ASCO Power Technologies®

5370 SERIES

Touch Display Interface

User's Guide

381333-486
6/2020

Schneider Electric

Table of Contents

Glossary of Abbreviations and Terms used in this manual

Abbreviation	Definition and explanation
Acc. 72EE2	Accessory 72EE2, designation for 5170 Quad Ethernet when provided with TS
AES	Advanced Encryption Standard
ASCO	ASCO Power Technologies
ASCOBus	ASCOBus2, protocol used by ASCO monitoring systems
ATS, TS	Automatic Transfer Switch, Transfer Switch
BMS	Building Management System
CMD	Command
CPMA	Critical Power Management Appliance, ASCO 5700 or 5900 SERIES
DIN	35 mm standard metal rail for mounting the TDI
DPM	Digital Power Meter, ASCO 5210
E-IO	Ethernet-IO Module, ASCO 5112
Gateway	Software or a computer running software that enables two different networks to communicate
Group 5	Automatic Transfer Switch Controller used on ASCO Transfer Switches
IS	Information System, group that manages the computers and networks for a business
IP	Internet Protocol, provides rules for sending and receiving data packets between nodes through the Internet
LAN	Local Area Net, is an Ethernet communications network that interconnects devices together within a limited area
MAC	Media Access Control, is a hardware ID number that uniquely identifies each device on a network
MIB	Management Information Base
Modbus	A serial communications protocol
Ping	A Serial or Ethernet open protocol used to determine the presence of a host on the Internet
RS485	Serial interface the 5170 Touch Display Interface supports to third party remote monitoring systems
SCADA	Supervisory Control and Data Acquisition System
SMTP	Simple Mail Transport Protocol, used for sending e-mail over a network
SNMP	Simple Network Management Protocol, used for exchanging management information between network devices
Subnet Mask	A number that defines a range of IP addresses that can be used in a network
TCP	Transmission Control Protocol, verifies delivery of data packets
TDI	Touch Display Interface, alternate local interface to 7000 Series transfer switches
TRAP	SNMP notification from Agent to Manager
TTL	Internal serial connection used between 5170 TDI to a Group 5 transfer switch controller and/or 5200 SERIES meter

Introduction

The Catalog 5370 Touch Display Interface (TDI) is a consolidated operator interface for 7000 Transfer Switches.. The TDI displays information in color about the transfer switch, load, and the power sources. This is not a controller; the Group 5 controller still controls the transfer switch. In addition to monitoring functions, the TDI also provides control functions. All monitoring and control functions can be done with the enclosure door closed for convenience and safety.

Many transfer switch settings can be made directly on the touch screen instead of the controller's power control center keypad. For example, the engine exerciser settings can be configured through the TDI's graphical screens. The TDI provides an easier way to change most transfer switch settings. The TDI includes a USB port so the user can download logs or upload software and notes.

- HMI with transfer switch status, event logs, alarming and transfer capabilities
- Email notification for alert conditions
- Modbus TCP/IP interface
- BACnet IP
- SNMP with trap notifications

Purpose of this Manual

This manual should be used to assist individuals who:

- will configure a TDI
- will monitor an ASCO transfer switch using the TDI.
- will monitor an ASCO transfer switch using Modbus, BACnet and/or SNMP protocols over Ethernet TCP/IP
- will configure and receive status changes and alarms through Email notification.

Status Information

The TDI provides status of both power sources (normal and emergency) and the position of the transfer switch.

- Voltage & frequency of Normal Source
- Voltage & frequency of Emergency Source
- Position of transfer switch (load connected to Normal Source or Emergency Source

If an ASCO Power Technologies metering device is provided, additional metering status is displayed:

- Voltage & Current on the load side
- Power, Energy
- Power Quality Information*

* Metering device: PowerLogic PM8210

Control Overview

The TDI allows control of the transfer switch, as configured by user management. These controls are included:

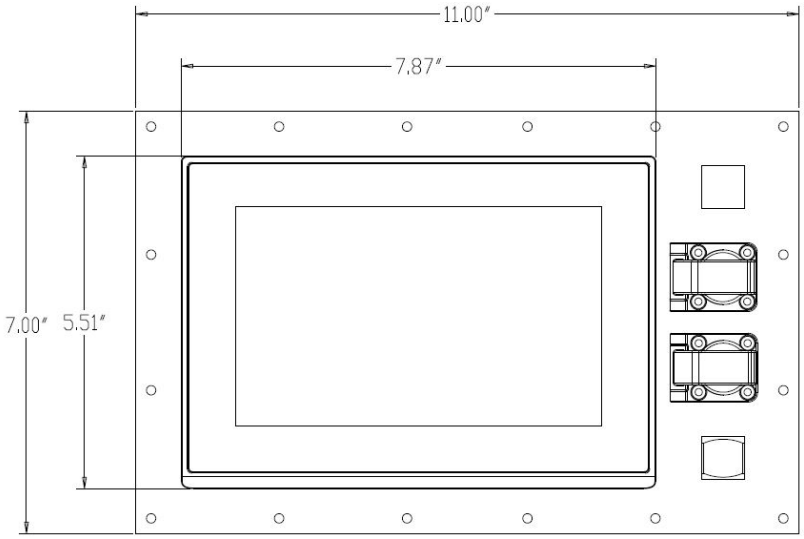
- Load transfer and retransfer (refer to Access Management section for role privileges)
- Toggle outputs
- Settings changes

Load transfer control requires Control or Admin level access with a password. Settings changes requires Admin level access with a password. User management can be set up (by the Admin users) for various users to monitor or to control the 7000 Series transfer switch.

