

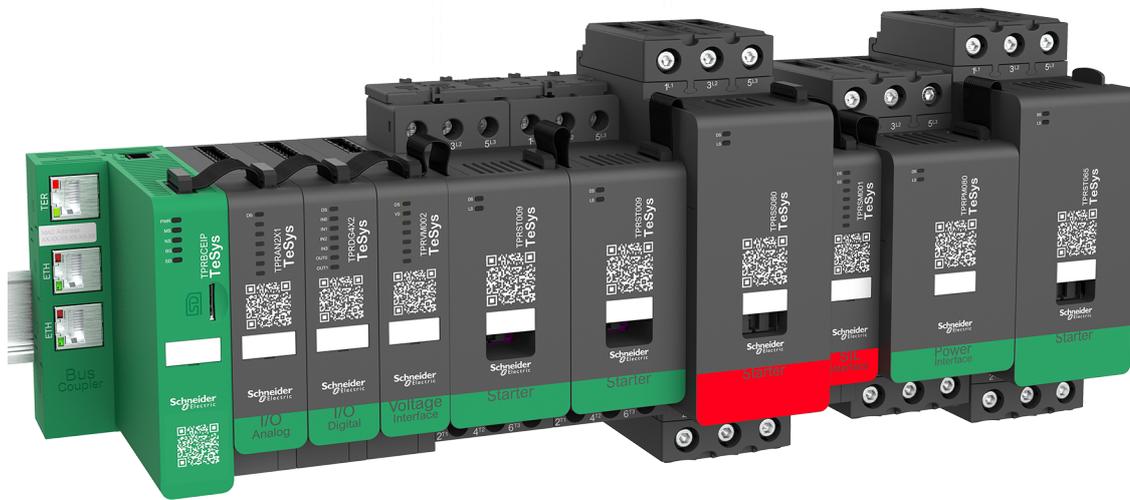
TeSys™ island

Quick Start Guide for EtherNet/IP™ Applications

Instruction Bulletin

This instruction bulletin describes how to quickly integrate TeSys island into the Rockwell Software® Studio 5000® environment.

8536IB1906EN
Release date 06/2019



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Table of Contents

About the Book.....	5
Scope.....	5
Validity Note.....	5
Related Documentation.....	6
Methodology.....	7
Obtain the L5X Files.....	7
Integration Procedure.....	8
Add an Ethernet Bridge.....	8
Import the TeSys™ island Module.....	9
Import the Subroutine.....	10
Import the Add-on Instructions.....	11
Create Instances of the AOIs.....	11
Calling Acyclic Data.....	13
Data Access Example.....	13
Accessing Data via AOI.....	13
Accessing Data via the Acyclic Buffer.....	15
Frequently Asked Questions (FAQs).....	16

Hazard Categories and Special Symbols

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

NOTE: Provides additional information to clarify or simplify a procedure.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

About the Book

Scope

This user guide provides instructions for configuring a TeSys™ island device within the Rockwell Software® Studio 5000® environment. For further information regarding the TeSys island devices, refer to *Related Documentation, page 6*.

Library Compatibility: L5X files exported from SoMove software are compatible with Studio 5000 major version 30 or higher. Refer to the Product Compatibility & Downloads page on the Rockwell Automation website to verify that the PLC firmware is compatible with the Studio 5000 version being used. As of the time of publication, this information can be found at <https://compatibility.rockwellautomation.com>.

Validity Note

This instruction bulletin is valid for all TeSys™ island configurations. The availability of some functions described in this bulletin depends on the communication protocol used and the physical modules installed on the island.

For product compliance with environmental directives such as RoHS, REACH, PEP, and EOL, go to www.se.com/green-premium.

For technical characteristics of the physical modules described in this bulletin, go to www.se.com.

The technical characteristics presented in this bulletin should be the same as those that appear online. We may revise content over time to improve clarity and accuracy. If you see a difference between the information contained in this bulletin and online information, use the online information.

