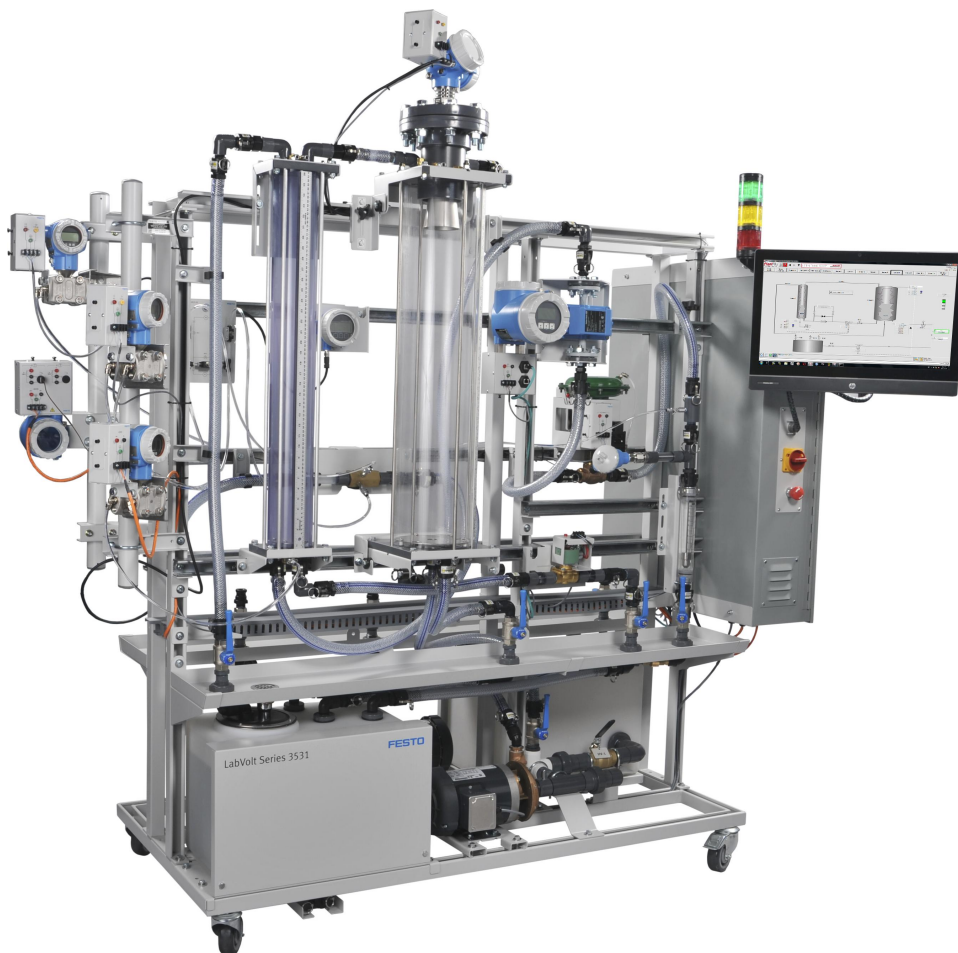


PlantPax™ Distributed Control System (DCS) Demonstrator - Pressure, Flow, Level, Temperature 589631 (3531-V0)

FESTO

LabVolt Series

Datasheet



* The product images shown in this document are for illustration purposes; actual products may vary. Please refer to the Specifications section of each product/item for all details. Festo Didactic reserves the right to change product images and specifications at any time without notice.

Festo Didactic
en 120 V - 60 Hz
01/2025

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General Description

The Distributed Control System (DCS) Demonstrator is a modular demonstration unit capable of showing real-life process applications across a wide range of industries, including water and wastewater, oil refining, petrochemical, and food processing.

The PlantPax DCS Training System is a demonstrator that can be used to train students on the instruments used to control or monitor industrial processes including temperature, pressure, flow, and level process variables. The training system is configured to teach different types of PID process control loops as well as different type of control strategies. The system is capable to monitor Pressure, Flow and Temperature process variables. The Demonstrator features two level PID control loops working simultaneously to maintain a stable level in each column even when disturbance occurs. The PID Level control loop of the large column works in Cascade mode with the flow rate and use a pneumatic control valve as a the final element.

