

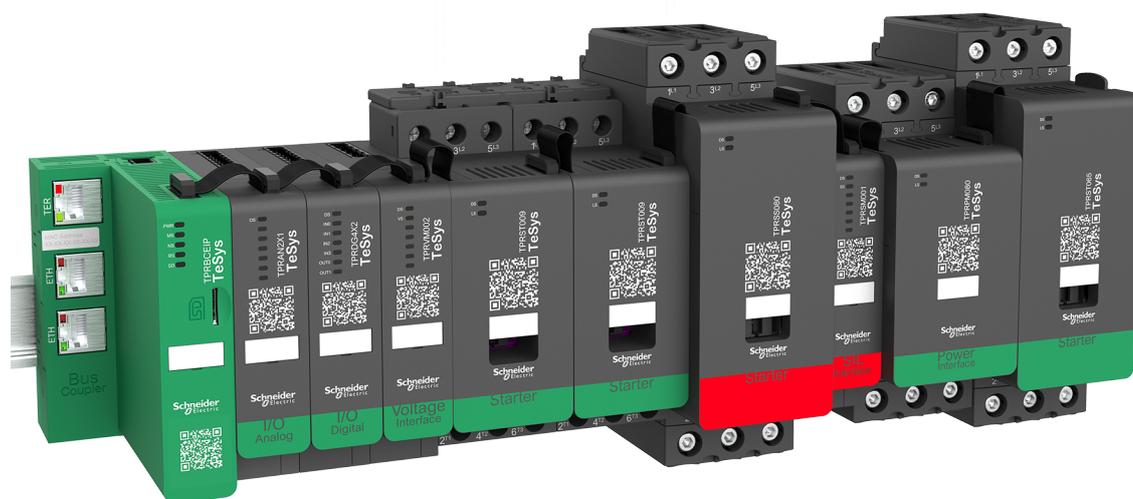
TeSys™ island

Operating Guide

Instruction Bulletin

This instruction bulletin introduces and describes the operation of TeSys island.

8536IB1903EN
Release date 06/2019



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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.

Chapter 1—Introduction

About This Manual

Document Scope

Use this document to operate, maintain, and troubleshoot the TeSys™ island.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Read and understand this document and all related documents before installing, operating, or maintaining the TeSys island. Installation, adjustment, repair, and maintenance must be performed by qualified personnel.

Failure to follow these instructions will result in death or serious injury.

Validity Note

This guide is valid for all TeSys™ island applications. The availability of some functions described in this guide 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.schneider-electric.com/green-premium.

For technical characteristics of the physical modules described in this guide, go to www.schneider-electric.com.

The technical characteristics presented in this guide 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 guide 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, Bus Coupler</i>	Describes constituent materials, recyclability potential, and environmental impact information for the TeSys island bus coupler	8536IB1908
<i>TeSys™ island Product Environmental Profile, Starters and Power Interface Modules</i>	Describes constituent materials, recyclability potential, and environmental impact information for the TeSys island starters and power interface modules	8536IB1909
<i>TeSys™ island Product Environmental Profile, Accessories</i>	Describes constituent materials, recyclability potential, and environmental impact information for the TeSys island accessories	8536IB1910
<i>TeSys™ island Product End of Life Instructions, Bus Coupler</i>	Contains end of life instructions for the TeSys island bus coupler	8536IB1911
<i>TeSys™ island Product End of Life Instructions, Starters and Power Interface Modules</i>	Contains end of life instructions for TeSys island starters and power interface modules	8536IB1912
<i>TeSys™ island Product End of Life Instructions, Accessories</i>	Contains end of life instructions for TeSys island accessories	8536IB1913
<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

Precautions

Read and understand the following precautions before performing any procedures in this guide.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside this equipment.
- Use only the specified voltage when operating this equipment and any associated products.
- Always use a properly rated voltage sensing device to confirm power is off.
- Use appropriate interlocks where personnel and/or equipment hazards exist.
- Power line circuits must be wired and protected in compliance with local and national regulatory requirements.
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices per NFPA 70E, NOM-029-STPS, or CSA Z462 or local equivalent.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- For complete instructions about functional safety, refer to the *TeSys™ island Functional Safety Guide*, 8536IB1904.
- Do not disassemble, repair, or modify this equipment. There are no user serviceable parts.
- Install and operate this equipment in an enclosure appropriately rated for its intended application environment.
- Each implementation of this equipment must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.



WARNING: This product can expose you to chemicals including Antimony oxide (Antimony trioxide), which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Qualified Personnel

Only appropriately trained persons who are familiar with and understand the content of this guide and all other related product documentation are authorized to work on and with this product.

The qualified person must be able to detect possible hazards that may arise from modifying parameter values and generally from mechanical, electrical, or electronic equipment. The qualified person must be familiar with the standards, provisions, and regulations for the prevention of industrial accidents, which they must observe when designing and implementing the system.

The use and application of the information contained in this guide requires expertise in the design and programming of automated control systems. Only you, the user, machine builder, or integrator, can be aware of all the conditions and factors present during installation, setup, operation, and maintenance of the

machine or process, and can therefore determine the automation and associated equipment and the related safeties and interlocks which can be effectively and properly used when selecting automation and control equipment, and any other related equipment or software, for a particular application. You must also consider applicable local, regional, or national standards and/or regulations.

Pay particular attention to conformance with any safety information, electrical requirements, and normative standards that apply to your machine or process in the use of this equipment.

Intended Use

The products described in this guide, together with software, accessories, and options, are starters for low-voltage electrical loads, intended for industrial use according to the instructions, directions, examples, and safety information contained in the present document and other supporting documentation.

The product may only be used in compliance with all applicable safety regulations and directives, the specified requirements, and the technical data.

Before using the product, you must perform a risk assessment of the planned application. Based on the results, appropriate safety-related measures must be implemented.

Since the product is used as a component of a machine or process, you must ensure the safety of persons by means of the overall system design.

Operate the product only with the specified cables and accessories. Use only genuine accessories and spare parts.

Any use other than the use explicitly permitted is prohibited and can result in unanticipated hazards.

TeSys™ island Overview

TeSys island delivers a connected and customized system for the direct control and management of low-voltage loads. The island optimizes availability of the physical modules with embedded pre-alarming management capabilities.

TeSys island targets performance and high-performance machines with automation architectures based on high-speed networks connecting devices to a PLC. Machinery operating at high production rates must avoid unplanned production downtime, which can be extremely costly. TeSys island helps reduce unplanned downtime with predictive maintenance so repairs can be completed during a scheduled maintenance window.

TeSys island is fully integrated into the PLC programming environment using digital objects. TeSys island is fully integrated into the EcoStruxure™ Machine portfolio that combines products and software packages into automation solutions for OEMs and machine builders. The system also supports integration into third-party PLCs.

Digital Tools Overview

For information on upgrading the firmware and changing island parameters, refer to the DTM online help or the *TeSys™ island DTM Online Help Guide*, 8536IB1907.

Operational Behavior

This section describes the following:

- The operational behavior of TeSys™ island
- The possible system states during the initial power up and operation of the island
- The basic operating features available during each state

System States

Below are the possible states for the island, including a brief description.

Off

The island is not energized.

Pre-operational

The island enters the pre-operational state during the boot process.

- The fieldbus and service ports on the bus coupler begin to activate.
- The Avatars selected for the island are not yet activated.
- All power modules (starters, SIL starters, and power interface modules) and I/O modules are in the Fallback state (de-energized), defined as follows:
 - Power modules are in the open state
 - Outputs from the I/O modules and power interface modules are off (set to zero)

Operational

Once the island has finished booting, it enters the operational state if the following conditions exist:

- No events are detected.
- The project file on the micro SD card loads successfully to the bus coupler.
- The hardware passes consistency checks.
- All settings in the .PSX project file are applied.

Once the island is in the operational state, the fieldbus and service ports are fully activated. All Avatars defined in the project file are activated and are processing the power modules and accessories in the island.

Test mode

You can enter test mode from the pre-operational and operational states.

Test mode gives you direct control of the power modules and the digital I/O module outputs, using the digital tools. These tools include SoMove™ software, running the TeSys™ island DTM, and the Operation and Maintenance Tool (OMT). During Test mode, the only Avatar activated is the System Avatar. Once you enter Test mode, you must manually exit Test mode to return the island to the operational state.

Minor Event

Minor events on the system include the following:

- No module in the island
- Too many physical modules detected in the island
- A mismatch between the installed modules and the modules defined in the context file
- A voltage fluctuation in the island's control power supply

If a module detects a recoverable minor event, the MS LED on the module flashes red.

When the island encounters a minor event, the fieldbus and service ports are activated. The only Avatar activated is the System Avatar. All power modules and I/O modules are in the device Fallback state and de-energized. To exit a minor event state that is not automatically recovered, you must reset the system or cycle control power. You can issue a system reset command manually from the digital tools and the PLC.

Major Event

When the island encounters a major event, the fieldbus and service ports are not activated. No Avatars are activated, including the System Avatar. All power modules and I/O modules are in the device Fallback state (de-energized). A cycle of the control power is required to exit a major event state.

If a module detects a non-recoverable major event, the MS LED on the module is illuminated and shows a steady red.

Degraded Mode

When fieldbus communication with the controller is lost, TeSys™ island remains in the operational state but enters Degraded mode. A communication loss is defined as follows:

- EtherNet/IP fieldbus: a communication loss is detected when an established exclusive owner connection times out.
- Modbus™/TCP fieldbus: a communication loss is detected after receiving no write requests to the cyclic I/O scanning data for the duration specified by the Communication Loss Timeout setting in the DTM.

NOTE: Loss of communication with the DTM or OMT does not trigger the transition to Degraded mode.

During Degraded mode:

- The Fieldbus ports remain active.
- The Service port remains active.
- The TeSys Avatars enter Fallback state. For the definition of Fallback state, see “System States” in the *TeSys island Operating Guide*, 85361B1903.

Recovering from Degraded Mode

You can enable the Degraded mode auto-reset option in the DTM. If *Enable Degraded Mode Auto-Reset* is set to Yes, then TeSys™ island exits Degraded mode when communication is restored. Refer to *Enabling Degraded Mode Auto-Reset*, page 14 for more information.

If the option *Enable Degraded Mode Auto-Reset* is set to No, then a System Restart command or a power cycle is required to exit Degraded mode.

Enabling Degraded Mode Auto-Reset

NOTE: The Auto-Reset function may lead to immediate energizing of the load, with an active command from the PLC or the Force mode function.

⚠ WARNING

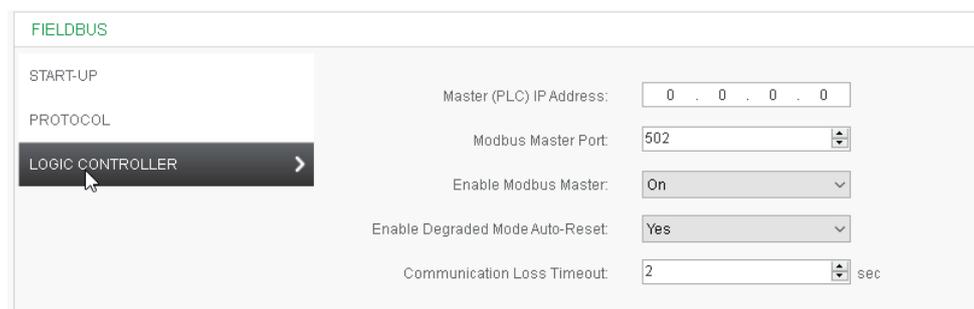
UNINTENDED EQUIPMENT OPERATION

Configure the Degraded Mode Auto-Reset in such a way that it does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

1. Under Fieldbus, select Logic Controller.
2. Set *Enable Degraded Mode Auto-Reset* to Yes.

Figure 1 - Enabling Degraded Mode Auto-Reset



Chapter 2—OMT Operations

This chapter describes the how to access and use the Operation and Maintenance Tool (OMT) to perform routine operation, maintenance, and troubleshooting tasks for TeSys™ island.

Connecting Your Tablet and Using the OMT

The section explains how to connect your tablet to the TeSys™ island bus coupler. To perform this procedure, the island must be on the network and able to communicate with the tablet using a wireless or wired connection.

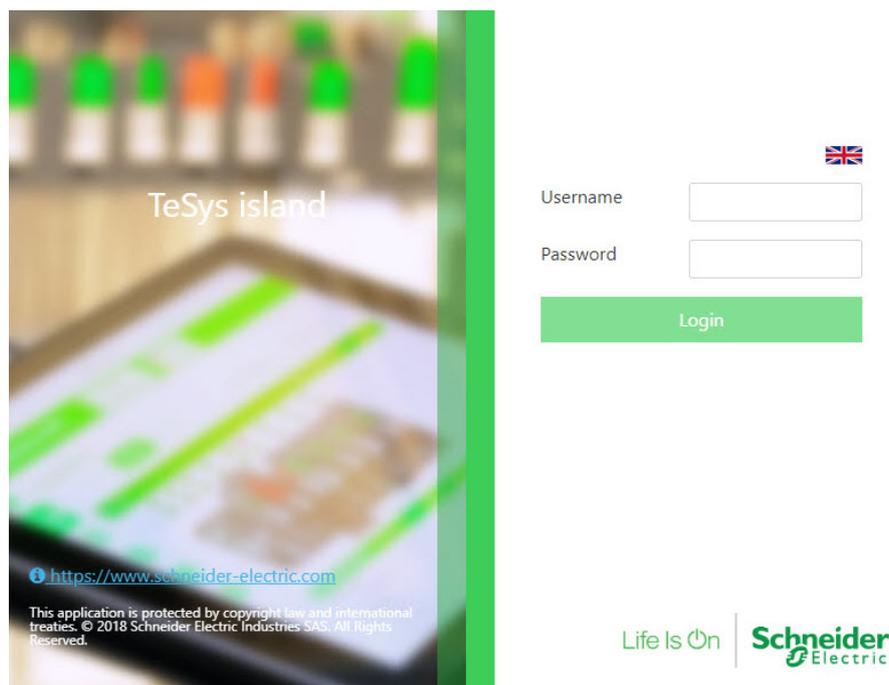
Once connection to the bus coupler is established, you can access the OMT.

1. Enter the address (format: *https://xxx.xxx.xxx.xxx*) of the bus coupler into the web browser on your tablet to access the OMT running on the bus coupler.

NOTE: The recommended browsers are Chrome or Safari.

2. If you are taken to the page, "Your Connection is not private":
 - a. Click the Advanced button.
 - b. Click the link "Proceed to xxx.xxx.xx.xx (unsafe)" to continue.
3. When connecting for the first time, enter *admin* as the username and *schneider18* as the password. Click Login.

