

800xA for Harmony

Operation

System Version 5.1

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Operation

System Version 5.1

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About This User Manual

General



Any security measures described in this user manual, for example, for user access, password security, network security, firewalls, virus protection, etc., represent possible steps that a user of an 800xA System may want to consider based on a risk assessment for a particular application and installation. This risk assessment, as well as the proper implementation, configuration, installation, operation, administration, and maintenance of all relevant security related equipment, software, and procedures, are the responsibility of the user of the 800xA System.

800xA for Harmony software allows connection to and control of the Harmony control system via the 800xA Systems Operator Workplace. This user manual describes the operations related to 800xA for Harmony specific functions.

User Manual Conventions

Microsoft Windows conventions are normally used for the standard presentation of material when entering text, key sequences, prompts, messages, menu items, screen elements, etc.

Warning, Caution, Information, and Tip Icons

This user manual includes Warning, Caution, and Information where appropriate to point out safety related or other important information. It also includes Tip to point

out useful hints to the reader. The corresponding symbols should be interpreted as follows:



Electrical warning icon indicates the presence of a hazard that could result in *electrical shock*.



Warning icon indicates the presence of a hazard that could result in *personal injury*.



Caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard that could result in *corruption of software or damage to equipment/property*.



Information icon alerts the reader to pertinent facts and conditions.



Tip icon indicates advice on, for example, how to design your project or how to use a certain function

Although Warning hazards are related to personal injury, and Caution hazards are associated with equipment or property damage, it should be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process performance leading to personal injury or death. Therefore, fully comply with all Warning and Caution notices.

Terminology

A complete and comprehensive list of terms is included in *System 800xA System Guide Functional Description (3BSE038018*)*. The listing includes terms and definitions that apply to the 800xA System where the usage is different from commonly accepted industry standard definitions and definitions given in standard dictionaries such as Webster's Dictionary of Computer Terms.

Released User Manuals and Release Notes

A complete list of all User Manuals and Release Notes applicable to System 800xA is provided in *System 800xA Released User Manuals and Release Notes (3BUA000263*)*.

System 800xA Released User Manuals and Release Notes (3BUA000263)* is updated each time a document is updated or a new document is released. It is in pdf format and is provided in the following ways:

- Included on the documentation media provided with the system and published to ABB SolutionsBank when released as part of a major or minor release, Service Pack, Feature Pack, or System Revision.
- Published to ABB SolutionsBank when a User Manual or Release Note is updated in between any of the release cycles listed in the first bullet.



A product bulletin is published each time *System 800xA Released User Manuals and Release Notes (3BUA000263*)* is updated and published to ABB SolutionsBank.

Section 1 Introduction

Product Overview

800xA for Harmony provides connectivity to the Harmony Distributed Control System (DCS). This connectivity is integrated with the 800xA Operator Workplace to provide a single operation and configuration view of the system.

Instruction Content

This instruction is comprised of multiple sections describing the features and operations of 800xA for Harmony that include the following:

- [Section 2, Faceplates.](#)
- [Section 3, Operating Parameters.](#)
- [Section 4, System Diagnostics Displays.](#)
- [Section 5, Block Details.](#)
- [Section 6, Module Details.](#)
- [Section 7, SOE Reporting.](#)
- [Section 8, Advanced Harmony Control System Monitoring.](#)
- [Section 9, Aspects.](#)
- [Section 10, Web Based Server Explorer.](#)
- [Section 11, Harmony Batch Support.](#)
- [Section 12, Replication Monitor.](#)
- [Appendix A, Tags.](#)
- [Appendix B, Tag Quality.](#)

Section 2 Faceplates

Introduction

Harmony faceplates and their associated Point Displays are available as aspects of a Harmony tag. A faceplate is a process dialog for supervision and control.

Refer to the *System 800xA Operations (3BSE036904*) instruction* for more detailed information on faceplates. Otherwise, specific Harmony information is detailed in this section.

Function

Harmony data is supplied to each faceplate for each Harmony tag type. This data is used to populate all of the faceplates dynamic controls. The user has control over each faceplate and Point Display, including acknowledging alarms, setting auto/manual mode and changing set points. The user can change the value or state of a Harmony tag property that is controllable through the faceplate or Point Display.

The following Harmony tags have faceplates:

- Device Driver (DD).
- Multi State Device Driver (MSDD).
- Remote Control Memory (RCM).
- SOE Report Trigger Tag.
- Remote Manual Set Constant (RMSC).
- Remote Motor Control Block (RMCB).
- Station.
- Analog.
- Enhanced Analog In.
- Enhanced Analog Out.
- Digital.
- Enhanced Digital In.

- Enhanced Digital Out.
- Data Acquisition Analog (DAANG).
- Data Acquisition Digital (DADIG).
- ASCII Text String.
- Text Selector.
- Analog Export.
- Digital Export.
- Module Status.
- Harmony Server Tag.
- PhaseX.

The following Harmony tags have Point Displays as extended faceplates:

- Device Driver.
- Multi State Device Driver.
- Remote Control Memory.
- SOE Report Trigger Tag.
- Remote Manual Set Constant.
- Remote Motor Control Block.
- Station.
- Analog.
- Enhanced Analog In.
- Enhanced Analog Out.
- Digital.
- Enhanced Digital In.
- Enhanced Digital Out.
- Data Acquisition Analog.
- Data Acquisition Digital.
- Analog Export.
- Digital Export.

Attributes

The faceplate functions depend on the tag type. However, all faceplates and Point Displays have five sections ([Figure 1](#)). These sections are as follows:

- Header (all).
- Status and Navigation Bar.

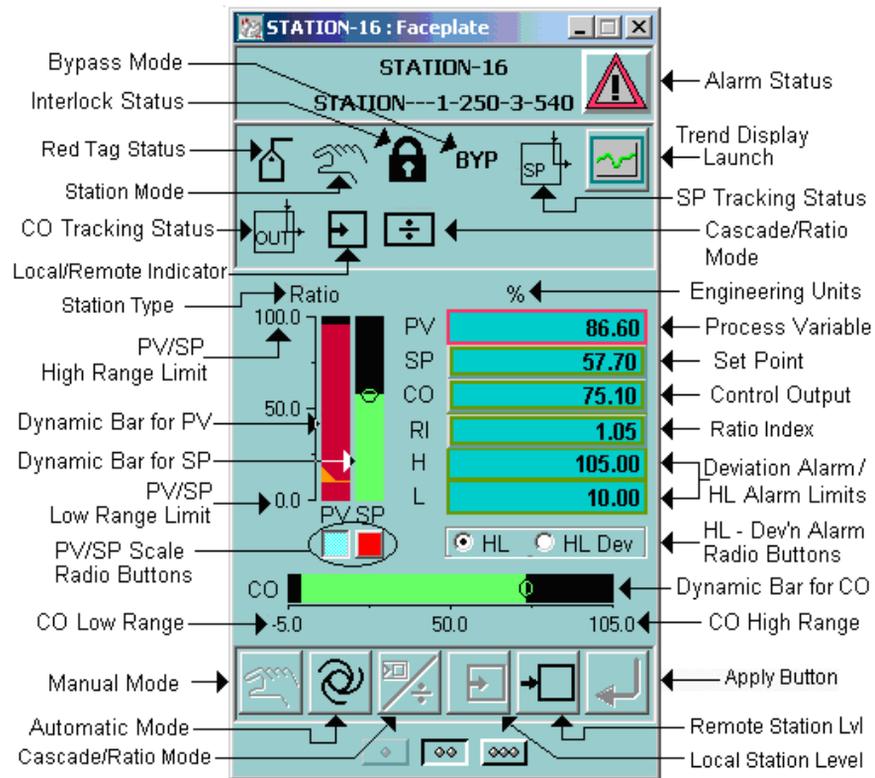


Figure 1. Faceplate Attributes

- Faceplate Element Area (all).
- Button Bar.
- View Selection Bar (all.)

All faceplates and Point Displays have these additional functions in common:

- Alarm state.
- Overall OPC® Tag Quality.

Some faceplates and Point Displays have these additional functions in common:

- OPC Quality of Individual Tag Properties.
- Digital Logic State Control.

- Direct Entry Window (DEW) Control.

Header

The header of the faceplate contains the Object name. It also contains the description of the Harmony tag as well as its alarm state.

The alarm state appears on the right side of the Header bar. This is used for both displaying and acknowledging the current tags alarm state.

Status and Navigation Bar

The Status and Navigation bar contains two types of icons. A Point Display launch button on the right hand side (upper right hand corner) and indicator icons everywhere else.

The Point Display button appears on the right hand side of the Status and Navigation bar for all analog tag types, but not for any of the digital tag types, Module Status, or Harmony Server. This causes a Point Display for that analog tag to be opened in a separate navigation window. Only the process variable (PV) for that tag appears as a single trend trace, with the exception of Station tags, which contains three traces. These traces are one for PV, one for Set Point (SP) and one for Control Output (CO).

The indicator icons display the current states for the Boolean status associated with the current tag being displayed. The status depends upon the type of tag being displayed. These may include red tag status, auto/manual modes, lock statuses, override statuses, and etc.

Element Area

The faceplate Element Area contains the graphical and numerical representations of the tag being monitored. Graphical items found in this area include dynamic bars, static scales, dynamic values, Boolean state indicators, quality indicators and alarm markers. The color of these items indicates alarms, type of input or output, and digital state. Numerical values found here are process variables, set points, control outputs, and high and low alarm limits. The scale and range values are derived from the high and low range limits defined for the tag. Anything appearing in the Element Area depends on the type of tag being displayed.



All operator actions and input done from the Element Area (faceplate body) of Harmony faceplates is a two step operation, requiring confirmation of operator input using the **Apply** button.

Button Bar

Various control buttons are available in the Button bar. All tag types with controllable fields or buttons in the Element Area have a button bar as well as an **Apply** button to the right (or in the lower right) of the Button bar. This button is enabled only when a control action on the faceplate (such as a DEW value change or an RCM state change) is in progress, allowing the user to select this button to apply the control change. Otherwise, the **Apply** button is disabled by having a grayed out look.

Control buttons are available depending on the tag type. These include buttons to set Station tags, Data Acquisition Analogs, and etc. to manual mode or to automatic mode, as well as various enable and override buttons.

A tool tip for each button is visible when the cursor is positioned over it. This tool tip describes the function of each button.



All operator actions done from the button bar of Harmony faceplates are a one step operation, with the resulting action initiated immediately upon selecting the button.



Selecting a button on a faceplate that is not in focus brings it into focus and initiates the corresponding action.

View Selection Bar

Faceplates for Harmony are represented with three different displays:

- Reduced.
- Normal.
- Extended.

There are three buttons in the View Selection bar, which appear at the very bottom of every faceplate. Selecting the one-dot button shows the reduced faceplate. Selecting the two-dot button shows the normal faceplate. Selecting the three-dot button shows the extended faceplate, which also shows a Point Display for each tag type that possesses one.

Some tag types have all three faceplate types. Others do not have the reduced size. The reduced faceplate button is disabled for these. For those tag types that do not have Point Displays, the extended faceplate button is disabled.

Red Tag

A red outline appears around all faceplate elements (faceplate, group displays, etc.) for certain Harmony tag types. This red outline is a flagging and disabling of a Harmony block to be used for performing maintenance on the corresponding hardware (motor, pump, etc.).



The red outline only appears if the red tag property (Harmony tag atom REDTAG/ACT) of the current object is logic state True. Refer to [Red Tag Tab](#) on page 69 for more information on configuring red tags. Refer to the *800xA for Harmony Configuration (3BUA000157*) instruction* for more information on red tag atoms.

The Harmony tag types that support red tagging are as follows:

- ASCII Read.
- DAANG Read.
- DADIG Read.
- DD Read.
- MSDD Read.
- PHASEX Read.
- RCM Read.
- RMCB Read.
- SOE Report Read.
- Station Read.



Avoid writing strings more than 3 characters to the OPC string value named REDTAG/KEYx via a third party OPC client, else the Harmony Servers may crash.

Override Status Icon

The override status icon appears in the Status and Navigation Bar if there is an override condition.



Synchronization Icon

The synchronization icon appears in the Harmony Server Faceplate Status and Navigation Bar during the synchronization phase at startup.



Alarm State and Alarm Indication

For each Harmony tag, the alarm state indicates and displays one of six possible alarm states as shown in [Table 1](#).

Table 1. Alarm Symbols and States

Alarm Symbol	Alarm State	
	Overall alarm status of tag is normal but not active and has been acknowledged.	Inactive and acknowledged
	Overall alarm status of tag is active. Alarm has been acknowledged.	Active and acknowledged
	Alarm has been manually configured to be hidden.	
	Overall alarm status of tag is normal. Return-to-normal has not been acknowledged. Button is raised to allow acknowledgement from operator.	Not active and not acknowledged

Table 1. Alarm Symbols and States (Continued)

Alarm Symbol	Alarm State	
	Overall alarm status of tag is active. Alarm has not been acknowledged. Button is raised to allow acknowledgement from operator.	Active and not acknowledged
	Alarm has been auto inhibited.	Auto disabled
	Alarm has been manually inhibited.	Manually disabled
	Alarm has been manually configured to be hidden.	
	Alarm has been shelved	

NOTE: 1. If there is a black question mark (?) inside of this alarm symbol, that means an alarm has been configured with errors.

The priority number and alarm state color shown is based upon the system configuration for the tag and the alarm priority color configured.

Priority Levels

Alarm priority levels range from 1 through 16. 1 through 3 are red, orange, and yellow respectively while 4 through 16 can be configured. [Table 1](#) shows only priority 1 alarms states.

Quality Indication

There are two types of qualities that the Harmony faceplates displays.

First, the overall OPC tag quality is displayed in all Harmony faceplate and Point Displays. During normal operation of the OPC connection, this quality reflects the quality of the overall tag as reported by the tag property `<tag-name>.QUALITY`. If there is no OPC connection or it is severed, the faceplate shows the quality for communications failure (OPC quality code 24).

Second, each analog tag property value for all faceplates that possess them, has an individual quality code associated with it. If the value is undeterminable due to a total failure of the OPC connection, then the symbol @ for OPC quality code 24 is shown, the last known value is displayed in the field, and a red X is placed over the field. Other reasons for bad quality (different quality codes) cause the last known value to be displayed in the field and a red X to be placed over the field.

Overall field qualities are described in [Tag QualityAppendix B, Tag Quality](#).

Digital Logic State Control

Some digital states can be changed by the operator by selecting either the 0 state or 1 state fields within the faceplate element for that tag.

Green indicates that a particular logic state has been chosen, at which point the **Apply** button is enabled. Select the **Apply** button to verify that the chosen state is to be entered and the change sent to the corresponding point in the control system. The operation is aborted if there is no user verification within 30 seconds or if the ESC key is selected. When the feedback of the new state of the digital signal in the control system reaches the Operator Workplace, the field of the new state is highlighted yellow and the field of the de-energized complement state is highlighted cyan.

Direct Entry Window (DEW) Control

In some analog tag types, dynamic bars and dynamic values allow user input through a feature known as the DEW.

User input Dynamic Bars have a drag handle, a small circle visible at the current value level. For bars and fields that are DEW editable, the user can select the bar or dynamic value, which causes a DEW to appear and the **Apply** button in the Button bar to be enabled. The user then has 30 seconds to do one of the following before verifying the change with the **Apply** button:

- Select the bar and drag its drag handle up or down.

- Manually type in the value in the direct entry window.
- Select the spin buttons (up and down) to ramp the value.

The operation is aborted if the ESC key is pressed or if there is no user verification within 30 seconds, at which time the DEW disappears, the **Apply** button is disabled, and the current value of the field is left alone. Otherwise, if the **Apply** button is selected or the ENTER key is pressed, the new value is put to the Configuration Server and ultimately the Harmony controller, changing the value of this field to the selected value.



The ramping increment of Harmony analog value fields are in 0.04 increments. The ramping increment for dynamic bars are in steps of 0.1.

Point Displays

Harmony Point Displays are expanded faceplates that include rudimentary trend elements, displaying the trace of the process value or state for the current time during the previous four minutes of operation. Point Displays occupy the extended slot of the faceplate control of those tag types that possess them. [Figure 2](#) shows an example of a Point Display.

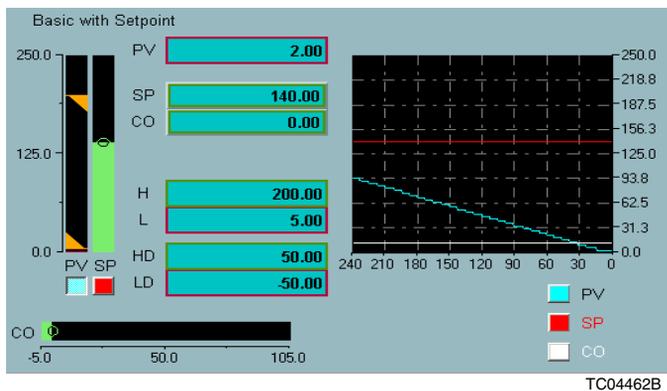


Figure 2. Point Display

Hot Keys

Within a Harmony workplace, Hot Keys can be pressed by the operator (operator control permissions are required) without the click of a mouse to do control operations such as ramping values up, ramping values down, changing digital states, acknowledging alarms, and etc. They can also be used to launch faceplates and thin client aspects associated with a highlighted object. Hot Keys make it easier for a user to monitor and change process values on an 800xA for Harmony console. However, caution should be exercised as the Hot Keys should be used in a timely manner and appropriate situations, such as an emergency stop of a pump or motor, an emergency ramp-up of water flow, or etc.



Refer to the *System 800xA Operations (3BSE036904*)* and the *System 800xA Operations Operator Workplace Configuration (3BSE030322*)* instructions for more information.

Object Hot Keys

The following list shows available predefined Hot Keys in the Operator Workplace:

- CTRL+SHIFT+E: Acknowledge faceplate alarm button.
- CTRL+SHIFT+R: Execute acknowledge verb.
- CTRL+SHIFT+Q: Acknowledge all alarms.
- CTRL+SHIFT+Y: Order manual mode; forced mode for input signals.
- CTRL+SHIFT+U: Order automatic mode; disabling of forced mode for input signals.
- CTRL+SHIFT+T: ToggleAltInputSelect.
- CTRL+SHIFT+0: Deactivate (off, false, zero, stop, etc.).
- CTRL+SHIFT+1: Activate (on, true, one, run, etc.).
- CTRL+SHIFT+K: SmallIncrease (+1% of Span).
- CTRL+SHIFT+H: SmallDecrease (-1% of Span).
- CTRL+SHIFT+L: LargeIncrease (+4% of Span).
- CTRL+SHIFT+J: LargeDecrease (-4% of Span).

Module Status Device Drive (MSDD) objects only:

- CTRL+ALT+1: SetToState1.
- CTRL+ALT+2: SetToState2.
- CTRL+ALT+3: SetToState3.

For Station objects only:

- CTRL+SHIFT+C: CascadeRatio.

Table 2 outlines which Object Tag Types that support each Hot Keys.