The Demonstrator also features a pressure control loop that maintain a stable pressure at the inlet of the large column. The pressure control loop uses the centrifugal pump with an industrial variable frequency drive to maintain the desired pressure.

The Learning System uses modern equipment and user guides that will explain students on how to configure and use devices found in the process industry. The system also features a sequencer performing an automatic start-up sequence to facilitate the operation of the system.

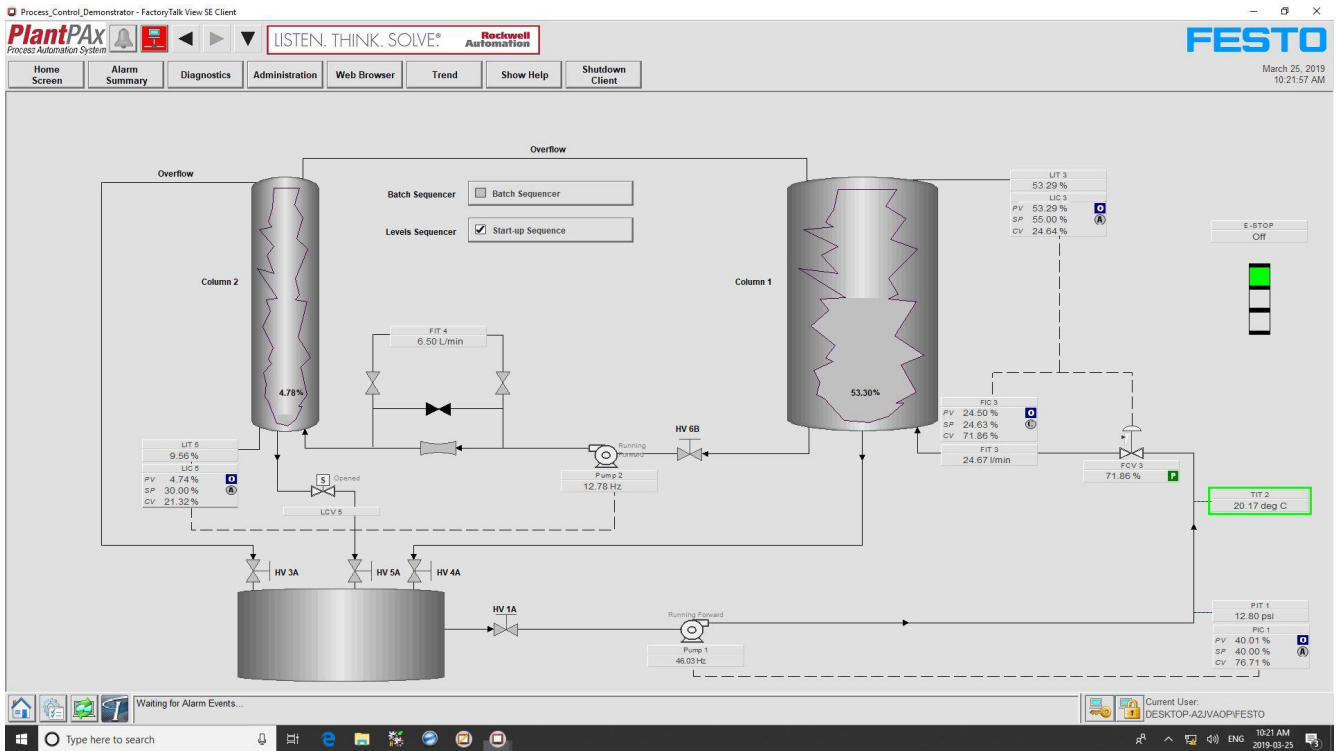
The Demonstrator features a batch sequencer that permit to fill-up the small column with four different amount of water and running the batches permit to the trainee to see the impact of the process stability.