Figure 2 - OMT Login Screen



4. You will be prompted to change your password.
 - a. Enter *schneider18* as the current password.
 - b. Enter your new password twice.
 - c. Click Submit.

NOTE: Passwords must contain a minimum of 10 characters, with at least one alphabetic and one numeric character.

Figure 3 - Change Password

Once you log in, the Control Panel is displayed in the OMT Home screen. If you do not have permission to access the Control Panel, Avatar View is displayed. The name of the connected island is displayed at the top of the status banner. Also displayed are the date and time, and the type of control that has been granted. See *Type of Control*, page 16.

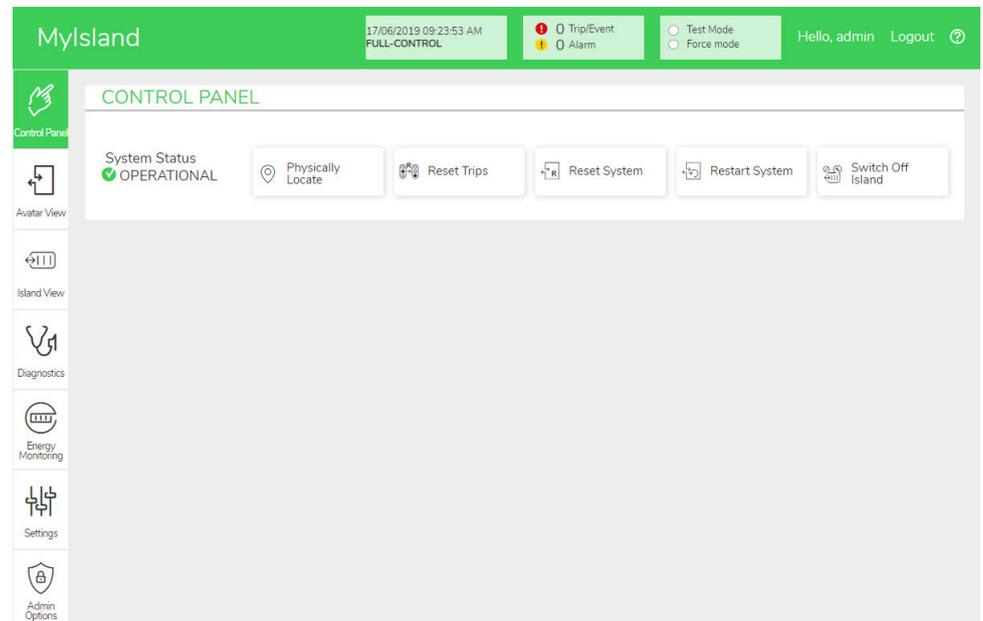
Table 2 - Type of Control

FULL-CONTROL	This type of access is granted to the first user that logs in to the island. This user has full control of the system.
READ-ONLY	This type of access is granted to any additional users that log in to the system while another user is connected with FULL-CONTROL access. These additional users are granted read-only access, since only one user can have full control at a time.

The following information is displayed on the OMT Home Screen:

- The number of critical and non-critical alarms
- An indicator flashes red when Test mode or Force mode is active.
- The Hello message, confirming that you are currently logged in to the system
- The option to log out of the OMT
- A question mark you can click to get help

Figure 4 - OMT Home Screen



The OMT home screen provides access to a variety of task-oriented panels. Select the desired panel by clicking the corresponding button on the left side of the screen:

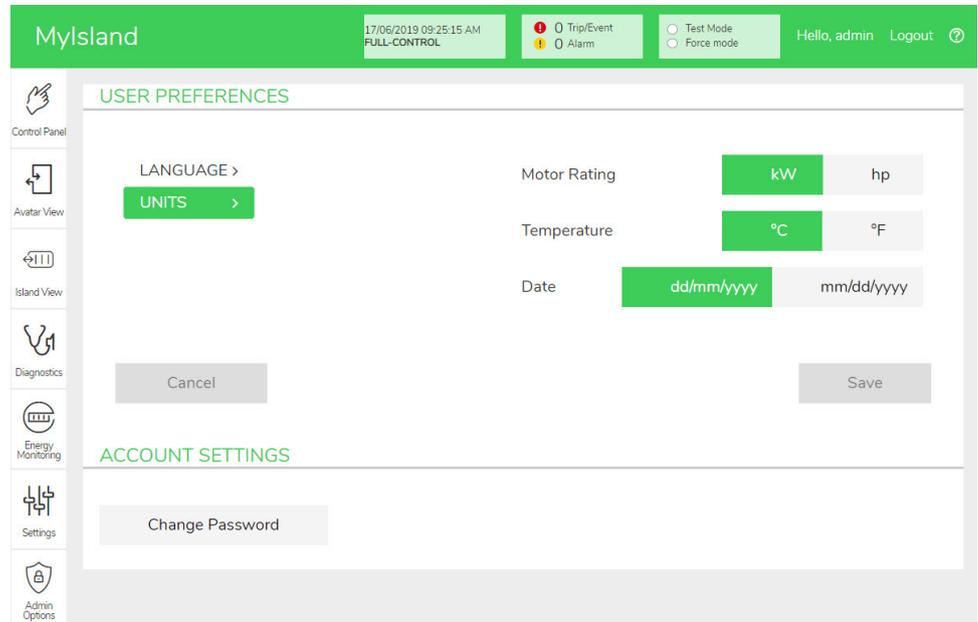
- Control Panel (*description, page 21*)
- Avatar View (*description, page 27*)
- Island View (*description, page 34*)
- Diagnostics (*description, page 40*)
- Energy Monitoring (*description, page 42*)
- Settings (*description, page 44*)
- Admin Options (*description, page 23*)

User Preferences

This section describes how to select display preferences for each user, such as language and units of measure.

Click the Hello user link in the banner at the top of the main OMT panel. The User Preferences and General Account Settings window opens.

Figure 5 - User Preferences



Language

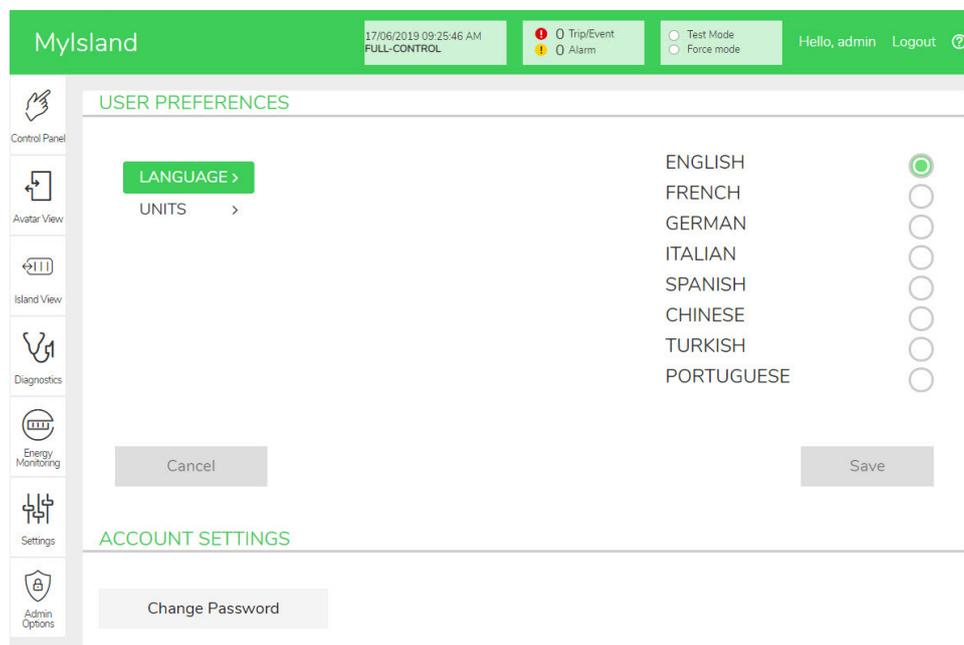
To change the display language in the OMT:

1. In the User Preferences window, Click Language.
2. Select the desired language.
3. Click Save.

The following languages are supported:

- English
- French
- German
- Italian
- Spanish
- Chinese
- Turkish
- Portuguese

Figure 6 - Setting Language



Units

To change the units of measurement displayed in the OMT:

1. Click Units.
2. Change the settings as desired. See *OMT Settings for Units of Measurement*, page 19.
3. Click Save.

Table 3 - OMT Settings for Units of Measurement

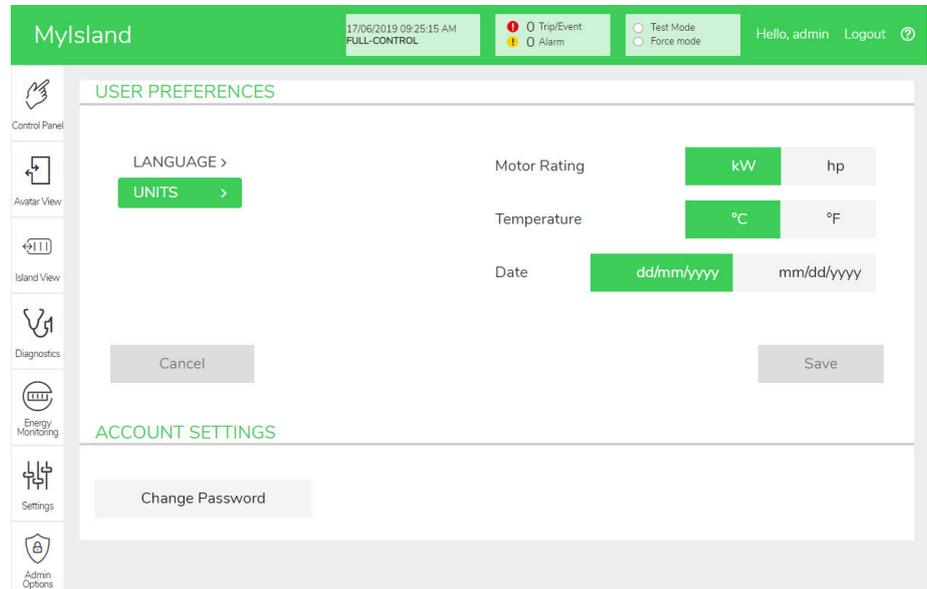
Unit	Options	Impacts
Motor Power	kW, hp	<ul style="list-style-type: none"> • Instantaneous Total Active Power • Maximum Total Active Power
Temperature	°C, °F	<ul style="list-style-type: none"> • Motor Overheat chart - Trip Status • Motor Overheat options - Thermal Protection settings
Date	dd/mm/yyyy, mm/dd/yyyy	<ul style="list-style-type: none"> • Banner time display • Log displays • Trip registers • Timestamp values for energy, power and voltage monitoring

Change Password

To change your OMT password once logged into the OMT:

1. Click the *Hello* link (user link) at the top of the main OMT panel. The User Preferences and General Account Settings window opens.

Figure 7 - User Preferences



2. In the General Account Settings section, click Change Password.
3. Enter the current password.
4. Enter the new password twice.
5. Click Submit.

NOTE: Passwords must contain a minimum of 10 characters, with at least one alphabetic and one numeric character.

Figure 8 - Change Password

Change Password
✕

Current Password

New Password

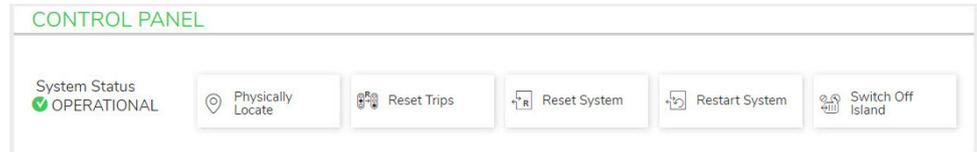
Confirm Password

Control Panel

This section describes the Control Panel functions in detail:

- When to use them
- How to use them
- The expected result after issuing a command

Figure 9 - Control Panel



Physically Locate

Before starting any activities using the OMT, verify that you are connected to the correct island.

1. Click the Control Panel icon.
2. Click Physically Locate.

The bus coupler's PWR LED illuminates a steady yellow for 5 s to help you identify which device the OMT is communicating with.

Reset Trips

If a protection trip occurs on your Avatar, you can use this command to reset all trips on the island.

1. Click the Control Panel icon.
2. Click Reset Trips.

All trips on the island are now reset.

Reset System

After a minor event occurs, you can use this command to reset the system.

1. Click the Control Panel icon.
2. Click Reset System.

The island is now reset.

Restart System

If you need to restart the island, issue the Restart System command.

1. Click the Control Panel icon.
2. Click Restart System.

The island now restarts.



Switch Off Island

Issue the Switch Off Island command to turn off all loads on the island, so the system can be used for maintenance purposes.

1. Click the Control Panel icon.
2. Click Switch Off Island.

The island is placed into a minor event state. The red MS LED illuminates on the bus coupler. All outputs on the island are opened. The connection to the PLC remains in place. The OMT connection also remains active.

Admin Options Panel

This section describes how the administrator can perform the following:

- add, modify, and delete other OMT users
- change the permissions assigned to each user group (see *Groups, page 24*)

Click the arrow to expand the User Management section.

Figure 10 - User Management

The screenshot displays the MyIsland Admin Options Panel. The top navigation bar is green and contains the following elements from left to right: the text 'MyIsland', a status box showing '17/06/2019 09:57:28 AM FULL-CONTROL', a box with 'Trip/Event' (red dot) and 'Alarm' (yellow dot), a box with 'Test Mode' and 'Force mode' (radio buttons), and the user information 'Hello, admin Logout' with a help icon.

