

Rockwell Automation Library of Process Objects: Run Time and Start Counter (P_RunTime)

Version 3.5

IMPORTANT

This manual applies to the Rockwell Automation Library of Process Objects version 3.5 or earlier.
For Rockwell Automation Library of Process Objects version 5.0, see

- [PROCES-RM200](#)

For Rockwell Automation Library of Process Objects version 4.0 or later, use the following manuals:

- [PROCES-RM013](#) contains logic instructions
- [PROCES-RM014](#) contains display elements



Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.



WARNING: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.



ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

IMPORTANT

Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.



SHOCK HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.



BURN HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.



ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

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Notes:

This manual contains new and updated information. Changes throughout this revision are marked by change bars, as shown to the right of this paragraph.

Software Compatibility and Content Revisions

Table 1 - Summary of Changes

Topic	Page
Changed software version from 3_1 to 3_5	10
Split visualization files table by type and reordered to align with installation requirements	10

For the latest compatible software information and to download the Rockwell Automation® Library of Process Objects, see the Product Compatibility and Download Center at <http://www.rockwellautomation.com/rockwellautomation/support/pcdc.page>.

For general library considerations, see Rockwell Automation Library of Process Objects, publication [PROCES-RM002](#).

Additional Resources

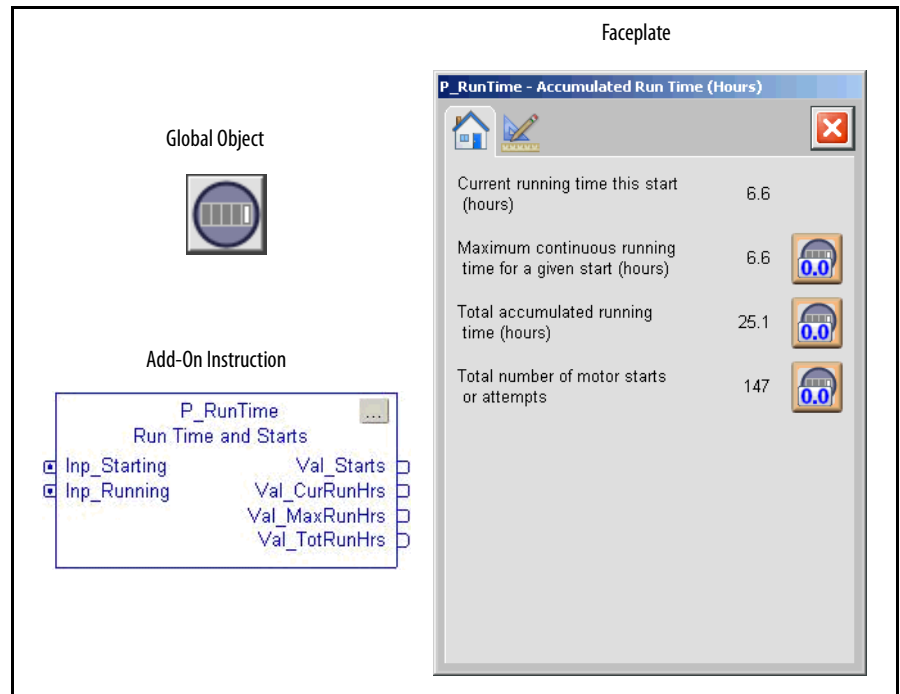
These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
PlantPAx® Distributed Control System Selection Guide, publication PROCES-SG001	Provides information to assist with equipment procurement for your PlantPAx system.
PlantPAx Distributed Control System Reference Manual, publication PROCES-RM001	Provides characterized recommendations for implementing your PlantPAx system.
Rockwell Automation Library of Process Objects, publication PROCES-RM002	Provides general considerations for the PlantPAx system library of process objects.
FactoryTalk® View Machine Edition User Manual, publication VIEWME-UM004	Provides details on how to use this software package for creating an automation application.
FactoryTalk View Site Edition User Manual, publication VIEWSE-UM006	Provides details on how to use this software package for developing and running human-machine interface (HMI) applications that can involve multiple users and servers, distributed over a network.
Logix5000™ Controllers Add-On Instructions Programming Manual, publication 1756-PM010	Provides information for designing, configuring, and programming Add-On Instructions.