The PlantPax™ DCS Demonstrator uses four different communication protocols between smart devices and smart transmitters. The four protocols are HART®, FOUNDATION™ Fieldbus, Profibus PA and Ethernet/IP.

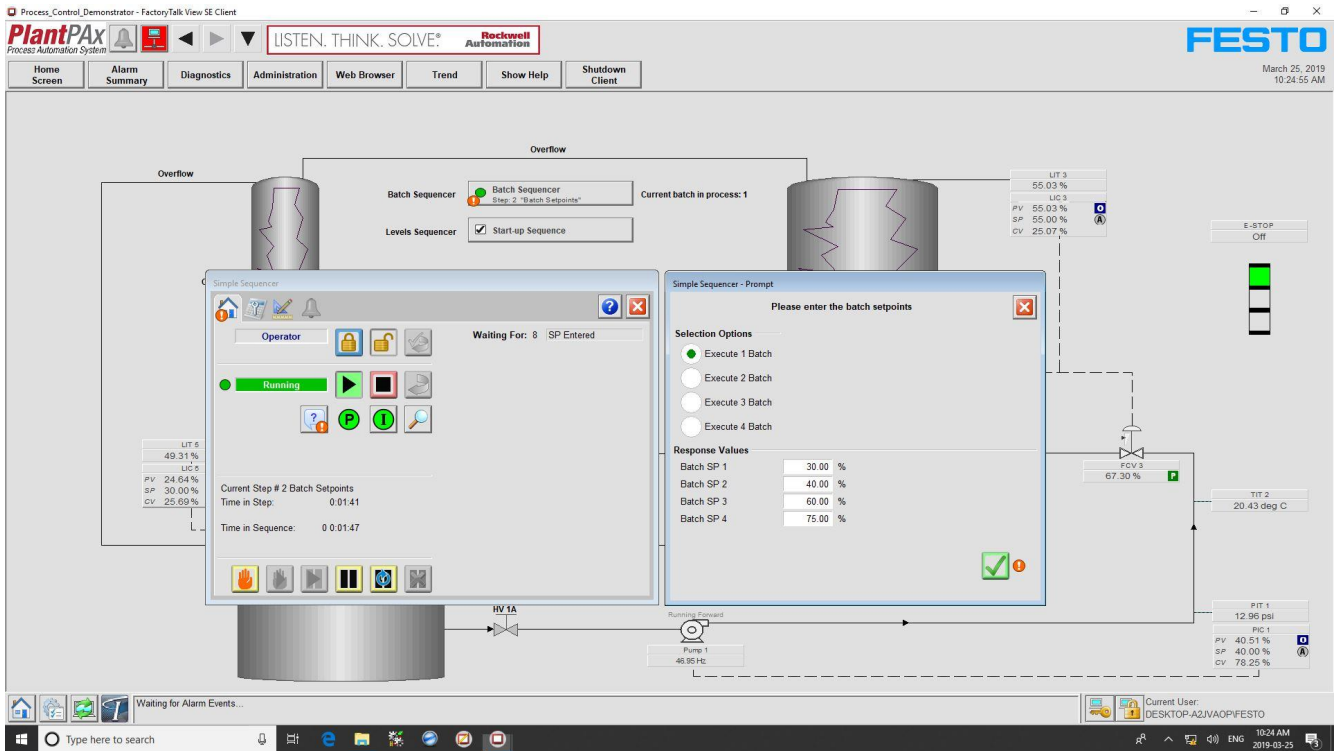
The HART® protocol shall enable communication between devices by superimposing digital signals on top of the existing 4-20 mA outputs. The FOUNDATION™ Fieldbus, Profibus PA and Ethernet I/P protocols shall work in the same manner as a Local Area Network (LAN) for smart devices. Each protocol has the option to be configured manually or through a computer using either a DCS system or an optional configuration software.

It is also possible to edit the HMI interface and the PLC program to change the control strategies using two optional software such as FactoryTalk Site Edition Studio and RSLogix 5000 Full Edition.