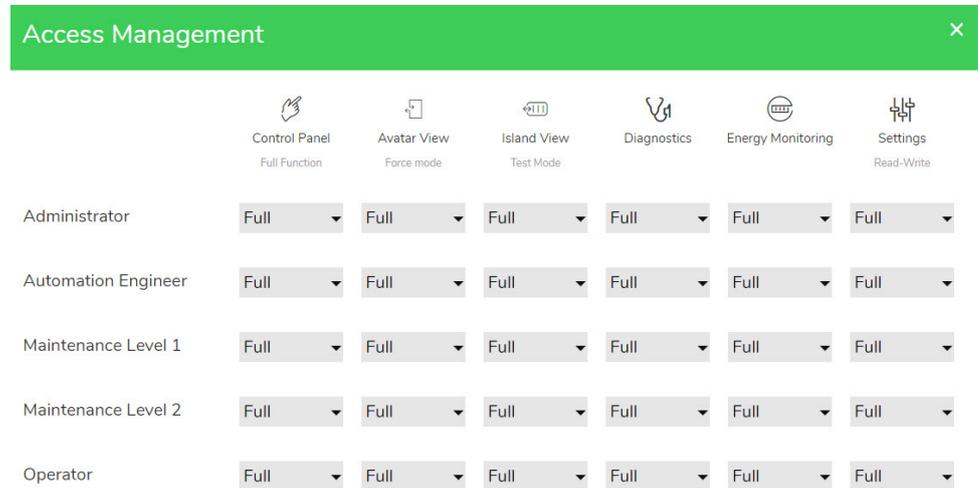
The main content area is divided into sections by a vertical sidebar on the left. The 'User Management' section is expanded, showing a table with the following columns: COMPLETE NAME, USER NAME, PASSWORD, GROUP, and LEARN MORE. The table contains one row for the user 'admin' with the group 'Administrator'. A green plus sign icon is visible to the right of the table. Below the table are sections for 'System Logs' and 'System Settings', both with expandable arrows. The sidebar on the left contains icons for 'Control Panel', 'Avatar View', 'Island View', 'Diagnostics', 'Energy Monitoring', 'Settings', and 'Admin Options' (highlighted in green).

COMPLETE NAME	USER NAME	PASSWORD	GROUP	LEARN MORE
	admin	•••••	Administrator	Learn more

Groups

Each user is assigned to a group that defines the user's privileges for read and write access. Click Learn More in the User Management section to open the Access Management window. This window displays the available groups, and allows the administrator to select which panels and functions the group can access. See the figure below.

Figure 11 - Access Management



From the drop-down menus for each type of user, select which rights to assign for that panel. The options are:

- None
- Limited
- Full

You can select the options for the different types of user:

- Administrator
- Automation Engineer
- Maintenance Level 1
- Maintenance Level 2
- Operator

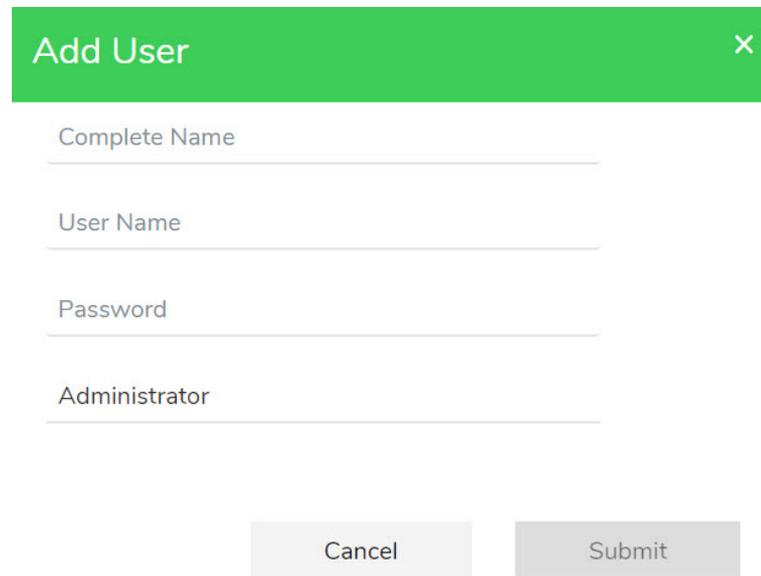
When all selections are complete, click the X in the top left of the Access Management window to close it.

Adding a New User

The administrator can add a new user to the OMT.

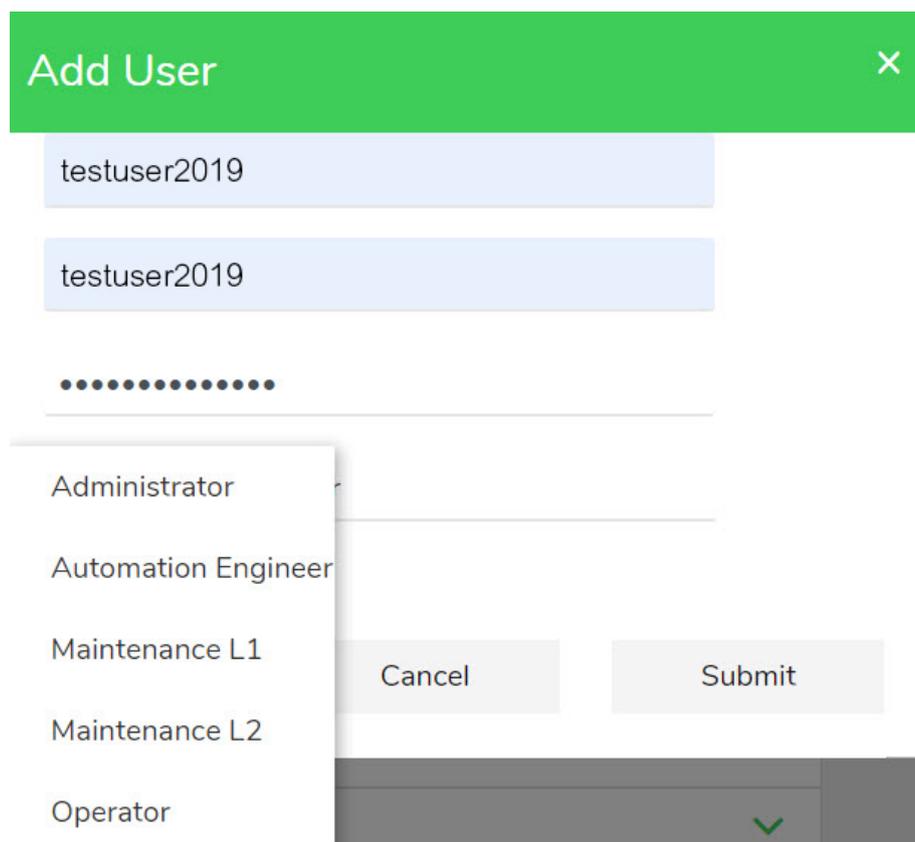
1. Click the green plus sign in the user Management section. The Add User window appears.

Figure 12 - Add User



The screenshot shows a modal dialog box titled "Add User" with a green header bar. Inside the dialog, there are four text input fields stacked vertically, labeled "Complete Name", "User Name", "Password", and "Administrator". At the bottom of the dialog, there are two buttons: "Cancel" and "Submit".

2. Enter the following information for the new user:
 - Complete Name
 - User Name
 - Password
3. Select the group to be assigned to the new user from the drop-down menu.
 - Administrator
 - Automation Engineer
 - Maintenance Level 1
 - Maintenance Level 2
 - Operator

Figure 13 - Add User Drop-down Menu

The screenshot shows a dialog box titled "Add User" with a green header and a close button (X) in the top right corner. Below the header, there are two text input fields, both containing the text "testuser2019". A horizontal line with a series of dots below it indicates a scrollable list. A drop-down menu is open, showing the following options: Administrator, Automation Engineer, Maintenance L1, Maintenance L2, and Operator. To the right of the drop-down menu, there are two buttons: "Cancel" and "Submit". At the bottom right of the dialog box, there is a green checkmark icon.

4. Click Submit.

Changing a User's Information

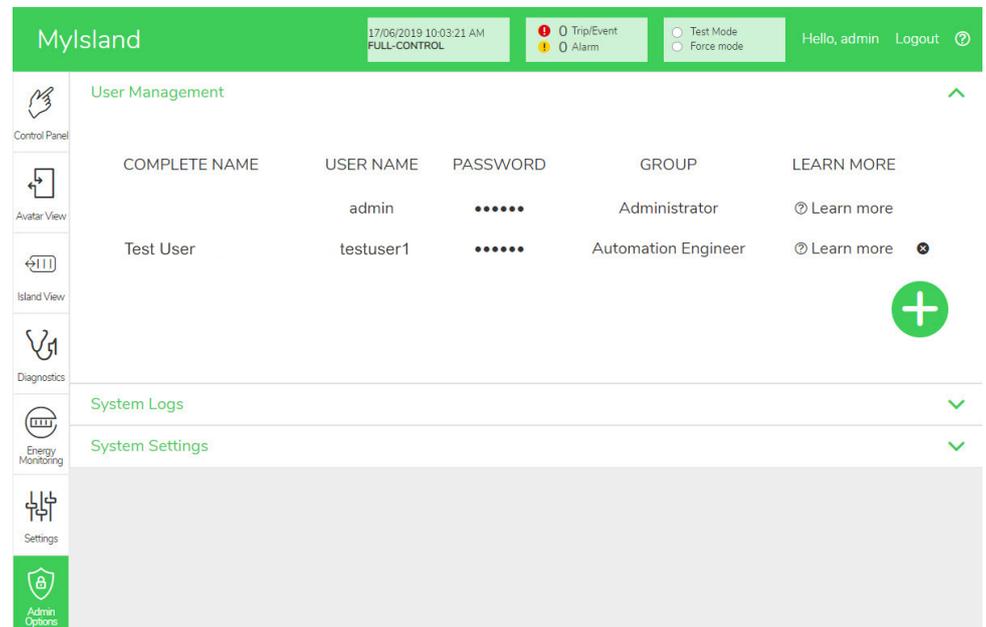
The administrator can change the following credentials for each user:

- Complete Name
 - User Name
 - Password
 - Group
1. Locate the user in the User Management window.
 2. Click the user's information to make the necessary changes.

Deleting a User

To delete a user, navigate to the User Management section in the Admin Options panel. Click the black **X** to the far right of the user you wish to delete.

Figure 14 - Deleting a User



Avatar View Panel

In the Avatar View panel, you can do the following:

- Display status and counter information about a selected TeSys™ Avatar
- Reset Minor Events, as well as trip and alarm counters, for the Avatar

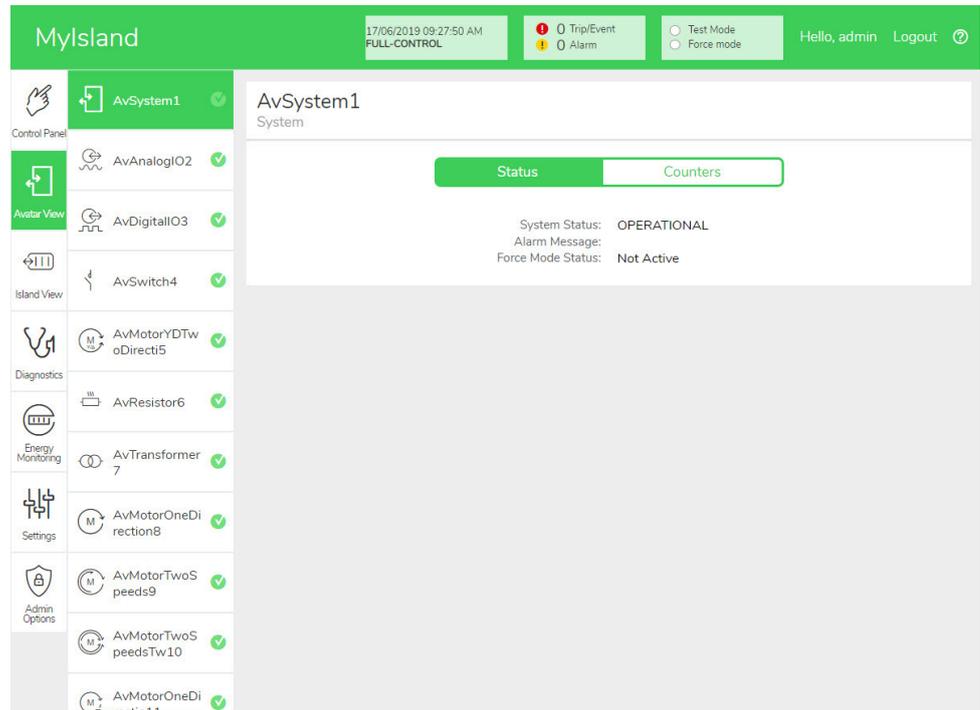
This panel includes an I/O view and a Counters view.

1. Click the Avatar View panel to display a list of Avatars configured on the island.
2. Perform Avatar maintenance tasks as necessary.

System Avatar

Click the System Avatar to check the System Status.

Figure 15 - System Avatar



Status

To access the status information for the system, click the Status tab in the System Avatar window. The following information is displayed in Status view:

- System status
- Alarm message
- Force mode status

Counters and Minor Event Reset

To access the trip and alarm counters for the system, or to reset Minor Events, click the Counters tab in the System Avatar window. The following information is displayed in Counters view:

- System Minor Events
- Fieldbus Comm. Events Counter
- System Alarms Counter
- Minor Events Record

To reset the System Minor Events, Fieldbus Comm. Events Counter, or the System Alarms Counter, click the Reset button.

Figure 16 - Reset Window

The screenshot shows the MyIsland OMT interface. At the top, there is a green header with the MyIsland logo, a date and time stamp (17/06/2019 09:28:19 AM), a control level indicator (FULL-CONTROL), and status indicators for Trip/Event (0) and Alarm (0). There are also buttons for Test Mode and Force mode, and a user profile (Hello, admin) with a Logout button.

The main content area is divided into a left sidebar and a main panel. The sidebar contains various system components like AvSystem1, AvAnalogIO2, AvDigitalIO3, AvSwitch4, AvMotorYDTwoDirect5, AvResistor6, AvTransformer7, AvMotorOneDirection8, AvMotorTwoSpeeds9, AvMotorTwoSpeedsTw10, and AvMotorOneDirection11. The main panel shows the 'AvSystem1 System' view with two tabs: 'Status' and 'Counters'. The 'Counters' tab is active and displays a table with three rows:

Counter Name	Value	Action
System Minor Events	0	Reset
Fieldbus Comm Errors Counter	0	Reset
System Alarms Counter	0	Reset

Below the counters table is a 'Minor Events' section with a table header:

Event	Date

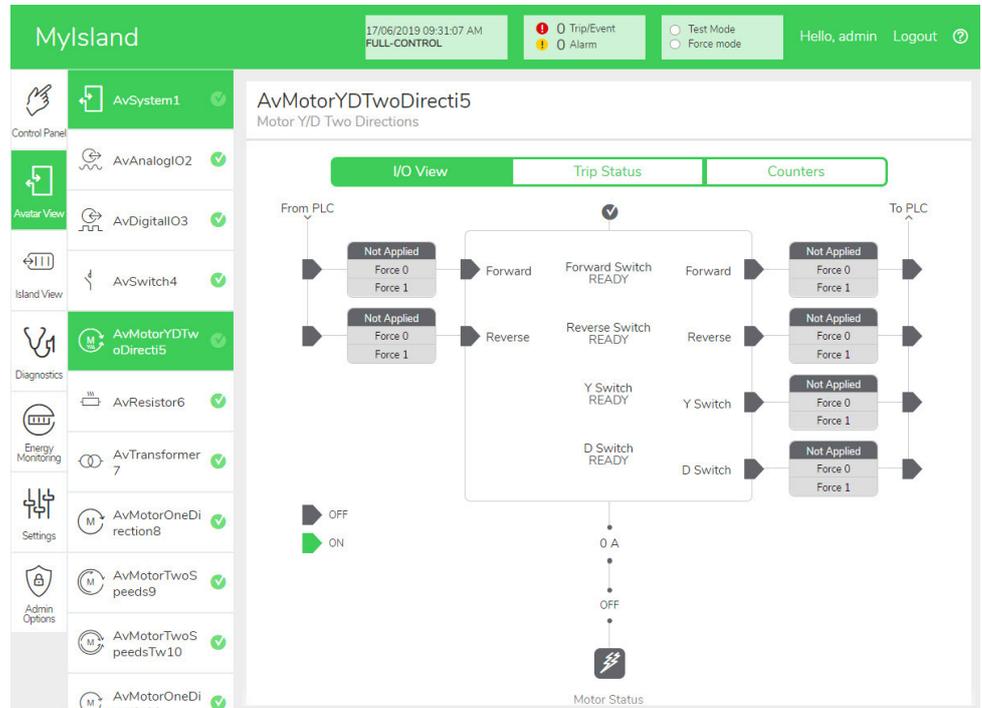
Avatars

I/O View

Click the TeSys™ Avatar you want to access. A new window opens, displaying the I/O view for the selected Avatar.

