



PlantPAx Modern DCS

Tomas Knobloch • Solution Consultant Process & SW • May•2022

expanding **human possibility**[®]

Application types

SKIDS or COMPLEX systems



LIFE SCIENCES

- ✓ Mixer
- ✓ Reactor
- ✓ Dosing
- ✓ Weighing
- ✓ Autoclave



OIL & GAS

- ✓ Well
- ✓ Injection Pump
- ✓ FWKO
- ✓ Treatment units
- ✓ LACT units



FOOD & BEVERAGE

- ✓ Water purification
- ✓ Boiler
- ✓ Compressor
- ✓ Fermenter
- ✓ Oven



CHEMICAL

- ✓ Reactor
- ✓ Boiler
- ✓ Compressor
- ✓ Distillation column



MINING, METALS & CEMENT

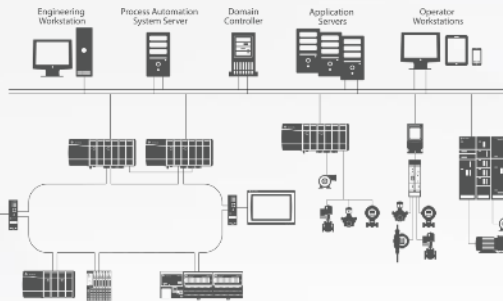
- ✓ Furnace
- ✓ Mill
- ✓ Flotation unit
- ✓ Water plant

THE CONNECTED ENTERPRISE



APPLICATION EXPERTISE

PlantPax[®]
Distributed Control System



PLANT-WIDE
Control and Optimization

SCALABLE
and Modular

SECURED
Open and Information-enabled

FLEXIBLE
Delivery and Support



PlantPAx

Modern DCS

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expanding **human possibility**[®]



PlantPax[®] System

Tools and Solutions

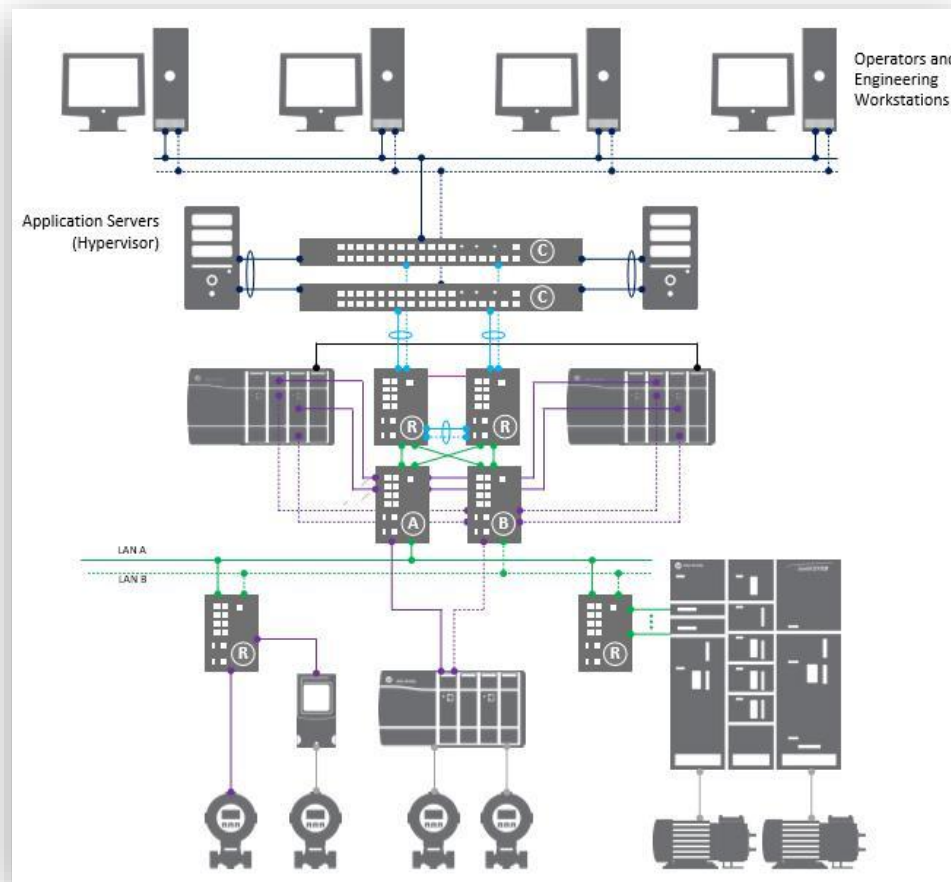
- Rapid Code development
- **Process System Estimator**
- Process Object Library Migration Tool
- Alarm Builder
- Competitive DCS Migration

Library of Objects

- Standard Objects reusable objects
- Class based solutions
- **Known performance characterization**
- Digital Device & Instrumentation Interface Objects

Reference Architecture

- Network Infrastructure
- Integration Skids
- Cybersecurity
- Platform Scale
- Known Performance



PlantPax system utilizes **trusted hardware and software** from Rockwell Automation's Integrated Architecture and applies those products **using a prescribed, characterized methodology**. That **methodology covers all aspects of the DCS**; from the hardware, the network infrastructure, the visualization, security, and asset management.

Product Development

- Key Process Features
 - **Controller**
 - Power
 - **HMI**
 - Historian
 - Asset Management

Documentation

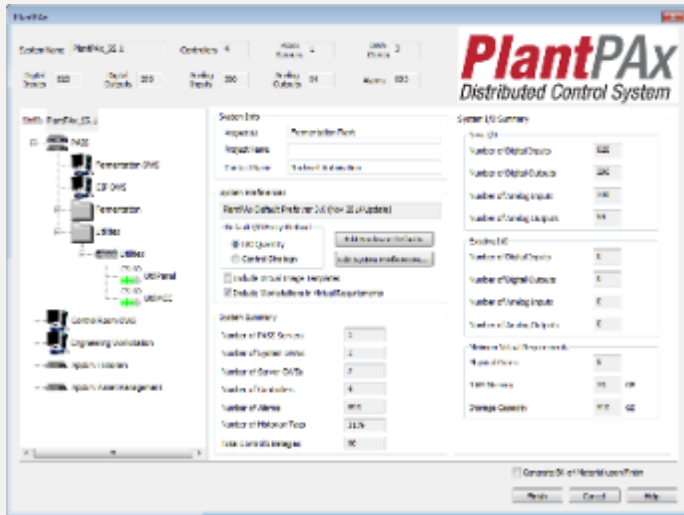
- System **Guidelines**
- System References
- User Manuals
- Selection Guides
- Infrastructure Manual
- Online Help