Related Documentation

Table 1 - Related Documentation

Document Title	Description	Document Number
<i>TeSys™ island System Guide</i>	Introduces and describes the main functions of TeSys island	8536IB1901
<i>TeSys™ island Installation Guide</i>	Describes the mechanical installation, wiring, and commissioning of TeSys island	8536IB1902
<i>TeSys™ island Operating Guide</i>	Describes how to operate and maintain TeSys island	8536IB1903
<i>TeSys™ island Functional Safety Guide</i>	Describes the Functional Safety features of TeSys island	8536IB1904
<i>TeSys™ island Third Party Function Block Guide</i>	Contains the information needed to create function blocks for third party hardware	8536IB1905
<i>TeSys™ island EtherNet/IP™ Function Block Library Guide</i>	Describes the TeSys island library used in the Rockwell Software® Studio 5000® environment	8536IB1914
<i>TeSys™ island EtherNet/IP™ Quick Start Guide</i>	Describes how to quickly integrate TeSys island into the Rockwell Software Studio 5000 environment	8536IB1906
<i>TeSys™ island DTM Online Help Guide</i>	Describes how to install and use various functions of TeSys island configuration software and how to configure the parameters of TeSys island	8536IB1907
<i>TeSys™ island Product Environmental Profile</i>	Describes constituent materials, recyclability potential, and environmental impact information for the TeSys island.	ENV-PEP1904009
<i>TeSys™ island Product End of Life Instructions</i>	Contains end of life instructions for the TeSys island	ENVEO-LI1904009
<i>TeSys™ island Instruction Sheet, Bus Coupler</i>	Describes how to install the TeSys island bus coupler	MFR44097
<i>TeSys™ island Instruction Sheet, Starters and Power Interface Modules, Size 1 and 2</i>	Describes how to install size 1 and 2 TeSys island starters and power interface modules	MFR77070
<i>TeSys™ island Instruction Sheet, Starters and Power Interface Modules, Size 3</i>	Describes how to install size 3 TeSys island starters and power interface modules	MFR77085
<i>TeSys™ island Instruction Sheet: Input/Output Modules</i>	Describes how to install the TeSys island analog and digital I/O modules	MFR44099
<i>TeSys™ island Instruction Sheet: SIL Interface and Voltage Interface Modules</i>	Describes how to install the TeSys island voltage interface modules and SIL interface modules	MFR44100

Methodology

A TeSys™ island device can be integrated into the Rockwell Software® Studio 5000® environment using the L5X import feature. Based on the TeSys island configuration, SoMove™ software provides L5X files that can be imported into the Studio 5000 environment, exposing the device data via add-on instructions.

NOTE: Due to data referencing, the L5X files must be imported in the order listed below. Follow the instructions provided in this manual.

The following files are generated by SoMove software:

1. Generic Ethernet Module: This file contains a Generic Ethernet AOP representing the TeSys island configuration. It includes comments in the Controller Tag section indicating what each piece of data is referencing. It uses the following naming convention: *{DeviceName}_Module.L5X*.
2. Explicit Messages (if acyclic data exists): This file contains the following:
 - subroutines containing explicit messages for calling acyclic data
 - a data buffer used to hold the acyclic data before and after transmissionIt uses the following naming convention: *{DeviceName}_Acyclic.L5X*.

NOTE: If a TeSys island configuration does not have acyclic data, this file is not generated.

3. Add-on Instructions (AOI): This file contains the AOIs used for generating function blocks. It must be imported last because the AOIs' reference tags are contained in the other two files. It uses the following naming convention: *{DeviceName}_Aoi.L5X*.

NOTE: If you alter the naming convention for a TeSys island or for pre-existing avatars, then when you integrate configuration changes into a project, all the imported Studio 5000 software entities (tags, AOIs, and generic Ethernet module) must be deleted and the import process repeated for the new configuration. See *Frequently Asked Questions (FAQs)*, page 16.

Obtain the L5X Files

Configure the island in the TeSys™ island DTM according to the *TeSys™ island Operating Guide*, 8536IB1903. Then, export the L5X files from the TeSys island DTM according to the following procedure.

1. In the TeSys island DTM, open the TeSys island project you wish to export.
2. From the drop-down menu, click Device.
3. Select Export > EDS to L5X File Format.
4. Click Save.

The file is saved as a zip file in the following format: *island_name.zip*.