NOTE: The information displayed for the Avatar in the I/O View is based on the specific avatar.

Figure 17 - Avatar I/O View



Force Mode

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Before using Force mode, ensure that forcing parameters or energizing loads will not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: Once Force mode is activated, commands from the digital tools take priority over commands from the PLC until you exit Force mode.

Once the island is in the operational state, Force mode can be activated and deactivated using the OMT or TeSys island DTM.

Using Force Mode to Simulate Commands from the PLC

Force mode allows you to test the logic of any TeSys™ Avatar by simulating receipt of commands from the PLC.

Table 4 - Simulating a PLC Command with Force Mode

Step	Action
1	Access Force mode: <ul style="list-style-type: none"> • To access Force mode using the OMT, navigate to the Avatar View panel and select an Avatar. Click I/O View. The logic diagram for the selected Avatar is displayed. • To access Force mode using the TeSys™ island DTM, click the Diagnostics tab and select an Avatar from Avatars. Click Status. The logic diagram for the Avatar is displayed.
2	To simulate receipt of a PLC command: <ul style="list-style-type: none"> • To simulate an Open command from the PLC, click Force 0. • To simulate a Close command from the PLC, click Force 1.
3	When finished, exit Force mode. See <i>Exiting Force Mode, page 32</i> .

Using Force Mode to Simulate Status Updates to the PLC

Force mode also allows you to simulate transmission of Avatar status updates from the island to the PLC.

Table 5 - Simulating Avatar Status Updates from the Island to the PLC

Step	Action
1	Access Force mode from the OMT or TeSys island DTM as described in <i>Simulating a PLC Command with Force Mode, page 31</i> .
2	To simulate Avatar status: <ul style="list-style-type: none"> • Click Force 0 to simulate transmission of contactor Closed status to the PLC. • Click Force 1 to simulate transmission of contactor Open status to the PLC.
3	When finished, exit Force mode. See <i>Exiting Force Mode, page 32</i> .

Using Force Mode to Simulate Status Changes of the Digital I/O Module Inputs and Outputs

Force mode also allows you to simulate status changes of the digital I/O module inputs and outputs. When force mode has not been applied, the status box is gray and shows Not Applied.

Table 6 - Status Box

Force Command	Input From PLC	Status To PLC
Force 0	Off	Off
Force 1	On	On

Table 7 - Simulating Status Changes of the Digital I/O Module Inputs and Outputs

Step	Action
1	Access Force mode from the OMT or TeSys island DTM as described in <i>Simulating a PLC Command with Force Mode</i> , page 31.
2	To simulate I/O status, under From PLC : <ul style="list-style-type: none"> Click Force 0 to turn Off the digital output. Click Force 1 to Close the digital output status.
	Under To PLC : <ul style="list-style-type: none"> Click Force 0 to Close the digital input status. Click Force 1 to Open the digital input status.

Exiting Force Mode

To exit Force mode, perform the steps in the following table:

Table 8 - Exiting Force Mode

Step	Action
1	To exit Force mode using the TeSys island DTM, in the Diagnostics tab, click Exit next to Force Mode , and then confirm you wish to exit.
2	To exit Force mode from the OMT:
	Click the Diagnostics panel. Click the Exit force mode button. A hazard message pop-up window appears. Click Yes to confirm that you want to exit Force mode. The status banner at the top indicates that the system is no longer in Force mode.

Counters

To access the trip and alarm counters for the TeSys™ Avatar, click the Counters tab in the Avatar window.

Figure 18 - Avatar Counters View

The screenshot shows the MyIsland web interface for the Avatar Counters view. The top bar displays the date and time (17/06/2019 09:32:29 AM), the user's role (FULL-CONTROL), and system status (Trip/Event, Alarm, Test Mode, Force mode). The sidebar on the left lists various system components, with AvMotorYDTwoDirecti5 selected. The main content area has three tabs: I/O View, Trip Status, and Counters. The Counters tab is active, showing two tables: Trip Counters and Alarm Counters. Both tables list various fault types with a count of 0. Below these tables is a Reset button. At the bottom, there is a Trip Record Register table with columns for Type and Date.

Trip Counters		Alarm Counters	
Thermal Overload	0	Thermal Overload	0
Jam	0	Jam	0
Undercurrent	0	Undercurrent	0
Long Start	0	Overcurrent	0
Overcurrent	0	Current Phase Unbalance	0
Stall	0	Ground Current	0
Current Phase Unbalance	0	Motor Overheat	0
Phase Configuration	0	All Alarms Counter	0
Ground Current	0		
Current Phase Reversal	0		
Current Phase Loss	0		
Motor Overheat	0		
All Trips Counter	0		

Auto-Reset Retry Counters	
Thermal Protection Group	0
Electrical Protection Group	0
Load Protection Group	0

Trip Record Register	
Type	Date

The following information is displayed for the Avatar in the Counters view:

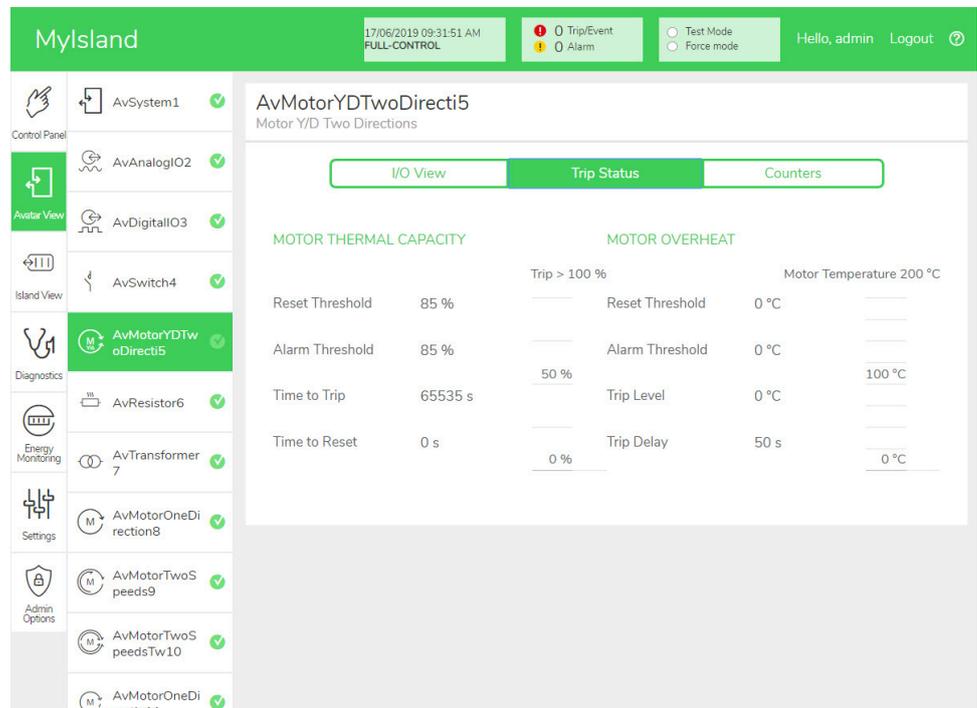
- Trip Counters
- Alarm Counters
- Auto Reset Counters
- Trip Record Register (last five trips)

To set the Trip or Alarm counters back to zero, click the Reset button.

Trip Status

To access the trip status for the TeSys™ Avatar, click the Trip Status tab in the Avatar window.

Figure 19 - Trip Status



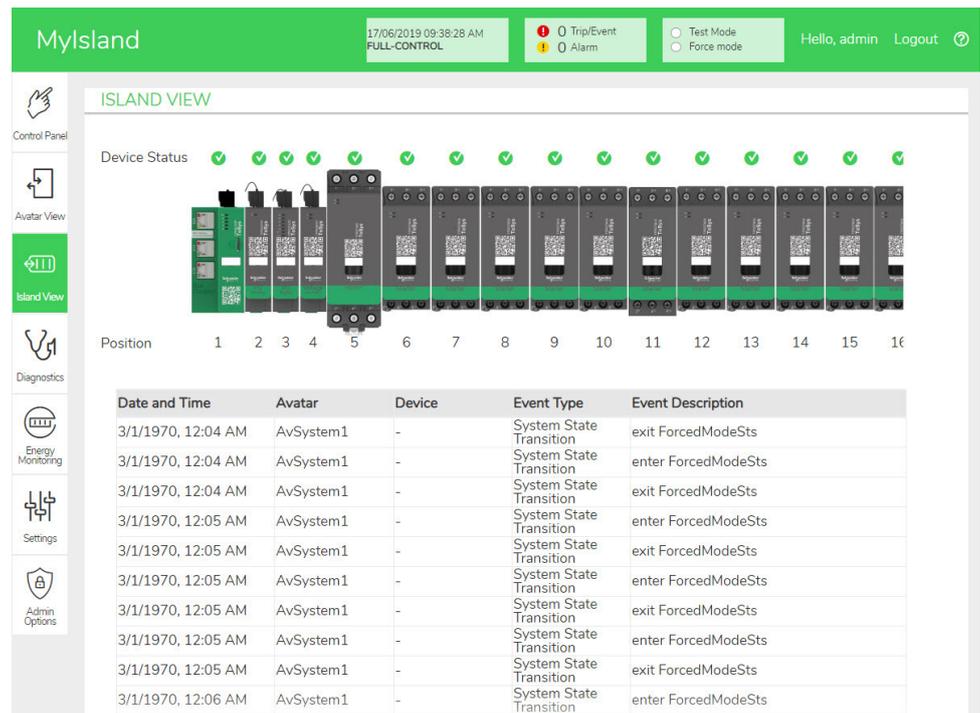
Island View Panel

The Island View panel displays status information for each device on the island.

- By clicking on a graphical representation of the device, you can obtain status information, including asset data and product identification.
- With the appropriate permissions, you can use Test mode.

Click the Island View panel to view a graphical representation of the island. The status of each device is displayed above the device on the island. A green circle with a check indicates that the device is in the ready state. A red alert symbol indicates that there is a device event on that physical device.

Figure 20 - Island View

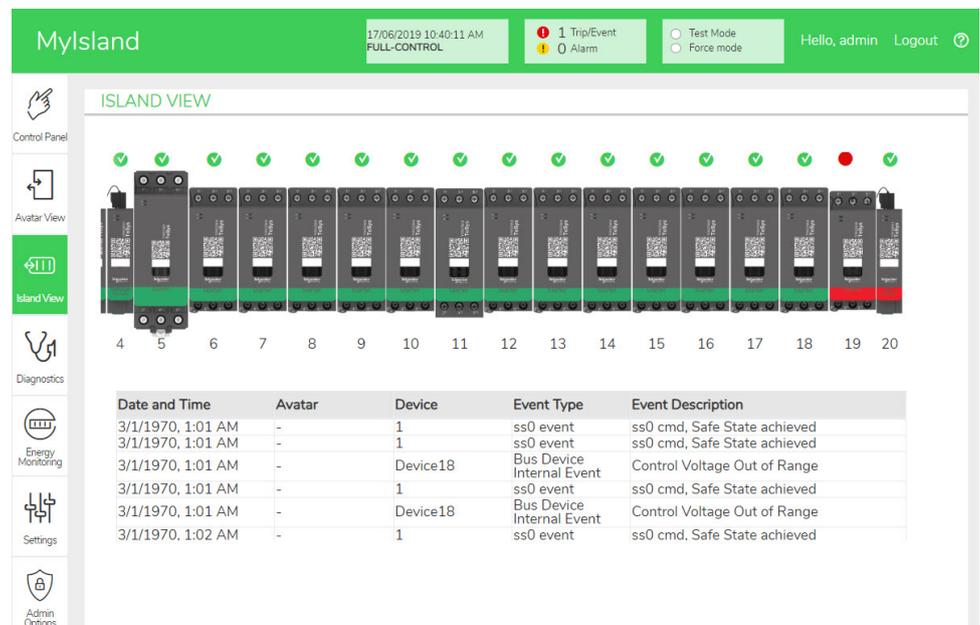


Device Events

If device events are present on the island:

- A red alert symbol appears in Island view above the devices that have experienced an event
- The LEDs on the physical devices flash red

Figure 21 - Device Event



Event Log

The Event Log is located at the bottom of the Island View window. The following information is captured in the event log:

- Date and Time
- Avatar
- Device
- Event Type
- Event Description

Device Information

From Island View, you can click on each device in the island to view its status.