You can view or download publications at <http://www.rockwellautomation.com/literature/>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Run Time and Start Counter (P_RunTime)

The P_RunTime (Run Time and Start Counter) Add-On Instruction is used to accumulate the total run time and count of starts for a motor or other equipment. It is a software implementation of the mechanical hour meter that is often mounted in the door of a Motor Control Center (MCC) bucket to show total motor run time. The run time and number of starts are variables used by maintenance personnel to determine when to perform maintenance activities on the motor or other equipment.



Guidelines

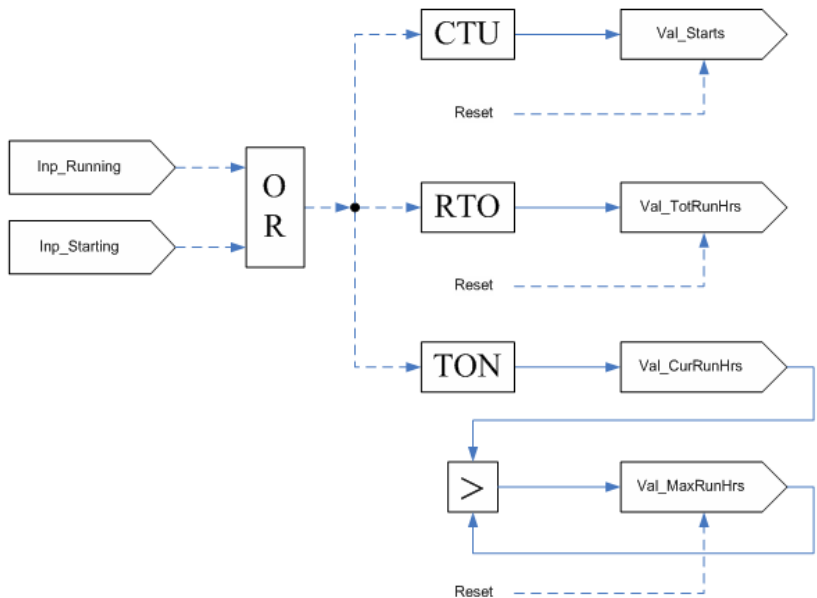
Use this instruction in these situations:

- You want the functionality of a run time meter or start counter without having to add hardware devices for these functions to your Motor Control Center (MCC).
- You need the total run time, current run time, maximum run time, or start count information for a piece of equipment on the operator display and you do not have monitoring software that provides the information.
- Your equipment monitoring software expects the controller to provide equipment run time and start values rather than just a Running status.

Do **not** use this instruction when you have advanced software for monitoring equipment run time that uses the equipment Running status as its input.

Functional Description

The diagram below shows the functional characteristics of the P_RunTime Add-On Instruction.



The following list shows the functional coding for the P_RunTime instruction.

Table 2 - P_RunTime Functional Coding

Input	Starting	Running	Stopped
Inp_Starting	1	Ignored	0
Inp_Running	Ignored	1	0

The P_RunTime instruction provides the following capabilities:

- Accumulate and display the total running time for the associated equipment.
- Accumulate and display the count of starts or start attempts for the associated equipment.
- Show the amount of run time since the last start (current run). This total is held after the equipment is stopped, until the next start, when it is reset to zero.
- Show the maximum amount of time for any single run; this is the highest value achieved by the previous total.
- Let maintenance personnel (but not operators) clear (individually) the total run time, starts count, or maximum single run time. This lets the times be reset when the motor or other equipment is serviced, rebuilt or replaced.

Required Files

Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline implementing your system. This lets you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix® firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.

Controller File

The P_RunTime_3_5-00_AOIL5X⁽¹⁾ Add-On Instruction must be imported into the controller project to be used in the controller configuration. The service release number (boldfaced) can change as service revisions are created.

Visualization Files

This Add-On Instruction has associated visualization files that provide a common user interface. These files can be downloaded from the Product Compatibility and Download Center at <http://www.rockwellautomation.com/rockwellautomation/support/pcdc.page>.