5. A notification appears, saying that the L5X files have been created. Click OK.

Integration Procedure

Prerequisites

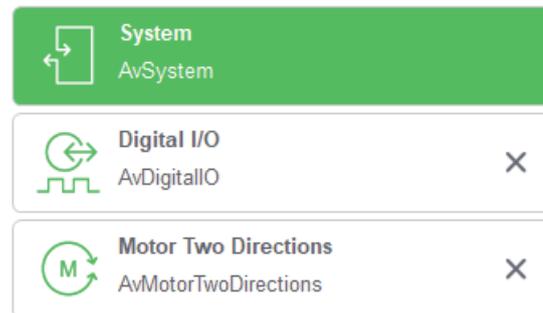
The integration procedure assumes that you have done the following:

- Set up a TeSys™ island device using SoMove™ software
- Obtained the L5X files needed for integration with the Rockwell Software® environment

Example Items

The TeSys island configuration used in this example includes the following items, as shown in the figure below.

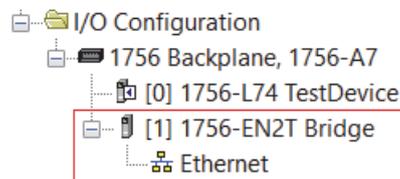
- Digital I/O module named *TeSysIslandDevice*
- Motor Two Directions avatar



Add an Ethernet Bridge

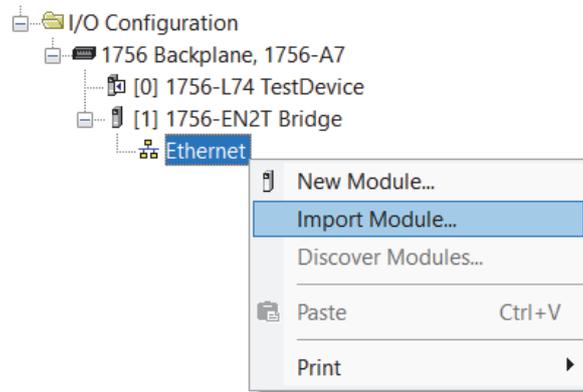
To add an Ethernet bridge:

1. Launch the Studio 5000® software.
2. Click Create > New Project.
A new project opens.
3. Select your PLC from the list of available PLCs.
4. Enter a Name for the PLC. Click Next.
5. Make any changes necessary for the PLC. Click Finish.
Your PLC module is added to the I/O Configuration tree.
6. Add an Ethernet bridge to its backplane.



Import the TeSys™ island Module

Import the TeSys island module to the Ethernet bridge. This file uses the following naming convention: *{DeviceName}_Module.L5X*.



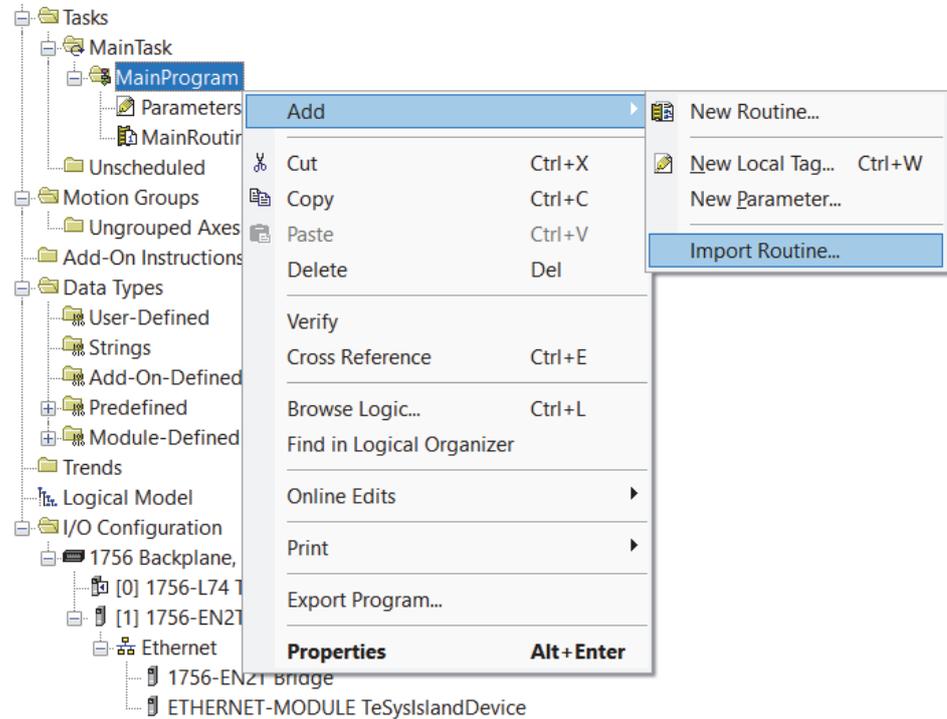
After import, the device shows up in the I/O configuration tree and the Controller Tags section of the project.