Table 2. Harmony Object Types and Hot Keys

Harmony Object Type	Hot Key															
	CTRL+SHIFT+												CTRL+ALT			
	E	R	Q	Y	U	C	T	0	1	K	H	L	J	1	2	3
Harm Server	X	X	X													
Analog Export	X	X	X						X	X	X	X				
Analog Read	X	X	X													
ASCII Read	X	X	X	X	X			X	X							
DAANG Read	X	X	X	X	X		X			X	X	X	X			
Harmony Object Type	Hot Key															
	CTRL+SHIFT+												CTRL+ALT			
	E	R	Q	Y	U	C	T	0	1	K	H	L	J	1	2	3
DADIG Read	X	X	X	X	X		X	X	X							
DD Read	X	X	X	X	X			X	X							
Digital Export	X	X	X					X	X							
Digital Read	X	X	X													
ENH Analog In	X	X	X	X	X					X	X	X	X			
ENH Analog Out	X	X	X	X	X					X	X	X	X			

Table 2. Harmony Object Types and Hot Keys (Continued)

ENH Digital In	X	X	X	X	X			X	X							
ENH Digital Out	X	X	X	X	X			X	X							
ModStat Read	X	X	X													
MSDD Read	X	X	X	X	X								X	X	X	
Harmony PHASEX Read	X	X	X													
RCM Read	X	X	X					X	X							
RMCB Read	X	X	X					X	X							
RMSC Read	X	X	X							X	X	X	X			
SOE Report Read	X	X	X					X	X							
Station Read	X	X	X	X	X	X		X	X	X	X	X	X			
Text Read	X	X	X													

NOTES:

1. The Increase / Decrease Hot Keys (CTRL+SHIFT+(K, H, L, J)), will change the SP for Station Tags in Auto mode, the CO for Station Tags in Manual mode, the USERVAL (user input) for DAANG tags, the OVRVAL (override value) for Enhanced Analogs, and the PV for all other writable Analog tag types.
2. The Deactivate (LS0) and Activate (LS1) Hot Keys (CTRL+SHIFT+(0, 1)), will change the SET_PRIO (Low alarm/high alarm) for ASCII Tags, the OVRVAL (override state) for Enhanced Digitals, and OUT/SIG for all other writable Digital tag types.

Launch Hot Keys

The following is a list of Launch Hot Keys:

- CTRL+SHIFT+F1: Launch Harmony Hot Keys Map file viewer aspect.
- CTRL+SHIFT+F2: Launch Faceplate.
- CTRL+SHIFT+F3: Launch Block Details Thin Client Aspect.
- CTRL+SHIFT+F4: Launch Module Details Thin Client Aspect.
- CTRL+SHIFT+F5: Launch Operating Parameters Thin Client Aspect.
- CTRL+SHIFT+F6: Launch Tag Configuration Web Aspect.
- CTRL+SHIFT+F7: Launch Trend Display (Analog Tag Types Only).

Control Faceplates

Control faceplates provide access to control function blocks within a controller in the Harmony DCS itself. This access is used to manually initiate process control operations. Automatic refers to operations to be performed under automatic controller execution. Manual refers to those actions to be initiated after taking a Harmony Function Block out of automatic control.



Refer to the Function Code Application Manual (2VAA000844*) instruction for a description of each function code (FC) and their outputs and specifications.

Device Control

A process device is controlled by manipulating the configuration in the controller. The faceplates used for device control give feedback to verify when changes requested from the Operator Workplace are actually implemented by a target device found in the field.

Device Driver (DD)

The DD faceplate represents a device driver function block in a Harmony controller. This function block provides an On (1 (one)) or Off (0 (zero)) signal to control a process device. A DD tag is required to both monitor and change the output provided by the block.

The DD block exception reports the current state, two feedback states, override status, mode, alarm status and quality to be displayed in the faceplate. [Figure 3](#) shows the location of the states and indicators.

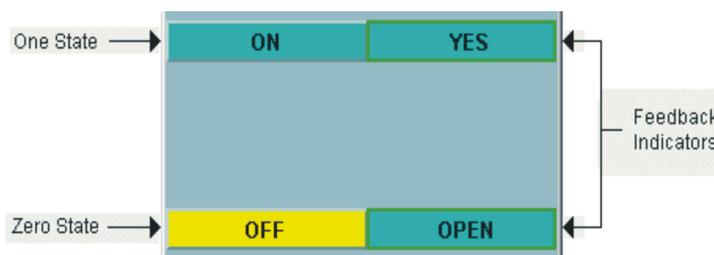


Figure 3. Device Driver Faceplate

The feedback one and two descriptors are text fields describing the feedback signals input to the DD function block. Each of these feedbacks indicate either an On or Off state. The feedback indicators provide a verification of the actual state of the field device. When a change is initiated, the descriptors do not change until the block tests the feedback inputs. This does not occur until after a specified time elapses. The DD block also tests the feedback signals to determine if the output status is either good or bad.

If the block is in manual mode, the user can change the block to a one state. If the current state is zero, the button is colored yellow. If the block is in manual mode, the user is can change the block to a zero state.

The override status icon appears in the Status and Navigation Bar shows the current operating condition of the block, automatic, manual or remote. A device driver block can be configured to operate in automatic mode only, automatic and manual mode, or remote mode only. The device driver function block specifications determine the acceptable operating modes.

Two buttons, one to set the device driver block to automatic mode and another to set the block to manual mode, appear in the Button bar beside the Acknowledge button.

When in automatic mode, the control logic sets the output status of the device driver block, and state changes are not allowed to be initiated from the Operator Workplace. Manual mode allows changing the output state of the Operator Workplace. When in remote control mode, the block output value tracks the value of another function block in the Harmony DCS, and, as in automatic mode, state changes are not allowed to be initiated in the Operator Workplace.

The override status icon appears in the Status and Navigation Bar if there is an override condition.

Multi State Device Driver (MSDD)

The MSDD faceplate represents the MSDD function block in a Harmony controller. This function block has three separate output conditions to provide three-state process device control. A MSDD tag is required to both monitor and change the output provided by the block in the Operator Workplace.

The MSDD block exception reports the current state, four feedback states, override status, mode, alarm status and quality to be displayed in the MSDD faceplate.

Figure 4 shows the location of the states and indicators.

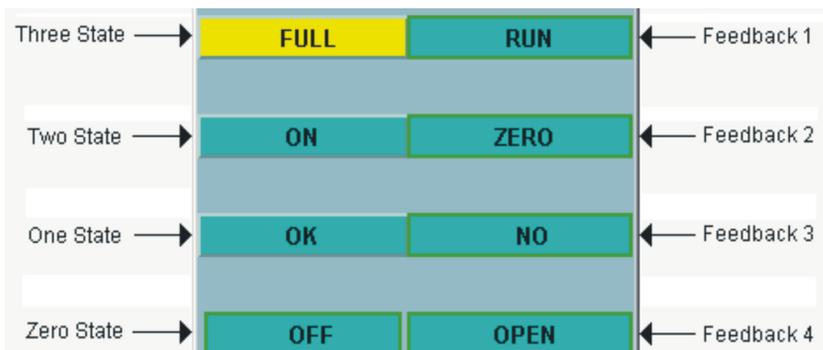


Figure 4. Multistate Device Driver Faceplate

The feedback one, two, three and four descriptors are text fields describing the feedback signals input to the MSDD function block. These feedbacks indicate either an On or Off state. The feedback indicators provide a verification of the actual status of the field device. The MSDD block uses the feedback signals to determine if the output status is either good or bad. The feedback state indicator identifies the current output based on feedback from the process. When a change is initiated, the indicator maintains its position until a specified time elapses before testing the feedback inputs. When the time elapses, the indicator denotes the state based on the feedback.

If the current state is three, then the button is colored yellow. If the block is in manual mode, the user can change the block to three state. If the current state is two, then the button is colored yellow. If the block is in manual mode, the user can change the block to two state. If the current state is one, then the button is colored yellow. If the block is in manual mode, the user can change the block to one state. If the current state is zero, then the button is colored yellow. Due to the nature of MSDD blocks, this state is not user-selectable.

An icon appearing in the Status and Navigation Bar shows the current operating condition of the block, automatic or manual. A MSDD block can be configured to operate in automatic mode only, or automatic and manual mode. The MSDD function block specifications determine the acceptable operating modes. Two buttons, one to set the MSDD block to automatic mode and another to set the block

to manual mode appears in the Button bar beside the Acknowledge button. When in automatic mode, the control logic sets the output status of the MSDD block and state changes are not allowed to be initiated from the Operator Workplace. Manual mode allows changing the output state from the Operator Workplace.

Remote Control Memory (RCM)

The RCM faceplates represents a RCM function block in a Harmony controller. Such a function block provides a set/reset memory flip-flop to control a process device. The RCM block exception reports the current state, permissive state, override status, alarm status and quality to be presented in the RCM faceplate.

The feedback indication, which verifies the change of state of the device associated with the RCM block, is indicated by which state button is yellow. If the current state is one, then the button is colored yellow. If the block is permissive, the user can change the block to one state. If the current state is zero, then the button is colored yellow. The user can change the block to zero state.

When the non-permissive status input from the RCM function block is logic state 1, then a keylock icon is shown in the Status and Navigation Bar. When the blocks non-permissive is not set (logic 0), then the icon does not show up. The RCM block must be in permissive state (non-permissive must be logic 0) to change the RCM to its One State (set).

The override status icon appears in the Status and Navigation Bar when there is an override condition. An override condition occurs when the RCM function block is permissive and there is a conflict between the set and reset inputs to the function block. The output tracks an alternate input if the set and reset signals are both logic 1 simultaneously.

Sequence of Events (SOE) Report Trigger Tag

The SOE Report Trigger Tag faceplate represents an SOE trigger block in a Harmony controller. Such a block provides a set/reset memory flip-flop to trigger the collection and reporting of SOE data, which originates in the Harmony DCS. The SOE system monitors specific digital input points from the field, providing change of state data for such points, to one-millisecond resolution. An SOE report trigger tag is required to monitor and control the output of the block. That means that it also monitors and controls the reporting of SOE logs in the operator console.

As with a standard RCM block, the SOE trigger block reports the current state, permissive state, override status, alarm status and quality to be presented in the SOE trigger report faceplate. However, there are three additional fields reported for SOE trigger tags, the read indicator, SOE report type and SOE recorder. Figure 5 shows the location of the attributes in the SOE report trigger tag faceplate.

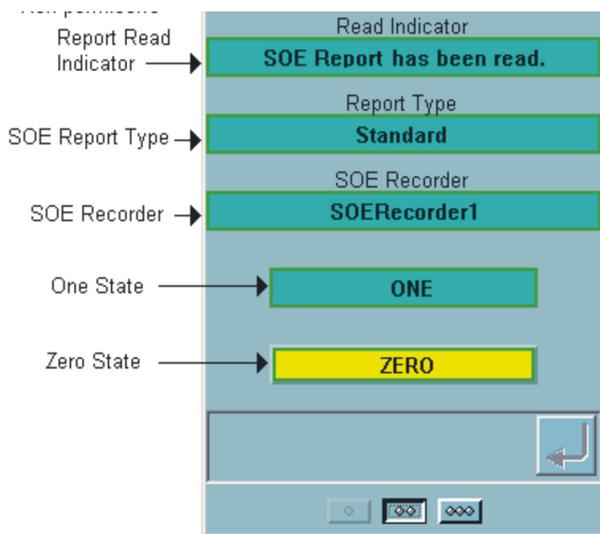


Figure 5. SOE Report Trigger Tag Faceplate

The One and Zero state indicator buttons as well as the non-permissive, Override, and Red Tag Statuses in the Status and Navigation Bar are similar in appearance and behavior to those of the RCM tag type and faceplate.

However, from the point of view of SOE triggering, when the state of an SOE trigger tag is Off (logic 0), there is no new SOE data detected by the SOE system. A state transition from On to Off indicates that there is no more SOE data to be read for the current SOE report, at which time, the SOE report is closed and printed and/or saved by the operator console.

The Read Indicator field displays the current report-read status of the SOE report triggered by this tag. After the SOE events have been read into the Configuration Server SOE report system, the Configuration Server sets this indicators state to logic

1 to indicate that an SOE report can be generated based on the events just read in. After the report is generated, this indicator is reset to logic 0.

The Report Type field shows the type of SOE report associated with the current SOE trigger tag. An SOE report can be one of five types: Standard, Summary, Pre-Fault, Post-Fault and Snapshot. Only reports of types Summary and Snapshot are user-triggerable via the One State button in the Faceplate Element. The remaining three types are triggered only by new SOE data from the DCS. SOE trigger tags for these types are not controllable by the user. Only the Standard and Summary types are available in Distributed SOE (DSOE) and Harmony SOE (HSOE) systems.

The Recorder field shows the name of the SOE recorder associated with this SOE report and this SOE trigger tag.

Remote Manual Set Constant (RMSC)

The RMSC faceplates represent remote manual set constant memory function blocks in a Harmony controller. Such a function block inserts a constant value used in the process control configuration. An RMSC tag is required to both monitor and change the constant value provided by the block from the Operator Workplace.

The remote manual set constant block reports the constant value, high and low range limits, tracking status, alarm status and quality that is displayed in the RMSC faceplate. The following information explains the attributes that relate to an RMSC tag and its faceplates. [Figure 6](#) shows the location of the attributes described.

The current value is the value that is currently set and reported as the constant value in the RMSC block. If this tag is not in tracking mode, then the user is able to use the DEW control by selecting either the PV subelement or the slider bar.

The Engineering Units field shows the unit of measurement for the process variable value. Maximum and minimum acceptable values appear at either end of the horizontal scale underneath the slider bar in the normal version of the RMSC faceplate, and underneath the PV field in the reduced version of the faceplate. The midrange value appears at the midpoint of the scale in the normal faceplate. The user can not enter a value outside these limits.

The Tracking Status Icon appears in the Status and Navigation Bar if this RMSC function block is set to tracking mode. The control logic can force the block to track an alternate process variable. The value cannot be changed when the block is tracking.

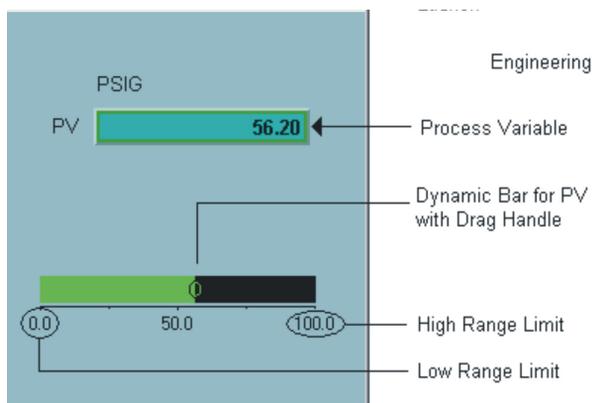


Figure 6. Remote Manual Set Constant Faceplate

Remote Motor Control Block (RMCB)

The RMCB faceplate represents a remote motor control function block in a Harmony controller. Such a function block implements a start and stop logic sequence to direct the startup or shutdown of a process device. An RMCB tag is required to both monitor and change the output provided by the block from the Operator Workplace.

The remote motor control block exception reports the current state, two feedback states, fault status, error code, alarm status and quality to be displayed in the RMCB faceplate. The following information explains the attributes that relate to an RMCB tag and its faceplate. [Figure 7](#) shows the location of the attributes described.

The text `Bad Start` appears in the Bad Start field if the corresponding RMCB function block detects a bad start of the process device. The block monitors the feedback signals to determine if a bad start has occurred.

The Error Code field of the RMCB faceplate element describes one of 10 different error codes that can be reported by the RMCB block:

- | | |
|---|------------------|
| 0 | No error. |
| 1 | Stopped. |
| 2 | Interlock one. |
| 3 | Interlock two. |
| 4 | Interlock three. |



Figure 7. Remote Motor Control Block Faceplate

- 5 Interlock four.
- 6 Feedback one set to zero state.
- 7 Feedback two set to zero state.
- 8 Feedback one set to one state.
- 9 Feedback two set to one state.

The block sends an interlock error code when an interlock is set to logic zero. Only one error code is displayed at a time. A different text string is associated with each error code. The text string associated with the current error code is reported to the Operator Workplace for display in this field.

Fault conditions reported by the RMCB block is shown in the Fault Text field in the Faceplate Element. A fault occurs when one of four interlock inputs to the block is set to Off (logic 0). All interlocks must be On (logic 1) to clear a fault.

The feedback one and two descriptors are text subelements that describe the feedback signals input to the RMCB function block. The feedbacks indicate either an On (logic 1) or Off (logic 0) state.

The feedback indications provide a verification of the actual status of the hardware device in the field. The RMCB block uses the feedback signals to determine if the output status is good or bad. The signals are also used to determine whether to maintain a run output or force the output to stop.

The current output, based on feedback from the process device associated with the RMCB block, is indicated by being rendered yellow. If the current state is one, then this button is colored yellow. The user can change the block to one state. This sets

the corresponding device to a running state. If the current state is zero, the button is colored yellow. The user can change the block to zero state. This sets the corresponding device to a stopped state.

Station

Station faceplates represent Harmony stations. The same functions that can be performed and the same values that can be displayed on a station physically located in the plant is performed and displayed on the Operator Workplace using such a faceplate. A station tag is required to acquire process values from a manual/auto (M/A) station block in a Harmony controller and to initiate control actions.

The station block level (local or computer) and mode (manual or automatic, and basic, cascade or ratio) determine the operations that can be performed from the Operator Workplace. The level and mode are changeable from the Operator Workplace.

The function, intricacies and behavior of Station blocks are beyond the scope of this document. For more information as to how Station blocks work, refer to the *Function Code Application Manual (2VAA000844*) instruction* (FCs 21, 22, 23 and 80).

A Station function block reports the dynamic values, mode, alarm status and quality that is displayed in a Station faceplate. The following information explains the attributes that relate to the station tag type. [Figure 8](#) shows the layout of the Station faceplate and its attributes.

The Process Variable field is labeled PV. The PV comes from the function block providing the station block control for this tag, usually a PID block. The user can not directly set this value.

The Engineering Units field shows the unit of measurement for the process variable and set point values.

The Station Type field shows what type of station the current point is:

- | | |
|---|-------------------------|
| 0 | Basic with Setpoint. |
| 1 | Basic without Setpoint. |
| 2 | Basic with Bias. |
| 3 | Ratio. |
| 4 | Cascade. |

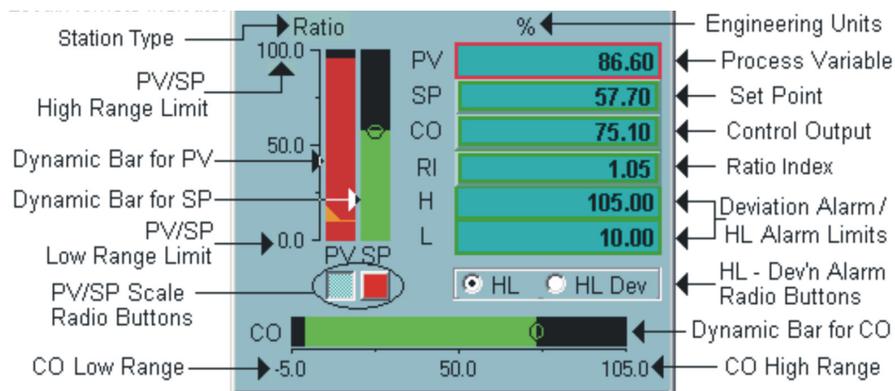


Figure 8. Control Station Faceplate

The PV dynamic bar shows the process variable as an expanding or contracting dynamic bar on the left hand side of the Faceplate Element Body. The bar expands vertically from the baseline mark on the scale as the process variable increases in value. It contracts towards the baseline mark as the value decreases. If the station is not in any alarm condition, the bar appears bright green. If the station is in any kind of alarm condition, the bar appears bright red. If the tags alarm or return-to-normal condition is unacknowledged, the bar blinks. The user can not directly set the value.