IMPORTANT The visualization file dependencies require Process Library content imports to occur in a specific order as reflected in the following tables:

- Images
- Global Objects
- Standard Displays
- HMI Tags
- Macros

Images are external graphic files that can be used in displays. They must be imported for FactoryTalk View to make use of them.

When PNG files are imported, they are renamed by FactoryTalk View with a .bmp file extension, but retain a .png format.

Table 3 - Visualization Files: Images (.png)

FactoryTalk View SE Software	FactoryTalk View ME Software	Description
All .png files in the images folder	All .png files in the images folder	These are the common icons used in the global objects and standard displays for all Process Objects.

The Global Object files (.ggfx file type) in the following table are Process Library display elements that are created once and referenced multiple times on multiple displays in an application. When changes are made to a Global Object, all instances in the application are automatically updated.

(1) The service release number (boldfaced) can change as service revisions are created.

Table 4 - Visualization Files: Global Objects (.ggfx)

FactoryTalk View SE Software	FactoryTalk View ME Software	Description
(RA-BAS) Common Faceplate Objects	(RA-BAS-ME) Common Faceplate Objects	Global objects used on process object faceplates.
(RA-BAS) Process Faceplate Motor Objects	(RA-BAS-ME) Process Faceplate Motor Objects	Motor global objects used on process object faceplates.
(RA-BAS) Process Graphics Library	(RA-BAS-ME) Process Graphics Library	Process global object device symbols used to build process graphics

The Standard Display files (.gfx file type) in the following table are the Process Library displays that you see at runtime.

Table 5 - Visualization Files: Standard Displays (.gfx)

FactoryTalk View SE Software	FactoryTalk View ME Software	Description
(RA-BAS) P_RunTime-Faceplate	(RA-BAS-ME) P_RunTime-Faceplate	The faceplate that is used for the object

HMI Tags are created in a FactoryTalk View ME application to support tab switching on Process Library faceplates. The HMI tags may be imported via the comma-separated values file (.csv file type) in the following table.

Table 6 - Visualization Files: HMI Tags (.csv)

FactoryTalk View SE Software	FactoryTalk View ME Software	Description
N/A	FTVME_PlantPaxLib_Tags_3_5_XX.csv where XX = the service release number.	These tags must be imported into the FactoryTalk View ME project to support switching tabs on any Process Object faceplate.

Controller Code

This section describes the parameter references for this Add-On Instruction.

Run Time and Start Counter Input Structure

Input parameters include the following:

- Input data elements (Inp_) are typically used to connect field inputs from I/O modules or signals from other objects.
- Configuration data elements (Cfg_) are used to set configurable capabilities and features of the instruction.
- Commands (PCmd_, OCmd_, MCmd_) are used by program logic, operators, and maintenance personnel to request instruction actions.

Table 8 - P_RunTime Input Parameters

Input Parameter	Data Type	Default	Description
EnableIn	BOOL	1	<p>Ladder Diagram: If the rung-in condition is true, the instruction's Logic routine executes. If the rung-in condition is false, the instruction's EnableInFalse routine executes.</p> <p>Function Block Diagram: If true, or not connected, the instruction's Logic routine executes. If the parameter is exposed as a pin and wired, and the pin is false, the instruction's EnableInFalse routine executes.</p> <p>Structured Text: No effect. The instruction's Logic routine executes.</p>
Inp_Starting	BOOL	0	1 = Motor is Starting (from motor instruction).
Inp_Running	BOOL	1	1 = Motor is Running (from motor instruction).
Cfg_PCcmdClear	BOOL	1	When this parameter is 1, program commands are cleared once they are acted upon. When set to 0, program commands remain set until cleared by the application program logic.
PCmd_ClearStarts	BOOL	0	<p>When Cfg_PCcmdClear is set to 1:</p> <ul style="list-style-type: none"> Set PCmd_ClearStarts to 1 to clear count of starts (attempts) Set PCmd_ClearMaxHrs to 1 to clear the maximum, continuous runtime for any start Set PCmd_ClearTotHrs to 1 to clear the Total Runtime These parameters reset automatically <p>When Cfg_PCcmdClear is set to 0:</p> <ul style="list-style-type: none"> Set PCmd_ClearStarts to 1 to clear count of starts (attempts) Set PCmd_ClearMaxHrs to 1 to clear the maximum, continuous runtime for any start Set PCmd_ClearTotHrs to 1 to clear the Total Runtime These parameters do not reset automatically
PCmd_ClearMaxHrs			
PCmd_ClearTotHrs			
MCmd_ClearStarts	BOOL	0	Maintenance command to Clear Count of Starts (attempts).
MCmd_ClearMaxHrs	BOOL	0	Maintenance command to Clear Maximum (continuous) Run Time for any start.
MCmd_ClearTotHrs	BOOL	0	Maintenance command to Clear Total Running Time.

