

Process Skid Demo is to Demonstrate the PlantPAx 5.0 Distributed control system capabilities.

PlantPAx5.0 is the latest Distributed Control System. Following are the key features of PlantPAx system.

- Expanding and improving how we want the network to be deployed. Characterized Reference architectures.
- New purpose-built controllers for process with:
 - Embedded Process Objects
 - Zero touch alarm configuration
 - Automatic Hardware Diagnostics
- IEC62443-3-3 Cybersecurity Certification
- Improved HART configuration/HART data structures
- New Organization, Ownership and Arbitration functionality
- Embedded Libraries support 21CFR11 audit trails & e-signature.

How to start the Process Skid Demo.

1. In the navigation bar go to display button "Process". It will open the Process Screen. One left side it shows the batch operating station. On the right-hand side, it shows the Detailed view of Process Skid equipment.
2. In the Batch operating station Press "Take Ownership" Button. In case the equipment is owned.
3. Press "Reset" button if the sequence is not in Idle state.
4. Press start button to Start the sequence.
5. Once the sequence is started it will show the status of running control recipe. The active step will be highlighted in green.

Question: Provide Brief summary of Process skid demo.

Answer: Process Skid Demo demonstrate the PlantPAx 5.0 Distributed control system capabilities. We are using a simple mixing process to demonstrate the batch capability. We are using ISA S88 compliance sequence manager. Sequence manager is a controller-based batch solution.

SequenceManager description:

SequenceManager™ provides basic controller-based batch management appropriate for single unit or multiple-independent unit operations. SequenceManager directs programs inside a controller in an ordered sequence for demanding applications. With SequenceManager, you can deliver fast and reliable execution while reducing infrastructure costs for standalone units. This promotes the delivery of complete skid-based systems that are easy to integrate. Benefits

- Create fast distributed batch response time closer to the process
- Reduce the cost to integrate complex skid structures to plant systems
- Reduce infrastructure cost and software complexity.

Following are Features of Sequence manager:

Overview

- Brings essential batch management forward to the 5x80P

Controllers

- Directs PhaseManager™ programs inside a Logix-based controller in an ordered sequence to conduct process-

oriented task

- Includes integrated visualization and reporting
- Integrated with FactoryTalk® Batch
- Functions with PlantPAx® Equipment Phase Object

Benefits

- Implement task-oriented sequences easily with native controller functionality
- Intuitive operation with integrated control and HMI solution
- Reduce infrastructure cost and software complexity

Process Skid demo description:

The process is simple. We have two storage tanks. Storage tank1 have material A. Storage tank2 have material B. We have mixer unit. Material A is transferred from Storage Tank1 to Mixing tank and then Material B is transferred from storage tank2 to Mixing tank.

After that Mixing operation is done in Mixing tank. Agitator is used to mix for a defined time. After mixing a new material C is produced.

In a shop floor the finished good is transferred to finished Material Tank. As in our case there is no finished Material Tank, we are transferring it back to Storage Tank1 and Storage Tank2 for making skid ready for next demo.

It also demonstrates the Integration of PlantPax5.0 with third party devices like instruments. We have readily available faceplate and control strategy for E&H instruments like FMR52 Ultra sonic sensor, TMT142 temperature transmitter, PMD75 Pressure Transmitter, Mass flow meter.

It also demonstrates IMCC (Integrated Motor circuit control) capability of PlantPax Distributed control system as following:

PlantPax5.0 have the premier integration with Rockwell VFD and smart overload relay. Device Faceplates are readily available for smart overload relay E300. Device faceplate for E300 shows the smart overload relay status, Current Ampere, %FLA full load ampere, % Thermal capacity used. It provides detailed diagnostics. It provided last four fault details. For each fault it provides description of alarm and also suggested the recommended action to resolve the issue. Face plate also provide the Energy Data like Real, Reactive and Apparent energy consumed.

Current KW, KVA, KVAR for three phases, Line to Line Voltage for three phases, Power factor and frequency.

Similarly, Device object library is available for different power devices like Rockwell VFD, power monitors.

Device Faceplates are readily available for Rockwell VFD. Device faceplate for VFD shows the smart overload relay status, Current Ampere, %FLA full load ampere, Reference frequency and current frequency. It provides detailed diagnostics. It provided last four fault details. For each fault it provides description of alarm and suggested the recommended action to resolve the issue. Face plate also provide the Energy Data like Real, Reactive and Apparent energy consumed.

Question: I started the Process skid. But pump is not running. Please guide how to resolve this issue.

Answer:

Click on the Pump object. VFD faceplate shall be opened.

Check if there is any Alarm in the Pump faceplate.

If there is Interlock trip alarm. Check that if interlock button is Black in color. If the interlock button is black in color, it indicates one or more required interlock is not healthy. If Interlock button is grey in color it means all Interlocks are healthy.

Press Interlock button that will open the interlock screen.

Interlock screen will provide the status of all the interlocks.

Check which interlock is not ok. X indication means interlock is not ok.

In case the equipment was running before, and it tripped. It will show Interlock trip alarm on the faceplate. Also on the Interlock detail faceplate it will highlight in light grey the interlock which failed first and caused tripping of running equipment.

Once all interlocks are healthy. Press the Alarm reset if there is any existing alarm, from the vfd faceplate. Once the alarm is reset the sequence should start normally.

Question: What is the software version used?

Answer: Following software are used:

1. Factory Talk View SE version 14.
2. Studio 5000 version 36.

Question: How I can see the statistical data of a solenoid valve.

Answer:

Click on the Valve object. Press on maintenance Tab. Press on Valve Stats button to open Valve Statistics.