Bus Coupler

If you click the bus coupler in the island view, a new window displays the status of the bus coupler. The following information is provided for the bus coupler:

- **Device Status**
 - Name tag
 - Position
 - Commercial reference number
 - Status
 - Irms
 - Upstream voltage presence
- **Asset Data**
 - Number of device power cycles
 - Time device on
 - Number of events
- **Product Identification**
 - Vendor name
 - Vendor URL
 - Produce name
 - MAC address
 - Serial number
 - Vendor ID
 - Major/minor revision
 - Product code
- **Device Logs**
- **Locate Command**

Figure 22 - Island View: Bus Coupler

MyIsland 17/06/2019 10:15:51 AM FULL-CONTROL Trip/Event Alarm Test Mode Force mode Hello, admin Logout

ISLAND VIEW

SELECTED DEVICE STATUS

Name Tag: Device1
 Position: 1
 Commercial Reference: TPRBCEIP
 Status: Ready

ASSET DATA

Number of Device Power Cycles: 8407
 Time Device On: 2923 Hour
 Number of Device Events: 9

PRODUCT IDENTIFICATION

Vendor Name: Schneider Electric
 Vendor URL: www.schneider-electric.com
 Model Name: Bus Coupler
 MAC Address: 00-11-00-4C-E5-01
 Serial Number:

COMMAND

Locate

System Restart

Locate Command

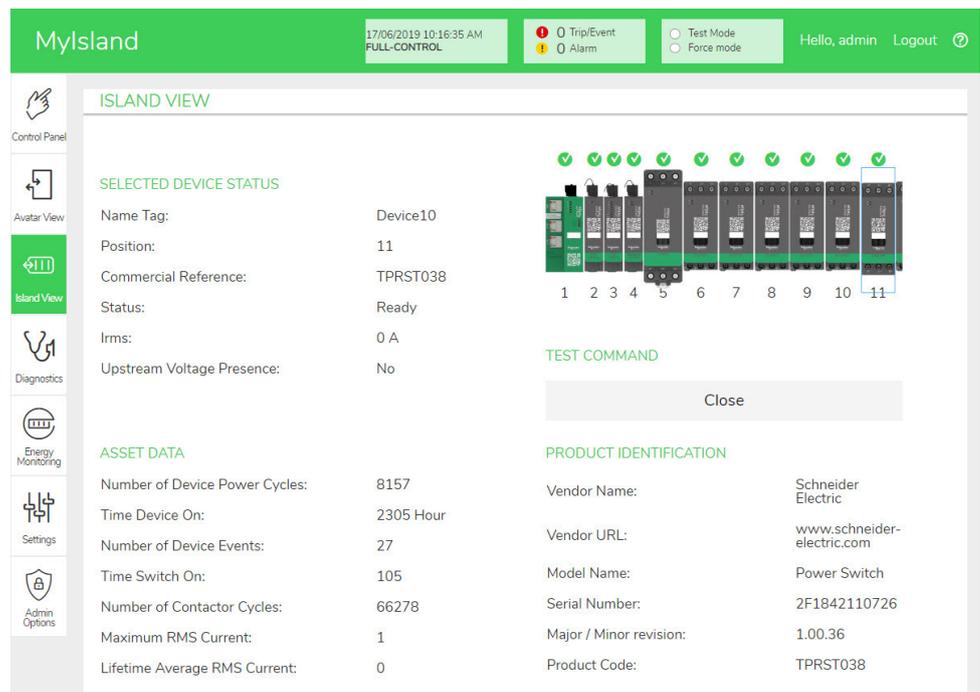
In Island View, click the Locate button to physically locate the connected island. The bus coupler's PWR LED illuminates a steady yellow for 5 s to help you identify which device the OMT is communicating with.

Starters and Power Interface Modules

To view the device status, click one of the starters or power interface modules in the island view. This action opens a new window displaying the status of the device. The following information is provided:

- **Device Status**
 - Name tag
 - Position
 - Commercial reference number
 - Status
 - Irms
 - Upstream voltage presence
- **Asset Data**
 - Number of device power cycles
 - Time device on
 - Number of events
- **Product Identification**
 - Vendor name
 - Vendor URL
 - Product name
 - MAC address
 - Serial number
 - Vendor ID
 - Major/minor revision
 - Product code
- **Device Logs**
- **Test Command**

Figure 23 - Island View: Devices



Test Mode

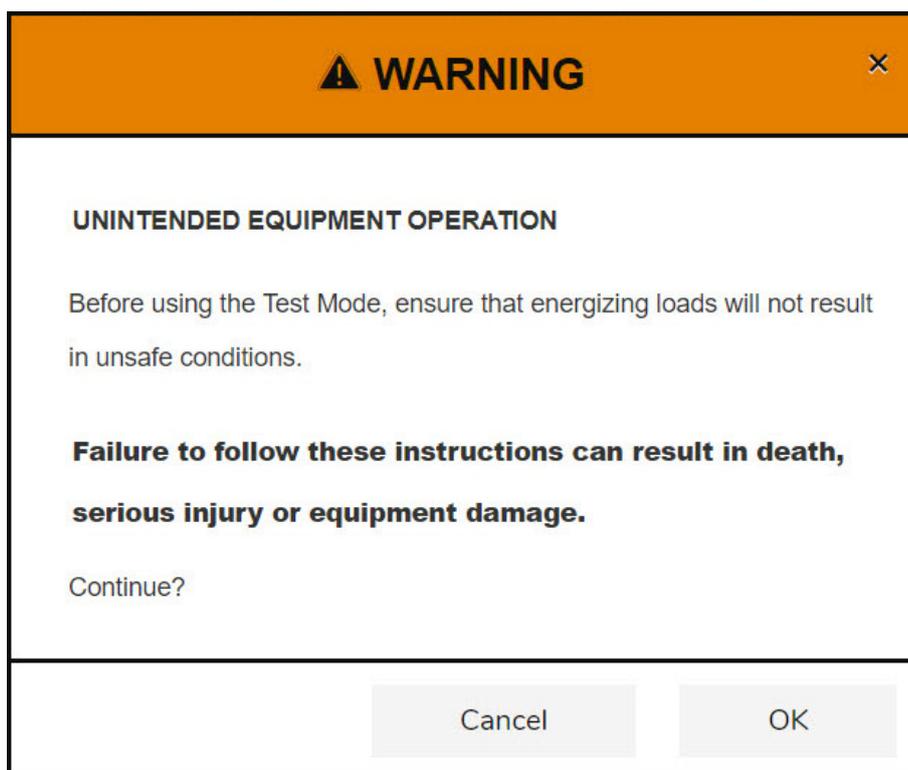
In Test mode, the Operation and Maintenance Tool (OMT) can directly control the power modules and the digital I/O modules. You can enter and exit Test mode during the pre-operational and operational states. In Test mode, the only TeSys™ Avatar activated is the System Avatar.

NOTE: Once you complete the Test mode activities, you must manually exit Test mode to return the island to the operational state.

To enter Test mode:

1. Under Test command, click the Close or Open command.
2. Click OK in the confirmation pop-up window to execute the Test command. This closes or opens the contactor or the device input.

Figure 24 - Execute Test Command Confirmation



- You can click any device in the island topology and perform a test command.
- Once you have tested all devices, you must manually exit Test mode.

NOTE: To exit Test mode, see *Exit Test Mode*, page 40.

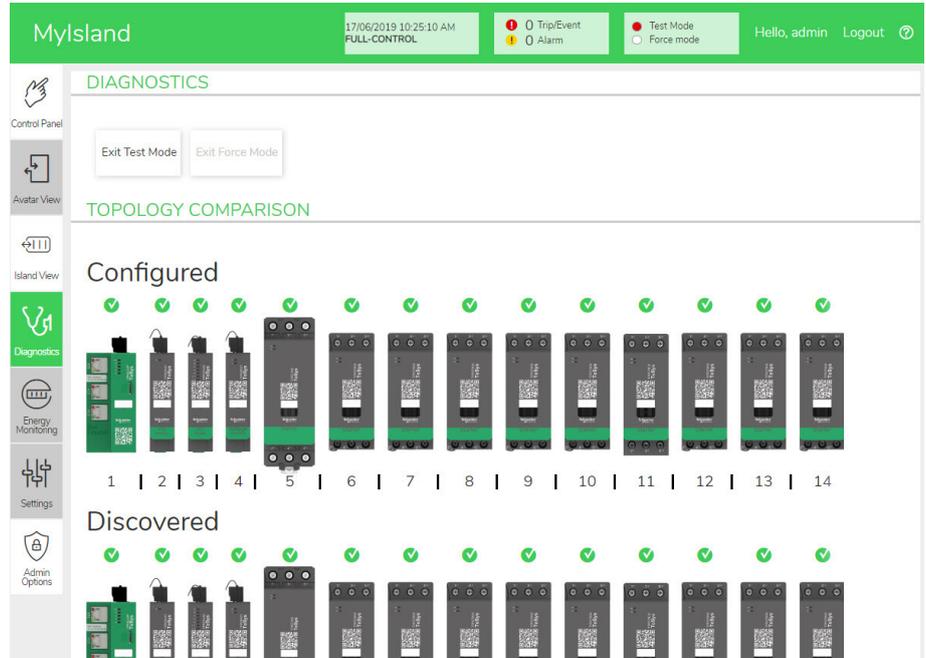
Diagnostics Panel

Exit Test Mode

Once you complete the Test mode activities, you must manually exit Test mode to return the island to the operational state:

1. Click the Diagnostics View panel.
2. Click the Exit Test Mode button.

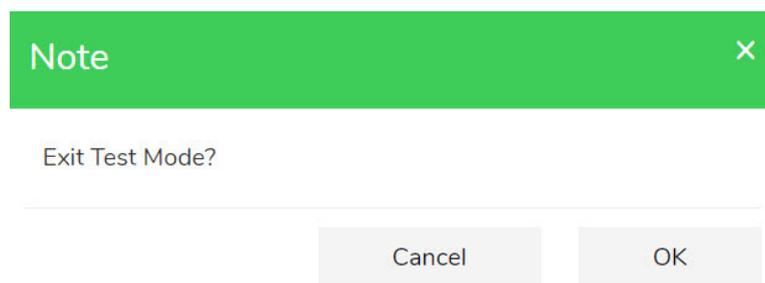
Figure 25 - Exit Test Mode



3. A pop-up appears. To confirm that you want to exit Test mode, click OK.

NOTE: The status banner at the top does **not** indicate that the system is no longer in Test mode.

Figure 26 - Exit Test Mode Confirmation

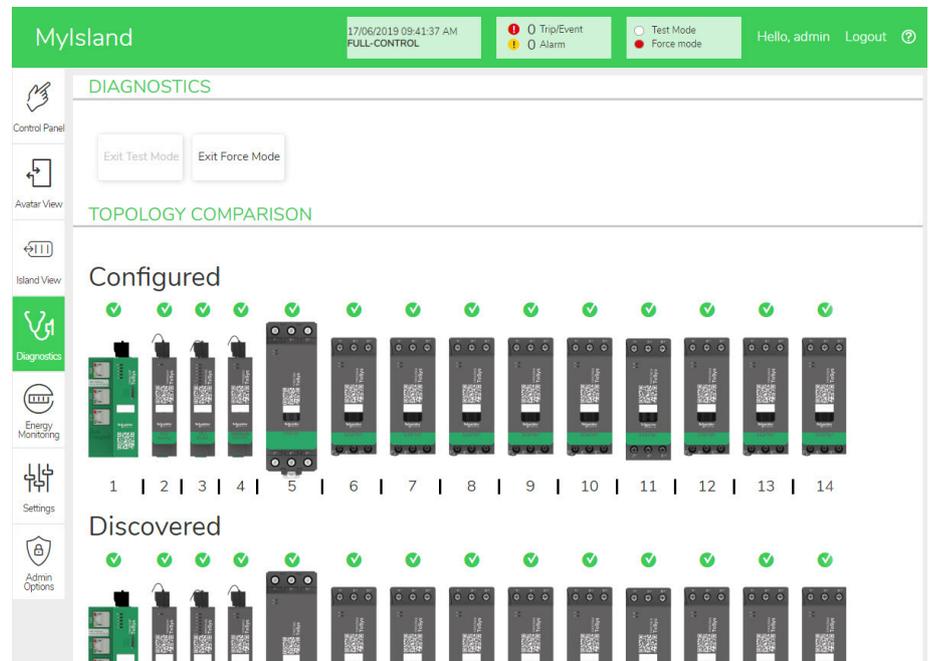


Exit Force Mode

Once you complete the Force mode activities, you must manually exit Force mode to return the island to the operational state:

1. Click the Diagnostics View panel.
2. Click the Exit Force mode button.

Figure 27 - Exit Force Mode



3. A pop-up appears. To confirm that you want to exit Force mode, click Yes.

Figure 28 - Exit Force Mode Confirmation



Compare Topology

This section describes how to compare the physical topology of the island against the island configuration file.

Energy Monitoring Panel

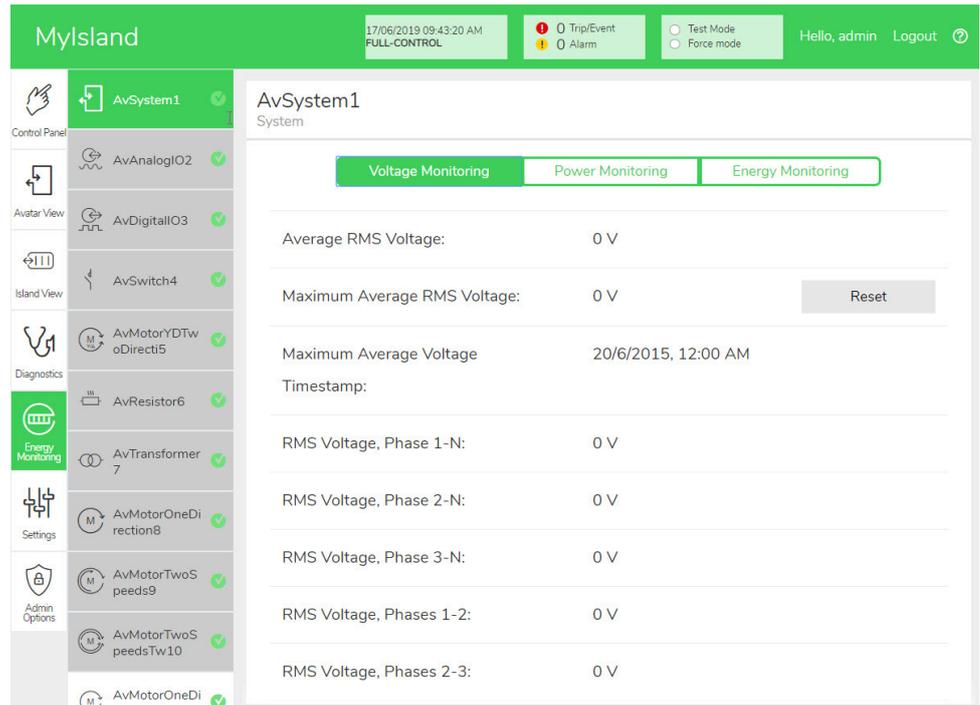
In the Energy Monitoring panel, you can access voltage monitoring, power monitoring, and energy monitoring for the system and for each TeSys™ Avatar.