Run Time and Start Counter Output Structure

Output parameters include the following:

- Value data elements (Val_) are numeric outputs of the instruction for use by the HMI. Values can also be used by other application logic or software packages.

Table 9 - P_RunTime Output Parameters

Output Parameter	Data Type	Description
EnableOut	BOOL	Enable Output: The EnableOut signal is not manipulated by this instruction. Its output state always reflects EnableIn input state.
Val_Starts	DINT	Total number of motor starts or attempts.
Val_CurRunHrs	REAL	Current running time this start (hours).
Val_MaxRunHrs	REAL	Maximum continuous running time for a given start (hours).
Val_TotRunHrs	REAL	Total accumulated running time (hours).
P_RunTime	BOOL	Unique parameter name for auto-discovery.

Run Time and Start Counter Local Configuration Tags

Configuration parameters that are array, string, or structure data types cannot be configured as parameters for Add-On Instructions. Configuration parameters of these types appear as local tags to the Add-On Instruction. Local tags can be configured through the HMI faceplates or in Studio 5000 Logix Designer application by opening the instruction logic of the Add-On Instruction instance and then opening the Data Monitor on a local tag. These parameters cannot be modified by using controller logic or Logix Designer application export/import functionality.

Table 10 - Local Configuration Parameters

Tag Name	Data Type	Default	Description
Cfg_Desc	STRING_40	'Accumulated Run Time (Hours)'	Description for display on HMI. The string shows in the title bar of the faceplate.
Cfg_Label	STRING_20	'Run Time'	Label for graphic symbol displayed on HMI. This string appears on the graphic symbol.
Cfg_Tag	STRING_20	'P_RunTime '	Tag name for display on the HMI. This string shows in the title bar of the faceplate.

Operations

This section describes the primary operations for Add-On Instructions.

Modes

The P_RunTime Add-On Instruction does not have modes and does not contain a P_Mode instruction instance. The Clear commands for the accumulators are accepted at any time.

Alarms

The P_RunTime Add-On Instruction provides no alarms. If alarms are required when any of its values exceed some limits, use one or more P_Alarm instructions with comparison logic, or use one or more P_AIn instructions to generate the necessary alarms.

Simulation

The P_RunTime Add-On Instruction does not have a Simulation capability.

Execution

The following table explains the handling of instruction execution conditions.