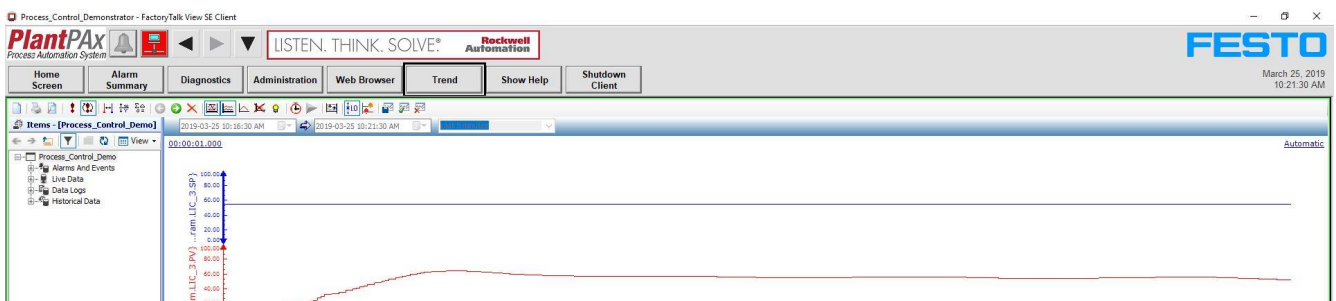
FactoryTalk Site Edition Station software is required and this one not included with the Demonstrator.



Main Screen



Batch Sequencer



Features & Benefits

- Smart transmitters using Hart, FOUNDATION Fieldbus, Profibus PA, Ethernet/IP communication protocols
- Many types of transmitters: Differential-pressure, Radar, Magnetic, Temperature
- Ethernet communication for variable frequency drives
- High-speed, touch screen computer
- Industrial Control Cabinet
- Advanced Network

List of Equipment

Qty	Description	Model number
1	Familiarization with the Process Control Demonstrator _____	590096 (52466-E0)
1	PlantPAX DCS Training System - Pressure, Flow, Level, Temperature _____	589880 (46801-V0)

List of Manuals

Description	Manual number
Electromagnetic Flow Meters (Workbook) _____	585123 (85990-00)
Electromagnetic Flow Meters (Workbook (Instructor)) _____	585126 (85990-10)
Control Valves (User Guide) _____	585145 (86001-E0)
Radar Level Transmitters (Workbook) _____	589760 (52200-00)
Radar Level Transmitters (Workbook (Instructor)) _____	589762 (52200-10)
Familiarization with the Process Control Demonstrator (User Guide) _____	590096 (52466-E0)

Table of Contents of the Manual(s)

Electromagnetic Flow Meters (Workbook) (585123 (85990-00))

- 1 Fundamentals of the Electromagnetic Flowmeters

Control Valves (User Guide) (585145 (86001-E0))

- 1 Basic Control Valve Theory
- 2 Basic Control Valve (46950-B)
- 3 Pneumatic Control Valve with a Positioner (46950-A)
- 4 Control Valve with DVC2000 (46950-0)
- 5 Control Valve with DVC6000 – HART/FF (46950-E/-D)
- 6 Control Valve with DVC6200 – HART/FF (46950-E/-D)
- 7 Electric Control Valve (46950-C)

Radar Level Transmitters (Workbook) (589760 (52200-00))

- 1 Fundamentals of Radar Level Transmitters

Familiarization with the Process Control Demonstrator (User Guide) (590096 (52466-E0))

- 1 Process Control Demonstrator
- 2 Control Panel
- 3 Disconnect Switch and Emergency Push-Button
- 4 AC Drives
- 5 PLC Fundamentals
- 6 The Human-Machine Interface
- 7 Process Columns

- 8 Differential-Pressure Transmitter
- 9 Radar Level Transmitters
- 10 Electromagnetic Flow Transmitter
- 11 Temperature Probes and Transmitter
- 12 Three-Valve Manifold
- 13 Solenoid Valve
- 14 Control Valve
- 15 Venturi Tube
- 16 Rotameter