1. Click the Energy Monitoring panel.
2. Select the Avatar.

In this panel, you can also reset any of the monitoring counters by clicking Reset.

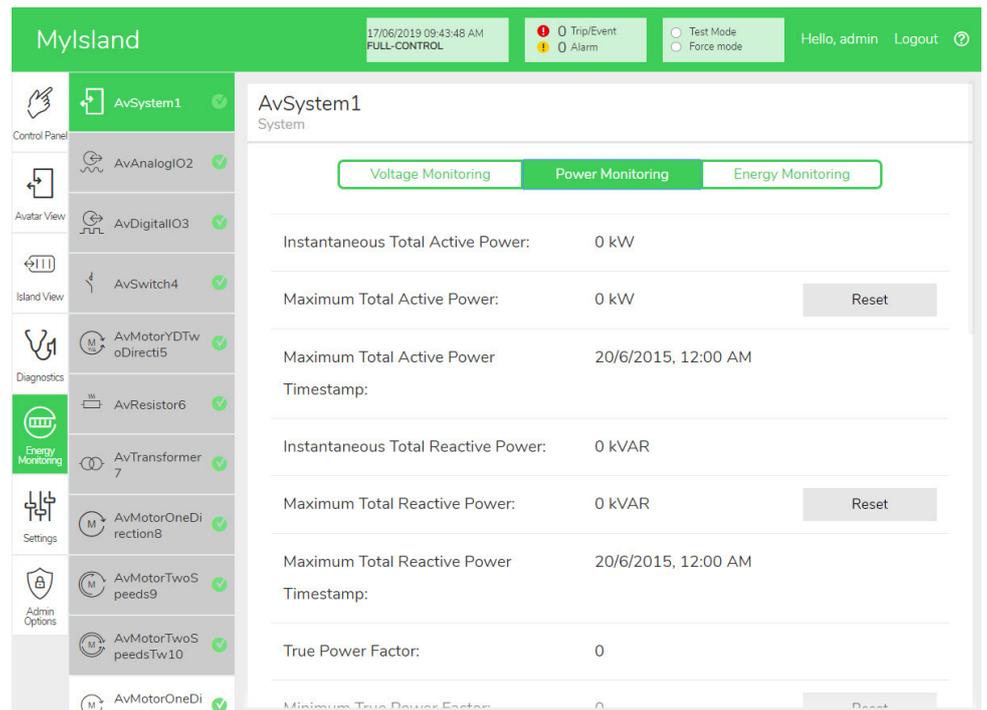
Voltage Monitoring

Figure 29 - System Voltage Monitoring



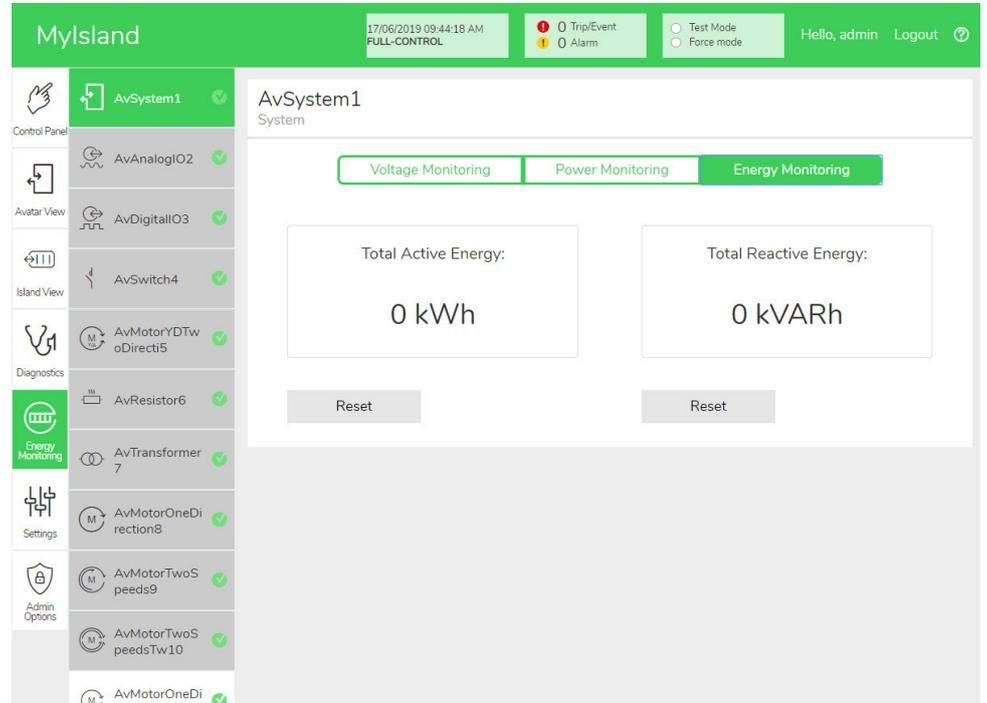
Power Monitoring

Figure 30 - System Power Monitoring



Energy Monitoring

Figure 31 - System Energy Monitoring



Settings Panel

The OMT can be used to view the system settings as well as individual TeSys™ Avatar settings. If your OMT access level permits, you can also edit any of the system and individual Avatar settings. Settings are configurable for the system, load, and device Avatars to enable energy monitoring and to customize the Avatar parameters.

For assistance in selecting the settings, refer to the DTM online help or the *TeSys™ island DTM Online Help Guide*, 8536IB1907. In the OMT tool, press F1 for help.

NOTE: TeSys GV devices should not be used with TeSys island for loads with trip classes set above trip class 15.

System

The following settings can be viewed and modified for the System Avatar.

Fieldbus

- IP Address
- Subnet
- Gateway
- IPv6 Address
- IP Mode
- Network Name
- Communication Loss Timeout

NOTE: For the definition of a communication loss, see *Degraded Mode*, page 13.

Fast Device Replacement (FDR)

- FDR Enable
- FDR Synchronization Enabled
- FDR Synchronization Period
- FDR Data Restore—Command
- FDR Data Backup—Command
- SD Log Update Period

Voltage

- Voltage Dip Threshold
- Voltage Swell Threshold

For more information on System settings, refer to the *TeSys™ island DTM Online Help Guide*, 8536IB1907.

Avatar

The following Avatar settings can be viewed or modified. For more information on Avatar settings, refer to the *TeSys™ island DTM Online Help Guide*, 8536IB1907.

General

- FLA

Thermal protection

- Thermal Overload
 - Thermal Overload Trip
 - Trip Class
 - Reset Threshold
 - Motor Auxiliary Fan Cooled
 - Thermal Overload Alarm
 - Overload Alarm Level
- Motor Overheat
 - Motor Overheat Trip
 - Trip Delay
 - Trip Level
 - Reset Threshold
 - Motor Overheat Alarm
 - Alarm Threshold
 - Temperature Sensor

Electrical Protection

- Current Phase Loss
 - Trip
 - Trip Delay
 - Trip Level
- Ground Current Detection
 - Trip
 - Trip Delay
 - Trip Level
 - Alarm
 - Alarm Level
- Current Phase Unbalance
 - Trip
 - Trip Delay - Start
 - Trip Delay - Run
 - Trip Level
 - Alarm
 - Alarm Level
- Phase Reversal
 - Trip

Load Protection

- Jam
 - Trip
 - Trip Delay
 - Trip Level
 - Alarm
 - Alarm Level
- Long Start
 - Trip
 - Trip Delay
 - Trip Level
- Stall
 - Trip
 - Trip Delay
 - Trip Level
- Undercurrent
 - Trip
 - Trip Delay
 - Trip Level
 - Alarm
 - Alarm Level
- Overcurrent
 - Trip
 - Trip Delay
 - Trip Level
 - Alarm
 - Alarm Level
- Rapid Cycle Lockout
 - Lockout
 - Timeout
- Rapid Restart Lockout
 - Lockout
 - Timeout

Automatic Reset

- Thermal
- Electrical
- Load

Chapter 3—Maintenance

Powering On the island

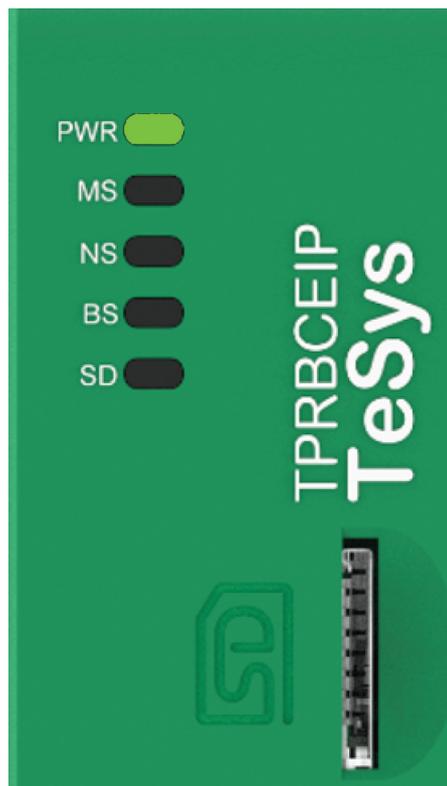
To power on the island:

1. Energize the bus coupler with 24 V.

The island enters the pre-operational stage. Once it finishes booting and all settings have been applied, the island enters the operational state.

NOTE: You can enter and exit Test mode using the digital tools throughout the pre-operational and operational states.

2. Verify that the PWR LED is illuminated and shows a steady green, indicating that power is applied and the island is operational.



Powering Off the island

To de-energize the bus coupler:

1. Disconnect upstream power to the island by removing the 24 V connection to the bus coupler.
2. Verify that the MS and NS LEDs on the bus coupler are off.

When the bus coupler is de-energized, all power modules (starters, SIL starters, and power interface modules) and I/O modules enter the device Fallback state, and all modules are de-energized. All contactors are set to open, and all outputs from the I/O modules are set to zero.

Module LEDs

This section describes the LED status of all modules available for TeSys™ island.

Bus Coupler LEDs

Table 9 - Bus Coupler LEDs

LED	Color	State	Description
PWR	Dual LED, Yellow/Green		
	Yellow	Static	System is booting.
	Green	On	Operating system running.
	Off	Off	Power supply for the device is missing, or hardware is not operational.
	Yellow	Static (5 s)	Identification of the connected bus coupler following a Locate command. Other LED behavior is overridden for 5 s.
MS Name in the device drawing: COM 0	Dual LED, Red/Green		
	Green	On	Device operational: The device is operating correctly.
	Green	Flashing	Standby: The device has not been configured.
	Red	On	Major event: The device has detected a non-recoverable major event.
	Red	Flashing	Minor event: The device has detected a recoverable minor event. NOTE: An incorrect or inconsistent configuration is a minor event.
	Red/Green	Flashing	Self-test: The device is performing its power-up testing.
	Off	Off	No power: No power is supplied to the device.
NS Name in the device drawing: COM 1	Dual LED, Red/Green		
	Green	On	Connected: The device has at least one established connection (even to the message router).
	Green	Flashing	No connections: The device has no established connections, but has obtained an IP address.
	Red	On	Duplicate IP: The device has detected that its IP address is already in use.
	Red	Flashing	Connection timeout: One or more of the connections targeting this device has timed out. This condition is cleared only if all timed out connections are reestablished or if the device is reset.
	Red/Green	Flashing	Self-test: The device is performing its power-up testing.
	Off	Off	Not powered, no IP address: The device does not have an IP address, or is powered off.
LINK/RJ45 Ch0, Ch1	LED, Green		
	Green	On	The device is connected to the Ethernet network.
	Off	Off	The device is <i>not</i> connected to the Ethernet network.
ACT/RJ45 Ch0, Ch1	LED, Yellow		
	Yellow	Flashing	The device is sending or receiving Ethernet frames.
BS/ERR	Black	Off	No connection to internal bus.
	Blinking green	On with COM	Connection / communication to internal bus.
	Steady green	On	Connection to internal bus.

Table 10 - Visual LED for SD Card

LED color status (Green/Red)	System status	Description
Steady Off	None	System power off.
Green, Steady On	Normal	Data files on the memory card used for FDR are identical with data files on the device.
Green, Blinking	Data exchanges	Read data from the SD card or write data on the SD card.
Red, Blinking	Alarm—SD Card Event	Data files on the memory card used for FDR are not identical with data on the device after update. SD card cannot be read or written, or SD card is missing.
Red, Steady On	Minor event	2 project files on the SD card.

Starters and Power Interface Module (PIMs)

Device Status is the top LED on all TeSys island modules except the bus coupler.

Table 11 - Device Status LED

Indicator State	Summary	Description
Single Flash Green/Red	LED Diagnostic	Visual indication that LEDs are operational.
Steady Off	Off	Module not energized.
Steady Red	Device Major Event	Internal device event.
Flashing Red	Not Ready	Discovery, addressing, firmware update, Device Minor Event, etc.
Steady Green	Ready, Open	Module is ready, and the contactor switch is open.
Flashing Green	Ready, Closed	Module is ready, and the contactor switch is closed.

Load Status is the second LED on starters and PIMs.

Table 12 - Load Status LED

Indicator State	Summary	Description
Single Flash Green/Red	LED Diagnostic	Visual indication that LEDs are operational.
Steady Off	Off/Not Ready	Module not energized or not ready.
Flashing Green/Red	Test mode	System Test state is activated.
Steady Red	Protection Trip	Avatar Protection Trip.
Flashing Red	Protection Alarm	Avatar Protection Alarm.
Flashing Green	Upstream Voltage	No upstream voltage presence detected.
Steady Green	Normal	Load is operating within normal conditions.

Voltage Interface Module (VIM)

Device Status is the top LED on all TeSys island modules except the bus coupler.

Table 13 - Device Status LED

Indicator State	Summary	Description
Single Flash Green/Red	LED Diagnostic	Visual indication that LEDs are operational.
Steady Off	Off	Module not energized.
Steady Red	Device Major Event	Internal device event.
Flashing Red	Not Ready	Discovery, addressing, firmware update, Device Minor Event, etc.
Steady Green	Ready	Module is ready.

Voltage Status is the second LED on the VIM.

Table 14 - Voltage Status LED

Indicator State	Summary	Description
Single Flash Green/Red	LED Diagnostic	Visual indication that LEDs are operational.
Steady Off	Off	Module not energized or not ready.
Flashing Green	Ready, No Voltage	Ready with no voltage detected.
Steady Green	Ready, Voltage	Ready with voltage detected.

SIL Interface Module (SIM)

Device Status is the top LED on all TeSys island modules except the bus coupler.