The screenshot shows the project tree on the left and a table of Controller Tags on the right. In the tree, 'Controller Tags' is highlighted under 'Controller TestDevice'. The table lists the imported TeSys island modules.

Name	Val	For	Style	Data Type	Description
- TeSysIslandDevice:I	{...}	{..}		AB.ETHE...	
- TeSysIslandDevice:...	{...}	{..}	Decimal	SINT[9]	
+ TeSysIslandDevi...	0		Decimal	SINT	AvSystem1:
+ TeSysIslandDevi...	0		Decimal	SINT	AvSystem1:
+ TeSysIslandDevi...	0		Decimal	SINT	AvDigitalIO:
+ TeSysIslandDevi...	0		Decimal	SINT	AvMotorTwoDirection:
+ TeSysIslandDevi...	0		Decimal	SINT	AvMotorTwoDirection:
+ TeSysIslandDevi...	0		Decimal	SINT	AvMotorTwoDirection: AvgIRMS
+ TeSysIslandDevi...	0		Decimal	SINT	AvMotorTwoDirection: AvgIRMS
+ TeSysIslandDevi...	0		Decimal	SINT	AvMotorTwoDirection: AvgIRMS
+ TeSysIslandDevi...	0		Decimal	SINT	AvMotorTwoDirection: AvgIRMS
+ TeSysIslandDevice:O	{...}	{..}		AB.ETHE...	
+ TeSysIslandDevice:C	{...}	{..}		AB.ETHE...	

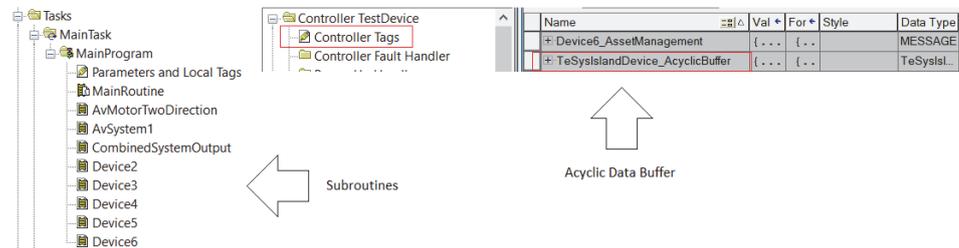
Import the Subroutine

Import the subroutine L5X file containing the acyclic data, if present. This file uses the following naming convention: $\{DeviceName\}_Acyclic.L5X$.



After import:

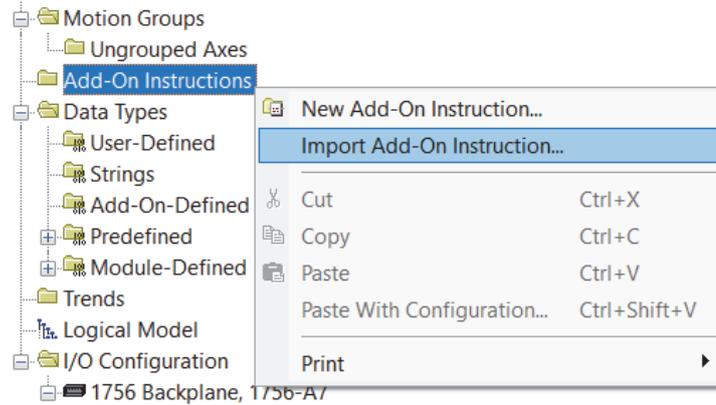
- the subroutines are visible in the Tasks tree
- the acyclic data buffer is visible in the Controller Tags section



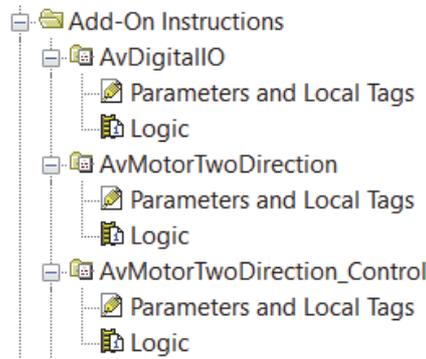
For more information on accessing the device data, see *Data Access Example*, page 13.