Additional Equipment Required to Perform the Exercises (Purchased separately)

Qty	Description	Model number
1	Compressor _____	588108 (6410-C0)
1	FactoryTalk View SE Station _____	588401 (46968-50) ¹
1	Calibration Kit _____	588416 (46980-00)

Software

Qty	Description	Model number
1	Studio 5000 Logix Designer Full Edition _____	587895 (5935-10) ²
1	Studio 5000 Logix Designer Full Edition (Commercial) _____	587894 (5935-B0) ³
1	FactoryTalk View Studio SE _____	588400 (46968-40) ⁴
1	FactoryTalk View SE Station, Commercial _____	588393 (46968-E0) ⁵
1	FactoryTalk View Studio SE, Commercial _____	588394 (46968-F0) ⁶
1	HART Software Configurator _____	588420 (46982-00)

Equipment Description

PlantPAx DCS Training System - Pressure, Flow, Level, Temperature 589880 (46801-V0)

List of Manuals

Description	Manual number
Electromagnetic Flow Meters (Workbook) _____	585123 (85990-00)
Electromagnetic Flow Meters (Workbook (Instructor)) _____	585126 (85990-10)
Control Valves (User Guide) _____	585145 (86001-E0)
Radar Level Transmitters (Workbook) _____	589760 (52200-00)
Radar Level Transmitters (Workbook (Instructor)) _____	589762 (52200-10)

¹ Allows only viewing the HMI which is enough to follow the exercises of this system. This is the Educational license version but a Commercial license version is also available.

² Allows editing the PLC program. This is the Educational license version but a Commercial license version is also available.

³ Allows editing the PLC program.

⁴ Software needed to program the HMI. This is the Educational license version but a Commercial license version is also available. If only running the HMI is preferred, select the Station version instead (limited to 2 hours at a time).

⁵ Allows only viewing the HMI which is enough to follow the exercises of this system.

⁶ Software needed to program the HMI. If only running the HMI is preferred, select the Station version instead (limited to 2 hours at a time).

Table of Contents of the Manual(s)

Electromagnetic Flow Meters (Workbook) (585123 (85990-00))

- 1 Fundamentals of the Electromagnetic Flowmeters

Control Valves (User Guide) (585145 (86001-E0))

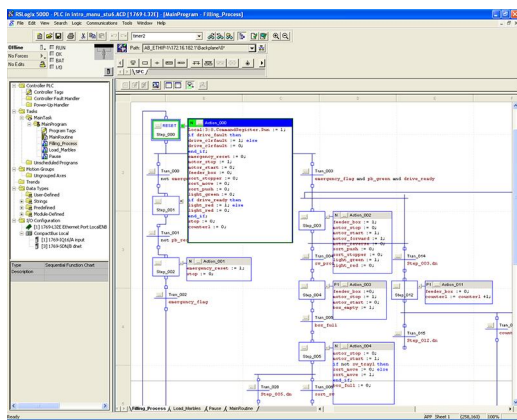
- 1 Basic Control Valve Theory
- 2 Basic Control Valve (46950-B)
- 3 Pneumatic Control Valve with a Positioner (46950-A)
- 4 Control Valve with DVC2000 (46950-0)
- 5 Control Valve with DVC6000 – HART/FF (46950-E/-D)
- 6 Control Valve with DVC6200 – HART/FF (46950-E/-D)
- 7 Electric Control Valve (46950-C)

Radar Level Transmitters (Workbook) (589760 (52200-00))

- 1 Fundamentals of Radar Level Transmitters

Optional Equipment Description

Studio 5000 Logix Designer Full Edition (Optional) 587895 (5935-10)



Studio 5000 Logix Designer is a Windows-based application, produced by Rockwell Software™, used to build programs for PLCs.

Studio 5000 Logix Designer provides a powerful integrated interface allowing users to easily build programs using four programming languages: relay ladder, structured text, sequential function chart, and function block diagram. The software allows students to concentrate on the logic aspects of PLC programming instead of spending time on complex syntax. It also features drag-and-drop editing, search-and-replace functions, and tools for verifying programs before running them on a PLC. Studio 5000 Logix Designer can be used to program a

PLC via the built-in RS-232 port or via an Ethernet link. The software comes with RSLinx lite which provides the functionality required to support RSLogix and RSNetWorx.