The Set Point Value field is labeled SP. This value represents the current set point value of the function block for this tag. The user can change the SP value.

Station tags allow adjustments to a Harmony control loop. A station tag is required to be defined for each station function block in a control module in the Harmony DCS where control or adjustment is needed. In the Operator Workplace, one of the features of the Harmony Station Object Type, which define station tags for this console, is the Station faceplate.

The SP dynamic bar shows the set point value as an expanding or contracting dynamic bar. The bar expands vertically from the baseline mark on the scale as the process variable increases in value. It contracts towards the baseline mark as the value decreases. Unlike the PV bar, this bar is always bright green. The user can change the set point value from the bar.

The PV/SP limits and range scale denotes the maximum and minimum values associated with both the PV and SP value bar. The mid-range value in the range

scale is depicted as the sum of the high and low limits, divided by 2. The high and low range limits are derived from the zero and span configured in the station function block for the process variable and set point value.

The Control Output Value field is labeled CO. The CO value also comes from the function block. If this block is in Manual Mode, the user can able to change the CO value.

The CO dynamic bar shows the set point value as an expanding or contracting dynamic bar. The bar expands horizontally from the baseline mark at the left end of the scale as the process variable increases in value. It contracts towards the baseline mark as the value decreases. Like the SP bar, this bar is always bright green. If the station is in Manual Mode, the user is able to change the control output value from the bar.

The CO range scale denotes the maximum, minimum and mid-values associated with the CO value bar. The mid-range value is depicted as the sum of the high and low limits, divided by 2. The high and low range limits are derived from the zero and span configured in the station function block for the control output value.

The Ratio Index field is labeled RI. This value appears only for Ratio-type stations in Cascade/Ratio mode. The function block supplies the Ratio Index value. It is operator changeable.

The high and low alarm limits are shown in those fields labeled H and L, respectively, in the Faceplate Element. These are the maximum and minimum alarm value thresholds configured in the corresponding station function block. If the process variable reaches or passes either the high or low alarm limit, the station is in an alarm condition. If the station is not in alarm, the outlines of both limit fields are colored green. If the station is in High Alarm, the outline of the (H) alarm field are colored red, and blink if the alarm is unacknowledged. If the station is in Low Alarm, the outline of the (L) alarm field is colored red, and blink if the alarm is unacknowledged.

The high and low deviation alarm limit indicators are shown as empty rectangles labeled HD and LD, respectively. If there is no Deviation Alarm condition, the outlines of both of these rectangles are colored green. The PV-SP deviation alarm limit denotes the maximum difference the process variable is allowed to have above or below the Set Point Value, and is configured in the station function block. If the Process Variable exceeds the Set Point Value by more than this difference value,

then the station is in High Deviation Alarm, in which case, the HD rectangle is outlined red, and blink if the alarm is unacknowledged. If the Process Variable is less than the Set Point value minus this difference, then the station is in Low Deviation Alarm, in which case, the LD rectangle is outlined in red, and blink if the alarm is unacknowledged.

An icon, which appears in the Status and Navigation Bar, shows the current operating condition of the block, automatic or manual. For a station that is cascade type or ratio type, another icon in the bar indicates if the station is operating in basic or cascade/ratio mode.

Two buttons, one to set the station block to automatic mode and the other to set the block to manual mode, appears in the Button Bar at the far left. On a cascade type or ratio type station in cascade/ratio mode, selecting on either auto or manual also causes such a station to revert to basic mode. The user can set a cascade or ratio station from basic to cascade operation or ratio operation. For a station whose type is neither cascade nor ratio, this button is always disabled.

A keylock icon appears in the Status and Navigation Bar if the Manual Mode Interlock is in effect for this station block, which holds the station in manual mode. The manual interlock is set by the control logic. Until the control logic releases the lockout, the station remains locked and cannot be changed from the console.

The letters BYP appear in the Status and Navigation Bar if the station is in Bypass Mode. Again, the control logic controls this mode, and, when in effect, control cannot be initiated from the Operator Workplace.

Two Tracking Status Icons, one for SP Tracking and the other for Output (CO) Tracking, may appear in the Status and Navigation Bar. The appropriate icon appears if the tracking mode indicated by that icon is set by the station block.

A control output (CO) track lock is set by the control logic. Such a track lock stays in effect until the logic unlocks the tracking. If the station goes into CO tracking mode, the control output percentage adjusts to changes in its reference signal to track. The user can not change the CO value when the station is in CO tracking mode.

When set point (SP) tracking is in effect, the set point tracks either the process variable or a selected variable. The set point tracking option chosen in the station function block determines when set point tracking is implemented. If the station is in set point tracking mode, the SP value cannot be changed from the console.

An icon to indicate the current station level, local or remote, also appears in the Status and Navigation Bar. If the station block is under local control, then the icon shown is a box with an arrow inside. If the block is under computer (remote) control, then a box with an arrow outside is shown.

Data Acquisition

The Data Acquisition faceplates is used for the various data acquisition tag types.

Analog

Analog faceplates are representations of Harmony analog tags. An analog function block exception reports the current analog value, alarm status and quality that are presented in these faceplates. The following information explains the attributes that relate to the analog tag type. [Figure 9](#) shows the location of the attributes to be included in the faceplate. Apart from alarm acknowledgement, these faceplates do not have any control capabilities.

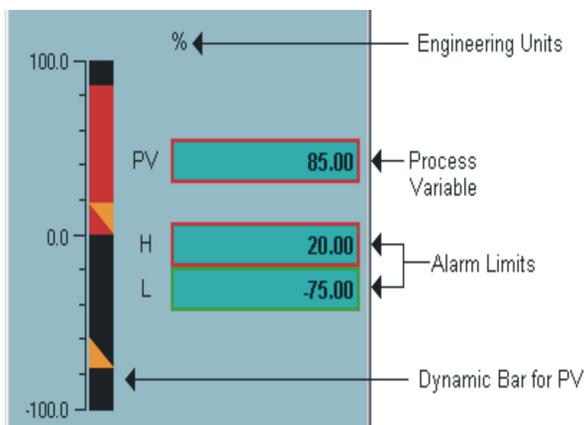


Figure 9. Analog Faceplate

The Process Variable field is labeled PV. The PV comes from the analog function block associated with this tag. If the tag is in any alarm state, the outline of this field appears red. If the tag is not in alarm, the outline appears green. In either case, if the

alarm or return-to-normal is not acknowledged, then the outline blinks. The user can not directly set this value.

The Engineering Units for the PV is shown directly above this field.

The PV dynamic bar shows the process variable as an expanding or contracting dynamic bar. The bar expands vertically from the baseline mark on the scale as the process variable increases in value. It contracts towards the baseline mark as the value decreases. If the tag is not in any alarm condition, the bar appears bright green. If any alarm condition exists, then the bar appears bright red. If the tags alarm or return-to-normal condition is unacknowledged, the bar blinks. The user can not directly set the value.

The PV limits and range scale denotes the maximum and minimum values associated with the PV value bar. The mid-range value in the range scale is depicted as the sum of the high and low limits, divided by 2. The high and low range limits are derived from the zero and span configured in the analog function block for the process variable.

The high and low alarm limits are shown in those fields labeled H and L, respectively, in the Faceplate Element. These are the maximum and minimum alarm value thresholds configured in the corresponding station function block. If the process variable reaches or passes either the high or low alarm limit, the analog function block is in an alarm condition. If the block is not in alarm, the outlines of both limit fields appear in green. If it is in High Alarm, the outline of the High (H) alarm field appear in red, and blink if the alarm is unacknowledged. If there is a Low Alarm, the outline of the Low (L) alarm field appear in red, and blink if the alarm is unacknowledged.

Analog Control and Enhanced Analog

The Enhanced Analog faceplates ([Figure 10](#)) are similar to the normal Analog faceplate, with some additional features. Enhanced Analog blocks have what are called the override status and override value. The enhanced analog faceplates allow changing the override status and override value. The override status indicates if the

current value is being overridden. These faceplates also show the I/O type, which is the type of enhanced analog block, input or output:

ENH/IN	I/O block input (FC 222)
ENH/OUT	I/O block output (FC 223)

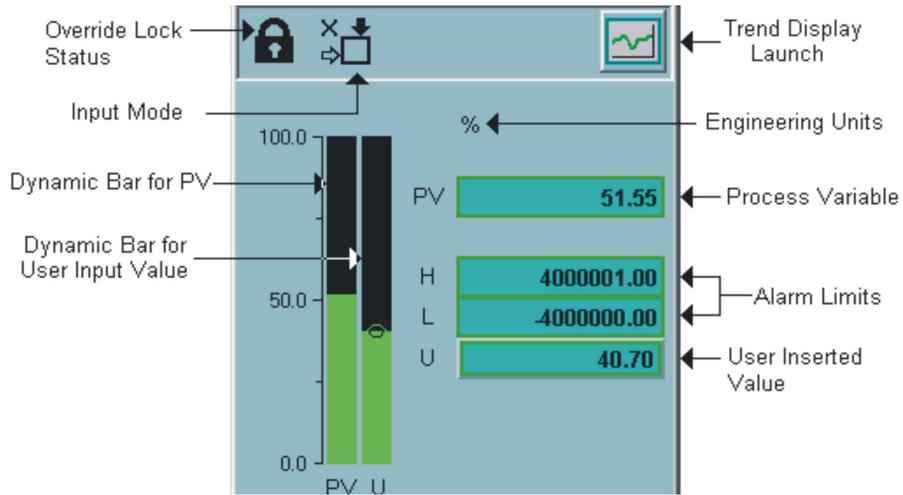


Figure 10. Enhanced Analog Faceplate

The Override Value field, labeled U, contains the user-inserted value for the enhanced analog block. This value takes effect as the process variable value if the override status of the enhanced block is enabled. The user can change the Override Value.

Beside the regular Process Value Bar is the Override Value Bar, which denotes the Override Value or User Inserted Value the same way as the former denotes the Process Variable, except this bar is always green. In addition, the user is able to select it to change the Override Value.

A keylock icon appears in the Status and Navigation Bar if the override lock status of the enhanced analog block is set (True). It is absent when the override lock for this block is not set. If the enhanced analog blocks override status is set, the operator cannot change the override value.

Another icon showing the current Input Mode, either Normal Input (alternate select off; lower arrow in icon is solid), or User Input (alternate select on; upper arrow in icon is solid) appears in the Status and Navigation Bar. In the case of Normal Input, the block tracks the regular process variable block output. In the case of User Input, the block overrides the process variable with the override value.

Two buttons, one for Normal Input, which disables the override state, and the other for User Input, which enables the override state, appears on the left side of the Button Bar.

Digital Faceplate

Digital Faceplates are representations of Harmony digital tags. A digital function block exception reports the current state, alarm status and quality that is presented in these faceplates. The following information explains the attributes that relate to the digital tag type. [Figure 11](#) shows the location of the attributes to be included in the faceplates.

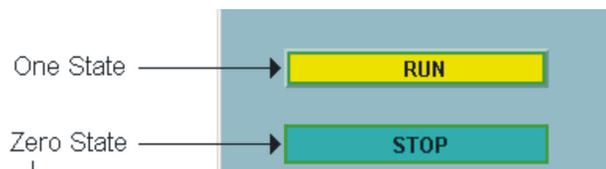


Figure 11. Digital Faceplate

The current output, based on the output state from the digital block, are indicated by yellow. If the current state is one, the button is colored yellow. If the current state is zero, the button is colored yellow.

Enhanced Digital

The Enhanced Digital faceplate ([Figure 12](#)) is similar to the normal Digital faceplate, with some additional features. Enhanced Digital blocks have what are called the override status and override value. The enhanced digital faceplate allows changing the override status and override value. The override status indicates if the

current value is being overridden. These faceplates also show the I/O type, which is the type of enhanced digital block, input or output:

ENH/IN	I/O block input (FC 224)
ENH/OUT	I/O block output (FC 225)

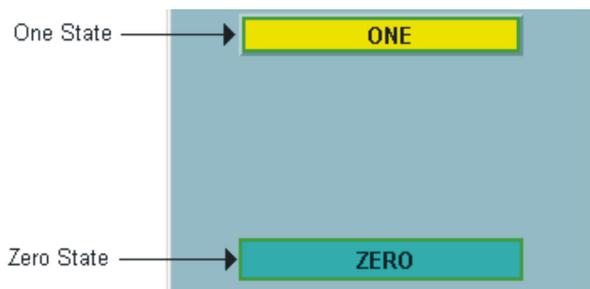


Figure 12. Enhanced Digital Faceplate

A keylock icon appears in the Status and Navigation Bar if the override lock status of the enhanced digital block is set (True). It is absent when the override lock for this block is not set. If the enhanced digital blocks override status is set, the operator cannot change the override value.

Another icon showing the current Input Mode, either Normal Input (alternate select off; lower arrow in icon is solid), or User Input (alternate select on; upper arrow in icon is solid) appears in the Status and Navigation Bar. In the case of Normal Input, the block tracks the regular block output state. In the case of User Input, the block overrides the output state with the override state. Two buttons, one for Normal Input, which disables the override state, and the other for User Input, which enables the override state, appears on the left side of the Button Bar.

Two buttons, one for setting the enhanced digital blocks override state to 0, and the other to set the override state to 1, also appear in the Button Bar beside the Input Mode buttons.

Data Acquisition Analog (DAANG)

DAANG faceplates (FC 177) provide multilevel alarming, rate-of-change alarming and deviation alarming for an analog point. It also supports several time-based alarming options which time-based alarm filtering capabilities. It also allows interaction with the block to change the input source and to enter a user-inserted value if desired. The block stores this user-inserted value in non-volatile memory in the controller module.

The DAANG faceplate represents a data acquisition analog function block in a Harmony controller. A data acquisition analog tag is required to both monitor and control the operation of this function block.

The DAANG block exception reports the current analog value, input source mode, alarm status and quality to be displayed in the data acquisition analog faceplate. The following information explains the attributes that relate to such a tag and its faceplate. [Figure 13](#) shows the location of the attributes described.

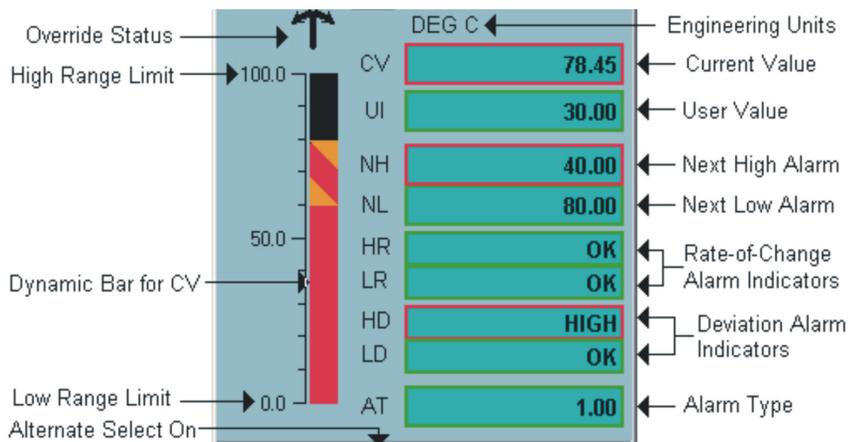


Figure 13. Data Acquisition Analog Faceplate

The Current Value field, labeled CV displays the analog value exception reported by the DAANG function block. This is the function block output. The output value depends on the input source selection and can be an actual process value, the alternate input value or the user-inserted value. If the tag is in any alarm state, the outline of this field appears red. If the tag is not in alarm, the outline appears green.

In either case, if the alarm or return-to-normal is not acknowledged, then the outline blinks. The user can not directly set this value.

The Engineering Units field shows the unit of measurement for the analog value.

The CV dynamic bar shows the current value as an expanding or contracting dynamic bar on the left hand side of the Faceplate Element. The bar expands vertically from the baseline mark on the scale as the value increases in value. It contracts towards the baseline mark as the value decreases. If the DAANG block is not in any alarm condition, the bar appears bright green. If the block is in any kind of alarm condition, then the bar appears bright red. If the tags alarm or return-to-normal condition is unacknowledged, the bar blinks. The user can not directly set the value.

The current-value limits and range scale denotes the maximum and minimum values associated with the CV bar. The mid-range value in the range scale is depicted as the sum of the high and low limits, divided by 2. The high and low range limits are derived from the zero and span configured in the analog function block for the current value.

The Next High Alarm field, labeled NH displays the next high alarm limit configured in the DAANG block. If the tag is in any high-alarm state, the outline of this field is red, blinking if unacknowledged. Otherwise, the outline is green. The Next Low Alarm field, labeled NL displays the next low alarm limit configured in the DAANG block. If the tag is in any low-alarm state, the outline of this field is red, blinking if unacknowledged. Otherwise, the outline is green.

The high and low rate-of-change alarm limit indicators is shown as empty rectangles labeled HR and LR, respectively. If there is no Rate-of-Change Alarm condition, the outlines of both of these rectangles are green. The rate-of-change alarm limits denote the maximum difference the currently-sampled input value is allowed to have above or below the previously-sampled value, and are configured in the DAANG function block. If the current value exceeds the previous value by more than the high rate-of-change difference, then the station is in High Rate-of-Change Alarm, in which case, the HR rectangle are outlined in red, and blink if the alarm is unacknowledged. If the current value is less than the previous value minus the low rate-of-change difference, then the block is in Low Rate-of-Change Alarm, in which case, the LR rectangle are outlined in red, and blink if the alarm is unacknowledged.

The high and low deviation alarm limit indicators are shown as empty rectangles labeled HD and LD, respectively. If there is no Deviation Alarm condition, the outlines of both of these rectangles are green. The deviation alarm limit denotes the maximum difference the selected input value is allowed to have above or below the deviation alarm reference value. Both the deviation limit and deviation reference are configured in the DAANG function block. If the selected input value exceeds the deviation reference by more than the deviation difference, then the block is in High Deviation Alarm, in which case, the HD rectangle are outlined in red, and blink if the alarm is unacknowledged. If the selected input value is less than the deviation reference minus the deviation difference, then the station is in Low Deviation Alarm, in which case, the LD rectangle are outlined in red, and blink if the alarm is unacknowledged.

The Alarm Value field, labeled AT, describe the priority of an alarm level or bad-quality being reported by the function block. The outline of this field is green.

An icon, which appears in the Status and Navigation Bar, shows the current input condition of the block, user-input (manual) or normal-input (auto).

Two buttons, one to set the DAANG block to user-input mode, and the other to set the block to normal-input mode, appears in the Button bar beside the Acknowledge button.

If the input condition is user-input (manual) state, the user-input value is used as the current value. If the input condition is normal-input (auto) state, the actual process value from the block is used as the current value.

An icon, which appears in the Status and Navigation Bar, shows the current alternate-selection condition of the block, Off or On.

