Serial Interface

The DeltaV Serial Interface provides a connection between the DeltaV system and other devices.

- Provides seamless information interface
- Plug-and-play easy to use
- Extends the life of existing equipment

Introduction

The Serial Interface provides a connection between the DeltaV system and devices that support a serial protocol, such as Modbus or Allen Bradley's Data Highway Plus.

The Serial Interface is supplied with Modbus software drivers pre-loaded. Plug your Serial Interface into any available slot in the I/O interface carrier, connect the third-party device, power up and play. Like all DeltaV I/O, the Serial Interface may be added online while the rest of the controller I/O is powered up and in use.[1]

Benefits

Provides seamless information interface. Using the Serial Interface with the DeltaV system, you gain an extended view of your entire plant. All serial information is readily available for display at the Operator Interface.

When connected to a PLC, DeltaV software may pass supervisory information to the PLC facilitating the coordination of control strategies across systems.

[1] Refer to Zone 2 installation instructions (12P2046) and/or Class 1 Division 2 installation instructions (12P1293) for details.

Plug-and-play easy to use. Plug-and-play installation saves money. The Serial Interface works just like other DeltaV I/O interfaces. It fits into any available slot on the controller I/O carrier. There are no dipswitches. *Just plug it in!*

The DeltaV controller auto-senses the Serial Interface and presents the configuration options. Online help makes this interface a snap to configure. After a simple point-and-click configuration exercise, your integrated solution is up and running.

Extends the life of existing equipment. Enhance existing capabilities—don't replace them. Many plants have a variety of devices already installed. With the Serial Interface you are able to effectively interface a DeltaV system with existing PLCs or other serial devices. This means that you can layer the state-of-the-art process control offered by a DeltaV system on to the devices you already have in place.

Product Description and Specification

The Serial Interface consists of a serial card (KJ3003X1-BA1) and a terminal block (KJ3003X1-EA1). The card contains two serial communications ports that support RS232 and RS422/485 half duplex, or RS422/485 full duplex signals. These ports are individually configurable and support data rates up to 115 KBaud.

The card has the common DeltaV form factor, allowing it to be plugged into any available slot in the I/O interface carrier. The card is clearly labeled with the interface type. LEDs, located on the front of the card, show the power, error, and port status of the interface at a glance.

The standard Modbus protocol includes the Serial Interface, the Modbus RTU, and ASCII communications protocol as defined in the Modicon Modbus Protocol Reference Manual dated March 1992 (PI-MBUS-300 REV D). Each Serial Interface port may be configured as either a master or slave device.

The serial card supports the following features using the Modbus protocol:

- Reading input data from Modbus coils, input status, holding registers and normal input registers.
- Writing output data to coils and holding registers.
- Output data can be written in single coil, register mode, or complete data set mode. This output mode is a configurable parameter.
- Input data can be read in as a complete data set, providing the best performance.

The serial card supports the input and/or output of 16 different data sets per serial port, for a total of 32 data sets per Serial Interface.

When data values come into the DeltaV system through a serial card, each data set that lands on one module counts as one DST. Each data set can hold up to 100 data values. Therefore, if you have 100 data values in a data set that comes in on one module, it counts as only one DST. If you have the same 100 values in a data set that comes into six modules, you will have six DSTs. In both cases, you can alarm and control any of the 100 values and the DST count will remain the same. The maximum number of DSTs supported per port in the DeltaV Serial Interface is 250.

Both Modbus RTU and Modbus ASCII communications modes are supported by standard Modbus protocol.