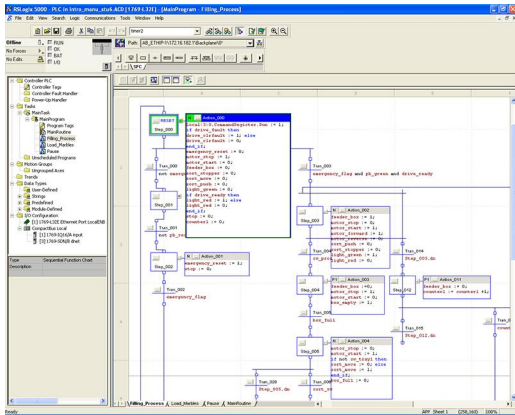
The following versions are available:

- 5935-0: Studio 5000 Logix Designer Lite Edition (Educationnal)
- 5935-A: Studio 5000 Logix Designer Lite Edition (Commercial)
- 5935-1: Studio 5000 Logix Designer Full Edition (Educationnal)
- 5935-B: Studio 5000 Logix Designer Full Edition (Commercial)

Specifications

Parameter	Value
Included Software	RSLogix 5000 and RSLinx Lite
Available Languages	Relay Ladder, structured text, sequential function chart, and function block diagram.
Computer Requirements	Pentium IV 2.8 GHz, 1 GB of RAM, at least 16 GB of free hard disk space, and a 1024 x 768 True Color graphics device. Recommended: Intel i5 2.4 GHz processor, 8 GB of RAM, 20 GB of free hard disk space, and DirectX 9 graphics device with WDDM 1.0 or higher. Compatible operating systems: Windows XP Professional with SP3, Windows 7 Professional (64-bit) with SP1 or Home Premium (64 or 32-bit) with SP1.

Studio 5000 Logix Designer Full Edition (Commercial) (Optional) 587894 (5935-B0)



Studio 5000 Logix Designer is a Windows-based application, produced by Rockwell Software™, used to build programs for PLCs.

Studio 5000 Logix Designer provides a powerful integrated interface allowing users to easily build programs using four programming languages: relay ladder, structured text, sequential function chart, and function block diagram. The software allows students to concentrate on the logic aspects of PLC programming instead of spending time on complex syntax. It also features drag-and-drop editing, search-and-replace functions, and tools for verifying programs before running them on a PLC. Studio 5000 Logix Designer can be used to program a

PLC via the built-in RS-232 port or via an Ethernet link. The software comes with RSLinx lite which provides the functionality required to support RSLogix and RSNetWorx.

The following versions are available:

- 5935-0: Studio 5000 Logix Designer Lite Edition (Educationnal)
- 5935-A: Studio 5000 Logix Designer Lite Edition (Commercial)
- 5935-1: Studio 5000 Logix Designer Full Edition (Educationnal)
- 5935-B: Studio 5000 Logix Designer Full Edition (Commercial)

Specifications

Parameter	Value
Included Software	RSLogix 5000 and RSLinx Lite
Available Languages	Relay Ladder, structured text, sequential function chart, and function block diagram.
Computer Requirements	Pentium IV 2.8 GHz, 1 GB of RAM, at least 16 GB of free hard disk space, and a 1024 x 768 True Color graphics device. Recommended: Intel i5 2.4 GHz processor, 8 GB of RAM, 20 GB of free hard disk space, and DirectX 9 graphics device with WDDM 1.0 or higher. Compatible operating systems: Windows XP Professional with SP3, Windows 7 Professional (64-bit) with SP1 or Home Premium (64 or 32-bit) with SP1.

Compressor (Optional) 588108 (6410-C0)



The Air Compressor is a quiet device well suited for classroom and school laboratories. The Air Compressor can be used to provide compressed air to different components. A conditioning unit, Model 6411-A, must be connected to the compressor for certain applications.