Table 15 - Device Status LED

Indicator State	Summary	Description
Single Flash Green/Red	LED Diagnostic	Visual indication that LEDs are operational.
Steady Off	Off	Module not energized.
Steady Red	Device Major Event	Internal device event.
Flashing Red	Not Ready	Discovery, addressing, firmware update, Device Minor Event, etc.
Steady Green	Ready	Module is ready.

Table 16 - SIL Status LED

Indicator State	Description
Single Flash Green/Red	Visual indication that LEDs are operational.
Steady Off	Module not energized or not ready.
Steady Green	No Safe Stop Command. ¹
Flashing Green	Successful Safe Stop Command, not yet in Safe State. ¹
Flashing Red	Successful Safe Stop Command, but indicative of a wiring issue. Safe State achieved. ¹
Steady Red	Successful Safe Stop Command. Safe State achieved. ¹

1. Safe Stop according to EN 61800-5-2. Safe State according to IEC 61511-1.

Digital I/O Module (DIOM)

Device Status is the top LED on all TeSys island modules except the bus coupler.

Table 17 - Device Status LED

Indicator State	Summary	Description
Single Flash Green/Red	LED Diagnostic	Visual indication that LEDs are operational.
Steady Off	Off	Module not energized.
Steady Red	Device Major Event	Internal device event.
Flashing Red	Not Ready	Discovery, addressing, firmware update, Device Minor Event, etc.
Steady Green	Ready	Module is ready.

Table 18 - DIOM Status LEDs

Indicator State	Summary	Description
Single Flash Green	LED Diagnostic	Visual indication that LEDs are operational.
Steady Off	Off	Module not energized.
Steady Off	Not Ready	Discovery, addressing, firmware update, Device Minor Event, etc.
Steady Off	I/O channel not active	Ready and I/O channel not active.
Steady Green	I/O channel active	Ready and I/O channel active.

Analog I/O Module (AIOM)

Device Status is the top LED on all TeSys island modules except the bus coupler.

Table 19 - Device Status LED

Indicator State	Summary	Description
Single Flash Green/Red	LED Diagnostic	Visual indication that LEDs are operational.
Steady Off	Off	Module not energized.
Steady Red	Device Major Event	Internal device event.
Flashing Red	Not Ready	Discovery, addressing, firmware update, Device Minor Event, etc.
Steady Green	Ready	Module is ready.

Updating the Firmware on the Bus Coupler

Use this procedure to update the firmware on the bus coupler using a micro SD card.

1. Download the firmware to your local PC. The firmware is delivered as an .SEDP file.
2. Insert the micro SD card into your PC.
3. Create a new folder on the micro SD card called *update*. Open the *update* folder.
4. Inside the *update* folder, create a new folder called *dlvpkg*. Open the *dlvpkg* folder.
5. Transfer the .SEDP file from your PC to the following location on the micro SD card:
update/dlvpkg/xxxxxxx.SEDP
6. Remove the micro SD card from your PC and insert it into the bus coupler.
The bus coupler starts the firmware upgrade and automatically reboots in about two minutes.

Device Replacement

Bus Coupler Replacement

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Turn off all power before working on or inside the equipment.

Failure to follow these instructions will result in death or serious injury.

You can only replace the bus coupler with another bus coupler having the same reference number (TPRBCEIP). You must configure the replacement bus coupler on the Ethernet network with the same settings as the original.

Three options exist to configure the new bus coupler's settings:

- Micro SD card
If the island's configuration has been saved to a removable micro SD card, insert the card into the new bus coupler.
- FDR server
If a micro SD card is not available or cannot be read or written, load the island configuration into the replacement bus coupler using FDR and a Schneider Electric™ PLC.
- SoMove™ project file
If the prerequisites are not met for the previous options, save the bus coupler's configured settings to a SoMove project file. Then, use SoMove software with the TeSys island DTM to transfer the configuration to the replacement bus coupler.

Consider the following before replacing the bus coupler:

- Is the replacement device the same model as the original?
- Is a micro SD card available?
- If the PLC is Schneider Electric brand, has the FDR server functionality been enabled and setup?
- Is a SoMove project available for configuration?

Micro SD Card

Use this option to replace the bus coupler if there is a micro SD card installed in the existing bus coupler.

Prerequisite: This option is valid only to replace a bus coupler which has stored data on a micro SD Card (that is, the SD Card visual indicator on the Bus Coupler being replaced has been in the Green, Steady On state).

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Turn off all power before working on or inside the equipment.

Failure to follow these instructions will result in death or serious injury.

1. Disconnect all power from the island.
2. Remove the micro SD card from the existing bus coupler.
3. Insert the micro SD card into the replacement bus coupler.
4. Remove the existing bus coupler from the DIN rail and install the replacement module by following the instructions in “Installing the Bus Coupler” in the *TeSys island Installation Guide*.
5. Apply power to the island, initiating the boot process. Observe the LEDs on the bus coupler until they turn green, indicating that the island has entered the operating state. The boot process takes about two minutes.

FDR Server

Prerequisites:

- The PLC must be Schneider Electric™ brand.
- The FDR server must be setup on the PLC.
- The Ethernet Services FDR settings must be enabled in the TeSys™ island DTM

NOTE: This option is recommended only when the micro SD card is not used or if the SD Card cannot be read or written.

⚡⚠ DANGER

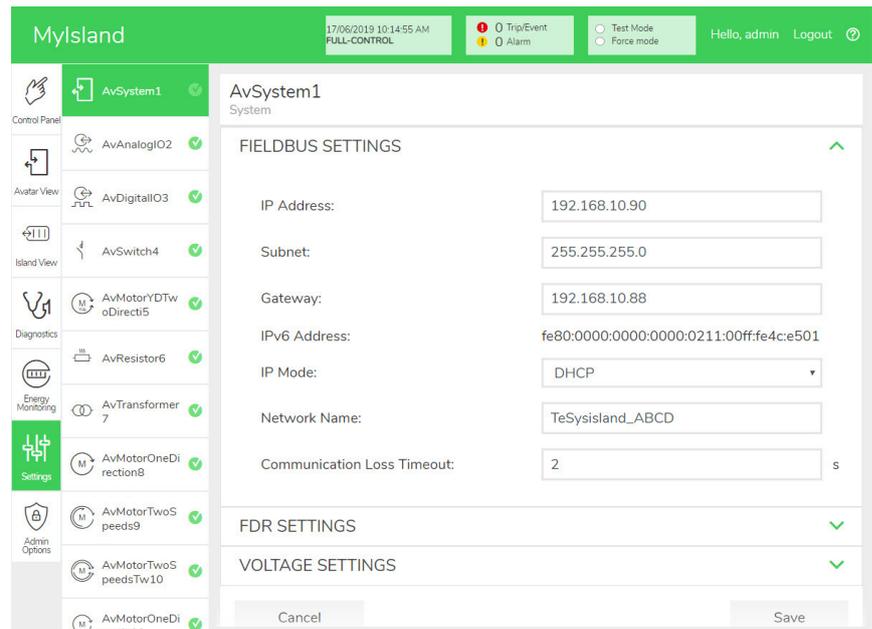
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Turn off all power before working on or inside the equipment.

Failure to follow these instructions will result in death or serious injury.

NOTE: When replacing **only** the bus coupler, Steps 1, 2, and 6 are not required.

1. Connect to the existing bus coupler via the OMT to obtain its Network Name.
 - a. Click the Settings icon.
 - b. Click the System Avatar.
 - c. Click Fieldbus Settings.



2. Capture the Network Name of the existing bus coupler. You will need it when configuring the replacement bus coupler.
3. Disconnect all power from the island.
4. Remove the existing bus coupler from the DIN rail and install the replacement module by following the instructions in “Installing the Bus Coupler” in the *TeSys island Installation Guide*.
5. Apply power to the island, initiating the boot process. Observe the LEDs until they turn green, indicating that the island has entered the operating state. The boot process takes about two minutes.

6. Connect via the OMT and set the Network Name of the replacement bus coupler as follows:
 - a. Click the Settings icon.
 - b. Click the System Avatar.
 - c. Click Fieldbus Settings

The screenshot shows the MyIsland OMT interface. At the top, there's a green header with 'MyIsland', the date and time '17/06/2019 10:14:55 AM', and system status 'FULL-CONTROL'. There are also indicators for Trip/Event, Alarm, Test Mode, and Force mode. The main content area is titled 'AvSystem1 System' and shows a sidebar with various system components like AvAnalogIO2, AvDigitalIO3, AvSwitch4, AvMotorYDTwoDirect5, AvResistor6, AvTransformer7, AvMotorOneDirection8, AvMotorTwoSpeeds9, AvMotorTwoSpeedsTw10, and AvMotorOneDirection11. The 'Settings' icon is highlighted. The 'FIELD BUS SETTINGS' section is expanded, showing the following configuration:

IP Address:	192.168.10.90
Subnet:	255.255.255.0
Gateway:	192.168.10.88
IPv6 Address:	fe80:0000:0000:0000:0211:00ff:fe4c:e501
IP Mode:	DHCP
Network Name:	TeSysIsland_ABCD
Communication Loss Timeout:	2 s

Below the fieldbus settings are sections for 'FDR SETTINGS' and 'VOLTAGE SETTINGS', both with green checkmarks. At the bottom of the settings panel are 'Cancel' and 'Save' buttons.

- d. Enter the Network Name of the bus coupler. This must be the same Network Name that was assigned to the bus coupler being replaced.
- e. Click Save.
- f. Click the Control Panel icon.
- g. Click Restart System. A dialog is displayed. Observe the indicated precautions before continuing.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

The Restart function will restart the island and attempt to reset faults. Verify that restarting the island will not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

CONTINUE Cancel

7. Click OK to restart the system, initiating the island's boot process. Observe the LEDs on the bus coupler until they turn green, indicating that the island has entered the operating state. The IP address and network take effect after the restart completes. The boot process takes about two minutes.

SoMove™ Project File

Use this option to replace the bus coupler when a working micro SD card is not available, and FDR is not an option.

Prerequisite: A SoMove project file can be loaded onto the replacement bus coupler using the TeSys™ island DTM.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Turn off all power before working on or inside the equipment.

Failure to follow these instructions will result in death or serious injury.

1. Disconnect all power from the island.
2. Remove the micro SD card from the existing bus coupler if one is installed.
3. Set the micro SD card aside. Do **not** insert the micro SD card into the replacement bus coupler.
4. Remove the existing bus coupler from the DIN rail and install the replacement module by following the instructions in “Installing the Bus Coupler” in the *TeSys™ island Installation Guide*.
5. Apply power to the island, initiating the boot process. Observe the LEDs until they turn green, indicating that the island has entered the operating state. The boot process takes about two minutes.
6. Connect to the island via the TeSys island DTM, and load the SoMove project file as follows:
 - a. Launch the TeSys island DTM.
 - b. Connect to the island.
 - c. Click Store to Device.
 - d. Select the project file that you wish to load from the PC to the bus coupler.

NOTE: The TeSys island DTM triggers the island to reboot as part of the process of loading the project file. Observe the LEDs until they turn green, indicating that the island has entered the operating state. The boot process takes about two minutes.

Module Replacement

This section contains instructions for replacing all TeSys™ island modules except the bus coupler:

- standard and SIL starters
- power interface modules
- SIL interface modules
- voltage interface modules
- digital I/O modules
- analog I/O modules

NOTE: The original device and the replacement device must have the same commercial reference number.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Turn off all power before working on or inside the equipment.

Failure to follow these instructions will result in death or serious injury.

1. Disconnect all power from the island.
2. Remove the existing module from the DIN rail.
NOTE: When replacing two speed, two direction, or Y/D starters, also remove the adjacent starter. Then remove any accessories used to connect the starters, so the accessories can be reused to install the replacement module.
3. Install the replacement module according to the instructions in the *TeSys island Installation Guide*:
 - *Installing Standard Starters and SIL Starters*
 - *Mounting Power Interface Modules on DIN Rail*
 - *Mounting the I/O and Interface Modules on DIN Rail***NOTE:** When replacing two speed, two direction, or Y/D starters, install any accessories to connect the replacement starter to the adjacent starter, before installing the modules on the DIN rail.
4. Apply 24 Vdc power to the island.
NOTE: Do not apply the mains power at this time.
5. Use Test mode to verify that the device is operating correctly.
6. Apply the mains power to the island, initiating the boot process. Observe the LEDs until they turn green, indicating that the island has entered the operating state. The boot process takes about two minutes.

Alarms and Events

This section lists the common alarms and events you might encounter, and possible corrective actions.

Alarms—Corrective Actions

Alarms inform you of potential issues with the island. They do not affect the Avatar or the state of the island. The following are potential internal events and protection alarms you might encounter during operation.

NOTE: Use the Event Log to help determine the cause of alarms on the system.

Internal Events

The following are potential internal events you might encounter during operation:

Asset Alarm

This alarm is triggered under the following conditions:

- When the *Number of Contactor Cycles* value for a starter or SIL starter on the island exceeds 90% of the life of the device (1,000,000)
- When the *Mirror Relay Operations Counter* for a SIL interface module (SIM) on the island equals or exceeds 90% of the life of device (100,000)

Corrective Action:

Check the device diagnostics for each device. The one triggering the alarm is the one with the highest number of operations. Schedule maintenance to replace it.

Device Temp Threshold Alarm

Device temperatures are monitored by reading their internal temperatures. A device internal temperature alarm is triggered for a device if the internal temperature read exceeds its defined threshold.

Corrective Action:

Verify that the equipment design meets the ambient temperature requirements for the product. Cycle the island power. Replace the device if cycling power is unsuccessful in clearing the alarm.

CPU Load Alarm

Triggered when the load read from the device exceeds 60%.

Corrective Action:

Cycle power. If the alarm is still present, contact your next level of support. The device may need to be replaced.

Avatar Alarm

A device within the Avatar has experienced an internal event such as the following:

- Communication Event
- AFE Communication Loss
- Control Voltage Out of Range
- DAC Communication Loss
- DAC Over Temperature
- DAC Output Event

Corrective Action:

Cycle power. If the alarm is still present, contact your next level of support. The device may need to be replaced.

Device Data Not Updated Alarm

Indicates a potential perturbation of communication between devices.

Corrective Action:

Verify that all installation guidelines are followed in the setup of the equipment.

Audit Record Capacity Alarm

The number of allowed audit records has been reached.

Avatar Protection Alarms

An Avatar protection alarm is a less-serious, though still undesirable, operating condition. An alarm indicates that corrective action may be required to help prevent a problem condition from occurring. If left unresolved, an alarm may lead to a trip condition. Alarm-related parameters can be configured for most protection functions.