Bundling and Services

- Process System Lifecycle Support
- Asset Utilization
- Network Services
- Cybersecurity

PlantPax[®] Design → Deploy → Verify

PlantPax[®] System Estimator



Studio 5000[®] with PlantPax[®] Libraries and Design Guides



Verification Tools

- PlantPax[®] V5.0 Checklist
- Rockwell Automation Graphic Audit Tool
- Topology Worksheet

Category Name	Value	Default	Status
PROPERTIES			
Processor	PLC-5/SLC-500	Processor: SLC-500	
Module	1756-IB16DI16DO16V	1756-IB16DI16DO16V	
Power	1756-PA1600	1756-PA1600	
Fork	0.0		
Heap	0.0		
Networks & Events	0.0		
Comments/Triggers	0.0		
CPU Use			
Message	0.0		
Message	0.0		
Safety	0.0		
Redundancy	0.0		
Appln	0.0		
Job Memory			
Job Memory (Inches)	10000	10000	
Job Memory (Bytes)	10000	10000	
Job & Logic (Inches)	10000	10000	
Job & Logic (Bytes)	10000	10000	
User	10000	10000	
Comment	High Water		
Total	0.0%		

Size and Select

Implement

Verify

Well defined and closed-loop design **process based on system characterization**

Sizing PlantPax® Systems

PlantPax® System Estimator allows the user to perform a detailed sizing estimation based on the specific application requirements

- Wizard in Integrated Architecture® Builder (IAB is a free download)
- Define, size, and generate BOM for your system
- Performs the system loading calculations for the user (Controller CPU utilization and Total Memory)
- User can customize sizing rules based on the application
- **Application data entered must be accurate and representative of proposed system**
- **System commissioned must also be representative of data entered into Process System Estimator.**

PlantPax
Distributed Control System

System Name: PlantPax_SS.1
Controllers: 4
PASS Servers: 1
OWS Clients: 3
Digital Inputs: 820
Digital Outputs: 296
Analog Inputs: 300
Analog Outputs: 94
Alarms: 893

System Info
Project ID: Fermentation Plant
Project Name:
Contact Name: Rockwell Automation

System Preferences
PlantPax Default Prefs ver 3.0 (Nov 2014 Update)
Default I/O Entry Method:
 I/O Quantity
 Control Strategy
 Include Virtual Image Templates
 Include Workstations in Virtual Requirements

System I/O Summary
New I/O
Number of Digital Inputs: 820
Number of Digital Outputs: 296
Number of Analog Inputs: 300
Number of Analog Outputs: 94
Existing I/O
Number of Digital Inputs: 0
Number of Digital Outputs: 0
Number of Analog Inputs: 0
Number of Analog Outputs: 0
Minimum Virtual Requirements
Physical Cores: 9
RAM Memory: 33 GB
Storage Capacity: 510 GB

System Summary
Number of PASS Servers: 1
Number of System OWSs: 1
Number of Server OWSs: 2
Number of Controllers: 4
Number of Alarms: 893
Number of Historian Tags: 3179
Total Control Strategies: 60

Generate Bill-of-Material upon Finish
Finish Cancel Help

PlantPax[®] System Estimator

How does the PlantPax[®] System Estimator show sizing problems?

The screenshot displays the PlantPax System Estimator interface. The main window shows a project tree on the left and configuration options for 'Location_001'. A 'Configure Location By I/O Quantities' dialog box is open, showing the following data:

Location Name: Location_001 Existing

Process Library Preferences: Process Library v4.00 - Profile A - Standard Tasks

I/O Count: DI: 200, DO: 200, AI: 200, AO: 200, Spare I/O: 0 %

Control Strategy Data Table:

	Control Strategy Data										Total Control Strategy Data													
	Qty @ 50ms	Qty @ 100ms	Qty @ 250ms	Qty @ 500ms	Qty @ 1s	Qty @ 2s	Qty @ 5s	Qty @ 10s	DI	DO	AI	AO	Viz Tags	Hist Tags	Alarm Tags	Mem KB	DI	DO	AI	AO	Viz Tags	Hist Tags	Alarm Tags	Mem KB
Simple_Regulatory	0	0	0	180	0	0	0	0	0	0	1	1	327	12	11	11.96	0	0	180	180	58860	2160	1980	3094.56
Complex_Regulatory	0	0	0	20	0	0	0	0	0	0	2	1	654	24	22	29.47	0	0	40	20	13080	480	440	798.68
Simple_2State_Discrete	0	0	0	140	0	0	0	0	1	1	0	0	100	2	4	7.70	140	140	0	0	14000	280	560	1302.00
Complex_2State_Discrete	0	0	0	60	0	0	0	0	1	1	0	0	100	2	4	10.91	60	60	0	0	6000	120	240	750.60
Complex_Reg_NonPID	0	0	0	0	0	0	0	0	3	3	1	0	280	6	9	11.17	0	0	0	0	0	0	0	0.00
ALMD_Only	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.27	0	0	0	0	0	0	0	0.00
Analog_Indicator	0	0	0	0	0	0	0	0	0	1	0	0	129	3	5	5.48	0	0	0	0	0	0	0	0.00
Digital_Indicator	0	0	0	0	0	0	0	0	1	0	0	0	65	3	2	4.12	0	0	0	0	0	0	0	0.00
Analog_Indicator (non-AOI)	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0.50	0	0	0	0	0	0	0	0.00
Digital_Indicator (non-AOI)	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0.35	0	0	0	0	0	0	0	0.00
User_Additional_Code	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.00	0	0	0	0	0	0	0	0.00
User_Def_A(ValveC)	0	0	0	0	0	0	0	0	0	0	1	1	104	3	4	12.09	0	0	0	0	0	0	0	0.00
User_Def_B(Seq)	0	0	0	0	0	0	0	0	0	0	1	331	1	3	19.58	0	0	0	0	0	0	0	0.00	
User_Def_C(ValveMO)	0	0	0	0	0	0	0	0	2	2	1	0	111	2	4	12.08	0	0	0	0	0	0	0	0.00
User_Def_D(ValveMP)	0	0	0	0	0	0	0	0	4	4	0	0	102	2	3	16.59	0	0	0	0	0	0	0	0.00

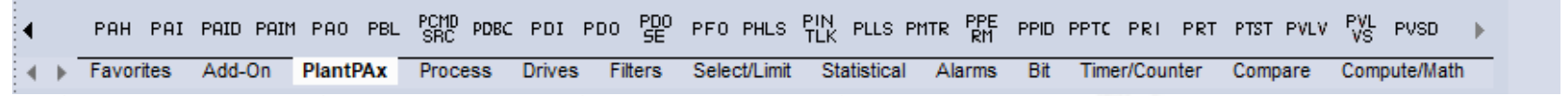
Controller Summary:

- Number of Digital Inputs: 200
- Number of Digital Outputs: 200
- Number of Analog Inputs: 200
- Number of Analog Outputs: 200
- Total Visualization Tags: 91940
- Total Historian Tags: 3061
- Potential Alarms: 3220
- CPU Used: 60.20 %
- Total Memory (KB): 7245.04

Under-Allocated I/O based on Control Strategy Preferences: DI: DO: AI:

What's in the Library of Process Objects?