Two buttons, one to set the alternate-selection for the DAANG block to Off, and the other to set the alternate-selection to On, appears in the Button Bar beside the Station Mode buttons.

The Alternate-Select condition supersedes the station mode condition. If alternate-select is On, the alternate input value is the value currently being used. If alternate-select is Off, then the current value is either the user-selected input or the actual process value, depending on the input mode.

If the non-permissive status input from the function block is logic state 1, then a keylock icon is shown in the Status and Deviation Bar. If the blocks non-permissive

is not set (logic 0), the icon does not show up. The DAANG block must be in permissive state (non-permissive must be logic 0) to control it.

If the letters NR appear in the Status and Deviation Bar, this indicates that the DAANG function block is in a no report condition. If the block is in report condition, these letters do not show up.

The quality override status icon appears in the Status and Navigation Bar if there is a quality override condition. The block allows an external source to override the quality status of the reported value.

Data Acquisition Digital (DADIG)

DADIG faceplates (FC 211) provide multilevel alarming capabilities for a digital point. Harmony allows interaction with the block to change the input source and to enter a user-inserted state if desired. The block stores this user-inserted state in non-volatile memory in the controller module.

The DADIG faceplate represents a data acquisition digital function block in a Harmony Controller. A data acquisition digital tag is required to both monitor and control the operation of this function block from the Operator Workplace.

The DADIG block exception reports the current state, input source mode, alarm status and quality to be displayed in the data acquisition digital faceplate. The following information explains the attributes that relate to such a tag and its faceplate. [Figure 14](#) shows the location of the attributes described.

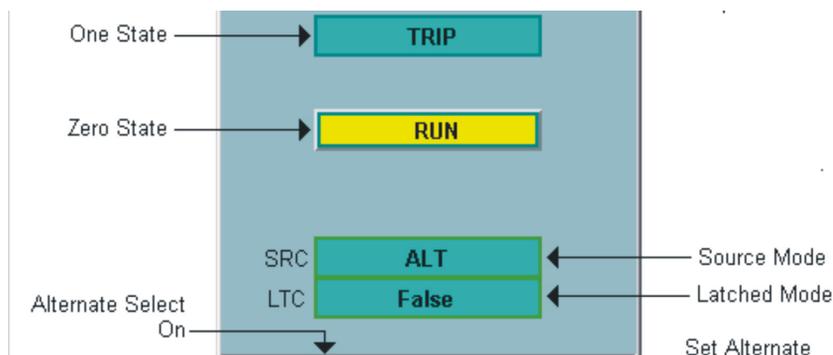


Figure 14. Data Acquisition Digital Faceplate

The Latched indicator is a text field, labeled LTC, in the Faceplate Element Body. The appearance of the word `Latched` in this field indicates that the function block has its alarm state latch feature enabled.

The source mode descriptor field, labeled SRC appears in the Faceplate Element Body. This is a text field to describe the input source currently selected. The controller reports the mode of the block. The descriptor also identifies whether the block is locked or not locked in a certain mode.

The current output, based on the output state from the DADIG block, is indicated by whichever state button in the Faceplate Element Body is yellow. The output state of the DADIG block depends on the input source selection. This source can be the actual process state, the alternate input state, or the user inserted state.

If the current state is one, the button is colored yellow. If the current state is zero, the button is colored yellow.

An icon, which appears in the Status and Navigation Bar, shows the current input condition of the block, user-input (manual) or normal-input (auto). Two buttons, one to set the DADIG block to user-input mode, and the other to set the block to normal-input mode, appears in the Button bar beside the Acknowledge button. If the input condition is user-input (manual) state, the user-input value is used as the current value. If the input condition is normal-input (auto) state, the actual process value from the block is used as the current value.

An icon, which appears in the Status and Navigation Bar, shows the current alternate-selection condition of the block, Off or On.

Two buttons, one to set the alternate-selection for the DADIG block to Off, and the other to set the alternate-selection for On, appears in the Button Bar beside the Mode buttons.

The Alternate-Select condition supersedes the mode condition. If alternate-select is On, the alternate input state is the state currently being used. If alternate-select is Off, then the current state is either the user-selected input or the actual process state, depending on the input mode.

Two buttons, one for setting the DADIG blocks alternate state to 0, and the other to set the alternate state to 1, appears in the Button Bar beside the Alternate Select Mode buttons.

If the non-permissive status input from the function block is logic state 1, then a keylock icon is shown in the Status and Deviation Bar. If the blocks non-permissive is not set (logic 0), the icon is not displayed. The DADIG block must be in permissive state (non-permissive must be logic 0) to control it.

If the letters NR appear in the Status and Deviation Bar, this indicates that the DADIG function block is in a no report condition. If the block is in report condition, these letters are not displayed.

The quality override status icon appears in the Status and Navigation Bar if there is a quality override condition. The block allows an external source to override the quality status of the reported value.

ASCII Text String Faceplate

The ASCII Text String faceplate allows interaction with an application program running inside a Harmony controller. For more information on the user-defined data export function block, refer to the *Function Code Application Manual* (2VAA000844*) instruction.

The user-defined data export block exception reports the ASCII string message, alarm status and quality that are displayed in an ASCII Text String faceplate. The attributes described below are incorporated into this faceplate (Figure 15).

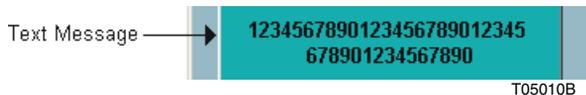


Figure 15. ASCII Text String Faceplate

The message box appears in the Faceplate Element Body of the ASCII Text String Faceplate, and contains the current ASCII text message string as reported by the block. This string supports up to 80 characters. This string can be truncated as per inputs into the data export function block. If the block is in manual mode, the user can modify this message by selecting on this box to get a text-based Direct Entry Window from which to manually type in a new string. Manual text string user entry is a two step operation.

The Red Tag Status Icon appears in the Status and Navigation Bar if the ASCII String block is red-tagged, which would indicate that the equipment associated with this block is offline for maintenance.

An icon, which appears in the Status and Navigation Bar, shows the current operating condition of the block, automatic or manual.

Two buttons, one to set the station block to manual mode, and the other to set the block to automatic mode, appears on the left side of the Button Bar. When the block is in manual mode, the user can enter a new message string into the block.

Two buttons, one to set the alarm priority of the block to low, and the other to set the alarm priority to high, appears in the Button Bar beside the Mode buttons.

The letters `NAK` appear in the Status and Navigation bar if the block rejects a users string input from the operator console.

If the non-permissive status input from the function block is logic state 1, then a keylock icon is shown in the Status and Navigation Bar. If the blocks non-permissive is not set (logic 0), the icon is not displayed. The block must be in permissive state (non-permissive must be logic 0) to manually change the text string.

The override status icon appears in the Status and Navigation Bar if there is an override condition. An override condition occurs when an external source is overriding the blocks quality status.

Text Selector

FC 151 sends message numbers to the Operator Workplace. The text selector can operate in one of two modes. The first mode uses the message number input to select the message to display. The second mode uses the value of a control status input to select one of three predefined messages. Control status reflects the current operating state of a device as good, bad or waiting. The text selector block references a control status output contained in FCs 123, 125, 129 and 136.

The message box appears in the Faceplate Element Body of the Text Selector Faceplate, and contains the current text message that corresponds with the current message number.

Analog Export Faceplate

Analog export tags exist only within the 800xA System. Whenever an operator changes the value of an analog export tag, the Configuration Server generates an exception report for that tag. This exception report is then received by other control systems, other Configuration Servers, as well as by other Harmony console types, such as the OIS 40 series of consoles, as an exception report for a regular analog tag.

The appearance and behavior of the Analog Export faceplate (Figure 16) is similar to that of the normal Analog faceplate, except that the PV is user changeable by way of a DEW from either the PV field or the PV dynamic bar.

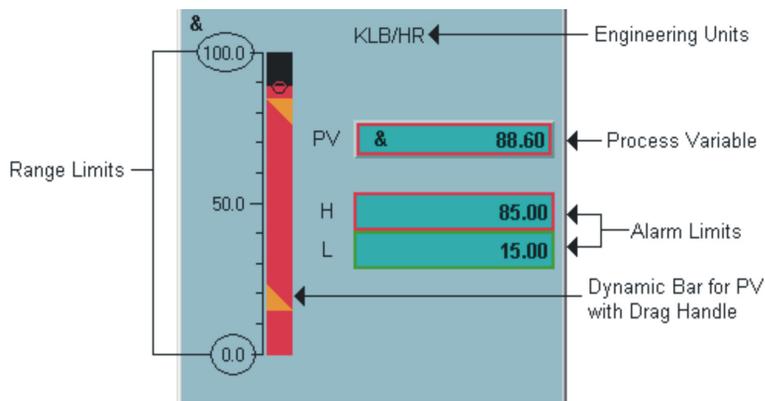


Figure 16. Analog Export Faceplate

Digital Export Faceplate

Digital export tags also exist only within the 800xA System. Whenever an operator changes the state of a digital export tag, the Configuration Server generates an exception report for that tag. This exception report is then received by other control systems, other Configuration Servers, as well as by other Harmony console types.

The appearance and behavior of the Enhanced Digital faceplate (Figure 17) is similar to that of the normal Digital faceplate, except that the state is user changeable by selecting the appropriate state descriptor field (as with RCMs, DDs,

MSDDs, etc.). There are also two state change buttons in the Button Bar (similar to those of Enhanced Digitals and DADIGs) for the same purpose.

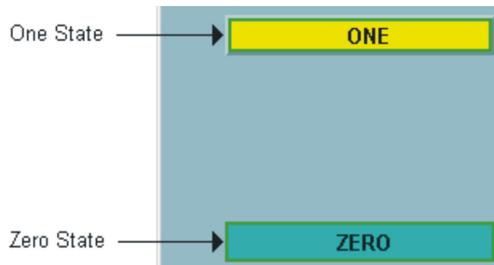


Figure 17. Digital Export Faceplate

Module Status Faceplate

Module status tags can be configured for every controller, process node, gateway, bridge and computer interface unit in a Harmony DCS. The Module Status faceplate (Figure 18) shows the Harmony address, the type of controller or node, and the operating mode (configure, error, fail, or execute) for the tag.

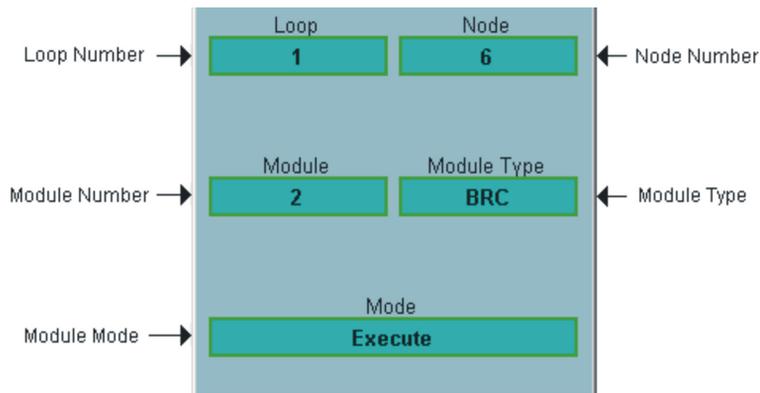


Figure 18. Module Status Faceplate

Harmony Server Faceplate

The Server faceplate (Figure 19) shows the Harmony address of the Server, as well as indicate whether the Server is online or offline. If the Server is inactive, select the Active status field to set it to Active. This field indicates whether or not the Server is a primary Server or a redundant Server.

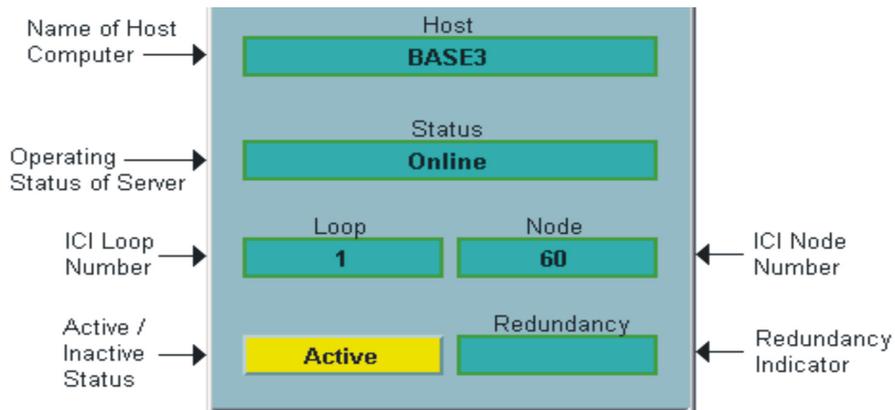


Figure 19. Harmony Server Faceplate

PhaseX

The aspect object type for PhaseX tags, which represent Harmony Phase Execution blocks (FC 218), is included.

For more information as to how the PhaseX block works, refer to the *Function Code Application Manual (2VAA000844*) instruction* for more information.

Refer to the *System 800xA Batch Management Operation (3BUA000145*) instruction* for the procedures to operate 800xA for Harmony for use with Batch Management.

Section 3 Operating Parameters

Introduction

This section describes the Operating Parameters function. The Operating Parameters can be accessed for any Harmony tag and the Harmony Server.

The Operating Parameters application allows monitoring and changing the status of tags maintained by the Harmony Server. The attributes of the tag are presented in a series of tabs activated by associated tabs: General, Harmony, and tag specific.

To access the Operating Parameters for a tag:

1. Right click a faceplate or Point Display to open the context menu. Or, right-click any Harmony tag in the Operator Workplace.
2. Select Harmony Operating Parameters in the Aspects list when the desired object is in focus.

General Tab

The General tab shows the information that identifies the tag in the Harmony system (Figure 20). Refer to Table 3 for a description of these items. The text fields in this tab cannot be edited. The only operation that can be performed on this tab is to enable or disable the Manual Inhibit option. Manual inhibit disables event reporting for the tag in the same way as automatic inhibit.

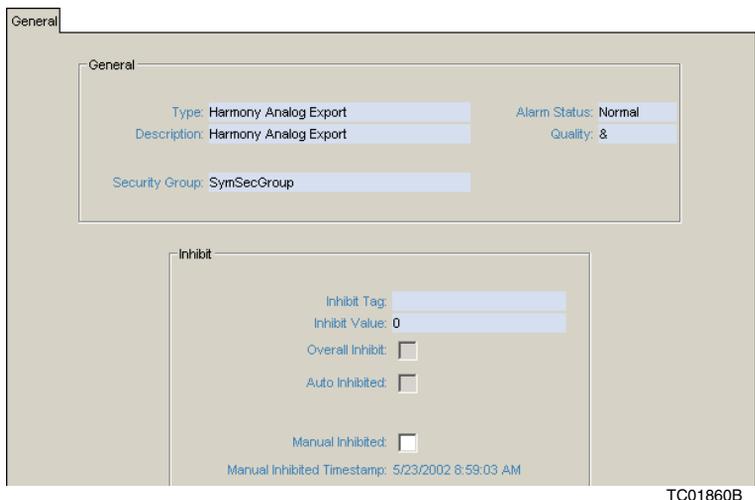


Figure 20. Operating Parameters - General Tab

Table 3. Operating Parameters - General Tab

Field	Description
Type	Tag type (Harmony station).
Description	Information entered during configuration that further describes the function of the tag.
Security group	Security group that the tag belongs to.
Alarm status	Selected if the tag is reporting an alarm. This is a single overall alarm status indication.
Quality	Information reported from the system about the quality of the tag. Refer to Appendix B, Tag Quality for a list of quality indicators.

Table 3. Operating Parameters - General Tab (Continued)

Field	Description
Tag inhibition	Information about the inhibit status of the tag. A tag inhibit disables event reporting for the tag.
Inhibit Tag	
Inhibit Value	Tag that causes the inhibit when the inhibit value is reached.
Overall Inhibit	Value set in during configuration that causes the inhibit.
Auto Inhibited	Indicates that the tag is inhibited.
Manual Inhibit	Selected if tag is automatically inhibited by another tag in the system.
Manual Inhibited	Enable to manually inhibit event reporting for the tag.
Timestamp	Time when the tag was manually inhibited.

Harmony Tab

The Harmony tab displays the block address of the tag, the scan status, and the number of exception reports processed for the tag (Figure 21). Refer to Table 4 for a description of these fields. The text fields on this page cannot be edited. The only operation that can be performed at this page is to enable or disable the Suspended option. A suspended tag is ignored by the system.

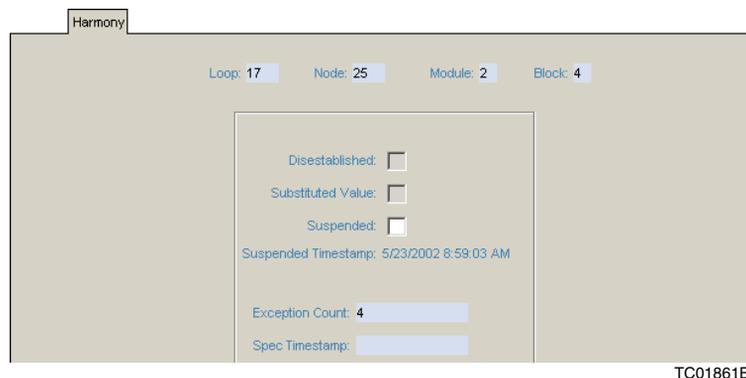


Figure 21. Operating Parameters - Harmony Tab

Table 4. Operating Parameters - Harmony Page

Field	Description
Loop	Loop number from 0 to 250 that identifies the communication network (loop) of the Harmony control unit.
Node	Node number from 0 to 250 that identifies the interconnection point on the communication network.
Module	Module number from 0 to 31 that identifies the device within the Harmony control unit.
Block	Function block location from 0 to 31,998 that identifies the location of a specific function block in the Harmony configuration (controller).
Disestablished	Selected if the tag is disestablished in the Cnet-to-computer interface. A tag becomes disestablished when a substitute value has been entered.
Substituted Value	Value of tag is manually substituted (refer to PhaseX Tag on page 67).
Suspended	Enable to have the system ignore the tag.
Suspended Timestamp	Time when the tag was suspended (manually or substituted).
Exception Count	Number of exception reports processed for this tag.
Spec Time Stamp	Time when specification data was received from the controller.

Tag Specific Tabs

The tag specific tabs provide operating details for the selected tag ([Figure 22](#)). Each tag type has a unique tab for its information. [Table 5](#) through [Table 15](#) describe the tag specific fields for each tag type. Refer to [PhaseX Tag](#) on page 67 for a

description of Substitute.