Import the Add-on Instructions

Import the add-on instructions (AOIs) as shown below. This file uses the following naming conventions: *{DeviceName}_Module.L5X*



After import, the AOIs are visible in the project tree.



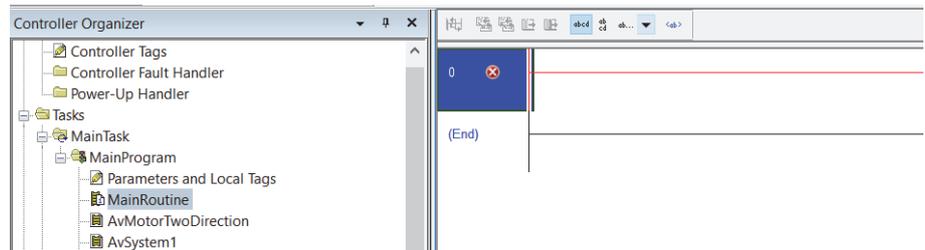
Each AOI contains either cyclic or acyclic data, which is indicated by the following naming convention:

- Cyclic data contains only the name of the avatar.
- Acyclic data contains the name of the avatar followed by an underscore (_) and the name of the acyclic data object.

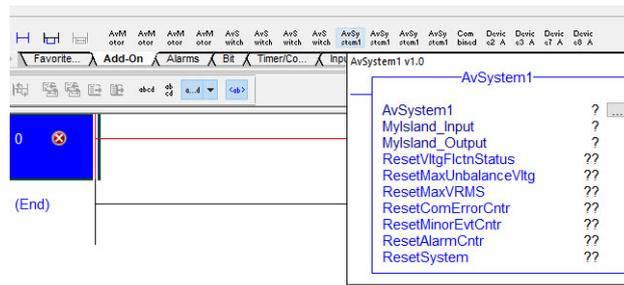
Create Instances of the AOIs

When creating an instance of an AOI, you must reference the module and the acyclic data buffer. Depending on the data present in the AOI (cyclic or acyclic), there are one or two tags to reference.

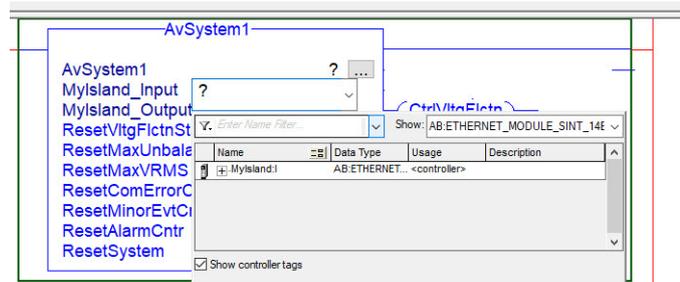
1. Enter the Main Routine by double-clicking it within the Tasks tree.



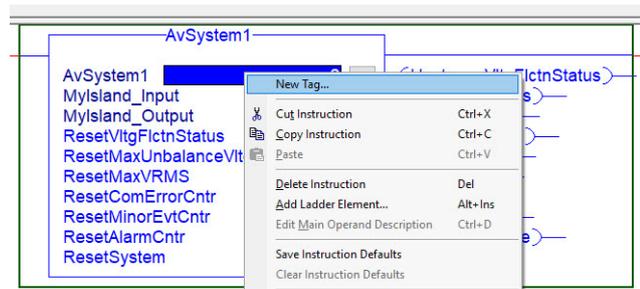
2. Add an AOI from the add-on list.