- Logix Objects in the Controller



PMTR

PMTR_01

- Inp_IOFault
- Inp_1PermOK
- Inp_1NBPermOK
- Inp_IntlkOK
- Inp_NBIntlkOK
- Inp_IntlkAvailable
- Inp_IntlkTriplnh
- Sts_Stopped
- Sts_Starting
- Sts_Running
- Sts_Stopping
- Sts_Jogging
- Sts_BypActive
- Sts_Err
- Sts_Hand
- Sts_OoS
- Sts_Maint
- Sts_Ovrd
- Sts_Ext
- Sts_Prog
- Sts_Oper
- Sts_ProgOperLock
- Ref_Ctrl_Set
- Ref_Ctrl_Cmd
- Ref_Ctrl_Sts
- BusObj
- Ref_FaultCodeList

PVSD

PVSD_01

- Inp_IOFault
- Inp_FwdPermOK
- Inp_FwdNBPermOK
- Inp_RevPermOK
- Inp_RevNBPermOK
- Inp_IntlkOK
- Inp_NBIntlkOK
- Inp_IntlkAvailable
- Inp_IntlkTriplnh
- Val_SpeedRef
- Val_SpeedFdbk
- Sts_Stopped
- Sts_StartingFwd
- Sts_RunningFwd
- Sts_StoppingFwd
- Sts_JoggingFwd
- Sts_BypActive
- Sts_Err
- Sts_Hand
- Sts_OoS
- Sts_Maint
- Sts_Ovrd
- Sts_Ext
- Sts_Prog
- Sts_Oper
- Sts_ProgOperLock
- Ref_Ctrl_Set
- Ref_Ctrl_Cmd
- Ref_Ctrl_Sts
- BusObj
- Ref_FaultCodeList

PPD

PPD_01

- Inp_PV
- Inp_CascSP
- Inp_InnerAvailable
- Inp_IntlkOK
- Inp_NBIntlkOK
- Inp_IntlkAvailable
- Inp_IntlkTriplnh
- Inp_RdyReset
- Inp_Reset
- Val_PV
- Val_SP
- Val_CVSet
- Val_CVOut
- Out_Reset
- Sts_Casc
- Sts_Auto
- Sts_Err
- Sts_Hand
- Sts_OoS
- Sts_Maint
- Sts_Ovrd
- Sts_Ext
- Sts_Prog
- Sts_Oper
- Sts_ProgOperLock
- BusObj

PDI

PDI_01

- Inp_PVData
- Inp_ModFault
- Inp_ChanFault
- Inp_PVUncertain
- Inp_Target
- Inp_Gate
- Inp_Reset
- Out_InpPV
- Out_Reset
- Sts_Err
- Sts_TgtDisagree
- BusObj

PAI

PAI_01

- Inp_PVData
- Inp_ModFault
- Inp_ChanFault
- Inp_PVUncertain
- Inp_Reset
- Val
- Val_InpPV
- Val_RoC
- Val_Dev
- Out_Reset
- Sts_Err
- Sts_HIHi
- Sts_HI
- Sts_Lo
- Sts_LoLo
- Sts_HIHoC
- Sts_HIDev
- Sts_LoDev
- Sts_Fail
- BusObj

What's in the Library of Process Objects?

- Graphic Symbols and faceplates

The screenshot displays a comprehensive library of process objects organized into several categories:

- PID:** Includes a 'Reboiler Steam Flow' object with a graph and numerical values: PV 40.79 SCFM, SP 41.00 SCFM, CV 46.04 %.
- Analog Objects:** Features 'Analog Fanout', 'High/Low Select' (set to 0.00 %), and 'Analog Valve' (69.9 % Open).
- Analog Inputs:** Shows four vertical bar indicators with values: 49.74, 20.41, 48.98, and 6.85.
- Valves:** Contains various valve symbols such as 'Ingr 1 Block Valve', 'Station Inlet', and 'Valve Control'.
- Drives:** Displays motor drive objects with status and speed: 'Generic VSD' (0.00 Hz), 'PowerFlex 755' (30.00 Hz), 'PowerFlex 753' (0.000 Hz), and 'Motor Speed Control' (45.00 Hz).
- Motors:** Shows 'Motor Control' objects in 'Stopped' or 'Running Forward' states.
- Logic:** Includes 'Configurable Logic' (OK) and 'Bacon' (n-Position Device).

The right side of the image shows configuration windows for specific process objects:

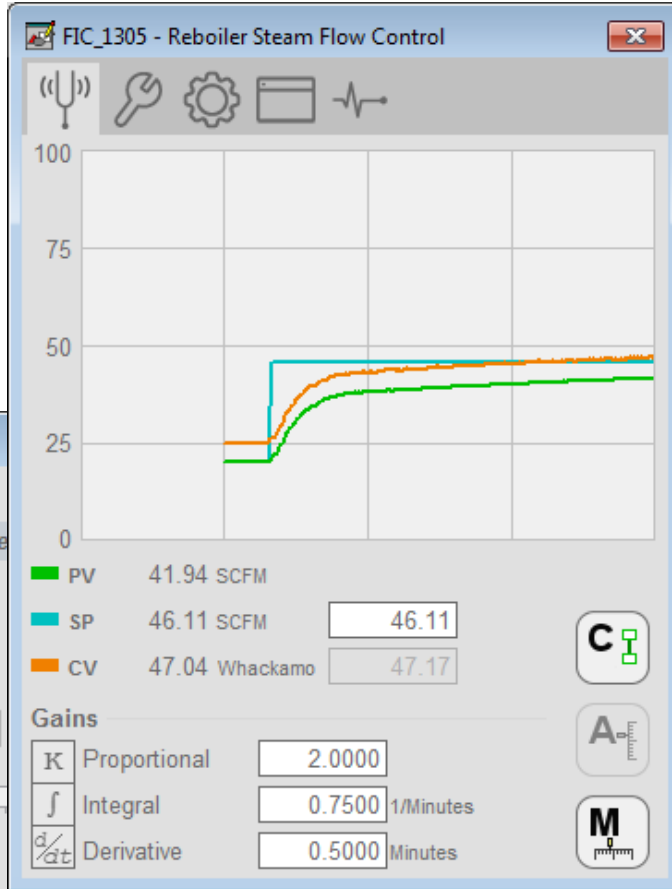
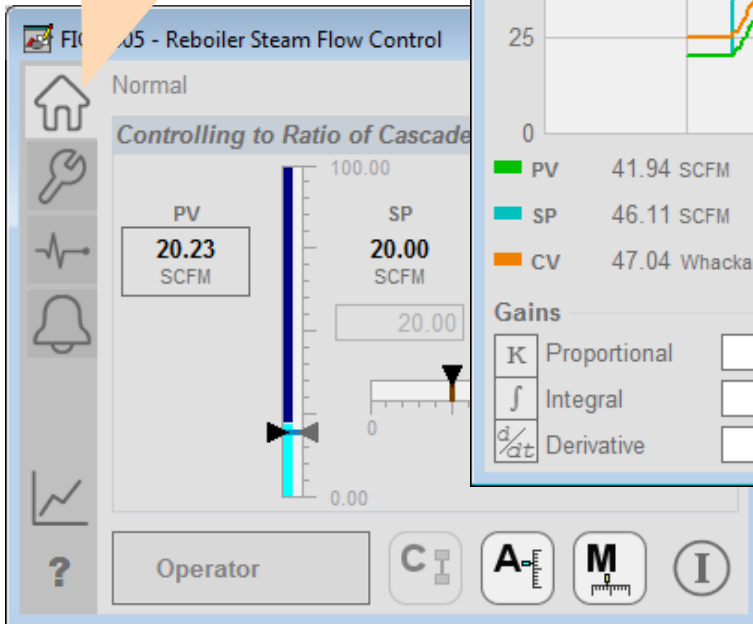
- MTR1005 - Tank Agitator:**
 - Settings for 'Use Run Feedback' (checked), 'Speed Setpoint Limits' (Maximum: 60.00, Minimum: 0.00), and 'Interlocks and Permissives' (Bypass Enabled: No).
 - Configuration for 'Time to pulse Out_Reset to clear fault (sec)' (2,000) and 'Time after 'Start' for feedback before fault (sec)' (15,000).
 - 'Drive Speed Scaling' section showing a feedback loop with 'Input' (8317), 'Scaled' (130.00), 'Feedback Reference' (30.00 Hz), and 'Output' (7561).
- Drive Fault - Drive Fault:**
 - Status: 'In Alarm, Unacknowledged'.
 - Options: 'Alarm Input Status', 'Alarm Disabled', 'Alarm Shelved', 'Alarm Suppressed'.

ISA 101 standards-based look and feel

Strategy: Basic operating display plus advanced configuration display

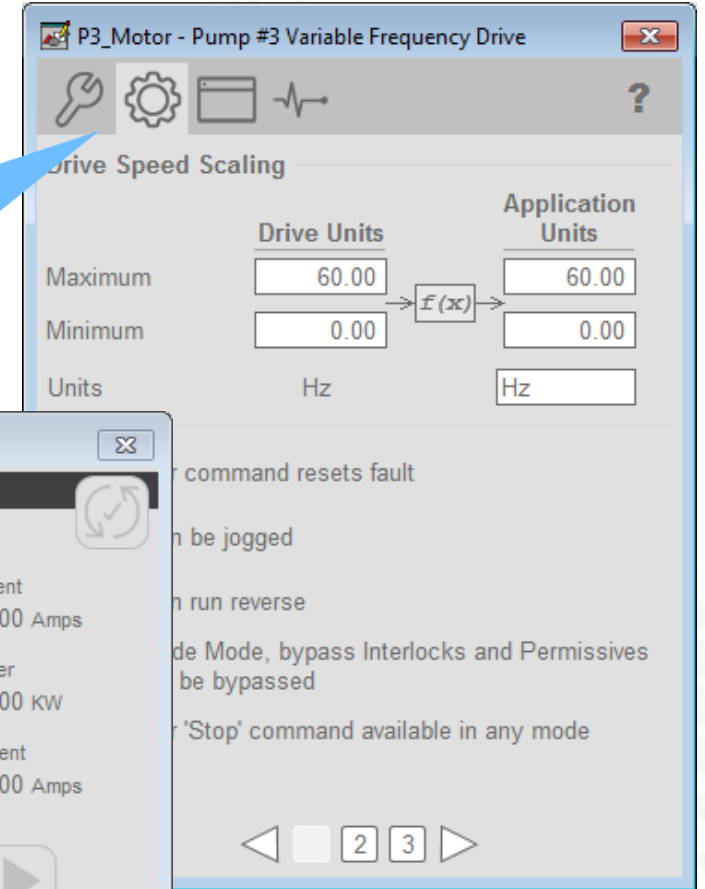
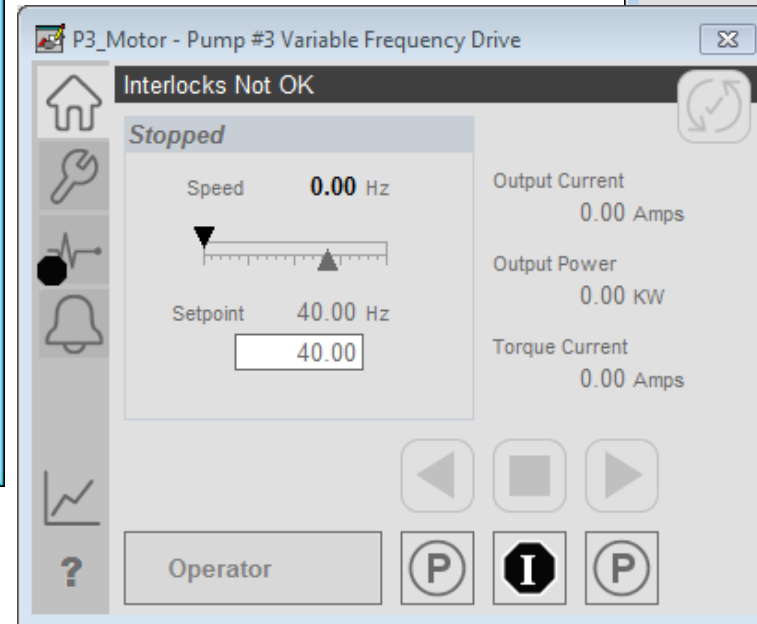
Basic Display

- Operation
- Basic Maintenance
- Basic Diagnostics
- Alarms
- Help



Advanced Configuration Display

- Advanced Maintenance
- Advanced Diagnostics
- Engineering / Configuration



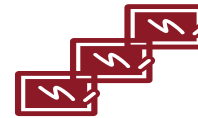
PlantPAx[®]

Distributed Control System

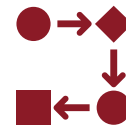
5.0



Reduced Footprint



Drives Consistent Delivery



Streamlined Workflows



Cybersecurity Enabled

Expanding the Logix Family for Process

Reduce deployment time and variability for process applications in the ControlLogix® and CompactLogix™ families.