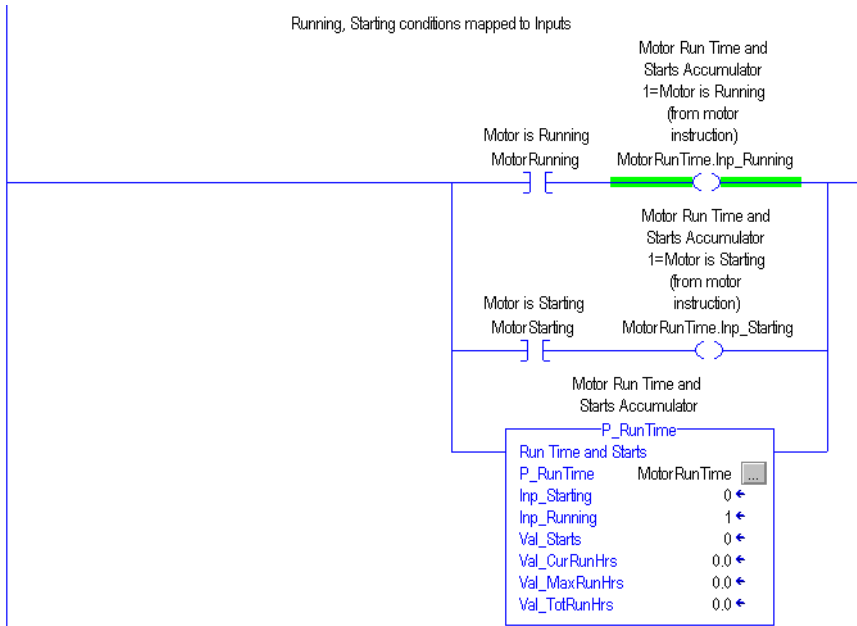
Condition	Description
EnableIn False (false rung) Handling	When executed with EnableIn false (say, on a false rung), the Run Time and Start Counter instruction is processed as if its timers and counter were on a false rung: timing stops, the Total Run Time (retentive) is held, the Starts counter is set with its enable false (it counts when the rung goes true if the Running or Starting input is true) and the Current Run Time (non-retentive) is reset. The last values of the instruction's values (outputs) are maintained while EnableIn is false. This processing lets the instruction be used as a ladder output instruction where the running state is provided as the rung condition. By setting the Running input (Inp_Running) to 1, the rung condition can be used to drive the instruction.
Powerup/Prescan Handling (initial modes)	On Powerup, the Current Run time is reset. Maximum Single Run time, Total Run time, and Starts Count are maintained.
Postscan (SFC transition) Handling	No SFC postscan logic is provided.

Refer to the Logix5000 Controllers Add-On Instructions Programming Manual, publication [1756-PM010](#), for more information.

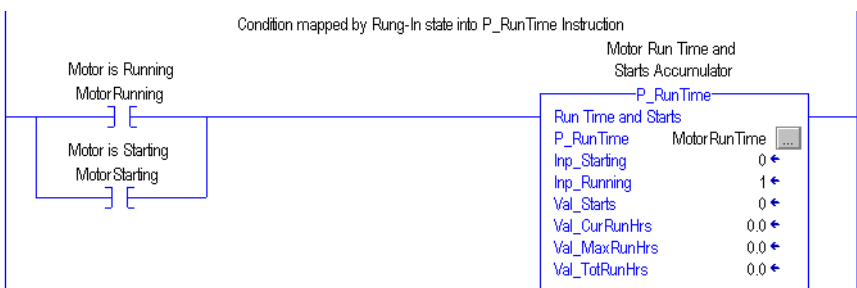
Implementation Using EnableIn False Feature

For the convenience of Ladder Diagram programmers, the P_RunTime instruction can be used in a Ladder Diagram Routine with the input condition carried by the Rung-In condition instead of being mapped on a separate branch.

The following illustration shows normal implementation with the input conditions mapped on separate branches.




The following illustration shows EnableIn **false** implementation with the input condition mapped to the P_ResInh instruction using the Rung-In state.



The Rung-In condition determines whether the Add-On Instruction's normal code ('Logic' Routine) is performed or its EnableIn False code ('EnableInFalse' Routine) is performed. In the P_RunTime instruction, the EnableIn False code performs the logic for a stopped motor. So to use the Rung-In mapping method, Inp_Running must be set to 1 (its default value). When the rung is **true**, the logic executes for a running motor and run time accumulates. When the rung is **false**, the logic executes for a stopped motor and run time is not accumulated.

Display Elements

A display element (global object) is created once and can be referenced multiple times on multiple displays in an application. When changes are made to the original (base) object, the instantiated copies (reference objects) are automatically updated. Use of global objects, in conjunction with tag structures in the ControlLogix system, aid consistency and save engineering time.