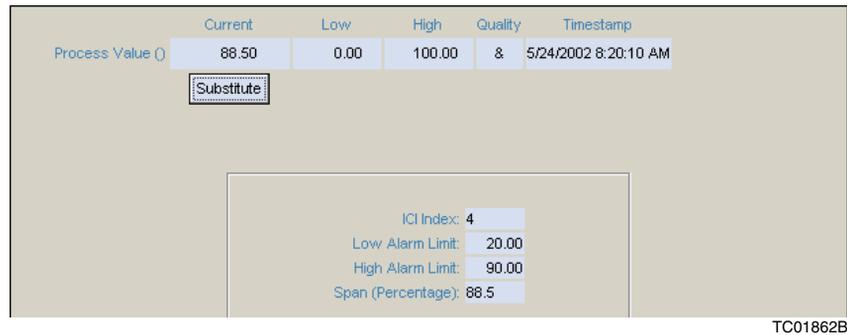


Figure 22. Operating Parameters - Tag Specific Tabs

Table 5. Operating Parameters - Analog, Analog Export, and RMSC Pages

Field	Description
Process value	
Current	Current process value being reported from the control system.
Low	Zero value in the configured Engineering Units.
High	Span value in the configured Engineering Units.
Quality	Quality of the value reported. Refer to Appendix B, Tag Quality for a list of quality indicators.
Timestamp	Time when the last value was reported.
Substitute	Enter a number to be used as the new process value.
ICI Index ¹	Has a range of integers 1-30,000 (depends on type of INICI device).
Low alarm limit	Low limit configured for the tag.
High alarm limit	High limit configured for the tag.
Out of calibration ²	Selected if the reported value is out of calibration.

Table 5. Operating Parameters - Analog, Analog Export, and RMSC Pages (Continued)

Field	Description
Span (Percent)	Span of the process variable in percentage based on the high and low limits.

NOTE: 1. Analog Export tag only. 2. Analog tag only.

Table 6. Operating Parameters - ASCII String

Field	Description
Output Value	
Current	ASCII string being reported by the control system.
Quality	Quality of the value reported. Refer to Appendix B, Tag Quality for a list of quality indicators.
Timestamp	Time when the last value was reported.
Substitute	Enter a text string to be used as the new process value. Select the Alarm check box if this is in the alarm state.
Sequence number	Maintained at the system level by the Harmony controller to assist in multiple user data packet management and user data packet ID.
Original string length	Original string length of the message in bytes.
Received string length	Received string length of the message in bytes.
Block string length	Block string length limit in bytes.
Console string length	Console string length limit in bytes.
Accept mode change	Selected if the mode change was accepted by the controller.
Data rejected	Selected if the data was rejected by the controller.
Data accepted	Selected if the data was accepted by the controller.
Remote truncation occurred	Selected if the data was remotely truncated.

Table 7. Operating Parameters - DAANG Page

Field	Description
Process value	
Current	Value being reported from the control system.
Low	Zero value in the configured Engineering Units.
High	Span value in the configured Engineering Units.
Quality Timestamp	Quality and time that the last value was reported. Refer to Appendix B, Tag Quality for a list of quality indicators.
Substitute	Enter a number to be used as the new process value.
Next lower limit	Next lower alarm setting.
Next higher limit	Next higher alarm setting.
High reference	Maximum positive reference of the monitored value.
Center reference	Defines the positive and negative segment for the display.
Low reference	Maximum negative reference of the monitored value.
Low constraint	Low constraint value configured for this tag. The input is constrained when below this configured value.
High constraint	High constraint value configured for this tag. The input is constrained when it exceeds this configured value.
Out of calibration	Selected if the reported value is out of calibration.
Force XR report	Forces an exception report to be generated.

Table 8. Operating Parameters - DADIG Page

Field	Description
Current	Current state being reported by the control system.
Quality	Quality of the value reported. Refer to Appendix B, Tag Quality for a list of quality indicators.

Table 8. Operating Parameters - DADIG Page (Continued)

Field	Description
Timestamp	Time when the last value was reported.
Substitute	Enter a number to be used as the new process value.
Current priority	Current priority number of the tag.
Current comment	Comment associated with the current priority.
Quality overwritten	Selected if the quality has been overwritten.
Force XR report	Forces an exception report to be generated.

Table 9. Operating Parameters - Digital, Digital Export, Device Driver, RMCB, and RCM Pages

Field	Description
Current	Current state being reported by the control system.
Quality	Quality of the value reported. Refer to Appendix B, Tag Quality for a list of quality indicators.
Timestamp	Time when the last value was reported.
Substitute	Enter a number to be used for the new process value.
ICI Index (Digital Export tag only)	Has a range of integers 1-30,000 (depends on the type of INICI device).
Current Priority	Current priority number of the tag.
Current Comment	Comment associated with the current priority.

Table 10. Operating Parameters - Enhanced Page

Field	Description
Override enabled	Selected if the override value is in use.
Override value	Value of the override.

Table 11. Operating Parameters - MSDD Page

Field	Description
Current	Current state being reported by the control system.
Quality	Quality of the value reported. Refer to Appendix B, Tag Quality for a list of quality indicators.
Timestamp	Time when the last value was reported.
Substitute	Enter a number to be used as the new process value.
Zero State	Feedback state zero being reported by the control system.
One State	Feedback state one being reported by the control system.
Two State	Feedback state two being reported by the control system.
Three State	Feedback state three being reported by the control system.

Table 12. Operating Parameters - Module Status Page

Field ¹	Description ¹
Module Type	Displays the type of controller.
Module Mode	Displays mode the controller is operating in.
Node Type	Displays the node type.
Module Revision	Displays the status bytes reported from the controller.
ICI Type	Selected if it is an ICI type.
Module Offline	Selected if the controller is offline.
Module Errors	Displays any module errors.
Communication Errors	Displays any communication errors.
System Errors	Displays any system errors.
Local I/O bad	Selected if the local I/O is bad.
Remote I/O bad	Selected if the remote I/O is bad.

NOTE: 1. These fields only display initial static values when the Harmony system is running in Plant Loop mode.

Table 13. Operating Parameters - Harmony Server Page

Field	Description
Loop	Loop that the Server is connected to.
Node	Node number of the Server/ICI.
Restarts	Number of restarts performed on the Server.
ICI type	Type of Cnet-to-computer interface that the Server is connected to.
ICI mode	Mode of the Cnet-to-computer interface that the Server is connected to.
ICI revision	Revision of the Cnet-to-computer interface that the Server is connected to.
XR Counts	Shows the exception report counts for each tag type reported by the Server. Allows for resetting the count to zero for any of the tag types.

Table 14. Operating Parameters - Station Page

Field	Description
Current	Value being reported from the control system.
Low	Zero value in the configured Engineering Units.
High	Span value in the configured Engineering Units.
Quality	Quality of the value reported. Refer to Appendix B, Tag Quality for a list of quality indicators.
Timestamp	Time when the last value was reported.
Process value	Current process value reported for the tag.
Control output	Current control output setting for the tag.
Set point	Current set point value for the tag.
Deviation limit	Allowed deviation between the output and the set point configured for the tag.
Ration index	Current ratio index value for the tag.
Substitute	Enter a number to be used for the new process value.
Station type	Shows the station type (basic, cascade, or ratio).

Table 14. Operating Parameters - Station Page (Continued)

Field	Description
Low alarm limit	Low alarm limit configured for the tag.
High alarm limit	High alarm limit configured for the tag.
Tuning block	Block address of the process variable track signal.
Station mode	Shows the station mode.
Computer control	Selected if the station is under computer control.
Mode locked control	Selected if the mode is locked.
Out of calibration	Selected if the reported value is out of calibration.

Table 15. Operating Parameters - Text Selector

Field	Description
Index	Text index value.
Text	Text assigned to the Index value.
Quality	Quality of the value reported. Refer to Appendix B, Tag Quality for a list of quality indicators.
Timestamp	Time when the last value was reported.
Substitute	Enter a number to be used for the new process value.

PhaseX Tag

The PhaseX tag does not have a specific tab associated with it. The only tabs for that tag is the General tab and the Harmony tab. Refer to [Table 3](#) and [Table 4](#) for information on each of the two tabs.

Substitute Value

In the tag specific pages, **Substitute** can be used to enter a substitute value for the tag. When substitution is used, scan is automatically turned off. [Figure 23](#) is an example of the set substitute fields that appear after selecting **Substitute**. There is a different set substitute value window for each type of tag.



Only operators with the proper security level can access the substitute function.

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Figure 23. Set Substitute Value

To enter a substitute value:

1. Select **Substitute**.
2. Enter a substitute value or select a substitute state.

For a process value, use the up/down arrow buttons beside the value or enter a new value directly in the field. The **Increment Step** selection determines the percentage of increment for each click of the arrow button: 0.4 percent of the span or 4.0 percent of the span.

3. Select **OK**. This disestablishes the tag and causes the substituted value to be used in 800xA System functions.

To remove a substituted value and reestablish a tag:

1. Select the **Harmony** tab.

2. Clear the **Suspended** check box.

Red Tag Tab

The Red Tag tab (Figure 24) is available on controllable tag types that supports red tagging. Red tagging is a way of placing a tag out of service (for maintenance or other purposes) in a way that prevents it from being put back into service by unauthorized users. Typically only a limited number of users are permitted to red tag a tag.

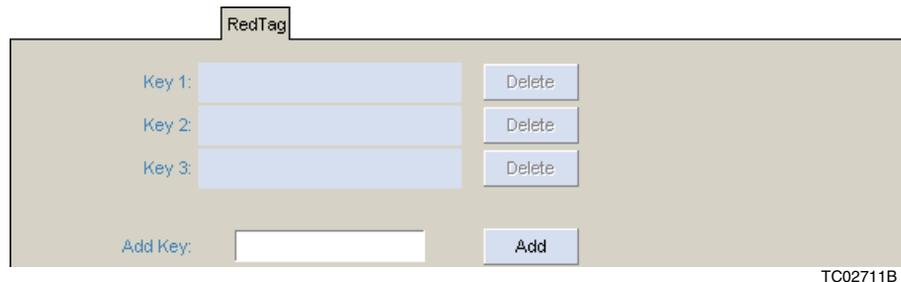
To red tag a tag:

- Enter a three character or smaller alphanumeric string in the Add Key field and select **Add**.

The faceplate displays a lock icon with a red background to indicate the tag has been red tagged. Up to three users can red tag a tag. This tag is not put back into service until all red tag keys are deleted by the users who added them.

To remove a red tag key:

- Select **Delete** next to the key.



The screenshot shows a control panel titled "RedTag". It features three rows, each with a label "Key 1:", "Key 2:", and "Key 3:" followed by a light blue input field and a "Delete" button. At the bottom, there is an "Add Key:" label, a white input field, and an "Add" button. The interface is set against a light beige background.

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Figure 24. Operating Parameters - Red Tag Page

Section 4 System Diagnostics Displays

Introduction

This section describes the system diagnostic display functions. This functionality improves the diagnostics and analysis capabilities for the Harmony system. These functionalities are aspects on the ModStat tag types only. The series of diagnostic displays consist of the following data:

- Loop Topology - a thin client web page displaying a list of online nodes which is generated by searching the loop for all nodes.
- Node Topology - a page detailing all modules (type, rev, mode and module address) in the selected node.
- Performance Statistics - a page containing a snapshot of information indicative of a node utilization in terms of its current message traffic for the node.
- NIS Event and Error Counters - a page containing a snapshot of event and error counters for the selected node (resettable, nonresettable).
- Exception Statistics - a page containing a snapshot of the exception report processing characteristics for the selected node (resettable).
- Communication Module Details - a thin client web page containing communication module details, memory utilization, and NIS details.
- General MFP Information - a thin client web page detailing the general information of MFP (only available for BRCs and MFPs at revision G.x or later).

Existing diagnostic displays are:

- Harmony operating parameters as described in [Section 3, Operating Parameters](#).
- Harmony block details as described in [Section 5, Block Details](#).

- Harmony module details as described in [Section 6, Module Details](#).
- Harmony operating parameters as described in [Section 7, SOE Reporting](#).

Loop Topology

The Harmony Loop Topology aspect provides a graphical representation ([Figure 25](#)) and tabular representation ([Figure 26](#)) of a loop.

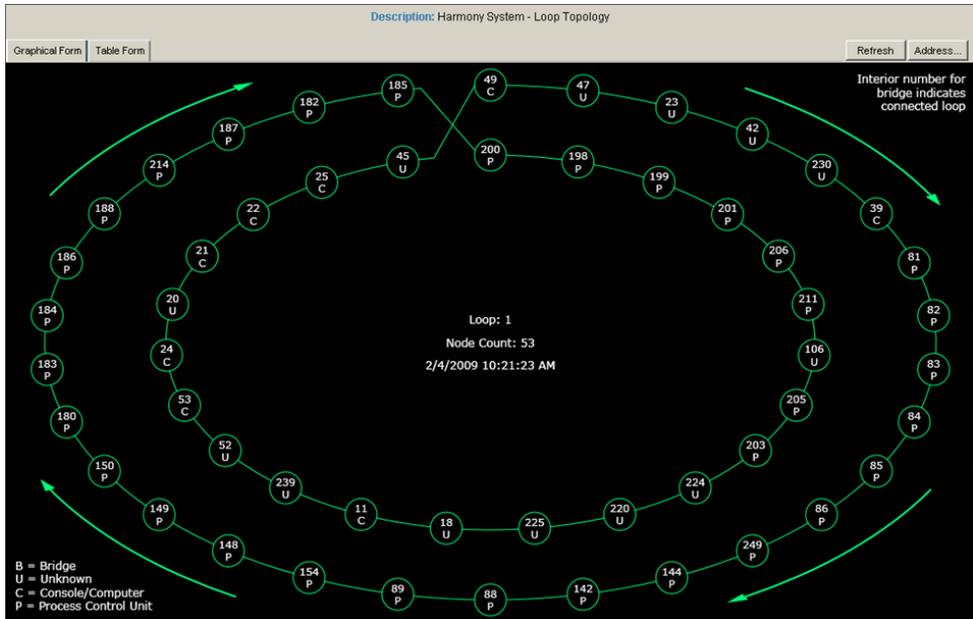


Figure 25. Graphical Form Tab

On the Graphical Form tab, each node in the loop is represented by a circle containing the node number and a node type designator (B, U, C, or P). The number of the node in the loop being bridged to is displayed outside of the bridge node circle and towards the inside of the loop. Arrows indicate the flow of data.

Loop information (loop number and the number of nodes in the loop) and the time the data was last updated is displayed in the center of the loop.

Node Address	Node Type
49	CIU
45	Unknown
25	CIU
22	CIU
21	CIU
20	Unknown
24	CIU
66	Unknown

Figure 26. Table Form Tab

To view the module address, type, revision, and mode of a node, select the node (Figure 27). Up to three node topology windows can be displayed at a time.

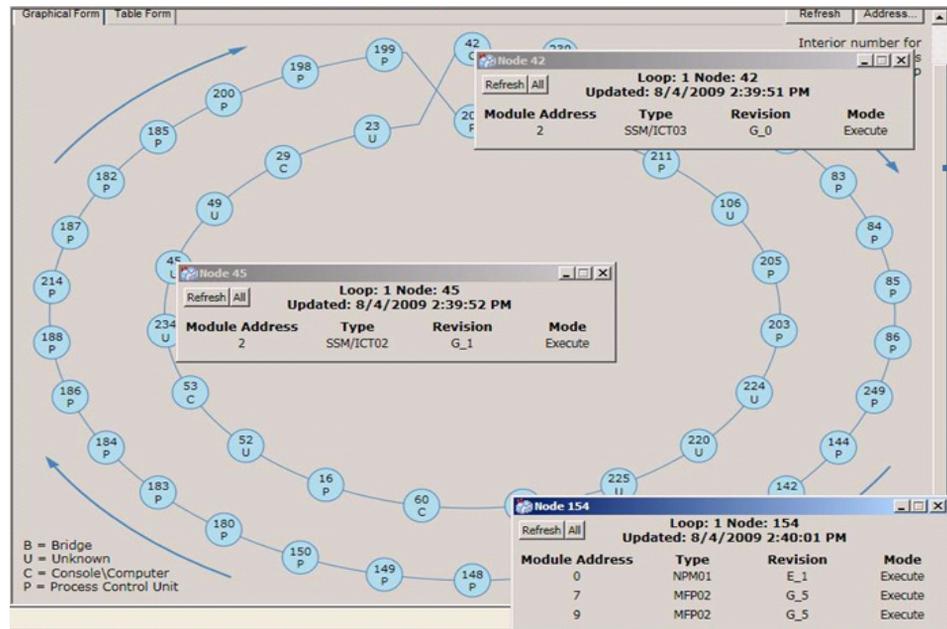


Figure 27. Node Topology Windows

To view loop topology information about another loop, click **Address**, enter the loop number, and click **OK**.

Loop information on the graphical tab is updated every 5 minutes by default. The node topology and table tab information need to be manually refreshed. This information is also updated when loop topology changes, a new loop is displayed, or **Refresh** is clicked.

The default colors used on the Graphical Form tab are configured by selecting the Object Library Structure\Harmony Global Preferences\Loop Topology Color Definition aspect (Figure 28).

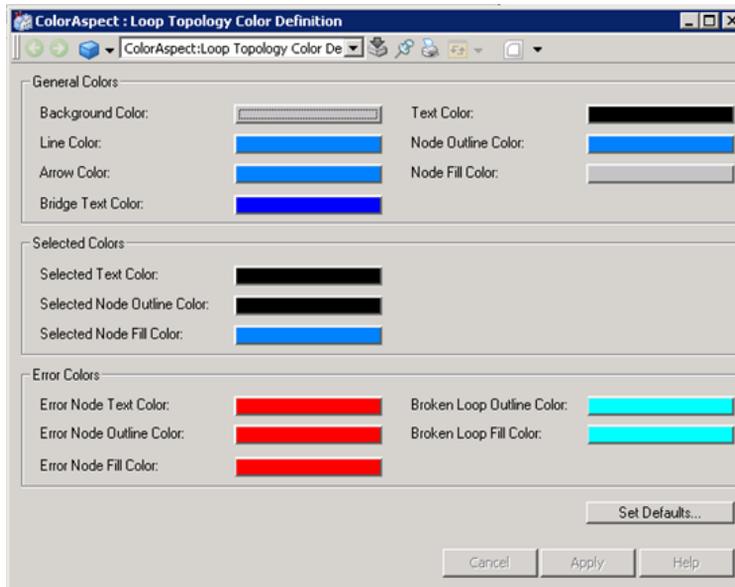


Figure 28. Loop Topology Color Definition Window

To change a default color:

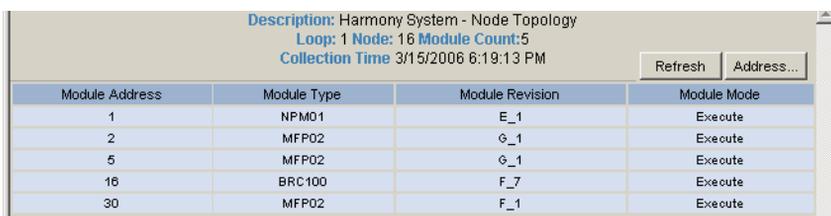
1. Click the colored button next to a color condition.
2. Select the desired color in the standard Windows color pallet and click **OK**.

If there is a loop failure (broken cable for example), the Graphical Form tab displays a loop snapshot just prior to the failure. The node immediately downstream from the fault location will appear in error colors. All nodes not communicating that are between the workstation and the node nearest the fault appear in broken node colors.

The nodes that are not communicating are the node symbols downstream from the workstation and upstream from the node nearest the fault.

Node Topology

The Harmony Node Topology is shown in [Figure 29](#). The **Refresh** button is used to update the information on the page. The **Address** button can be used to request the node topology for the desired node.