The Circulator Pump is available in different variants depending on ac power network voltages and frequencies. Because of this, the actual module may vary from the one shown in the picture.

Specifications

Parameter	Value
Power Requirements	
Current	4.8 A
Service Installation	Standard single-phase ac outlet
Tank Capacity	15.1 L (4 gal)
Flow Rate	42.5 L/min at 620 kPa (1.5 SCFM at 90 psi)
Maximum Pressure	800 kPa (120 psi)
Noise Level	40 dB(A) (about as quiet as a refrigerator)
Physical Characteristics	
Dimensions (H x W x D)	TBE
Net Weight	TBE

FactoryTalk View Studio SE (Optional) 588400 (46968-40)

FactoryTalk View Site Edition is a Windows-based application suite, produced by Rockwell Software, which simplifies the creation of graphic human-machine interfaces (HMI), such as operator interface solutions, to monitor and control machines and small processes. This versatile suite is compatible with the PlantPAX DCS Demonstrator, Model 3531-V,

HMI applications are developed and edited using FactoryTalk View Studio, which also has limited runtime capabilities to test your interface. A completed application can be loaded directly on the Touch-Screen Computer of the PlantPAX DCS Demonstrator

Your applications can also be designed to run on the touch-screen computer for an unlimited period of time, but doing so requires the purchase of FactoryTalk View Site Edition Station Runtime.

Available versions:

- 46968-0 FactoryTalk View ME Studio (Educational)
- 46968-1 FactoryTalk View ME Studio (with Foxboro OPC server, Educational)

- 46968-2 FactoryTalk View ME Station (Educational)
- 46968-3 FactoryTalk View ME Station (with Foxboro OPC server, Educational)
- 46968-A FactoryTalk View ME Studio (Commercial)
- 46968-B FactoryTalk View ME Studio (with Foxboro OPC Server, Commercial)
- 46968-C FactoryTalk View ME Station (Commercial)
- 46968-D FactoryTalk View ME Station (with Foxboro OPC server, Commercial)

FactoryTalk View SE Station (Optional) 588401 (46968-50)

FactoryTalk View Site Edition is a Windows-based application suite, produced by Rockwell Software, which simplifies the creation of graphic human-machine interfaces (HMI), such as operator interface solutions, to monitor and control machines and small processes. This versatile suite is compatible with the PlantPAx DCS Demonstrator, Model 3531-V,

HMI applications are developed and edited using FactoryTalk View Studio, which also has limited runtime capabilities to test your interface. A completed application can be loaded directly on the Touch-Screen Computer of the PlantPAx DCS Demonstrator

Your applications can also be designed to run on the touch-screen computer for an unlimited period of time, but doing so requires the purchase of FactoryTalk View Site Edition Station Runtime.

Available versions:

- 46968-0 FactoryTalk View ME Studio (Educational)
- 46968-1 FactoryTalk View ME Studio (with Foxboro OPC server, Educational)
- 46968-2 FactoryTalk View ME Station (Educational)
- 46968-3 FactoryTalk View ME Station (with Foxboro OPC server, Educational)
- 46968-A FactoryTalk View ME Studio (Commercial)
- 46968-B FactoryTalk View ME Studio (with Foxboro OPC Server, Commercial)
- 46968-C FactoryTalk View ME Station (Commercial)
- 46968-D FactoryTalk View ME Station (with Foxboro OPC server, Commercial)

FactoryTalk View SE Station, Commercial (Optional) 588393 (46968-E0)

FactoryTalk View Site Edition is a Windows-based application suite, produced by Rockwell Software, which simplifies the creation of graphic human-machine interfaces (HMI), such as operator interface solutions, to monitor and control machines and small processes. This versatile suite is compatible with the PlantPAx DCS Demonstrator, Model 3531-V,

HMI applications are developed and edited using FactoryTalk View Studio, which also has limited runtime capabilities to test your interface. A completed application can be loaded directly on the Touch-Screen Computer of the PlantPAx DCS Demonstrator

Your applications can also be designed to run on the touch-screen computer for an unlimited period of time, but doing so requires the purchase of FactoryTalk View Site Edition Station Runtime.