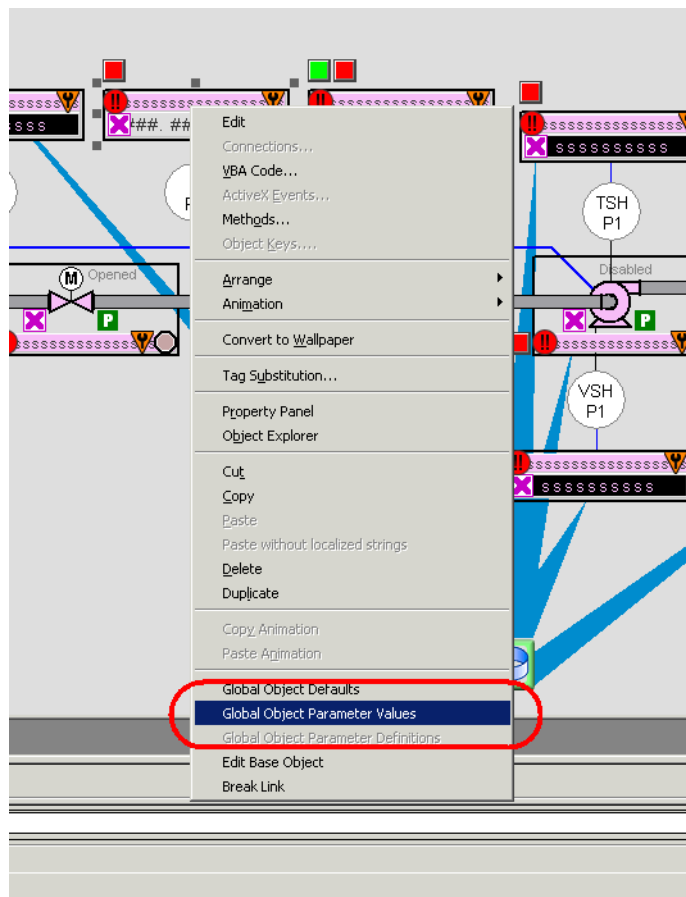
Display Element Name	Display Element	Description
GO_P_RunTime		Standard Run Time Global Object.

The graphic symbol in the table above is for use on faceplates and end-user process graphic displays.

Using Display Elements

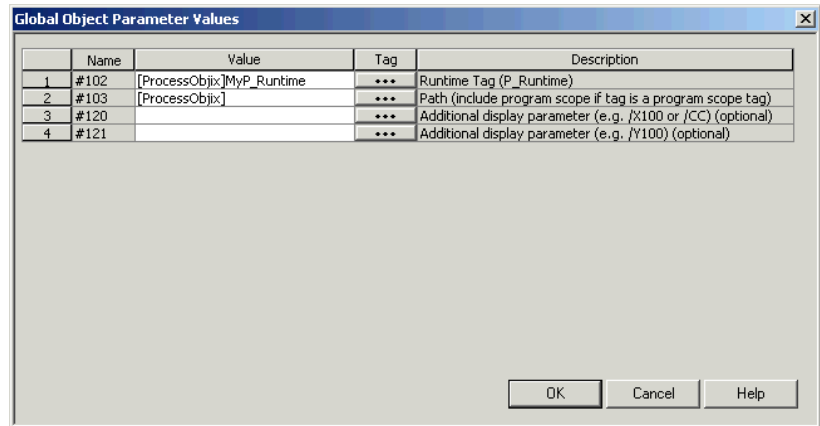
The graphic symbol for P_RunTime instruction can be found in the global object file (RA-BAS) Process Graphics Library.ggfx. Follow the steps below to use the graphic symbol.

1. Copy the global object from the global object file and paste it in the display file.



- In the display, right-click the global object and choose Global Object Parameter Values.

The Global Object Parameter Values dialog box appears.



The global object parameters are as follows.

Parameter	Required	Description
#102	Y	Object tag to point to the name of the associated object Add-On Instruction in the controller.
#103	Y	Path used for display navigation features to other objects. Include program scope if tag is a program scope tag.
#120	N	Additional parameter to pass to the display command to open the faceplate. Typically used to define position for the faceplate.
#121	N	Additional parameter to pass to the display command to open the faceplate. if defining X and Y coordinate, separate parameters so that X is defined by #120 and Y is defined by #121. This lets the same parameters be used in subsequent display commands originating from the faceplate.

- Type the tag or value in the Value column as specified in the Description column.