Valve Statistics have Time in state totalizers for different states like opened, opening closed closing state. It also calculates the min max total and average time.

It also counts the total number of Open and Close strokes. Number of open and close strokes completed. Number of open and close strokes that failed to complete. Also, it calculates Number of open and close strokes which are slow that mean when the opening or closing time is more than the average time.

Following is the bill of material:

Ref. No.:	APHQ -1802	BILL OF MATERIAL	
Rev.:	1	Project:	APHQ Process Demo (regional demo unit)
Pages:	2	Application:	Process Demo
Date:	10 February 2018	Engineer:	DHX

No.	Description	Tag	Brand	P/N	Qty	Remarks
1	CB, 15A, 2Pole	10CB01	Allen-Bradley	1492-SPM2C150	1	
2	CB, 6A, 2Pole	10CB03	Allen-Bradley	1492-SPM2C060	1	
3	CB, 4A, 1Pole	10CB02, 10CB05, 10CB11, 10CB12, 10CB13, 37CB01	Allen-Bradley	1492-SPM1C040	6	
4	MPCB, 0.63-1.0A	10CB04	Allen-Bradley	140M-C2E-B10	1	
5	MPCB, Aux. Contact	(10CB04)	Allen-Bradley	140M-C-AFA20	1	
6	Power Supply 24VDC 10A	10PS01	Allen-Bradley	1606-XLS240E	1	
7	Power Supply 12VDC 2.5A	10PS02	Allen-Bradley	1606-XLP50B	1	
8	ControlLogix Power Supply	20PLC01	Allen-Bradley	1756-PA72	1	
9	ControlLogix Chassis, 7-Slot	(20PLC01)	Allen-Bradley	1756-A7	1	
10	ControlLogix Processor 5580	20PLC02	Allen-Bradley	1756-L85E	1	
11	ControlLogix Analog Input	22PLC01	Allen-Bradley	1756-IF8IH	1	
12	Temperature Transmitter, 4-20mA Hart	22TX01	E + H	TMT142-E21331BAA1	1	
13	Ultrasonic Sensor, Output 4-20mA	22TX02, 22TX03	Allen-Bradley	873M-D18AI800-D4	2	
14	Cable, 4 pins, Sensor	(22TX02, 22TX03)	Allen-Bradley	889D-F4AC-5	2	
15	ControlLogix Analog Output	23PLC01	Allen-Bradley	1756-OF8IH	1	
16	Control Valve, 4-20mA	23CV01, 23CV02	Kai Lenda KLD	KLD20T / BQE-K02T	2	
17	ControlLogix Digital Input	24PLC01	Allen-Bradley	1756-IB16D	1	

18	Pushbutton, Emergency Stop	24PB01	Allen-Bradley	800F-1YML1	1	
19	ControlLogix Digital Output	25PLC01	Allen-Bradley	1756-OW16I	1	
20	Electric Valve, 24V	25EV01, 25EV02, 25EV03	Kai Lenda KLD	BD3S	3	
21	Light, LED, Blue-Red, 12V	25LED01-2, 25LED03-4, 25LED05-6			3	
22	Light, LED, White, 12V	25LED07, 25LED08			2	
23	ControlLogix Terminal Block	(22PLC01, 23PLC02, 24PLC01, 25PLC01)	Allen-Bradley	1756-TBCH	4	
24	ControlLogix Ethernet Module	26PLC01	Allen-Bradley	1756-EN2T	1	
25	Stratix 5700 Managed Switch 10 Port	31SW01	Allen-Bradley	1783-BMS10CGN	1	
26	Ethernet / Foundation Fieldbus Gateway	32GW01	Allen-Bradley	1788-EN2FFR	1	
27	Pressure Transmitter	32TX01	E + H	PMD75-5RA8FE1DDBM+74	1	
28	Level Transmitter	32TX02	E + H	FMR52-BGECCDBPAHK + AAILJDKEKGZ1	1	
29	Industrial Computer with 18.5" LCD	35HMI01	Allen-Bradley	6200P-19WS3C1	1	
30	Dynamix Vibration Module	36DYN01	Allen-Bradley	1444-DYN04-01RA	1	
31	Dynamix Vibration Module Connector	(36DYN01)	Allen-Bradley	1444-DYN-RPC-SCW-01	1	
32	Dynamix Terminal Base	(36DYN01)	Allen-Bradley	1444-TB-A	1	
33	Dynamix Terminal Base Connector	(36DYN01)	Allen-Bradley	1444-TBA-RPC-SCW-01	1	
34	Accelerometer	36ACC01, 36ACC02	Allen-Bradley	1443-ACC-AT-S	2	
35	Accelerometer Cable 16 ft.	(36ACC01, 36ACC02)	Allen-Bradley	1443-CBL-MS3IBC-16S	2	
36	PowerFlex 525 Drive Frame A 4.8A	37DRV01	Allen-Bradley	25B-A4P8N114	1	
37	AC Motor (Pump)	37MTR01	Iwaki	MX-100VM-32	1	
38	Fan, 220V	37FAN01	Rittal		1	
39	Contact, 9A, 220VAC coil	38CT01	Allen-Bradley	100-C09F10	1	
40	E300 Overload Module	38OL01	Allen-Bradley	193-ESM-VIG-30A-C23	1	
41	E300 IO Module	(38OL01)	Allen-Bradley	193-EIO-43-240	1	
42	E300 Communication Module	(38OL01)	Allen-Bradley	193-ECM-ETR	1	
43	AC Motor (Agitator)	38MTR01			1	

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