was started
SCAN_ID	DT_UNSIGNED8	The default scan thread associated with the ROC
COMM_STATUS	DT_UNSIGNED8	The communications status with the ROC 0: Good 1: Could not bind to the local adapter 2: Could not connect to the ROC 3: Connection limit to the ROC exceeded 4: Could not log in to the ROC
OPERATOR ID	DT_WCHAR_PTR	The operator ID used when connecting to the ROC
PASSWORD	DT_UNSIGNED16	The password used when connecting to the ROC
ACCESS_LEVEL	DT_UNSIGNED8	The access level used when connecting to the ROC
SYNC_ENABLE	DT_UNSIGNED8	Set to 1 to enable time synchronization for the ROC
SYNC_READS	DT_UNSIGNED8	Specifies the number of network latency sensing reads to perform as part of time synchronization
SYNC_TIME	DT_UNSIGNED32	The timestamp at which the last time synchronization was performed
SYNC_LATENCY	DT_UNSIGNED16	The average network latency measured for the last time synchronization
SYNC_STD_DEV	DT_UNSIGNED16	The standard deviation of network latency measured for the last time synchronization
SYNC_DIFF	DT_UNSIGNED32	The difference in between the ROC and host times after the last time synchronization
SYNC_STATUS	DT_UNSIGNED8	The result code for the last time synchronization 0: Success 1: Failed 2: Network latency too high to attempt sync 3: Network variance too high to attempt sync 4: Sync completed with excessive difference
LATENCY_AVG	DT_UNSIGNED16	A running average of the network latency to the ROC
LATENCY_SD	DT_UNSIGNED16	A running standard deviation of the network latency to the ROC

Table 3. ROC_UNIT_LOGON Function Block.

Exponential doubling (up to 16 times the original interval) is used. For example, if 6 retries are specified with a base interval of 250ms, retries will occur at times 250ms, 750ms, 1,750ms, 3,750ms, 7,750ms and 11,750ms.

ROC_HISTORIAN. This function block is used to configure and control history collection for a ROC

Name	Data Type	Use
ROC_ID	DT_UNSIGNED32	The ID ROC
SCAN_ID	DT_UNSIGNED8	The scan thread associated with the historian (set to 0 to use the ROC's default)
SCAN_ENABLE	DT_UNSIGNED8	Set to 1 to have the history captured each time the scan thread runs
TRIGGER	DT_UNSIGNED8	Write to this attribute to manually trigger a history capture
PGAS	DT_UNSIGNED8	Set to 1 to have a PGAS report generated after each capture
FLOW_CAL	DT_UNSIGNED8	Set to 1 to have a Coastal Flow report generated after each capture
DIRECTORY	DT_WCHAR_PTR	The directory into which the history and report files will be placed
REPORT_START	DT_UNSIGNED32	The earliest timestamp covered by the last history acquisition. Also, when triggering a manual history capture, this should be the beginning of the history range to report on.
REPORT_END	DT_UNSIGNED32	The last timestamp covered by the last history acquisition. Also, when triggering a manual history capture, this should be the end of the history range to report on.

Table 4. ROC_HISTORY Function Block.

Point Parameter Blocks

ROC_P_<DataType>. These function blocks are used to access a single parameter of a single point. There is one for each data type, and the name of the function block corresponds to that type (e.g., ROC_P_UINT8 is used for unsigned, 8-bit integer parameters).

Name	Data Type	Use
TLP_T	DT_UNSIGNED8	The point type component of the parameter's TLP address
TLP_L	DT_UNSIGNED8	The logical point component of the parameter's TLP address
TLP_P	DT_UNSIGNED8	The parameter component of the parameter's TLP address
PARAM_NAME	DT_WCHAR_PTR	A descriptive name for the parameter
WRITE_ENABLE	DT_UNSIGNED8	Set to 1 if the parameter is writeable
VALUE_IN	<Data Type>	The input for writing to the parameter
VALUE	<Data Type>	The current value of the parameter
ROC_ID	DT_UNSIGNED32	The ID of the ROC
SCAN_ID	DT_UNSIGNED8	The scan thread associated with the parameter (set to 0 to use the ROC's default)
SEC_SCAN	DT_BOOLEAN	Set to true to have the block update at the secondary scan rate of the scan thread it is assigned to
COMM_STATUS	DT_UNSIGNED8	Unused

Table 5. ROC_PARAM_UINT8 Function Block.