TIP Click the ellipsis (...) to browse and choose a tag.
Values for items marked '(optional)' can be left blank.

- Click OK.

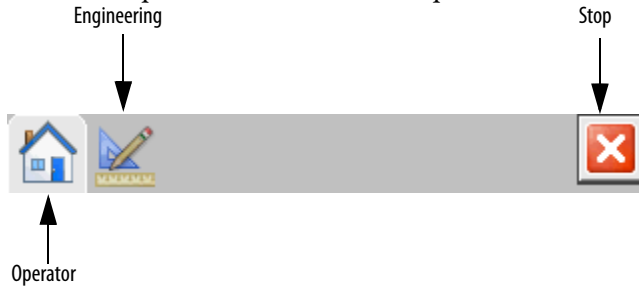
Faceplate

The P_RunTime faceplate consists of two tabs and each tab consists of one or more pages.

Each faceplate title bar contains the value of local configuration tags Cfg_Tag and Cfg_Desc.

Description

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon at the top of the screen to access a specific tab.



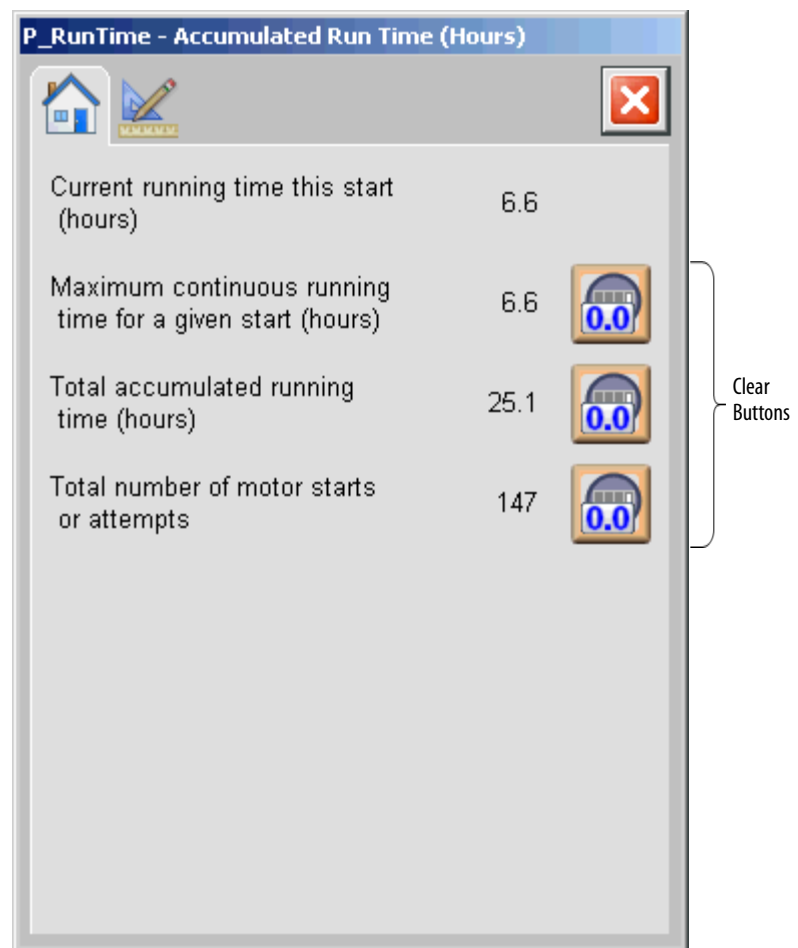
The faceplate provides the means for operators, maintenance personnel, engineers, and others to interact with the P_RunTime instruction instance, including viewing its status and manipulating it through its commands and configuration. When a given input is restricted via Factory Talk View security, the required user Security Code letter is shown in the tables that follow.

Operator Tab

The Faceplate initially opens to the Operator ('Home') tab. From here, an operator can monitor the device status.