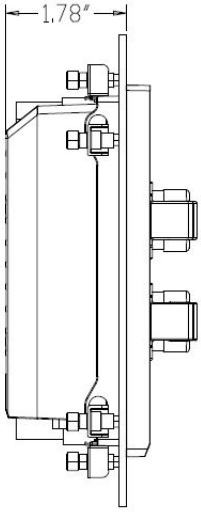
General Specifications

Power	Rated Voltage	24 VDC
	Power Requirements	36 Watts
	Terminal Methods	Terminal block
Environmental	Operating Temperature	-40° to 158° F (-40° to 70° C)
	Storage Temperature	-40° to 158° F (-40° to 70° C)
	Humidity Rating	5% - 95% relative humidity, non-condensing
Display	Type	Capacitive Touch
	Size	7 inch diagonal
	Resolution	800 x 480
Connectivity	Ethernet Ports	Two RJ45, 10/100/1000 Mbps
	USB	Two Type A Ports 2.0

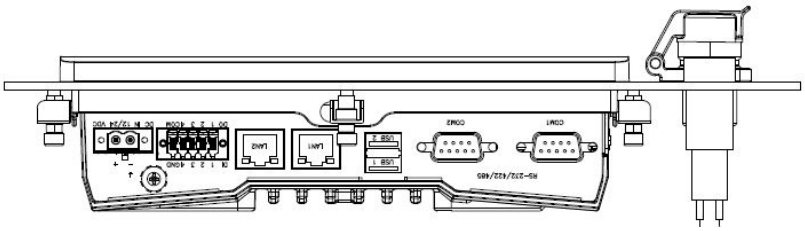
Outline Drawings



FRONT VIEW



SIDE VIEW



TOP VIEW

5370 TDI Startup Checklist

This will describe the functions and equipment needed use a TDI.

Connect Hardware 1

- ☐ Connect TDI to 5170 QEM (Using Ethernet)
- ☐ Connect Group 5 Controller to 5170 QEM (Using TTL)
- ☐ *Optional:* Connect 5210 DPM (Using TTL)
- ☐ *Optional:* Connect 5112 E-IO(s) (Using Ethernet)
- ☐ *Optional:* Connect Power Logic PM8000 (Using Ethernet)

The TDI comes factory default connected and this step should be used for verification or replacement units.

Configure Network Settings 2

- ☐ Configure TDI TCP/IP
- ☐ Configure 5170 QEM IP and Serial Address
- ☐ *Optional:* Configure 5112 E-IO(s) IP Address
- ☐ *Optional:* Configure Power Logic PM8000 IP Address

The TDI and all monitored devices come with factory default IP addresses that will need to be configured to integrate into a facility network factory default connected and this step should be used for verification or replacement units.

Configure Devices 3

- ☐ Configure Transfer Switch and Optional Meter

Configure Alarms & Notification 4

- ☐ Configure alarms
- ☐ *Optional:* Configure Email Notification

The TDI and all monitored devices come with factory default alarm configuration.
ASCO recommends using the included 5170 QEM for alarm notification.

Configure Trend 5

- ☐ *Optional:* Configure trending

Configure Protocol 6

- ☐ *Optional:* Enable Modbus
- ☐ *Optional:* Enable SNMP
- ☐ *Optional:* Configure BACnet

ASCO recommends using the included 5170 QEM for Modbus and SNMP for monitoring of all devices except an optional PM8210..

Configure User and Security 7

- ☐ *Optional:* Configure Active Directory
- ☐ *Optional:* Configure Users & Passwords
- ☐ *Optional:* Configure Two-Factor Authentication
- ☐ *Optional:* Configure Inactivity Timers

Quick-Start Guide

The quick-start guide will provide the user with the information to establish a hardware connection, energize, and conduct the initial login to the TDI.

The TDI provides Ethernet access that allows users to view data from ASCO Transfer Switches, 5210 Digital Power Meters, 5112 Ethernet-IO Modules and/or PM8000. All users must follow these precautions:

DANGER

To avoid possible shock, burns, or death, de-energize all electrical sources to the Transfer Switch before installing the 5370 Touch-Interface Module.

NOTICE

Be sure that *Users* to whom you give access are those persons that you want to view information about and/or control the electrical system.

Connections

Operational Power

The TDI operates using 24VDC and will be supplied from the transfer switch that feeds a 24VDC terminal on the unit.