Thermal Overload Alarm

The Thermal Overload protection function is based on a motor thermal model using phase currents as inputs. If enabled, this function triggers an alarm when the motor capacity used exceeds the percentage set in the Overload Alarm Level parameter.

Jam Alarm

The Jam protection function detects when a motor is jammed during the Run state—and it either stops, or is suddenly overloaded and draws excessive current. If enabled, this function triggers an alarm when the maximum phase current (I_{max}) exceeds the specified Jam Alarm Level parameter value.

Undercurrent Alarm

The Undercurrent protection function detects unexpected low current consumption during the Run state. This condition is typically associated with motors running free, without a load—for instance, if a drive belt or shaft has broken. If enabled, this function triggers an alarm when the average phase current remains below the specified Undercurrent Alarm Level parameter value.

Overcurrent Alarm

Avatars with Overcurrent Alarm enabled signal an Overcurrent Alarm if the maximum phase current exceeds the Overcurrent Alarm Level in the motor Run state.

Phase Unbalance Alarm

The Current Phase Unbalance protection function only applies to three-phase installations. If enabled, this function triggers an alarm when the current phase unbalance exceeds the specified Current Phase Unbalance Alarm Level parameter value.

Ground Current Alarm

The Ground Current Detection protection function detects ground currents—indicating contact between an energized conductor and ground or the equipment frame. If enabled, this function triggers an alarm when the ground current exceeds the specified Ground Current Alarm Level parameter value.

Motor Overheat Alarm

The Motor Overheat protection function is only available for Avatars whose Temperature Sensor Available parameter is activated. These Avatars include an analog I/O module that is wired to the temperature input from a temperature sensor associated with the protected motor. If enabled, this function triggers an alarm when the motor temperature exceeds the percentage set in the Overheat Alarm parameter.

Minor Events—Corrective Actions

When the island encounters a minor event:

- The fieldbus and service ports remain activated.
- Only the System Avatar is activated.
- All power modules and I/O modules are in the device Fallback state.
- To exit a minor event state that is not automatically recovered, a system reset, restart, or control power cycle is required. A system reset command can be issued manually from the TeSys™ island DTM, the OMT, or the PLC.

The following scenarios cause the island to encounter a minor event:

Table 20 - Minor Events and Corrective Actions

Minor Event	Diagnosis	Corrective Action
Topology mismatch	The island configuration in the active context file does not match the actual discovered topology of the island	Determine the proper configuration and align the configuration with the physical hardware The OMT and the DTM have a compare function in the diagnostics views to compare the topology. Perform one of the following: <ul style="list-style-type: none"> • System Reset • System Restart • Control power cycle
Switch off island command	Island received Switch Off Island command	N/A
Too many modules	The number of physical modules detected in the island is beyond the maximum allowed limit of 21	<ol style="list-style-type: none"> 1. Power down 2. Remove modules to meet the 21 maximum requirement 3. Power on
No modules on island	There are no physical modules installed on the island	Complete the installation of the modules on the island
Control voltage 120%	The voltage was over 120% for longer than the allowed duration	Verify that the power supply voltage is within range
Firmware update unsuccessful	Firmware download to the device was unsuccessful after three consecutive tries	<ul style="list-style-type: none"> • Check for the latest version of firmware available • Contact support
Summary file integrity check	Configuration file corruption detected	<ul style="list-style-type: none"> • Download a new configuration file to the island • Verify that the micro SD card is functioning properly
Context file integrity check	Configuration file corruption detected	<ul style="list-style-type: none"> • Download a new configuration file to the island • Verify that the micro SD card is functioning properly
Avatar settings file integrity check	Configuration file corruption detected	<ul style="list-style-type: none"> • Download a new configuration file to the island • Verify that the micro SD card is functioning properly
Avatar settings file malformed	Configuration file corruption detected	<ul style="list-style-type: none"> • Download a new configuration file to the island • Verify that the micro SD card is functioning properly
No active project file	Bus Coupler is not configured with an active project file	Configure Bus Coupler using engineering tools

Major Events—Corrective Actions

When the island encounters a major event:

- The fieldbus and service ports are not activated.
- No Avatars are activated, including the System Avatar.
- All power modules and I/O modules are in the device Fallback state.
- A cycle of the control power is required to exit a major event state.

The following scenarios cause the island to encounter a major event:

Major Event	Diagnosis	Corrective Action
Control Voltage exceeds 150%	The voltage was over 150% for longer than the allowed duration	Verify that the power supply voltage is within range.
Control voltage exceeds 120% for 2 s	The voltage was over 120% for longer than the allowed duration of 2 seconds consecutively	Verify that the power supply voltage is within range.
Bus Coupler Internal Device Event	The LED is red, and Fieldbus communication is not working on the Bus Coupler	Cycle power. If the problem persists, contact the next level of support.

Chapter 4—Troubleshooting

This section describes the following:

- What to do if a device detects an event
- How to perform a factory reset

Avatar Device Event

When an internal event is detected on a given device, all Avatars related to that device are impacted. For instance, an event detected on a SIL interface module impacts all the avatars belonging to its SIL Group.

In this situation, each impacted Avatar signals an Avatar Device Event and puts its associated devices into the Fallback state according to the table below (device dependent).

TeSys island Module Triggering an Avatar Device Event	Data Behavior
Voltage interface module	All RMS and instantaneous voltage and power measurements reported as 0.
SIL interface module	SIL Group status is reported as "SIL Group Impacted By ADE."
Power devices (power interface module, starter, SIL starter)	Fallback state: power modules are open. <ul style="list-style-type: none"> • Current and power measurements reported as 0. • Energy calculations for Avatar updated with input of 0 power.
Digital I/O module, analog I/O module	Fallback state: <ul style="list-style-type: none"> • Digital outputs are off (set to 0). • Analog outputs go to 0 V or 0 mA, depending on configuration. • Inputs reported as 0.

Performing a Factory Reset

The TeSys™ island system can be reset to factory settings, returning the bus coupler to its out-of-the-box conditions. This is useful, for example, to quickly get to Test mode when building or modifying an island.

TeSys island accepts a Factory Reset command from the digital tool (TeSys island DTM or OMT) with exclusive control when the system is in Pre-Operational mode, Test mode, or Minor Event state.

Upon receiving a Factory Reset command, TeSys island

1. Deletes the following files:
 - system context files (active, pending, and SDP if present)
 - SEDP files (including active, pending, or update)
 - Users file
2. Automatically restarts

NOTE:

- When the Users file is deleted, any added users are removed. In addition, the group management and the administrative password are reset to default values.
- A Factory Reset command does **not** delete log files.

System Logs

TeSys™ island maintains two log files:

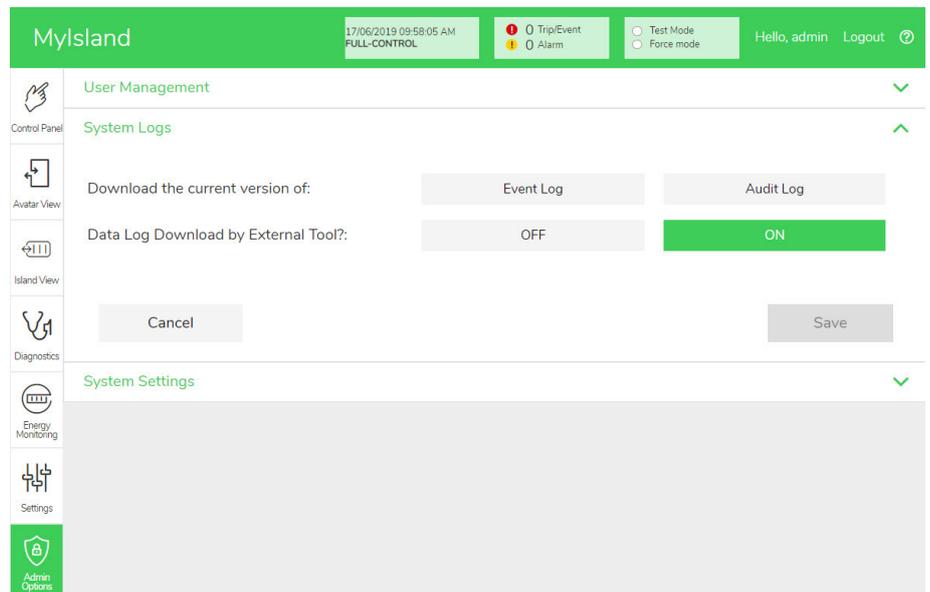
- a System Event log related to the normal operation of the system
- a security related Audit log

Multiple events occurring simultaneously (for example, alarms that are simultaneously cleared when the load is turned off) are logged as individual events. There is no constraint or preference for the order in which multiple simultaneous events are logged.

To view the system logs:

1. Click the User Management panel.
2. Expand the System Logs window.

Figure 32 - System Logs



You can download the current version of the Event log or the Audit log.

- The Event log is a .csv file containing the events that can be used for debugging.
- The Audit log is a cybersecurity feature showing actions related to user logins, user access to Force mode, and user downloads of new context files. It logs any security-related event.

Event Log

The System Event Log is a CSV file with each event logged in a separate line delineated by the newline escape sequence `\n`, using semicolon separators and the following columns:

- Timestamp
- Avatar identification
- Device identification
- Event identification
- Event description

Event Log Priority

TeSys™ island supports an Event Log Priority Threshold, with a range of 0–7 and default value of 3. The priorities are defined in the table below:

Event	Priority
System State Transition	0
Avatar Protection Trip	1
Avatar Protection Reset	1
Avatar Protection Alarm	2
System Minor Event	0
System Alarm	0
Island Device Internal Event	0
Safe Stop ²	1
System Time Update	0
Debugging	6
System Other	3
Power Outage	4

System Event Log Attributes

System Event Log attributes are defined in the following table.

Attribute	Description
timestamp	The system time YYYY-MM-DDThh:mm:ss.mmm Example: 2018-01-02T15:02:59.970
avatarName	The user defined Avatar name
avatarNumber	The number of the Avatar in the digital tool
avatarSafeGroup ³	The SIL group of the Avatar
deviceTag	The user defined device tag
deviceNumber	The number of the device in the physical order of the system (the Node ID on the internal bus)
value	The new value of the data change event being logged.

System State Transition Events

TeSys™ island logs the following System State Transition events when there is any change in value of the System Avatar Status data:

- Degraded Mode
- Force Mode
- Minor Event
- Test Mode
- Operational
- Pre-Operational

2. Safe Stop according to EN 61800-5-2.

3. Safety Integrity Level according to standard IEC 61508

Avatar Protection Trip Events

TeSys™ island logs the following Avatar Protection Trip events:

- Thermal Overload
- Motor Overheat
- Jam
- Undercurrent
- Long Start
- Overcurrent
- Stall
- Ground Current
- Current Phase Reversal
- Phase Configuration
- Current Phase Unbalance
- Current Phase Loss

Avatar Protection Reset Events

TeSys™ island logs Avatar Protection Reset events.

Avatar Protection Alarm Events

TeSys™ island logs the following Avatar Protection Alarm events:

- Thermal Overload
- Motor Overheat
- Jam
- Undercurrent
- Overcurrent
- Ground Current
- Current Phase Unbalance

System Minor Events

TeSys™ island logs the following System Minor Event events:

- No Device
- Too Many Devices
- Device Mismatch
- Internal Com Loss
- SD Card Event

System Alarm Events

TeSys™ island logs the following System Alarm events:

- Control Voltage Fluctuation
- Asset Alarm
- No Context
- Device Data Not Updated

Island Device Internal Events

TeSys™ island logs the following island device internal events.

NOTE: AFE stands for analog front end. DAC stands for digital-to-analog converter.

- Communication Event
- AFE Over Temperature
- CPU Over Temperature
- AFE Communication Loss
- Control Voltage Out Of Range
- DAC Communication Loss
- DAC Over Temperature
- DAC Output Event

Safe Stop Events

NOTE: Safe Stop according to EN 61800-5-2.

TeSys™ island logs the following Safe Stop events ⁴ for SIL groups 1–10:

- Not yet in Safe State ⁴
- Safe State achieved ⁴
- Wiring issue, in Safe State ⁴

Debugging Events

TeSys™ island logs Debugging events.

System Other Events

TeSys™ island logs the following System Other events:

- Invalid System Context
- Invalid SW/FW Image
- Factory Reset Command Received

Power Outage Events

TeSys™ island logs Power Outage events, with a detailed definition of the Event Description in the bus coupler specifications.

System Time Update Events

TeSys™ island logs System Time Update events “Time before update” (value before system time update, in timestamp format).

4. Safe Stop according to EN 61800-5-2. Safe State according to IEC 61511-1.

Audit Log

The Audit Log is a CSV file with each event logged in a separate line delineated by \n, using semicolon separators and the following columns:

- Timestamp
- Event source
- Event type
- Event identification
- Event result

Audit Log Format

- TeSys™ island formats the **timestamp** in the Audit Log in the following format:

YYYY-MM-DDThh:mm:ss.mmm

Example: 2018-01-02T15:02:59.980

- TeSys island formats the **source** in the Audit Log in the following format with valid values as defined below:

<<source IP address>>,<<type of tool>>,<<user name>>

NOTE: If the source IP address is not known, a hyphen (-) is substituted.

Valid values for <<type of tool>> are

- DTM
- OMT
- other

Valid values for <<user name>> are

- the user name for the *OMT* tool type
- a hyphen (-) for the *DTM* and the *other* tool type

Examples:

- 192.168.100.1,OMT,Bob
- 192.168.0.1,DTM,-

System Command Events

TeSys™ island logs the following System Command events in the Audit Log:

- System Reset
- System Restart
- Switch Off Island
- System Alarms Cntr Rst
- System Minor Events Cntr Rst
- Fieldbus Comm. Events Cntr Rst
- Locate Island
- Enter Test Mode
- Enter Forced Mode
- Exit Test Mode
- Exit Forced Mode
- Forced Mode Release Control
- Factory Reset Command

User Login Events

TeSys™ island logs the following User Login events in the Audit Log:

- successful user login attempts
- number of unsuccessful login attempts for this user since last successful login

Island Topology Change Events

TeSys™ island logs the following Island Topology Change events in the Audit Log:

- **Device added**

The bus coupler has discovered a new device that has not been addressed. This event is detected when the bus coupler receives any response to a “Read Device ID Out” message, periodically sent to Bus Device address 127, requesting Device ID information.

- **Device removed**

The bus coupler has detected that a Bus Device has stopped communicating on the bus.

File Transfer Events

TeSys™ island logs File Transfer events for received files, indicating whether they are successfully validated by ESW in the Audit Log.

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As standards, specifications, and design change from time to time,
please ask for confirmation of the information given in this publication.

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