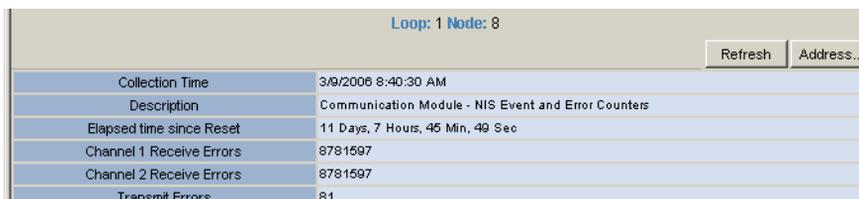


Module Address	Module Type	Module Revision	Module Mode
1	NPM01	E_1	Execute
2	MFP02	G_1	Execute
5	MFP02	G_1	Execute
16	BRC100	F_7	Execute
30	MFP02	F_1	Execute

Figure 29. Node Topology

NIS Event and Error Counters

The NIS Event and Error Counters is shown in [Figure 30](#). The **Refresh** button is used to update the information on the page. The **Address** button can be used to request the event and error counters for the desired node.



Collection Time	3/9/2006 8:40:30 AM
Description	Communication Module - NIS Event and Error Counters
Elapsed time since Reset	11 Days, 7 Hours, 45 Min, 49 Sec
Channel 1 Receive Errors	8781597
Channel 2 Receive Errors	8781597
Transmit Errors	81

Figure 30. NIS Event and Error Counters

Exception Statistics

The Exception Statistics is shown in [Figure 31](#). The **Reset** button will reset the exception statistics in the module. The **Refresh** button is used to update the information on the page. The **Address** button can be used to request the exception statistics for the desired node.

Loop: 1 Node: 8	
Collection Time	3/9/2006 8:42:33 AM
Description	Communication Module - Exception Statistics
Elapsed Time Since Reset	11 Days, 12 Hours, 21 Min., 25 Sec
Peak Exception Rec Rate (Points/sec)	0
Peak Exception Send Rate (Points/sec)	10
Received XR Count	0
send XR Count	157291
Received XR Packet Count	0
sent XR Packet Count	154449

Figure 31. Exception Statistics

Performance Statistics

The Performance Statistics is shown in [Figure 32](#). The **Refresh** button is used to update the information on the page. The **Address** button can be used to request the performance counters for the desired node.

Loop: 1 Node: 8	
Collection Time	3/15/2006 6:36:39 PM
Description	Communication Module - Performance Statistics
CIJ Utilization (%)	3
Bytes/Sec From Controller Bus	52
Bytes/Sec to Controller Bus	97

Figure 32. Performance Statistics

Communication Module and NIS Details

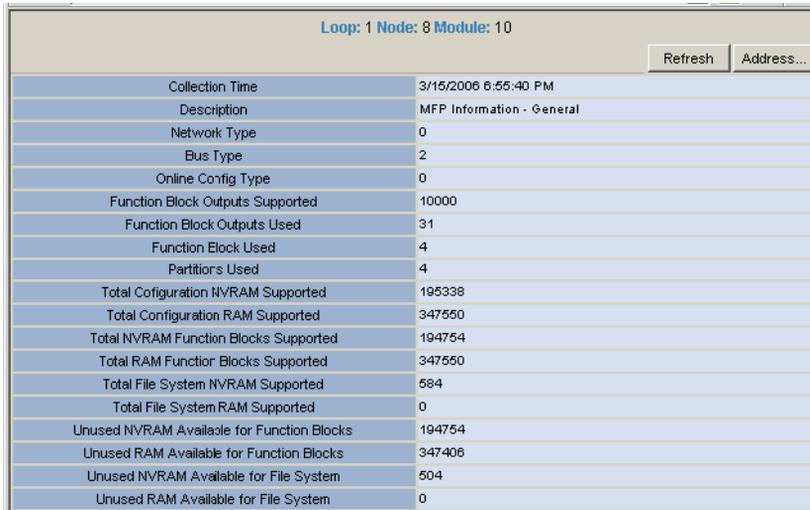
The communication module details, memory utilization and NIS details is shown in [Figure 33](#). The **Refresh** button is used to update the information on the page. The **Address** button can be used to request the module details for the desired node.

Loop: 1 Node: 8	
Description: Communication Module - Details and Memory Utilization	
Collection Time: 3/15/2006 6:57:34 PM	
ComModuleDetails NISDetails	
Refresh Address...	
Type	NPM01
Revision	E_5
Total Memory (Bytes)	399360
Unused Memory (Bytes)	398660
Temporary Memory Bytes Allocated	0
SW1	00000000
SW2	00001000

Figure 33. Communication Module and NIS Details

Module General Information

Module general information is shown in Figure 34.



Loop: 1 Node: 8 Module: 10	
Collection Time	3/15/2006 6:55:40 PM
Description	MFP Information - General
Network Type	0
Bus Type	2
Online Config Type	0
Function Block Outputs Supported	10000
Function Block Outputs Used	31
Function Block Used	4
Partitions Used	4
Total Configuration NVRAM Supported	195338
Total Configuration RAM Supported	347550
Total NVRAM Function Blocks Supported	194754
Total RAM Function Blocks Supported	347550
Total File System NVRAM Supported	584
Total File System RAM Supported	0
Unused NVRAM Available for Function Blocks	194754
Unused RAM Available for Function Blocks	347406
Unused NVRAM Available for File System	504
Unused RAM Available for File System	0

Figure 34. Module General Information

Section 5 Block Details

Introduction

This section describes the Block Details function. The Block Details can be called for any Harmony tag that acquires data from a function block in a Harmony controller (Station, MSDD, DD, Digital, etc.).

Purpose

The Block Details function inspects function blocks that are within a selected controller. It displays specifications and the outputs of a selected function block and additional information related to the FC. Some specifications of the selected function block are tunable. It also provides various ways of navigating to other function blocks in the controller. Block Details information is presented in a series of tabs.

To access the Block Details function:

- Right click a Harmony tag to open the context menu and select **Harmony Block Details**, or select **Harmony Block Details** directly from the Aspect list.

Overview

The top of this display indicates the hardware address of the function block being examined and its FC number and name.

The following items are shown:

- Specifications - Specification data.
- Outputs - Current output value(s) of the FC block.
- Description - Description of the FC.
- Address - Enter a new block address.
- NextBlock - Jump to a next block address in the module.

Print

To print information on the current Block Details screen, right-click on the upper portion of the Block Details window and select **Print**.



This prints an exact copy of what is shown in the Block Details window.

Enhanced Operator Action Event Format

The enhanced format for recording tuning operations in the Block Details utility is shown in [Figure 35](#).

Creation Time	Name	Comment	Operator
10/19/2005 8:59:43 AM	HarmServer	Gain parameter of first input tuned from 1 to 10 at block address 1-1-2-216 for tag Not Found	operator2
10/19/2005 8:59:08 AM	STA-PCU1-002	PV low alarm point in engineering units tuned from -101 to 0 at block address 1-1-2-220 for tag STA-PCU1-002	operator2
10/19/2005 8:57:54 AM	STA-PCU1-002	PV high alarm point in engineering units tuned from 55 to 100 at block address 1-1-2-220 for tag STA-PCU1-002	operator2
10/19/2005 8:49:24 AM	HarmServer	High output limit tuned from 105 to 90 at block address 1-1-2-217 for tag Not Found	operator2
10/19/2005 8:47:24 AM	STA-PCU1-002	PV high alarm point in engineering units tuned from 200 to 55 at block address 1-1-2-220 for tag STA-PCU1-002	operator2
10/19/2005 8:43:41 AM	ANALOG-100	Low alarm point limit value tuned from -4.332161E-02 to -110 at block address 1-250-3-410 for tag ANALOG-100	SPSLABVengineer
10/19/2005 8:43:16 AM	ANALOG-100	High alarm point limit value tuned from 66 to 23 at block address 1-250-3-410 for tag ANALOG-100	SPSLABVengineer
10/19/2005 8:40:08 AM	ANALOG-100	High alarm point limit value tuned from 90 to 66 at block address 1-250-3-410 for tag ANALOG-100	OpiTService

Figure 35. Enhanced Operator Action Event Format

The following information is presented in each column:

Name Column: <Tagname> or <Harmony Server Name>



If the current block does not correspond to a configured tag, the name of the active harmony server will be used.

Comment Column: **aa** tuned from **bb** to **cc** at block address **yy** for tag **zz**

Where: **aa** is the function code specification changed (the description as it appears in Block Details)

bb is the previous value of the specification.

cc is the updated value of the specification

yy is the Harmony function code address (Loop-PCU-Module-Block)

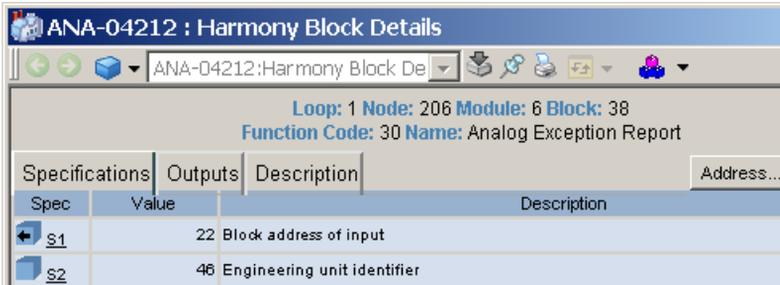
zz is the object name of the tag as found in the ConfigServer database based on the Loop-PCU-Module-Block address. If there is no match for the address in the ConfigServer, the object name will be reported as **Not Found**.

Operator Column: In a domain environment: <Domain\User>. In a workgroup environment: <User>

Specifications Tab

The Specifications tab displays a list of FC specification records. Icons under the Specifications tab are used to show additional information about each specification as shown in [Figure 36](#):

-  Indicates a specification which references another function block output.
-  Indicates a specification whose value can be tuned.
-  Indicates a specification that does not reference another block and is not tunable.



Specifications	Outputs	Description	Address...
← s1	22	Block address of input	
s2	46	Engineering unit identifier	

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Figure 36. Specification Tab

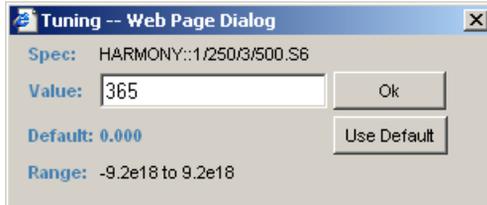
Tunable Blocks

Specifications whose value can be changed when the controller is in execute mode are said to be tunable. A Tuning window appears (Figure 37) by selecting a tunable icon for a tunable specification.



Tuning permissions are needed to tune. Refer to the *800xA for Harmony Configuration (3BUA000157*) instruction* for more detailed information on permissions.

Enter a new value in the Value field. Select **Ok** to send the tune block command to the controller. By selecting **Use Default**, the default value of the specification is inserted into the value box.



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Figure 37. Tuning

Properties Option

The Properties option is available for each specification type. It can be accessed by selecting the underlined specification name (S1, S2, etc.). The result produces the window as shown in Figure 38.

Outputs Tab

The Outputs tab displays function block output records (Figure 39). The following items are shown:

- Output - Output number.
- Block - Block number associated with the output value.
- Type - Data type of the output value.
- Value - Value of the block output.
- Description - Description of the output value.

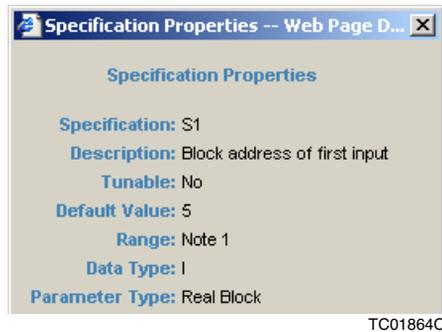


Figure 38. Specification Properties

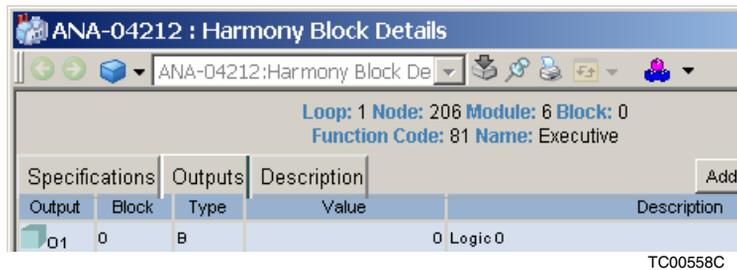


Figure 39. Outputs Tab

Description Tab

The Description tab contains a description of the FC that is currently on display.

Block Navigation

The **NextBlock** button is a command for jumping to the next configured function block within the controller. When **Address...** is clicked, a block address box appears (Figure 40). Enter the desired address and select **OK**.

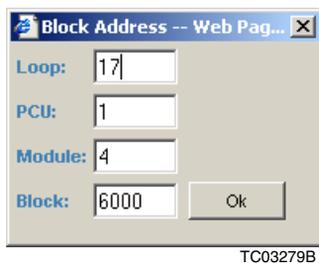


Figure 40. New Block Address

Section 6 Module Details

Introduction

This section describes the Module Details function. The Module Details can be called for any Harmony controller or communications interface (IMMFP12, HAC, and etc.).

Purpose

The Module Details application provides detailed information about the operational status of a selected Harmony module. The Module Details are presented in a series of tabs.

To access the Module Details function:

- Right-click a Harmony tag to open the context menu and select **Harmony Module Details** or **Harmony Module Details** directly from the Aspect list.

Overview

Loop, Node, and Module information along with three tabs is displayed on the main screen (main view) that appears when the Harmony Module Details aspect is invoked as shown in the following [Figure 41](#),

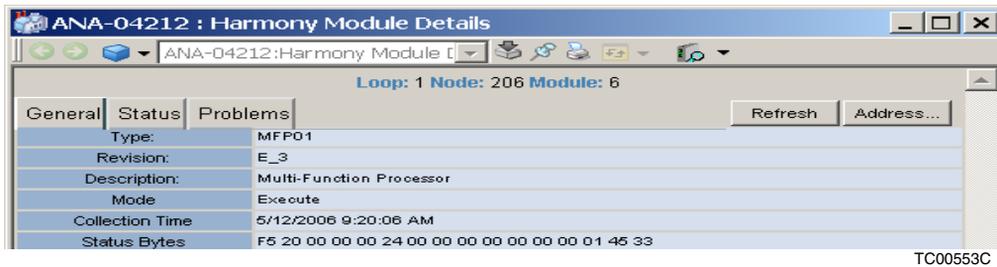


Figure 41. Main Screen

Views

The General tab displays the Type, Revision (firmware), Description, Mode, Collection Time, and Status Bytes (refer to [Figure 41](#)).



The Module Details display does not automatically refresh. Click the navigator **Refresh** button to refresh the data in the display.

If the application is unable to determine a revision level, N/A displays in the Revision field. The possible operating modes are:

- Execute - Online and in execute mode.
- Configure - Online and in configure mode.
- Error - Online and in error mode, this indication occurs when a controller configuration error exists.
- Failed - Offline due to the existence of an internal problem.

To select a different address, click **Address** enter the new information.



If an invalid address is entered, the application displays a message indicating that it is not possible to scan the selected module.

The number of status bytes depends on the type of module. Some modules return five status bytes when others return 16 bytes. Of these bytes, the first two are common to most modules. The remaining bytes are specific to a particular module. Each byte is represented with a hexadecimal value.

[Table 16](#) describes the meaning of the data that is presented in bytes one and two. Convert the hexadecimal value to a binary value then refer to [Table 16](#) for further interpretation of the status bytes.

Table 16. Controller Status Bytes

Byte	Bit							
	7	6	5	4	3	2	1	0
1	ES	MODE		TYPE				
2	FTX	BAC	RIO	LIO	CFG	NVF	NVI	DSS

The terms and acronyms used in [Table 16](#) are defined as:

- ES** Error summary:
0 = ok, 1 = error exists.
If there is an error indicated in the status information, the bit is set to one.
- MODE** Module mode:
00 = configure, 01 = failed
10 = error, 11 = execute.
- TYPE** Module type. Each Harmony module has a different type identifier.
- FTX** First time in execute mode:
0 = no, 1 = yes.
- BAC** Summary of remote backup status:
0 = ok, 1 = bad.
- RIO** Summary of local input status:
0 = ok, 1 = bad.
- LIO** Summary of local input status:
0 = ok, 1 = bad.
- CFG** Online configuration changes being made:
0 = no, 1 = yes.
- NVF** Nonvolatile memory failure:
0 = no, 1 = yes.
- NVI** Nonvolatile memory initialized:
0 = no, 1 = yes.
- DDS** Station status:
0 = ok, 1 = bad.

Status Tab

The Status tab displays a list of status error messages that apply to the selected module at the time of the last scan.

Problems Tab

The Problems tab displays a list of problem report messages that apply to the selected module at the time of the last scan.

Section 7 SOE Reporting

Introduction

This section describes operations for the SOE reporting system of Harmony. It includes a brief description of SOE report operation.

SOE reporting in Harmony is intended for use by plant personnel to closely monitor critical digital points where it requires that the sequence of changes of state for points or groups of points must be known in the most exacting ways possible. SOE reporting lists all digital state transitions in chronological order with one millisecond resolution. The external interfaces involve one or both of two types of SOE architectures: DSOE/HSOE and Rochester SOE.

SOE reporting allows the collection of precise state transition event data originating in a sequence of events recorder (SER), or a DSOE system in the control system. In the HSOE system, digital state transitions are recorded and timestamped to one millisecond resolution at the time of occurrence. These events are then available to any console in the control system.

The Harmony configuration Server allows the configuration of the SOE report tag and SOE recorder objects. The Harmony Configuration Server monitors SOE trigger points in the control system and collects the SOE data. The Harmony report system makes the data available for the user to view.

Supported Functions

The SOE reporting system provides the following functions:

- Allows configuration and definition of the trigger tags, wait time, report types, and other information necessary for a complete implementation of features provided by DSOE and by FC 99 (SER).

- Wait for notification that one millisecond resolution SOE data has arrived within the DSOE fixed SEM blocks 5000 and 5001 or the FC 99 block by monitoring the associated trigger tags, and then collect them.
- Build SOE reports from the data that it has gathered through communications with hAPI using preconfigured report formats.
- Automatically collects an SOE report upon completion.
- The SOE report can be manually printed.

Configuration

The configuration of the SOE report tags and SOE recorders are done on the configuration Server. Each SOE report tag is derived from an SOE report tag. Each report keys off this tag when SOE reports are processed for it. The hardware address is the output block of the SOE reporting function block in the controller responsible for reporting SOE events to the Harmony Configuration Server system.

Trigger Tag

The SOE data collection by the Harmony Configuration Server system is started automatically when or shortly after the trigger tag goes into a trigger state. When an SOE report is triggered, SOE events are read in from the SOE function block. When an SOE report is completed, it is stored in an internal queue and the REPORTREAD property is set to one to trigger the report system. Upon resetting of the REPORTREAD property to zero or the time duration exceeding the defined cache time, the report is removed from the head of the queue.

SOE Report Collection

When the REPORTREAD property is triggered for a configured SOE report object, the report formats the SOE event report into a predefined SOE report and resets the REPORTREAD property to zero. The report system makes the SOE data available for the user to view.