Overview

Leverage native features like **embedded instructions and task modeling** to minimize project design time.

Available in three ControlLogix® catalogs and two CompactLogix™ catalogs.

8-series Logix controller performance profile

- 2 in CompactLogix – 2 Mb, 4 Mb
- 3 in ControlLogix – 3 Mb, 10 Mb, 40 Mb

Benefit

- **Out-of-the-box settings and instructions** that follow PlantPax® guidelines
- Intuitive workflows eliminate unnecessary rework, simplify design and deploy effort



Expanding our plant-wide infrastructure

Process controller

Process Skids CompactLogix™ controllers

5370

5380

5480

Plant-wide

PlantPax® System ControlLogix® controllers

5570

5580

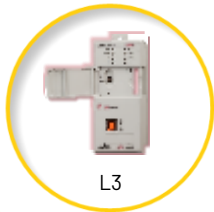
Integrated

Scalable

Information-enabled



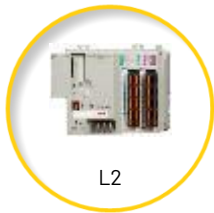
Armor™



L3



Armor™
GuardLogix®



L2



L1



Process



5380



GuardLogix®



5480



Armor™



5570



Process



Armor™
GuardLogix®



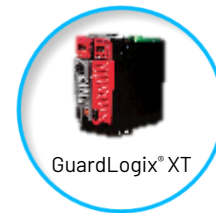
GuardLogix®



5580



XT



GuardLogix® XT



GuardLogix®

Embedded Process Instructions

Simplifying Lifecycle Management

Reduced footprint (Simplification & Strings)

Many strings moved from instructions to extended tag properties

Instructions in firmware (No overhead memory consumed)

Less Servers, higher data volumes

Drives consistent delivery

Library native to controller and design pallet

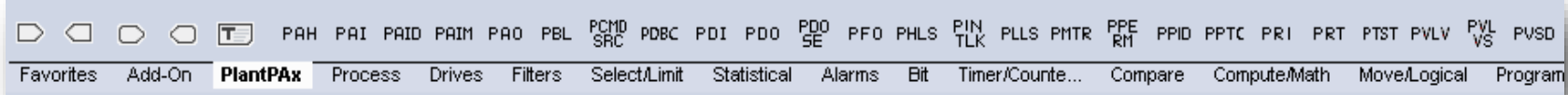
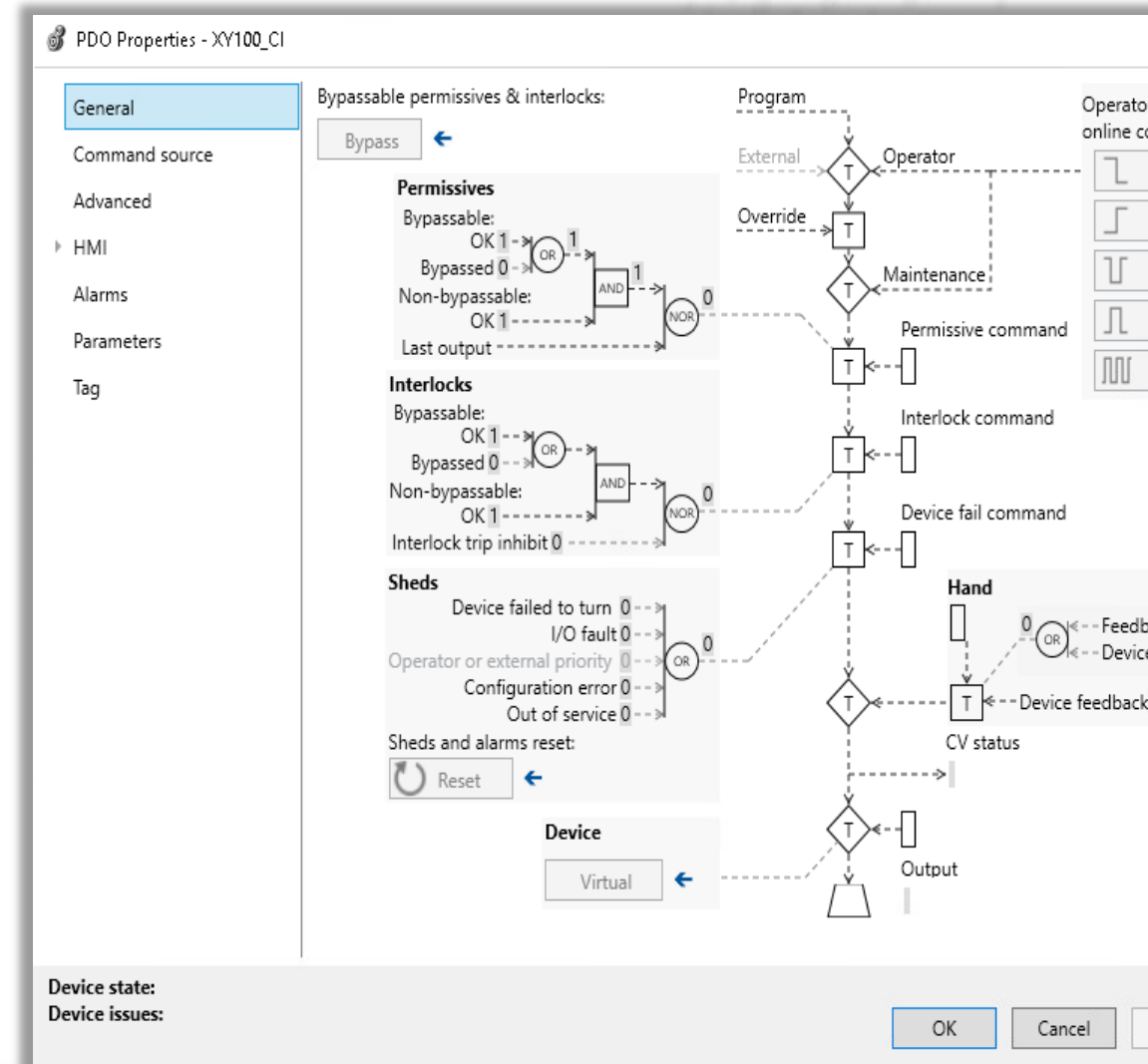
Simplifies lifecycle management