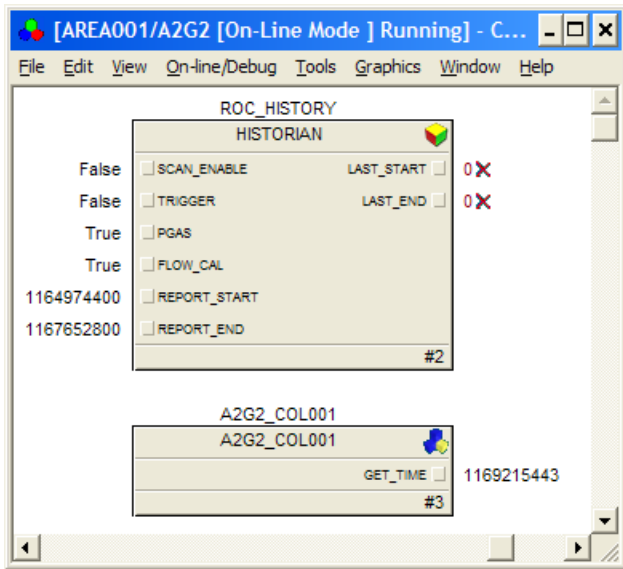
Point Blocks

ROC_P_<POINT_TYPE>_A. These function blocks represent a point type in the ROC. The parameters in this group are limited to only the most frequently used parameters. The name of the function block is derived from the point types' standard abbreviations (e.g., ROC_P_AIN_A is the function block for an analog input).

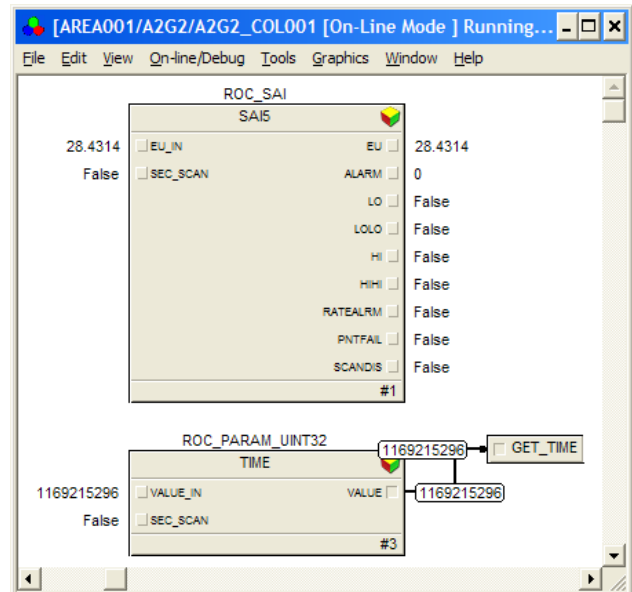
Name	Data Type	Use
ROC_ID	DT_UNSIGNED32	The ID of the ROC
POINT_INDEX	DT_UNSIGNED8	The logical index of the point
SCAN_ID	DT_UNSIGNED8	The scan thread associated with the parameter (set to 0 to use the ROC's default)
SEC_SCAN	DT_BOOLEAN	Set to true to have the block update at the secondary scan rate of the scan thread it is assigned to
COMM_STATUS	DT_UNSIGNED8	Unused
<Parameter Abbreviation>		Each frequently used parameter from the point type will be included as an attribute. The name of the attribute matches the standard abbreviation for the parameter.

Table 6. ROC_P_<POINT_TYPE>_A Function Block.

These function blocks represent a complete point type in the ROC. The function blocks in this group are identical to their counterparts from the previous section except that they contain all of the point type's parameters.



ROC_HISTORY function block.



ROC analog input function block.

Ordering Information

Description	Model Number
ROConnect 500 Function Block License	VE2246S0500
ROConnect 1000 Function Block License	VE2246S1000
ROConnect 5000 Function Block License	VE2246S5000

The ROConnect interface requires the ROConnect interface application software and a ROConnect function block license. The ROConnect application software must be purchased from Mynah Technologies. The ROConnect function block license must be purchased from Emerson Process Management. The ROConnect application software and ROConnect function blocks may be used on a DeltaV ProfessionalPlus or Application Station.

The ROConnect interface application software is sized according to the number of function blocks required. The ROConnect application software licenses available from Mynah Technologies are listed below. Contact Mynah Technologies for more information or visit www.mynah.com/products/roconnect.

Description	Mynah Technologies Model Number
ROConnect Software License for 500 Function Blocks	IOD-3101
ROConnect Software License for 1000 Function Blocks	IOD-3102
ROConnect Software License for 5000 Function Blocks	IOD-3103

Related Products

Prerequisites

- ROConnect application software, release 1.1 or later
- DeltaV system software, v8.3 or later.
- DeltaV ProfessionalPlus or Application Station.
- One or more ROC809 controllers.

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