Available versions:

- 46968-0 FactoryTalk View ME Studio (Educational)
- 46968-1 FactoryTalk View ME Studio (with Foxboro OPC server, Educational)
- 46968-2 FactoryTalk View ME Station (Educational)

- 46968-3 FactoryTalk View ME Station (with Foxboro OPC server, Educational)
- 46968-A FactoryTalk View ME Studio (Commercial)
- 46968-B FactoryTalk View ME Studio (with Foxboro OPC Server, Commercial)
- 46968-C FactoryTalk View ME Station (Commercial)
- 46968-D FactoryTalk View ME Station (with Foxboro OPC server, Commercial)

FactoryTalk View Studio SE, Commercial (Optional) 588394 (46968-F0)

FactoryTalk View Site Edition is a Windows-based application suite, produced by Rockwell Software, which simplifies the creation of graphic human-machine interfaces (HMI), such as operator interface solutions, to monitor and control machines and small processes. This versatile suite is compatible with the PlantPAX DCS Demonstrator, Model 3531-V,

HMI applications are developed and edited using FactoryTalk View Studio, which also has limited runtime capabilities to test your interface. A completed application can be loaded directly on the Touch-Screen Computer of the PlantPAX DCS Demonstrator

Your applications can also be designed to run on the touch-screen computer for an unlimited period of time, but doing so requires the purchase of FactoryTalk View Site Edition Station Runtime.

Available versions:

- 46968-0 FactoryTalk View ME Studio (Educational)
- 46968-1 FactoryTalk View ME Studio (with Foxboro OPC server, Educational)
- 46968-2 FactoryTalk View ME Station (Educational)
- 46968-3 FactoryTalk View ME Station (with Foxboro OPC server, Educational)
- 46968-A FactoryTalk View ME Studio (Commercial)
- 46968-B FactoryTalk View ME Studio (with Foxboro OPC Server, Commercial)
- 46968-C FactoryTalk View ME Station (Commercial)
- 46968-D FactoryTalk View ME Station (with Foxboro OPC server, Commercial)

Calibration Kit (Optional) 588416 (46980-00)



The Calibration Kit includes the equipment required to precisely adjust the control valves and to perform diagnostic tests on electrical devices. The kit contains a Fluke 725 multifunction process calibrator which can act as a source and measure different parameters. A calibration pump completes the kit and is used to calibrate pressure devices.

A Calibration Kit, Model 46980 or 46981, is required to characterize and tune processes in the Pressure, Flow, Level, and Temperature Process Training Systems.

Manual

Description	Manual number
(Workbook) _____	594085 (54387-00)

HART Software Configurator (Optional) 588420 (46982-00)



The Software Configurator includes the FieldCare software necessary to interpret the data related to the different smart devices and to configure their parameters. The HART version also includes a communication box for data transfer between a HART device and a PC with a USB port.

Available versions:

46982-0 HART Software Configurator

- 46982-A FOUNDATION Fieldbus Software Configurator
- 46982-B HART/FOUNDATION Fieldbus Software Configurator

List of Manuals

Description	Manual number
HART Device Configuration (Workbook) _____	585164 (86050-00)
HART Device Configuration (Workbook (Instructor)) _____	585165 (86050-10)

Table of Contents of the Manual(s)

HART Device Configuration (Workbook) (585164 (86050-00))

- 2-1 Two-Wire Transmitter
- 2-2 Four-Wire Transmitter (Optional)
- 2-3 Output Device (Optional)
- 3-1 HART Multidrop with Multiple Transmitters

Specifications

Parameter	Value
Computer Requirements	A currently available personal computer running under one of the following operating systems: Windows® 7 or Windows® 8.

Reflecting the commitment of Festo Didactic to high quality standards in product, design, development, production, installation, and service, our manufacturing and distribution facility has received the ISO 9001 certification.

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