SOE Report Faceplate

The SOE Report faceplate represents an SOE function block in a controller. This function block provides a set and reset, flip flop memory to control a process device. An SOE report tag object is required to monitor and control the output of this function block. In both cases, SOE trigger tags can be configured for the blocks to monitor SOE trigger points in the control system. The SOE reporting system then collects and makes available the SOE reports whenever the trigger points indicate the presence of SOE data. The SOE reports are configured with SOE recorder and SOE report objects. Digital points are assigned to the SOE recorders. The recorders are then assigned to the SOE report objects.

The SOE report object is configured for each SOE report that is to be done by Harmony. An SOE report tag is used for triggering SOE reports. Each SOE report object has an SOE recorder associated to it. Figure 42 shows the location of the attributes describe.

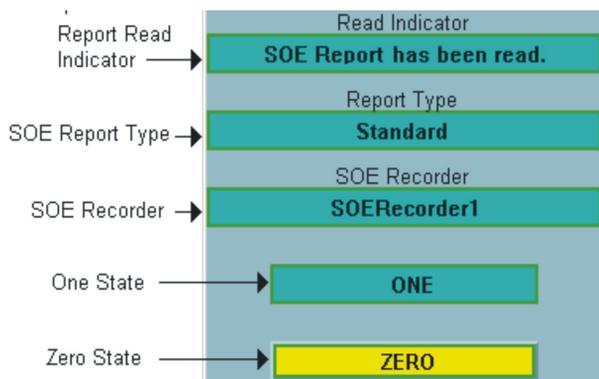


Figure 42. SOE Report Trigger Tag Faceplate

Read Indicator

Indicates whether an SOE report is active and being monitored and collected by the SOE system, or if the report is inactive.

Report Type

There are five available report types:

- Standard.
- Summary.
- Pre-fault.
- Post-fault.
- Snapshot.

Located in the second Report Type field is the name of the recorder that is associated with the SOE report object.

SOE Recorder

This is the name of the SOE Recorder where the data is read.

Go State One or Go State Zero

The current state is text that describes the output being reported by the SOE Report function block. State One monitors report activity. It displays TRIP if it has been triggered to collect data at a given time, and State Zero monitors the status of the trigger, in this case ([Figure 42](#)) it has been stopped. The descriptor that appears depends on the input source selection and can be an actual process state, the alternate input state, or the user inserted state. The descriptor that appears is either the one or zero state descriptor defined in the database.

During SOE Report function block configuration, input conditioning can be chosen to develop the function block output.

Non-Permissive

Shows the status being reported as the permissive input to the function block. The block must be in a permissive state to control the SOE Report function block. The lock icon appears in the signal field panel when the SOE Report is set to non-permissive.

Override

Indicates that the block is in an override condition.

The block allows an external source to override the quality status of the reported value. A visible override icon determines an override condition.

Saved Reports

Saved reports can be reviewed at a later time if the report action is configured to export to an object path. In the example (Figure 43), the saved reports are retained as objects under the SOE Report folder found under Reports in the Scheduling Structure.

The screenshot displays the H3-AS System // Plant Explorer Workplace interface. The left sidebar shows a tree view with 'Reports' expanded to 'SOE Report Folder'. The main window shows a table of report aspects and a detailed report view.

Aspects of "SoeReport_11Jun20041..."	Modified	Desc...	Inherited	Category name
Completed Report Type Reference	6/11/2004 1:13:1...	Cont...	False	Completed Report
File Viewer	6/17/2004 3:10:3...	Integ...	False	File Viewer
Name	6/11/2004 1:13:1...	The ...	False	Name
Object Icon	5/8/2003 2:09:26...	Icon ...	True	Object Icon
Report Printing	7/24/2003 9:18:1...	Singl...	True	Report Printing
Scheduling Structure	6/11/2004 1:13:1...	[Sch...	False	Scheduling Stru...

Trigger Indicator	Event Time	Tajn Name	Tajn Descri
	13:12:48:873	DIGITAL-151	DIGITAL-1...
	13:12:48:873	DIGITAL-140	DIGITAL-1...
	13:12:48:873	DIGITAL-129	DIGITAL-1...
	13:12:48:873	DIGITAL-118	DIGITAL-1...
	13:12:48:873	DIGITAL-107	DIGITAL-1...
	13:12:48:873	DIGITAL-96	DIGITAL-1...
	13:12:48:873	DIGITAL-85	DIGITAL-1...

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Figure 43. Saved SOE Report View

To review a printed report:

1. Select the completed report according to the date timestamp.
2. Select the File Viewer aspect to display the report generated for this time trigger.

The report data can then be reviewed by scrolling within the view provided

To reprint a completed report:

1. Select the Report Printing aspect to display file(s) that can be printed.
2. Select the file and click **Print File** to reprint the report.

Archived reports can be saved and viewed only if the system includes the 800xA Information Manager that is configured to archive report data.

The View Report Logs aspect is used to view reports that have been configured to Save To History.

Section 8 Advanced Harmony Control System Monitoring

Introduction



This is a feature that requires an additional license working with 800xA Asset Optimization.



Refer to the *System 800xA Asset Optimization Operation (3BUA000150*) instruction* for specific information on Asset Optimization.

Harmony modules provide specific information on their operational status in the form of status bytes. Some modules return five status bytes where others return up to 16 bytes. Of these bytes, the first two bytes are common to most modules and format of the remaining bytes differs from module to module. Harmony provides OPC access to the status bytes on the Module Status tags.

The status byte conditions that the asset monitor reads are grouped into several conditions that represent different functional categories of the Harmony modules. Each status byte condition determined by the monitor is represented by a line in the description of the condition that it has been grouped into. The description for each condition is copied to an output record with a similar name.

If the status byte condition state warrants a higher severity level than the current severity level of the asset monitor condition, then the asset monitor conditions subcondition is changed to one that carries the appropriate elevated severity level. The subcondition of the asset monitor conditions that represent these groups will always be the subcondition that carries the severity level warranted by the most serious status byte condition for the module.

Due to the differences in the information reported in the status bytes for each Harmony module, some modules will not have status byte information to be reported in each asset monitor condition. In this case, the unused asset monitor

conditions will remain in their normal state and have the description of Not Applicable.

Monitor View

Many of the states or conditions indicated by the monitor have possible cause and/or suggested action information that is provided by the monitor if relevant. To view this information, perform the following:

1. Navigate to the main view for the instance of the asset monitor for which you wish to see the cause/action information.
2. Right click anywhere in one of the condition rows displayed.
3. Select **Asset Monitor Status**.
4. Select **Conditions**.
5. For each condition, view the possible cause and suggested action information, along with other information. Each line of the possible cause/action text is prefixed with the abbreviation of the status byte field that it relates to. Most status byte fields do not have possible cause or suggested action information for non-alarm states.



Refer to the *System 800xA Asset Optimization Operation (3BUA000150*)* and the *System 800xA Asset Optimization Configuration (3BUA000118*)* instructions for specific information on Asset Optimization.

Supported Modules

The following table (Table 17) lists the module types that are supported by the Asset Monitors.

Table 17. Supported Module Types

Module Types			
AMM01	CPM02	LCM01	MPC01
AMM02	CPM03	LCM02	NPM01

Table 17. Supported Module Types (Continued)

AMM03	CSC01	IPT02	MFP12
AOM01	CTM01	LCM03	NPM11
BIM01	CTT01	LIM01	NPM12
BIM02	CTT02	LIM02	PBUG01
BRC100	GCM01	LIM03	PCI01
BRC200	HAC	LMM01	PCI02
BRC300	HNCC	LMM02	PCT01
BRC400	HNPM	LSM01	PIM01
BTM01	ICI01	MCP01	PPG01
CBC01	ICT01	MCP02	PPR01
CIC01	ICT03	MFC01	PPT01
CLC01	ICT12	MFC02	PTM01
CLC02	ICT13	MFC03	QRC01
CLC03	IET800	MFC04	SBM01
CLC04	IIT01	MFP01	SCM01
COM02	IIT02	MFP02	SEM01
COM03	IIT03	MFP03	SLC01
COM04	IPT01	MFP11	SLC21

Section 9 Aspects

Introduction

800xA for Harmony provides multiple aspects of a specific Harmony tag. Each of these aspects provides specific information on that Harmony tag.

System Status Viewer

The System Status Viewer is used in the Harmony OPC Server Network object to monitor the status of the Harmony Server and ModStat Read objects.

For a description of the different columns and fields in the System Status Viewer or more information on the other uses of the System Status Viewer, refer to the *System 800xA System Administration and Security (3BSE037410*) instruction* for more information.

Harmony Server Object

For the Harmony Server object, the Description field can display one or all of the following messages, separated by commas:

- Alarm State (Normal or Alarm) - This displays Normal as long as there are no other errors. If the status is Offline or any of the other errors exist then it displays Alarm.
- Status (Online or Offline) - Indicates that the CIU is Online or Offline
- CommErr - Indicates that there is some kind of communication error.
- InternalErr - This is the internal error in the Configuration Server. Refer to the system and application event log for more details.

ModStat Object

For the ModStat object, the Description field can display one or more of the following messages, separated by commas:

- Module Mode (Execute, Config or Failed) - Indicates whether the module is executing, being configured or if the module has failed (redlit).
- Noffline - Indicates that the node has been taken offline
- Nmoderr - One or more module errors.
- NcommErr - Module communication errors.
- NsysErr - One or more node system errors.

An X (Figure 44) in the Details column for this row represents there is more information available. To get more information on a certain object, select the X on the row containing that object.

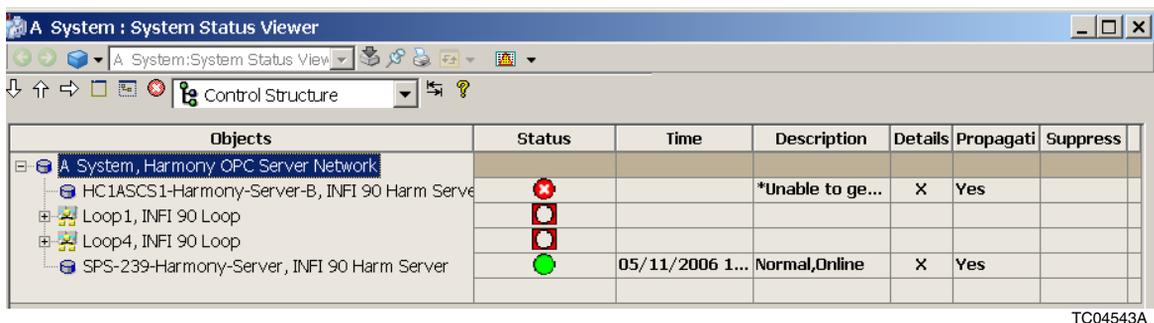


Figure 44. System Status Viewer

Select the Harmony Server object row to call up the Module Details the Harmony Server is getting it exceptions through. Select the Harmony ModStat Read object to call up the Module Details for the Loop address defined in the Tag Configuration for this object.

If the module is offline then it indicates Offline, but because it is offline all the other objects indicate that they are unable to get System Status data.

To get a better hierarchy of the modules in the system, the ModStat Objects can be inserted into the Functional Structure under defined Areas. When the area is

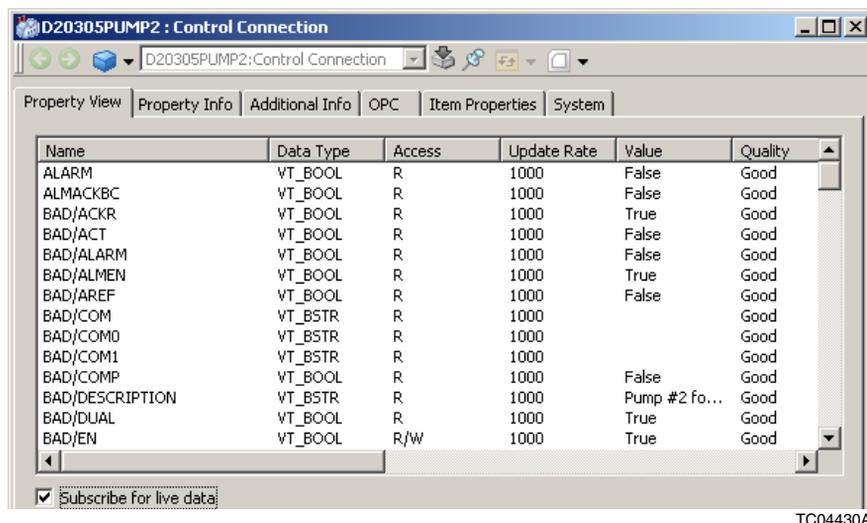
collapsed, the Status propagates upward into the Status Icon for the Area. This can give a better overview of the modules.

Harmony ID

This unique identifier is the Object ID in the configuration Server. The Harmony Synchronizer aspect uses this identifier, during the synchronization process, to optimize performance.

Control Connection

For more information on the Control Connection aspect, refer to the *System 800xA System Planning (3BSE041389*) instruction*. [Figure 45](#) shows an example of the Property View tab. The properties are different depending on the Harmony Object Type. The Subscribe For Live Data check box can be set to retrieve data from the corresponding OPC Server.



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Figure 45. Control Connection Aspect

Authentication

OPC properties can be configured to require an explicit authentication operation for the operation to be performed. Two different authentication operations are supported: reauthentication and double authentication. Either option can be configured for each OPC property on an individual Harmony object or type.

Properties or atoms of a certain tag can be set to reauthenticate or to double authenticate.

Reauthentication

This is used to guarantee that an operation is performed by the correct person. Requiring a reauthentication action immediately before a change is to be performed guarantees that no one has the possibility to operate or make changes to a workplace when the user who normally operates it temporarily leaves. Once a tag or atom has been configured this way and a change is being made, the user is prompted to enter a user ID and a password for the changes to take place as shown in [Figure 46](#).

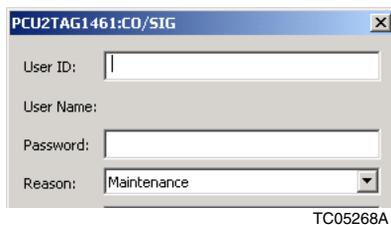


Figure 46. Reauthentication Approval

Double Authentication

This used for operations critical to the quality of the product or required by regulation. It is used where the knowledge of an operator is too limited or where there must be another operator that verifies the change before it is done. Once a tag or atom has been configured this way and a change is being made, the user is prompted to enter a user ID and a password for the changes to take place as shown in [Figure 47](#).



Second Approval

User ID:

User Name:

Password:

Reason: Maintenance

Approval Comment: (optional)

OK Cancel

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Figure 47. Double Authentication Approval



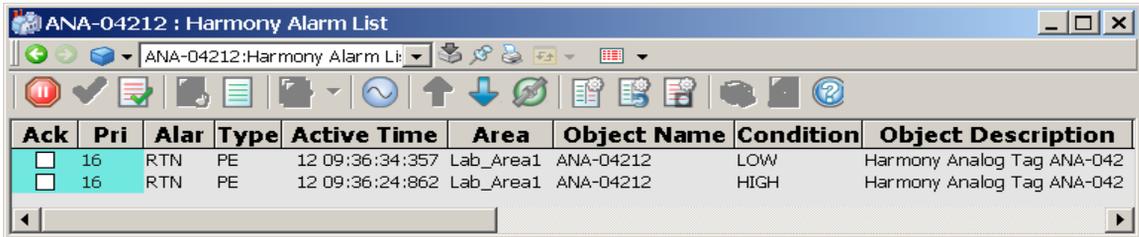
Refer to the *System 800xA Administration and Security (3BSE037410*)* instruction for more information on configuring this feature.

Alarm List

Refer to the *System 800xA Configuration (3BDS011222*)* instruction for a description of the Alarm and Event Lists.

Harmony Alarm List

The Harmony Alarm List is located in the Control Structure. The Harmony Alarm List is a predefined alarm state list which displays alarm state changes for tag objects. Single or multiple selected alarm acknowledges or silences can be done from this list. When it is called up from the Harmony OPC Server Network object, it contains alarms for all the tag objects (Figure 48).



TC04431B

Figure 48. Harmony Alarm List

When it is called up from an tag object, it only contains alarms for that object.



For the Alarm List to work, the Alarm Service must be set up according to procedures presented in the *System 800xA Configuration (3BDS011222*) instruction*.

Logover

The logover feature enables a fast temporary switch of the user running a workplace. When the logover function is activated, an authentication dialog is displayed that allows the user to log over to a valid 800xA System/Windows user. The logover changes the permissions and user roles but keeps all open windows with their present contents. These permitted actions in the open windows are controlled by the permissions of the logged over user. To return to the user that was logged on before the user switch, the revert user option of the user tool can be activated. The revert user operation requires reauthentication.

To use the logover function:

1. Locate the ABB icon in the bottom right hand corner in the Operator Workplace. To the left of the icon is the user account name.
2. Right-click this name.
3. Select **Change User** from the pop up menu as shown in [Figure 49](#).
4. Enter the user ID and password in the Change User dialog box. Enter the logover `domain\user account` as created in the domain account.
5. Click **OK**.

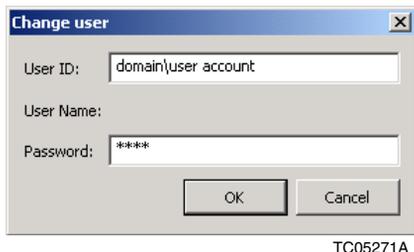


Figure 49. Logover

To revert back to the previous user:

1. Repeat [Step 1](#) through [Step 2](#) from above.
2. Select **Change User** from the pop up menu as shown in [Figure 49](#).
3. Enter the user ID and password in the Change User dialog box. Enter the primary **domain\user account** as created on in domain account.
4. Click **OK**.

The following Harmony aspects support the logover functionality.

- Block Details (tuning).
- Module Details (read).
- Operating Parameters (substitute, red tag, inhibit).
- OPC Events (acknowledge).
- OPC Items (Read, Control).
- Configuration Server Objects (modify).

NIC Time Synchronization

For nodes with dual NICs, Harmony time synchronization must be set for a specific network. The time synchronization options allow the user to choose the network interface and the priorities for time synchronizations. Refer to [Figure 50](#).

1. To access this, select the following:
Start > Programs > ABB Industrial IT 800xA > 800xA for OCS Systems > Harmony > Timesync Configuration.
2. Select the IP Address of the network interface that is desired to use.



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Figure 50. NIC Time Synchronization

3. Select the Network Priority.

The priorities are as follows:

- 1 - Lowest
- 5 - Medium.
- 10 - Highest.

4. Click **Apply**.

5. Click **OK**.

Section 10 Web Based Server Explorer

Introduction

This section explains Web Based Server Explorer access and operation. It also provides some SQL information for defining Tag Summary queries.