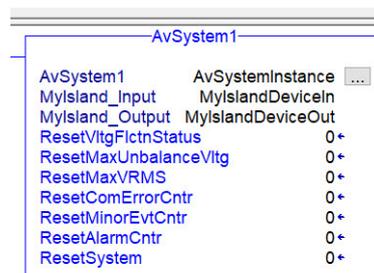
3. Fill in the reference tags for each In/Out parameter. These tags are in the Controller Tags list with names matching the In/Out Parameters.



4. Create an instance of the AOI and name it.

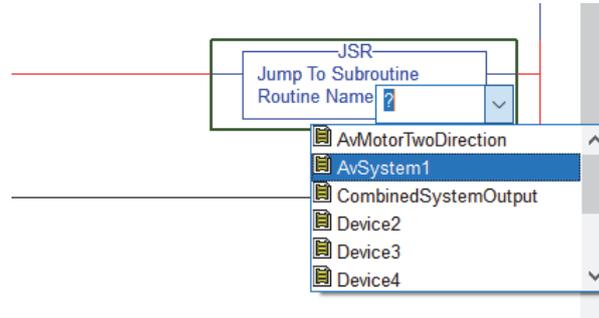


The AOI is now fully configured and ready for use.



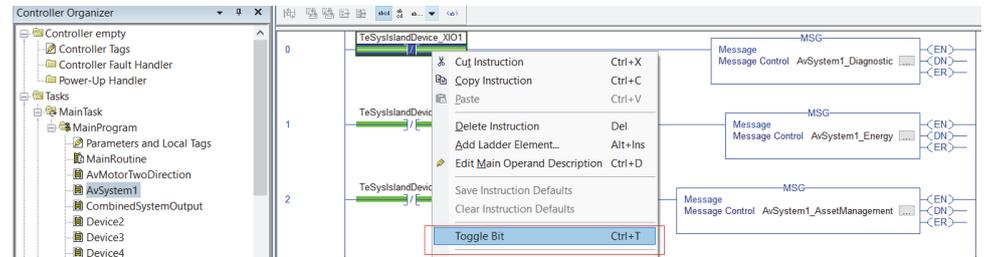
Calling Acyclic Data

When calling acyclic data, you must add a Jump To Subroutine operation to the Main Routine. The subroutine needed for the target AOI matches the associated Avatar.



This action pushes or pulls data, depending on the type of data the explicit message is accessing.

1. Open the subroutine.
2. Toggle the Examine If Open bit on the rung containing the message associated with the target AOI.



Data Access Example

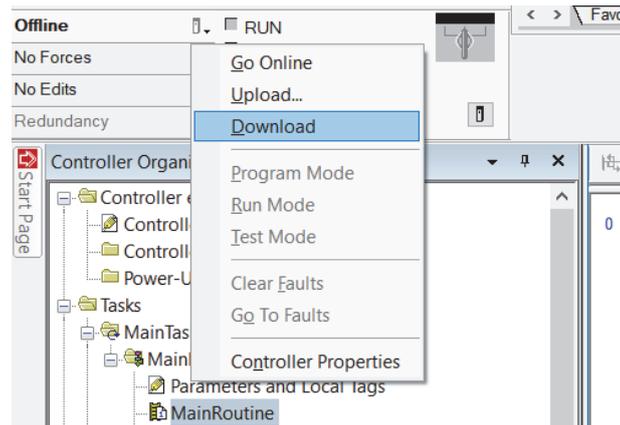
The following section provides an example of how to access data on the TeSys Island. These example AOIs:

- were added to the project using the same process described above
- are the for cyclic system data (AvSystem1), acyclic system diagnostic (AvSystem1_Diagnostic), and acyclic system asset management (AvSystem1_AssetManagement)

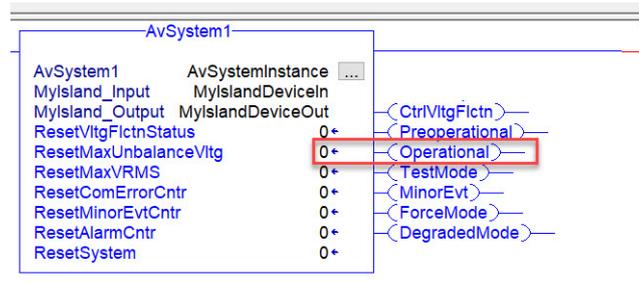
Accessing Data via AOI

After setting up the AOIs you plan to use:

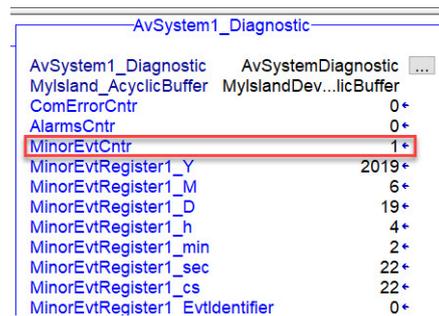
1. Download the program.
2. Set the PLC to Run mode.



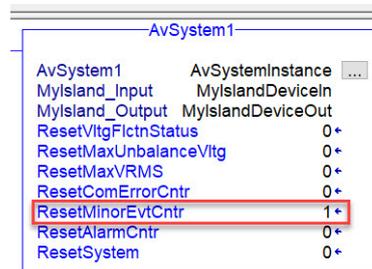
If the device is properly set up, and does not have any trips or other events, the cyclic system AOI should indicate that the system is operational.



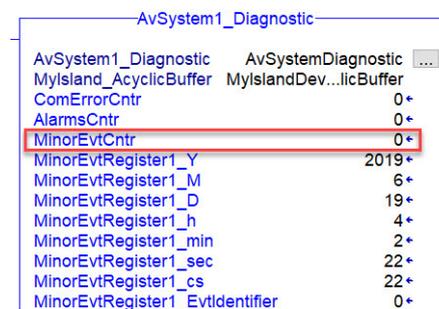
To view acyclic data, the appropriate explicit message must be accessed. See *Calling Acyclic Data*, page 13. As shown here, the device currently has one Minor Event logged via the System Minor Event Counter within the acyclic system diagnostic AOI.



This value can be reset by flipping the Minor Event Reset bit within the cyclic system AOI.



After a refresh of the acyclic system diagnostic data (see *Calling Acyclic Data*, page 13), the counter returns to 0.



Accessing Data via the Acyclic Buffer

AOIs are capable of exposing only SINT, INT, DINT, REAL, and BOOL data types as Input/Output parameters. Due to this constraint, STRING registers are placed within the acyclic data buffer and can be accessed there.

After you toggle the bit to access the acyclic system asset management data (see *Calling Acyclic Data*, page 13), the STRING data does not appear in the AOI. Instead, it appears within the acyclic data buffer. This buffer can be found in the Controller Tags list with naming convention *{DeviceName}_AcyclicBuffer*.

Name	Value	Force Mask	Style	Data Type
+ MyIsland.C	{...}	{...}		AB-ETHERNET...
+ MyIsland.I	{...}	{...}		AB-ETHERNET...
+ MyIsland.O	{...}	{...}		AB-ETHERNET...
- MyIsland_AcyclicBuffer	{...}	{...}		MyIsland_Acyclic...
- MyIsland_AcyclicBuffer.AvSystem1_VendorName	'Schneider Electric'	{...}		MyIsland_20
+ MyIsland_AcyclicBuffer.AvSystem1_VendorName.LEN	18		Decimal	DINT
+ MyIsland_AcyclicBuffer.AvSystem1_VendorName.DA...	{...}	{...}		SINT[20]
+ MyIsland_AcyclicBuffer.AvSystem1_ProductCode	'TPRBCIEP'	{...}		MyIsland_32
+ MyIsland_AcyclicBuffer.AvSystem1_AppRevision	'00.0300'	{...}		MyIsland_7
+ MyIsland_AcyclicBuffer.AvSystem1_VendorURL	'www.schneider-electric...	{...}		MyIsland_64
+ MyIsland_AcyclicBuffer.AvSystem1_ProductName	''	{...}		MyIsland_32

The remaining data is accessible within the AOI.