Streamlined workflow

Controller based alarming

Instructions native to controller (no importing of A0Is)

Supports multiple library versions on one system



Process Controller Exclusive

PlantPax[®] System 5.0

Process Objects – NG Integrated Configuration

Overview

New SAMA diagram interface

SAMA is an acronym standing for Scientific Apparatus Makers Association, referring to a unique form of diagram used primary in the power generation industry to document control strategies

Benefits

Intuitive design-time configuration interface

Consistent experience w/ objects and firmware instructions

Eliminate need for disparate tools

Greatly reduce # of steps to configure new object

TagDescription	
LC004	
P_PIDE	Proportional + Integral + Derivative
Inp_PV	Out_CV 0.0
Inp_CascSP	Val_PV 0.0
Inp_PVGrdQ	Val_SP 0.0
Inp_PVBad	Val_CVSet 0.0
Inp_PVUncertain	Val_CVOut 0.0
Inp_CVIOFault	Val_Mode 9
Inp_Hand	Sts_Caso 0
Inp_IntlkOK	Sts_Auto 0
Inp_NBIntlkOK	Sts_Man 1
Cfg_PVEUMin	Sts_BypActive 0
Cfg_PVEUMax	Sts_Err 0
	Sts_Hand 0
	Sts_Maint 0
	Sts_Ovrd 0
	Sts_Prog 0
	Sts_Oper 1



Rockwell Software

Studio 5000

PlantPax[®] System 5.0

Select and Go Alarms within the Instructions

Simple alarm setup and configuration

Single environment – **deploy alarms when creating control elements** in Logix Designer

One place to go to add and configure alarms

One click to add alarms from the object's definition

Predefined alarms on every object

Allow users to enable alarms for each instance.

PAI Properties - FI0921*

General
PV fail check
Advanced
HMI*
Alarms*
Parameters
Tag

Use Alarm

<input checked="" type="checkbox"/> High High	Gate delay s	0.000	Limit m3/h	2800	Dea
<input type="checkbox"/> High		0.000		2500	
<input type="checkbox"/> Low		0.000		300	
<input type="checkbox"/> Low Low		0.000		150	
<input type="checkbox"/> High deviation		0.000		0	
<input type="checkbox"/> Low deviation		0.000		0	
<input type="checkbox"/> High RoC		0.000		0 /s	

Settings for all alarms

Apply following settings to all alarms

Class:

Alarm group:

FactoryTalk View command:

Allow operator to shelve alarm
 Allow maintenance to disable alarm

Instruction Usage

See PlantPax[®] and Process instruction usage per task for optimal task balancing and visibility

Overview

See a dashboard of each task and the instructions used.

Use with embedded webpage to see CPU utilization and avoid task overlap.

Benefit

Consistent performance and visibility into task loading during project creation.

Easier identification of number of control strategies.

The screenshot shows the 'Instruction Usage' window with a table of instruction usage per task. The table has columns for Category, Instruction, Fast, Normal, Slow, System, and Total. The data is as follows:

Category	Instruction	Fast	Normal	Slow	System	Total
PlantPax	PAI	0	1	0	0	1
PlantPax	PAO	0	1	0	0	1
PlantPax	PCMSRC	0	18	0	0	18
PlantPax	PDI	0	1	0	0	1
PlantPax	PDO	0	1	0	0	1
PlantPax	PFO	0	1	0	0	1
PlantPax	PTST	0	1	0	0	1
Total		0	24	0	0	24

A context menu is open over the 'Tasks' column, showing options: New Task..., Cut (Ctrl+X), Copy (Ctrl+C), Paste (Ctrl+V), and Instruction Usage (highlighted with a red box). The 'Tasks' column also shows a list of tasks: Fast (100 ms), Normal (250 ms), Slow (500 ms), System (1000 ms), Unscheduled, Motion Groups, and Alarm Manager.

Process Controller Exclusive

Automatic Diagnostics

Access and display diagnostic information without additional programming

Event Time	State	Area	Server Name	Message	Message Code	Subject	Subject Na...	Device Type	Product Na...	Catalog
<all>	<al...>	<al...>	<all>	<all>	<all>	<all>	<all>	<all>	<all>	<all>
11/19/2019 11:5...	↕	/Line1...	FactoryTalk ...	Connection Los...	CONN_LOSS	Device	[ADDA]\$DE...	Communic...		
11/19/2019 12:2...	↕	/Line1...	FactoryTalk ...	Major Fault T03...	CTRL_FLT_3_16	Controller	[ADDA]\$CO...	0	0	
11/19/2019 12:2...	↕	/Line1...	FactoryTalk ...	Connection Los...	CONN_LOSS	Unknown	[ADDA]\$DE...	General Pur...	1756-OB32/A	1756-OB32/A
11/19/2019 12:2...	↕	/Line1...	FactoryTalk ...	Connection Los...	CONN_LOSS	Device	[ADDA]\$DE...	Communic...	5094-Ethern...	5094-AEN2S...

Event Time: 11/19/2019 12:24:36 PM
Assessment:
State: Active and Unsuppressed
Area: Line1_Data
Server Name: FactoryTalk Linx
Message: Major Fault T03:C16 - I/O Fault: I/O module connection failed on required module.
Message Code: CTRL_FLT_3_16
Subject: Controller
Subject Name: [ADDA]\$CONTROLLERSV33_AD_demo
Vendor: 0
Device Type: 0
Product Name: 0
Catalog:
Major Revision: 0
Minor Revision: 0
Address: FTVSEDEMO19\Ethernet\192.168.1.85\Backplane\6

Maintenance Screens
Connection Fault North Building rack 8 slot 3
Open Wire Channel 3 module 7 slot 5

Controller Properties - Tkn_Pax5_test1
Nonvolatile Memory Capacity Internet Protocol Port Configuration Security Alarm Log PlantPax
General Major Faults Minor Faults Date/Time Advanced SFC Execution Project Redundancy
Controller Fault Handler: <none>
Power-Up Handler: <none>
 Match Project to Controller
Serial Number: 011A2BFC
 Allow Consumed Tags to Use RPI Provided by Producer
 Report Overflow Faults
 Enable Automatic Diagnostics
OK Cancel Apply Help