Access

The Web Based Server Explorer utility accesses diagnostic tools for the Harmony system (Figure 51). To access the utility, select the following menu options from the Start menu:

ABB Industrial IT 800xA > 800xA for OCS Systems > Harmony > Web Based Server Explorer

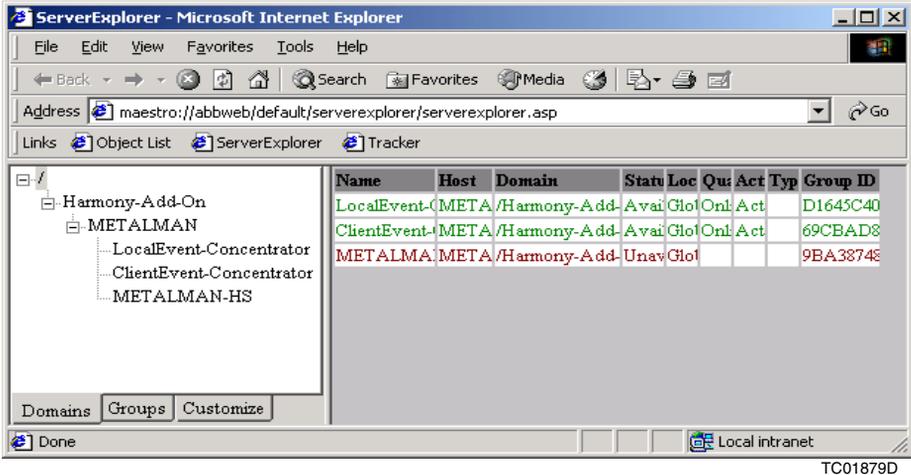


Figure 51. Web Based Server Explorer

The Server Explorer shows status information for each of the connectivity Servers in the system (in the same domain). The left side of the view can be used to navigate to a particular machine then connectivity Server on that machine. The right side of the view changes to show the status of the selected machine or selected Server. Selecting a header on the right side sorts the entries by that column.

Tabs

Both the Domains tab and the Groups tab are simply different views for listing information for all the software connectivity Servers running in the system. There are two components in the display (navigation tree and information pane). The navigation tree allows the user to select the Domain, Group, or individual software Server to view status. Also, the user can either shut down or start a particular Server as well as view the Server Diagnostics for the selected Server. The information pane can be customized to display up to nine columns of information pertaining to the Servers.

Domains Tab

This tab presents a view organized by the Server domain names as defined in the network identification tab. Selecting the root of the navigation tree causes all of the connectivity Servers found in the system to be presented in the information pane. Listed under the root of the navigation tree are the domains located in the system. Selecting the desired domain causes all of the connectivity Servers found within the domain to be presented in the information pane. Expanding the listed domains allows the user to view the various workstations in the system, listed by name. Selecting a particular workstation in the network lists only those software Servers located on the selected workstations.

Groups Tab

This tab presents a view organized by Server groups found in the network. Selecting the root of the navigation tree causes all of the connectivity Servers found on the network to be presented in the information pane. Listed under the root of the navigation tree are the software Servers. Selecting a Server group name lists the Server names grouped beneath the selected Server group. Often, there is only one connectivity Server beneath each Server group. However, there can be more as in

the case of a redundant Server pair which may have two Harmony Servers under one Server group name.

Custom Tab

This tab allows the user to select which columns are displayed in the information pane for the Domain and Group views. The available columns are: Name, Host, Domain, Status, Local, Quality, Active State, Type and Group ID. Following is a brief explanation of the information presented under each column.

- **Name** - The name of the connectivity Server.
- **Host** - The computer which is hosting the Server.
- **Domain** - The domain name for the Server, including the parent domains it belongs to. The format is as follows:
`/ParentDomain/HostComputerName/SoftwareServerName.`
- **Status** - The current status of the Server indicated as either Available or Unavailable.
- **Local** - Indication of whether the Server is either globally available or locally available, shown as Global or Local.
- **Quality** - Indicates whether the Server is either Online or offline.
- **Active** - Indicates whether the Server is Active or inactive.
- **Type** - In a redundant Server situation, this indicates whether the displayed Server is the primary or redundant. The field is blank if the Server is not part of a redundant group of Servers.
- **Group ID** - A unique identifier for the Server.

The Web Based Server Explorer provides access to the following tools:

- Server Diagnostics.
- Start/Stop Server.

Server Diagnostics

Server Diagnostics provides detailed information about the working status of a selected Server. The Server Diagnostics are presented in a series of tabbed pages.

The General tab displays Server information provided by all types of Servers. The Tags tab provides a summary of tag objects and their associated properties.

To open diagnostics for a specific Server:

1. Select a server from the list in the Web Based Server Explorer (Figure 51).
2. Right click on the selected Server, then select **Server Diagnostics** from the menu.

General Tab

The General tab shows Server status (Figure 52), host, description, and type information. The scrollable list contains the complete set of properties belonging to the corresponding Server tag and their values. These values are updated once a second.

Tags Tab

The Tags tab displays a scrollable tree of the tags hosted by the selected Server (Figure 53). The number of tags available in the Server appears in the Number of Tags field. To select a tag, select a name in the tree. When a tag is selected a list of its properties are displayed in the right list view and the number of properties is displayed in the Number of Properties field.

When a tag is selected, right-click the tag to call up a menu that allows selecting Operating Parameters or Block Details for the selected tag.

To see the properties associated with the tag:

1. Select the node button (+) or select the tag name.
2. Select one of the properties. The list view on the right shows the data format and the value of the property selected. The icons show the available data formats for the property and indicate the primary format from the available ones.

The following list describes the data format icons:

- ✓ - Data format supported.
- ✓✓ - Primary data format.
- ✗ - Data format not supported.

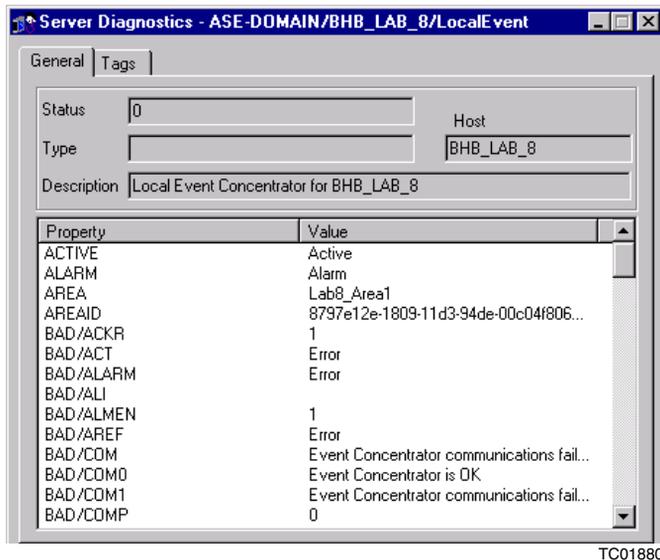


Figure 52. Server Diagnostics - General Tab

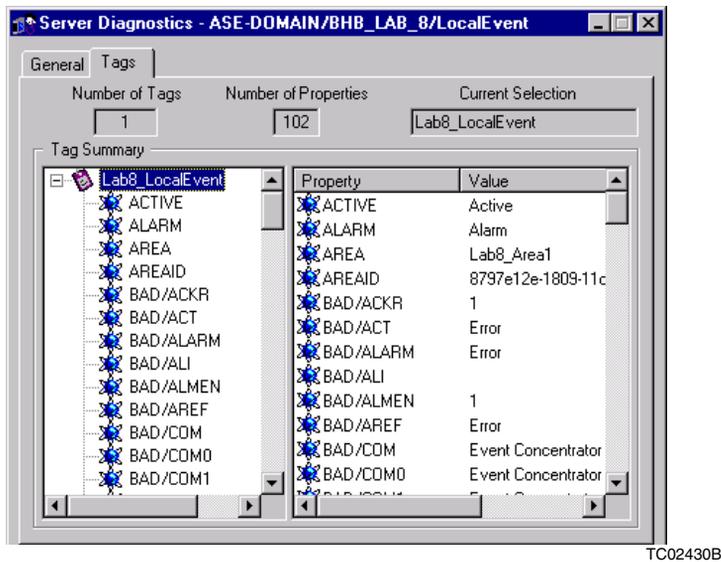


Figure 53. Server Diagnostics - Tags Tab

This tab updates automatically to reflect changes in the Server information.

Start/Stop Server

The Web Based Server Explorer gives the ability to start or stop a selected Server.

To start a specific Server if stopped:

1. Select a server from the list in the Web Based Server Explorer ([Figure 51](#)).
2. Right click on the selected Server, then select **Start Server** from the menu.

To stop a specific Server if running:

1. Select a server from the list in the Web Based Server Explorer ([Figure 51](#)).
2. Right click on the selected Server, then select **Stop Server** from the menu.

Servers can only be restarted when the prior instance of the Server task has stopped completely. This can be checked in the Windows Task Manager.

Section 11 Harmony Batch Support

Introduction

Harmony Batch processing with 800xA for Harmony uses the PHASEX function block. Although PHASEX is similar to the traditional batch sequence (BSEQ) function block used to run process control sequences, PHASEX incorporates some important features needed to achieve flexible batch process control. PHASEX differs from the BSEQ function block in its phase by phase interface with the batch management system and other enhancements.

Refer to the *System 800xA Batch Management, Operation (3BUA000145*) instruction* for the procedures to operate 800xA for Harmony for use with Batch Management.

Section 12 Replication Monitor

Introduction

The replication monitor allows the user to see the current state of replication as it is currently configured on the Configuration server and all Connectivity servers. The monitor indicates which subscriptions are up to date and allows replication to be manually started for any subscription that is out of date. To view the replication status, run the replication monitor from the start menu (**All Programs\ABB Industrial IT 800xA\800xA for OCS Systems\Harmony\Configuration\Replication Monitor**) on 800xA for Harmony Configuration and Connectivity servers.

Configuration Server

The replication status shows 1 of 9 possible states (refer to [Replication States](#)) the database is in, the next scheduled date and time for replication, the current sequence (version) number of the database, and whether online changes are enabled (true).

Connectivity Server

The replication status shows 1 of 3 possible states (refer to [Replication States](#)) and availability, the last date and time replication occurred, the current sequence (version) number, and a button that allows manual replication, but is disabled for one of the following scenarios:

- The Configuration server is unavailable or online changes are disabled.
- The Connectivity server is unavailable or the replication status is replicating or waiting.

- The sequence number of the subscription matches the sequence number of the configuration.

Replication States

Table 18 provides a description for the possible states a Configuration or Connectivity server can have:

Table 18. Replication States

Status	Description
Offline ¹	The machine or the DSS (Data Sync Server) cannot be contacted.
Online ¹	The DSS was contacted successfully, but the replication is currently idle.
Online (backup)	In addition, the Connectivity server was started from a previous backup.
Offline (failed)	The DSS was contacted but the last replication failed. Check the application event log or the system event page for more information.
Waiting	Replication is waiting for a lock in order to begin updating the subscription.
Initializing	The subscription is being initialized again.
Replicating ¹	Changes are being replicated.
Back up	The Connectivity server database is being backed up.
Restore	The Connectivity server database is being restored.

NOTE: 1. Only the Offline, Online, and Replicating states are valid for Connectivity servers.

Date Synchronization

The data synchronization function determines whether or not the databases are synchronized after each object update or not. When updating many objects in the

configuration it may be desirable to disable synchronization until all changes have been made to reduce system load. After all changes have been made, enable data synchronization so that all changes will be propagated to the rest of the system. If the user chooses to disable synchronization, the user will have the ability to choose how to run the updates when turning it back on (Figure 54).

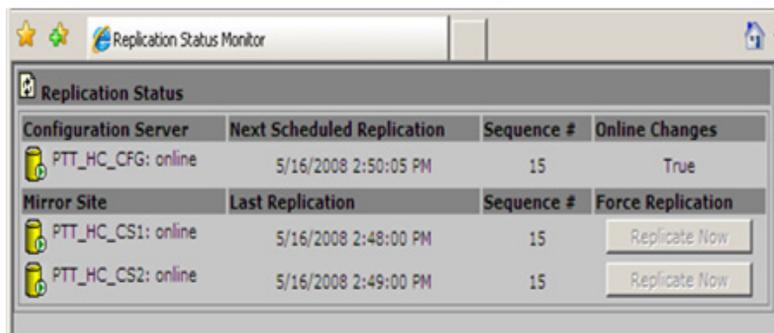


Figure 54. Date Synchronization - Replication Status

Replication Status

This indicates the status of the Configuration server and the Connectivity servers on a system. The following are the fields that describe the replication status.

- [Next Scheduled Replication](#).
- [Sequence # - Configuration Server](#).
- [Online Changes](#).
- [Last Replication](#).
- [Sequence # - Mirror Site](#).
- [Force Replication \(Manual Replication\)](#).

Next Scheduled Replication

This is the date and time for the next scheduled replication. The frequency of replication occurs every 5 minutes. If the configuration is constantly changing, replication can be postponed up to 30 minutes. This condition is indicated when the word postponed appears after the date and time.

Sequence # - Configuration Server

Each time a configuration change is made, the sequence number is incremented by one.

Online Changes

If `True` is displayed, online changes have occurred. Otherwise, no online changes have occurred.

Last Replication

This indicates the date and time the subscription was last updated on this Connectivity server.

Sequence # - Mirror Site

Indicates the current sequence number of the Connectivity server. If the sequence number matches the Configuration server, all changes to this record will have been replicated and all updates are available on the Connectivity server.

Force Replication (Manual Replication)

When enabled, the Connectivity server will be replicated to match the configuration database.

Appendix A Tags

Types

A tag contains all information required to find a point in the process control configuration (function block) and to establish communication between it and the Harmony system. Not all controller function blocks can be assigned a tag.

Each tag type available for Harmony can provide access to one or more FCs. [Table 19](#) lists and describes the Harmony tag types.

Table 19. Harmony Tag Types

Type	Support	Function Code ¹	Purpose
Harm Server	Used internally	N/A	Configures specific information related to the Harmony control system.
Analog Export	Used internally	N/A	Export of Analog value to communications interface.
Analog Read	Analog exception report	FC 30	Acquires an Analog exception reported value.
Analog Read	Analog Exception Report with High/Low Alarm Deadband	FC 48	Acquires an Analog exception reported value with alarm deadband.
ASCIIText ²	User defined data export	FC 194	Enables communication between Harmony and a C language or batch program running in a controller. Allows transfer of text strings.

Table 19. Harmony Tag Types (Continued)

Type	Support	Function Code ¹	Purpose
DAANG ²	Data Acquisition Analog	FC 177	Acquires an Analog exception reported value providing enhanced multiple level alarming as well as deviation and rate alarming. It also allows selecting the input source for the function block in a controller and writing a user inserted value to the block.
DADIG	Data Acquisition Digital	FC 211	Acquires a Digital exception reported state providing enhanced alarm management capabilities. It also allows selecting the input source for the function block in a controller and writing a user inserted value to the block.
DD	Device Driver	FC 123	Acquires an exception reported set or reset state for a device. It also allows initiating manual control.
Digital Export	Used internally	N/A	Export of Digital value to communications interface.
Digital Read	Digital exception report	FC 45	Acquires a Digital exception reported state.
Digital Read	Digital Exception Report with Alarm Deadband	FC 67	Acquires a Digital exception reported state with alarm deadband.
Enhanced Analog Input ²	Enhanced Analog exception report	FC 222	Acquires an Enhanced Analog input exception reported value.
Enhanced Analog Output ²	Enhanced Analog exception report	FC 223	Acquires an Enhanced Analog output exception reported value.
Enhanced Digital Input ²	Enhanced Digital exception report	FC 224	Acquires an Enhanced Digital input exception reported value.

Table 19. Harmony Tag Types (Continued)

Type	Support	Function Code ¹	Purpose
Enhanced Digital Output ²	Enhanced Digital exception report	FC 225	Acquires an Enhanced Digital input exception reported value.
ModStat Read	Module Status monitor	N/A	Monitors the status of a designated communications interface (node) or controller.
MSDD Read	Multi State Device Driver	FC 129	Acquires an exception reported status for a three state device. It also allows initiating manual control.
PhaseX Read	Phase execution	FC 218	Provides the execution environment for a Batch 90 program that is interfaced to the Production Management software (Batch Management or BDM).
RCM Read	Remote Control Memory	FC 62	Acquires an exception reported set or reset state of a device. It also allows initiating device control.
RMCB Read	Remote Motor Control block	FC 136	Acquires an exception reported start or stop state of a device. It also allows initiating device control.
RMSC Read	Remote Manual Set Constant	FC 68	Acquires an exception reported constant value and allows changing the value stored in the controller.
SOE Recorder	Multiple digital points of various types	Varies	Configured to define the field point configuration of the SOE device.
SOE Report Read	Sequence of Events Logs	FC 99, SEM blocks: 5000 and 5001	Configured for each SOE Report in Harmony. An SOE Report tag is a function block used for triggering SOE Reports.

Table 19. Harmony Tag Types (Continued)

Type	Support	Function Code ¹	Purpose
Station Read	M/A Station - basic M/A Station - cascade M/A Station - ratio Control Station	FC 21 FC 22 FC 23 FC 80	Monitors the exception reported variables from a control station. It also allows changing the control output, set point (SP), or ratio index.
Text Read	Text Selector	FC 151	Acquires an exception reported Text Selector message. The message, generated by the controller, contains a message number that corresponds to a text string defined in Harmony. It also contains a color and blink option.
System Definition	N/A	N/A	Refer to Section 9, System Definition for more information.

NOTES:

1. Refer to the *Function Code Application Manual (2VAA000844*)* for more information and for descriptions of FC specifications.
2. Not supported by Plant Loop.

Appendix B Tag Quality

Indicators

Tag quality is reported by the tag and is indicated with ASCII characters. The quality indicator appears in several functions such as event page, faceplate, reports. [Table 20](#) contains a list of the default quality indicators, their descriptions and overall field quality codes.

Table 20. Quality Indicators

Condition	Character	Quality	Quality Code
Bad quality	X	Bad, nonspecific, device failure, or sensor failure.	0, 12, 16
	.	Bad, configuration error.	4
	?	Bad, not connected.	8, 128
	/	Bad, last known value.	20
	@	Bad, communication failure.	24
	~	Bad, out of service.	28
Uncertain quality	<blank>	Uncertain, nonspecific.	
	/	Uncertain, last usable value, sensor not accurate, engineering units exceeded, or subnormal.	64, 68, 80, 84, 88
Good quality	<blank>	Good, nonspecific.	192
	&	Good, local override.	216

Table 20. Quality Indicators (Continued)

Condition	Character	Quality	Quality Code
Increasing/ decreasing	<blank>	Not increasing, not decreasing, not amended, not annotation.	—
	^	Value increasing.	—
	v	Value decreasing.	—
	+	Amended.	—
	#	Annotation.	—

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Revision History

Introduction

This section provides information on the revision history of this User Manual.



The revision index of this Configuration Manual is not related to the 800xA 5.1 System Revision.

Revision History

The following table lists the revision history of this User Manual.

Revision Index	Description	Date
-	First version published for 800xA 5.1	June 2010
A	Second version published for 800xA 5.1 Rev A	May 2011
B	Third version published for 800xA 5.1 Rev B	March 2012
C	Fourth version published for 800xA 5.1 Rev E	July 2015

Updates in Revision Index A

The following table shows the updates made in this User Manual for 800xA 5.1 Rev A.

Updated Section/Sub-section	Description of Update
Appendix A - Tags , <i>Table 19 (Harmony Tag Types)</i> .	Added information related to Analog Read type.
Appendix A - Tags , <i>Table 19 (Harmony Tag Types)</i> .	Added information related to Digital Read type.
Section 7 - SOE Reporting , <i>Supported Functions</i> subsection.	Changed the word 'semAPI' to 'hAPI'.

Updates in Revision Index C

The following table shows the updates made in this User Manual for 800xA 5.1 Rev E.

Updated Section/Sub-section	Description of Update
Section 2 - Faceplates	New Synchronization Icon added.

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