AvSystem1_AssetManagement	
AvSystem1_AssetManagem...	AvSystemAsset ...
MyIsland_AcyclicBuffer	MyIslandDev...licBuffer
MacAddress_XX	255 ←
MacAddress_YY	255 ←
MacAddress_ZZ	255 ←
MacAddress_UU	255 ←
MacAddress_VV	255 ←
MacAddress_WW	255 ←
TimeDeviceOn	0 ←
DeviceEvtCntr	0 ←

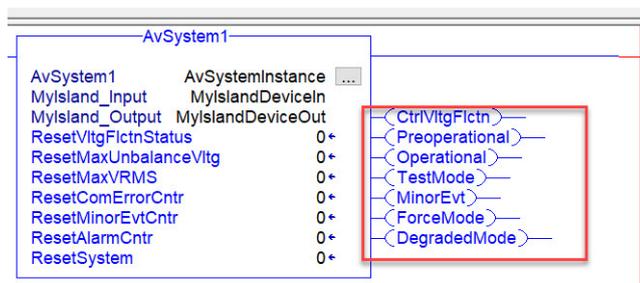
Frequently Asked Questions (FAQs)

Where can STRING data be accessed?

Due to AOI constraints, complex data types cannot be exposed as Input/Output parameters. Refer to *Accessing Data via the Acyclic Buffer*, page 15 for instructions on accessing STRING data.

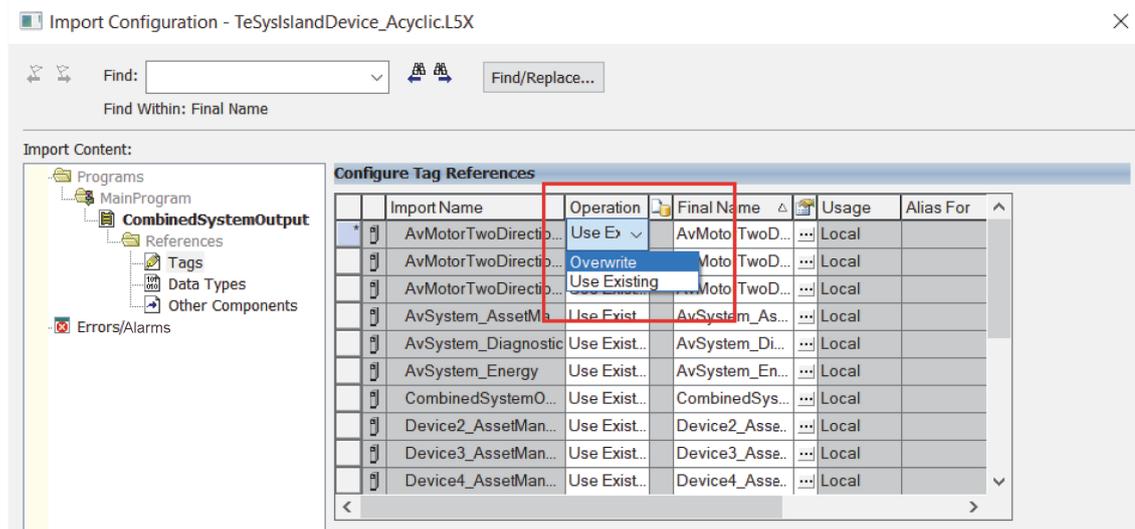
What are the lines attached to the right side of the AOI?

All the data exposed by an AOI exists within the main body, except for data exposed with Output parameters of type BOOL. This data exists on the right side of the AOI, as outlined with the red box in the screenshot below.



How are TeSys™ Island configuration changes integrated into a project?

- If the naming convention has been altered for a TeSys island or pre-existing Avatars, all the imported Studio 5000® software entities (tags, AOIs, and generic Ethernet module) must be deleted and the import process repeated for the new configuration.
- If the naming convention has not changed for pre-existing entities, the import process can be repeated without deleting previously imported entities. Change the import Operation from *Use Existing* to *Overwrite*, as shown in the image below.



Why do 32-bit unsigned integers have a maximum displayed value of 2,147,483,647?

Rockwell Software® Studio 5000 software only handles signed integers. For this reason, the maximum positive value that can be displayed for 32-bit unsigned integers is 2,147,483,647. To enforce this, logic exists within AOIs to max out UDINT registers if the sign bit is used. For these TeSys island registers, a flag exists as an exposed parameter to indicate overflow. These flags are of type BOOL with the naming convention *{TagName}_O*.

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