The Operator tab shows the following information:

- Current running time for the current start
- Maximum continuous running time for any given start
- Total running time for all starts
- Total number of motor start attempts



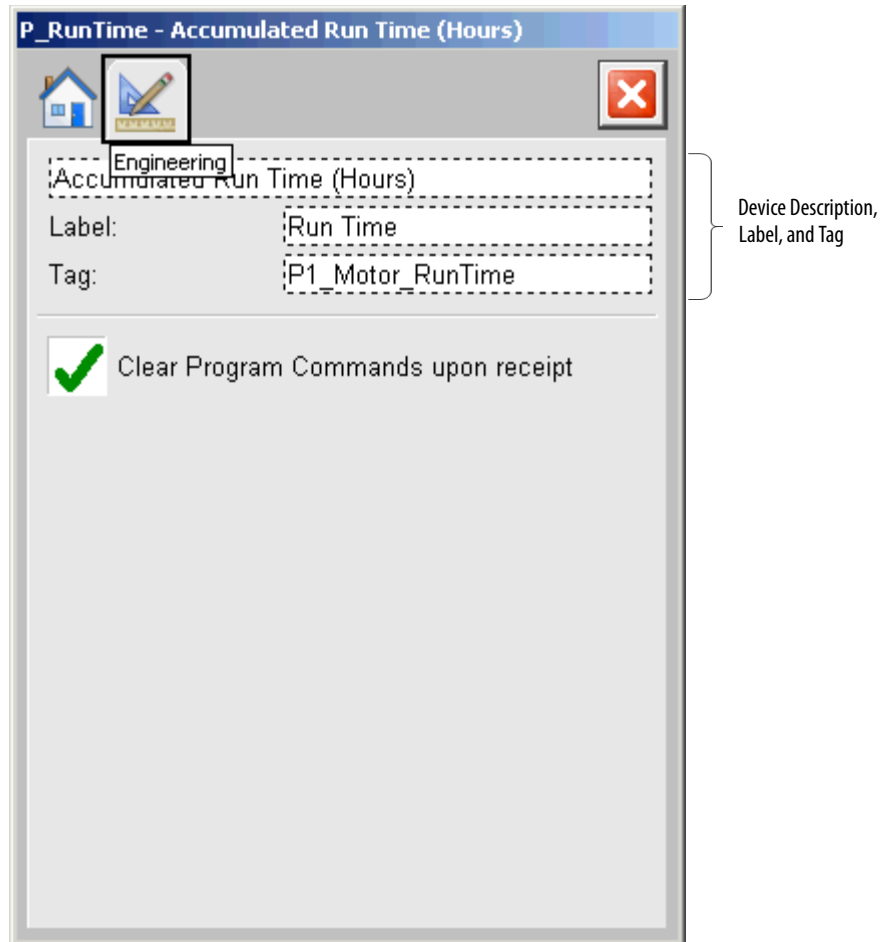
The following table lists the functions on the Operator tab.

Table 11 - P_RunTime Operator Tab Description

Function	Action	Security Required
	Click to clear maximum continuous running time for any given start.	Equipment Maintenance (Code C)
	Click to clear total running time.	
	Click to clear total number of motor starts or start attempts.	

Engineering Tab

On the Engineering tab, you can configure the description, label, and tag for the device.



The following table lists the functions on the Engineering tab.

Table 12 - Engineering Tab Description

Function	Action	Security	Configuration Parameters
Description	Type a description of the Run Time Accumulator that appears on the title bar of each faceplate.	Engineering Configuration (Code E)	Cfg_Desc
Label	Type label text that appears on the graphic symbols.		Cfg_Label
Tag	Type the text that appears in the title bar of each faceplate		Cfg_Tag
Clear Program Commands on receipt	Check to clear Program commands on receipt.		Cfg_PCmdClear

Notes:

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products.

At <http://www.rockwellautomation.com/support> you can find technical and application notes, sample code, and links to software service packs. You can also visit our Support Center at <https://rockwellautomation.custhelp.com/> for software updates, support chats and forums, technical information, FAQs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit <http://www.rockwellautomation.com/services/online-phone>.

Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual. You can contact Customer Support for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/rockwellautomation/support/overview.page , or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation tests all of its products to help ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication [RA-DU002](#), available at <http://www.rockwellautomation.com/literature/>.

Rockwell Automation maintains current product environmental information on its website at <http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page>.

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