Alarms and Events Database

Highly Integrated HART

Features

Add and replace HART devices online

HART signals & connection status indicated Logix Designer I/O tree

Integrated device diagnostics via profile

PlantPax® connection type selection

Benefits

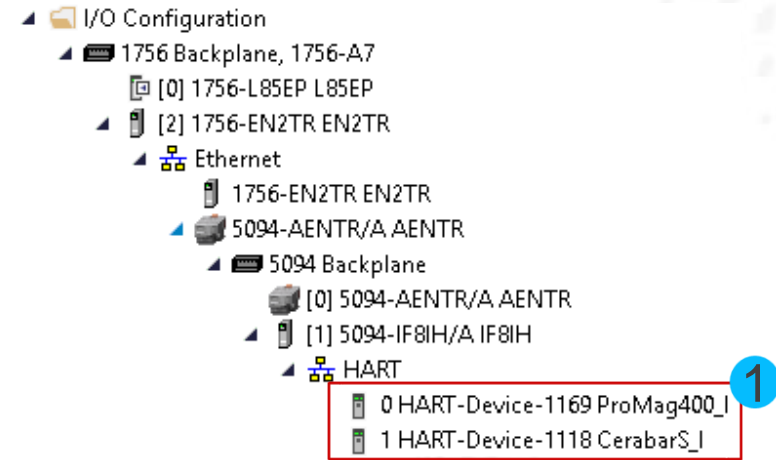
Intuitive Integration

Visible access to HART reference name

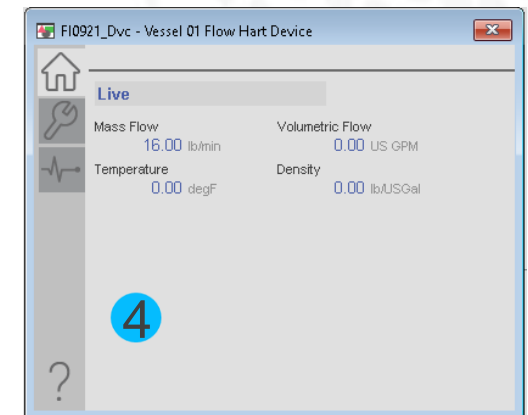
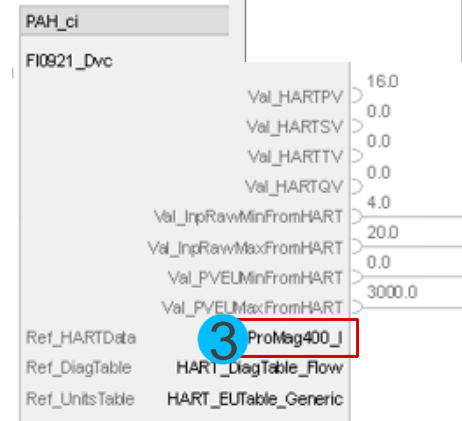
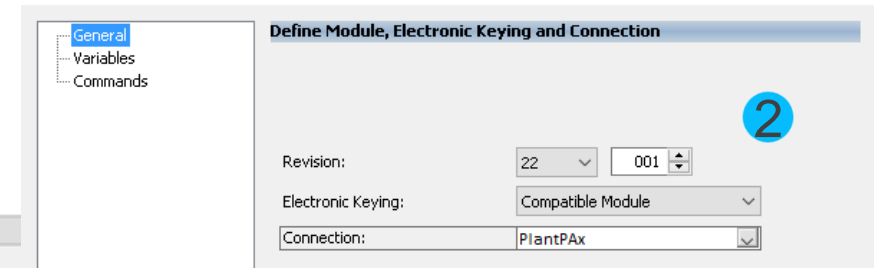
PlantPax data type (connection) pre-defined for PAH (HART interface) instruction

Device diagnostics included in PlantPax data type connection

Out of the box Faceplate renders HART content



Module Definition



Process Controller High Availability

Available at Launch of PlantPAx® 5.0!



- Intended as an addition to the 5570 redundancy solution (also available in V33)
- Leverages the 1756-RM2 modules

Cybersecurity Certifications

ISA99/IEC 62443



IEC 62443-4-1 – Rockwell Automation has a certified secure development lifecycle.



IEC 62443-4-2 – Select products in the Rockwell Automation portfolio are certified against this standard as an enabler to system cybersecurity



IEC 62443-3-3 – A Rockwell Automation system reference architecture will have certification that provides the basis for all customer systems to get certified.



IEC 62443-2-4 – Rockwell Automation delivery arm (SSB) have processes and certification to deliver customer system that are cyber secure



[Securing your PlantPax® system in The Connected Enterprise White Paper](#)

Published with the PlantPax 4.6 Launch, Summer 2019

[It's 10:00 p.m. Do You Know Where Your Data Is?](#)

Blog Post for Life Sciences Cybersecurity

PlantPax 5.0 Documentation Restructure

Focus: Core

Combine
one User

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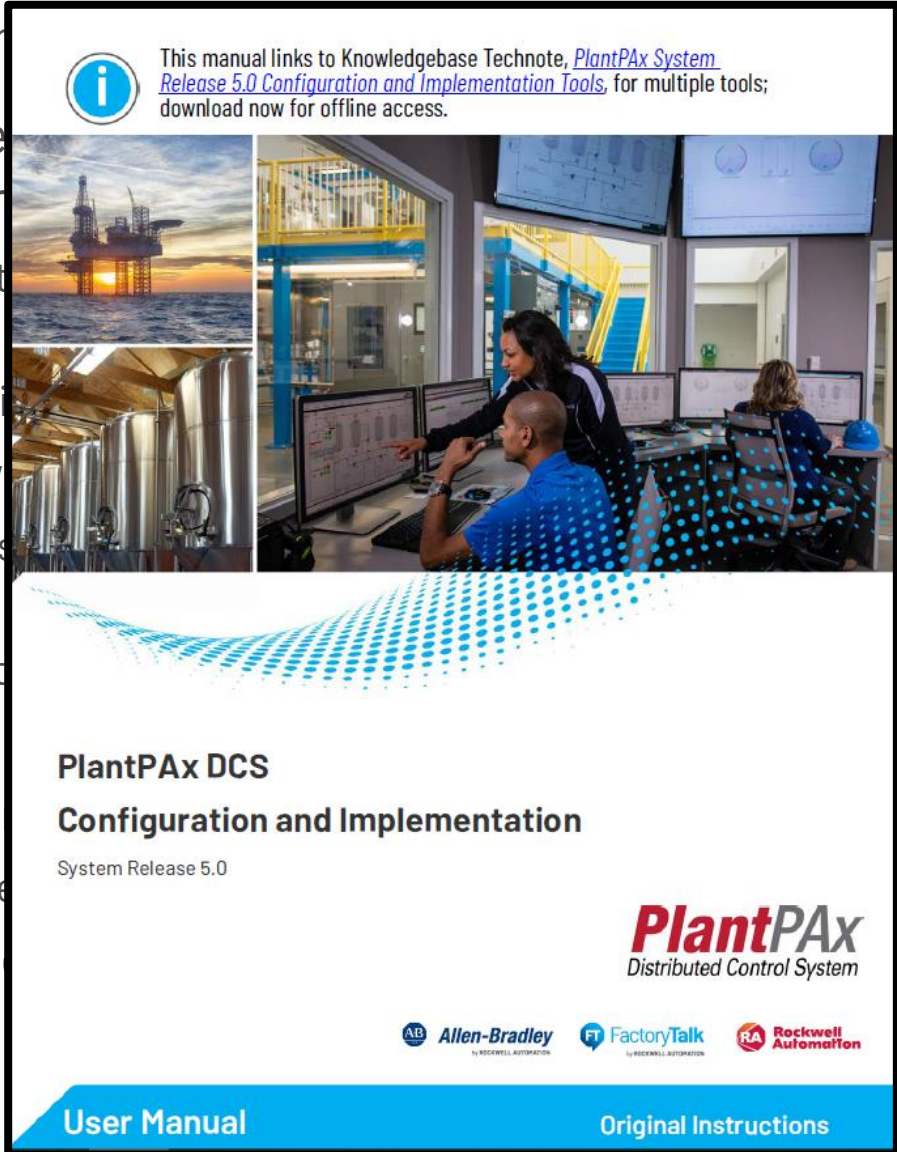
Benefits