Other Protocols Supported

The DeltaV serial module can support other serial driver protocols downloaded directly into the serial card. Custom drivers currently available from Fisher-Rosemount Systems for the DeltaV serial module include:

- AGA3 Gas Flow Calculators
- AGA8 Gas Flow Calculators
- Allen-Bradley Data Highway Plus
- Control Technique Drive (Modbus)
- Mettler O-082 Weight Scale
- Modbus Redundancy
- Moore Products LIL
- RMV9000MVCU3 Controller
- Rotork Pakscan
- Satorious MP-8 Weight Scale
- Satorious xBPI Weight Scale
- Siemens 3964R
- Spartan DeltaV Metering Program
- Turnbull TCS6000
- Brooks Instruments Petrocount Ratio Management System

Fisher-Rosemount Systems has a long history of developing new custom serial driver protocols for its other control systems. Call your local sales office for availability of these drivers and any driver not listed above.

Modbus Function Codes Supported

The Serial Interface uses the following Modbus communications protocol function codes to read and write values to and from the Modbus device when acting as a Modbus master device.

Modbus Function Codes Supported		
Code	**Meaning**	**Description**
1	Read coil dtatus	Obtain current status (on/off) of a group of logic coils
2	Read input status	Obtain current status (on/off) of a group of discrete inputs
3	Read holding registers	Obtain current binary value of one or more holding registers
4	Read input registers	Obtain current binary value of one or more input registers
5	Force single coil	Force logic coil to a state of ON or OFF
6	Preset single register	Write a single binary value into a holding register
8	Diagnostics	Sub-function 2 is used to retrieve the Diagnostic Register of a PLC
15	Force multiple coils	Forces a series of consecutive logic coils to defined ON or OFF states
16	Preset multiple registers	Writes specific binary values into a series of consecutive holding registers
17	Report slave ID	Used to obtain the run (on/off) state of a PLC

For detailed information on the Modbus communications protocol and specific communications function codes refer to the *Modicon Modbus Protocol Reference Guide* dated March 1992 (PI-MBUS-300 REV D).

Serial Interface Specifications	
Number of serial ports	2
Number of data sets per Serial Interface card	32 (16 per port)
Number of Device Signal Tags per Serial Interface	500 maximum (total of both ports)
Number of device signal tags per Serial Interface port	500 maximum[2]
Port types	RS232, RS422/485 half duplex, RS 422/485 full duplex (configurable with the DeltaV Explorer)
Isolation	Each port is isolated from the system and from the other. These ports must be externally grounded.
Baud rate	300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
Parity	Even, Odd, None
Data bits	7 or 8
Stop bits	1 or 2
Retry count	0 – 255
Message time out	100 – 25,500 msec. (100 msec. Increments)
Transmit delay	0 – 25,500 msec. (100 msec. Increments)
Send outputs on startup	In the DeltaV Explorer, the user is able to indicate whether or not outputs should be sent on interface initialization.

[2] Note that the total capacity of the Serial Interface Card can be used with a single port. This provides maximum flexibility for project needs.

Environmental Specifications	
Storage temperature	-40 to 85 °C (-40 to 185 °F)
Operating temperature	0 to 60 °C (-32 to 140 °F)
Relative humidity	5 to 95% , non-condensing
Airborne contaminants	ISA-S71.04-1985 Airborne Contaminants Class G3
Hazardous area/location*	CENELEC Zone 2 IIC T4 hazardous area and Class 1, Div 2, Groups A. B, C, D T4 hazardous locations.
Protection rating	IP 20
Shock	10 g ½-sine wave for 11 ms
Vibration	3 mm peak-to-peak from 5 to 13 Hz; 0.5 g from 13 to 150 Hz

*Refer to Zone 2 installation instructions (12P2046) and/or Class 1 Division 2 installation instructions (12P1293) for information on installing in hazardous areas.

Ordering Information

The DeltaV Serial Interface ships from the factory with Modbus drivers pre-installed.

Drivers other than Modbus must be purchased separately and then downloaded into the Serial Interface.

Users must purchase a *Serial Interface port-license* to activate each port on the Serial Interface, regardless of what protocol they are using on the serial card.

Description	Model Number
Serial Interface, 2-ports, terminal block	VE4006P2
Serial Interface port license	VE4102

Prerequisites

- DeltaV version 3.0 or later software.
- DeltaV M3, M5 Plus or MD controller.

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