- Combi

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 This manual links to Knowledgebase Technote, [PlantPax System Release 5.0 Configuration and Implementation Tools](#), for multiple tools; download now for offline access.




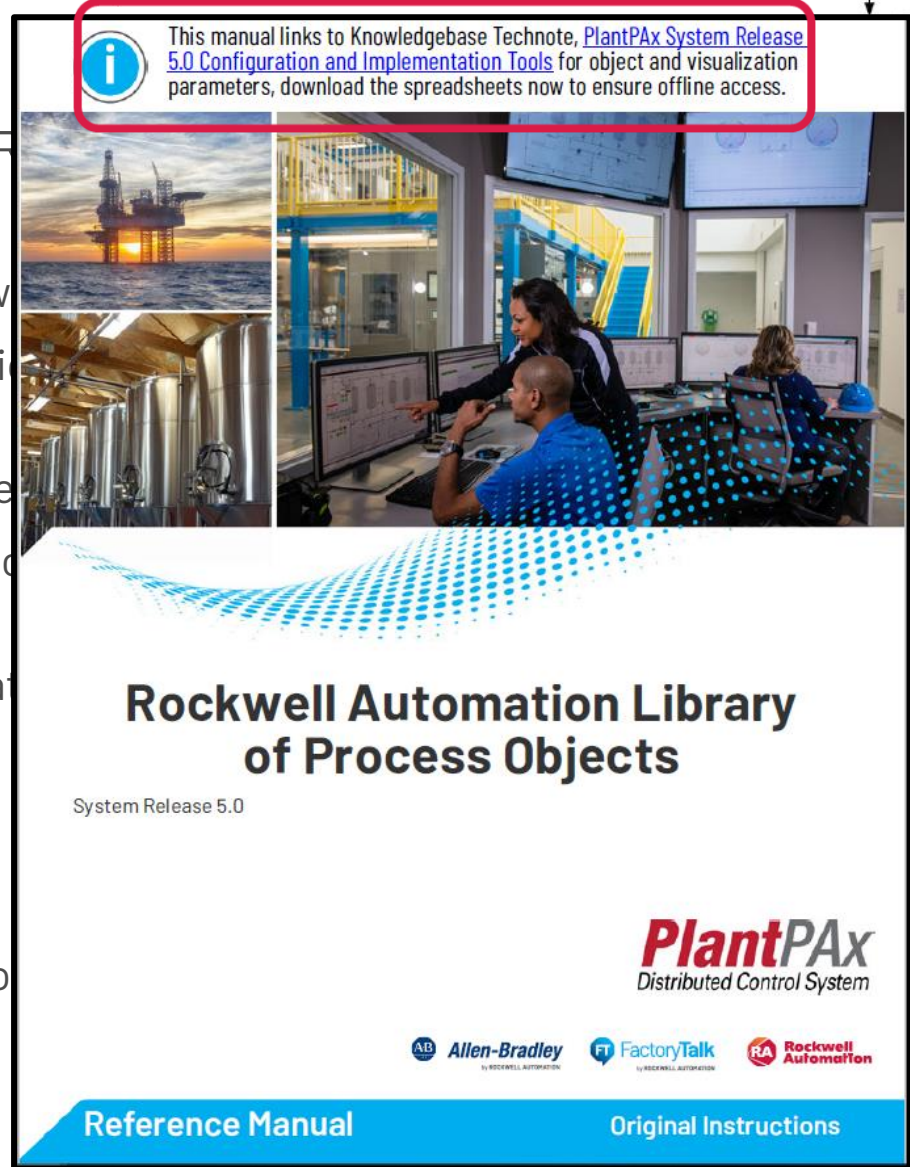
PlantPax DCS
Configuration and Implementation
System Release 5.0

PlantPax
Distributed Control System




User Manual Original Instructions

 This manual links to Knowledgebase Technote, [PlantPax System Release 5.0 Configuration and Implementation Tools](#) for object and visualization parameters, download the spreadsheets now to ensure offline access.

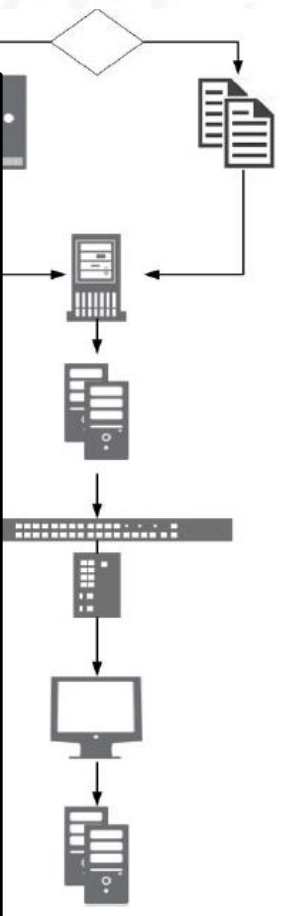


**Rockwell Automation Library
of Process Objects**
System Release 5.0

PlantPax
Distributed Control System



Reference Manual Original Instructions





PlantPAx

Modern DCS

Tomas Knobloch • Solution Consultant Process & SW • May•2022

expanding **human possibility**[®]



Thank you.
Questions ???