Internal Network For TDI And Configuring Monitored Devices

The TDI connects to the 5170 Quad-Ethernet Module (QEM), also known as the Acc. 72EE2, which provides information to the unit. The 5170 QEM will function as a single point of connection for internal connections and as a single point for external Ethernet connections. The transfer switch Group 5 controller and 5210 Power Meter will connect by TTL to the 5170 QEM. The 5112 Ethernet-IO and Powerlogic PM8000 will connect to the 5170 QEM by Ethernet. See below topography for internal network (Figure 1).

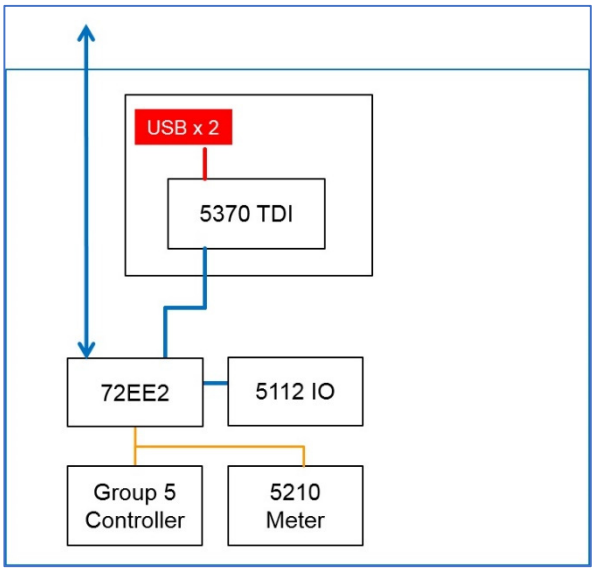


Figure 1. Internal Network topography

TTL

The controller and meter (5210 DPM) uses this medium to connect to the hardware gateway. They also supply operational power to the hardware gateway.

Ethernet Connections

The TDI, additional devices for IO or metering and outbound communication, uses Ethernet as a means of connecting to the hardware gateway.

Transfer Switch Controller

The transfer switch controller functions as the device that manages the automatic functions of the transfer switch and collects most of the status information regarding the transfer switch. The Group 5 controller connects to the 5170 QEM by TTL cable. Reference Group 5 Operator Manual for instructions on configuring the controller 381333-126.

Meter

The meter will be mounted on the load side of the transfer switch and will provide power and energy information to the TDI. The PowerLogic PM8000 will provide power quality information. The TDI supports only one meter:

- The 5210 Digital Power Meter connects to the 5170 QEM by TTL cable. Reference ASCO 5210 Digital Power Meter Operator Manual for instructions on configuring the meter 381333-368.
- The PowerLogic PM8210 connects to the 5170 QEM by Ethernet cable.

IO Module

The IO Module is provided to monitor the status of the bypass-isolation transfer switch. The 5112 Ethernet-IO Module connects to the 5170 QEM by Ethernet cable.

Hardware Gateway

The hardware gateway concentrates data from all the monitored devices inside the transfer switch and provides information to the TDI. It also functions as the ethernet access point for outbound information from the TDI. The 5170 Quad-Ethernet Module connects to the TDI by ethernet cable. Reference ASCO 5170 Quad-Ethernet Module Operator Manual for instructions on configuring the meter 381333-459.

TDI

Your display's default protocol settings meet the needs of most systems with only basic configuration. You can customize these settings to meet your specific needs. These are advanced procedures that require an understanding of your display's hardware configuration, supported protocols, and the communications network and power system that your TDI is connected to.

The TDI uses dual-stack IPv4/IPv6 routing technology to manage network communications and allow network hosts to communicate with the TDI.

Your display's dual port Ethernet connections enable you to have independent IP addresses for connectivity to separate networks.

Use CAT5 (or higher) Ethernet cables with unshielded RJ45 modular connectors to wire your TDI's Ethernet communications to wire your TDI's Ethernet communications

⚠ WARNING

POTENTIAL COMPROMISE OF SYSTEM AVAILABILITY, INTEGRITY, AND CONFIDENTIALITY

- Change default passwords to help prevent unauthorized access to device settings and information.
- Disable unused ports/services and default accounts to help minimize pathways for malicious attackers.
- Place networked devices behind multiple layers of cyber defenses (such as firewalls, network segmentation, and network intrusion detection and protection).
- Use cybersecurity best practices (for example, least privilege, separation of duties) to help prevent unauthorized exposure, loss, modification of data and logs, or interruption of services.
- All programming software should be kept in secured locations and should never be installed in or connected to any network other than the network for which the software is intended.
- All methods of mobile data exchange with the isolated network such as CDs, USB drives, etc. should be scanned before use.
- Laptops and other digital equipment that have connected to any other network besides the intended network should never be allowed to connect to the safety or control networks without proper sanitation.
- Minimize network exposure for all control system devices and/or systems, and ensure that they are not accessible from the Internet.
- When remote access is required, use secure methods, such as Virtual Private Networks (VPNs), recognizing that VPNs should be updated to the most current version available. Also recognize that VPN is only as secure as the connected devices.
- Communication protocols are accessible on a network, therefore best practices should be used to transfer sensitive information and to prevent unauthorized access.

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

Accessing the TDI

Enter the default credentials to access the module (Figure 2).

Username: **admin**

Password: **PowerQuest5**

(username and password are case sensitive).

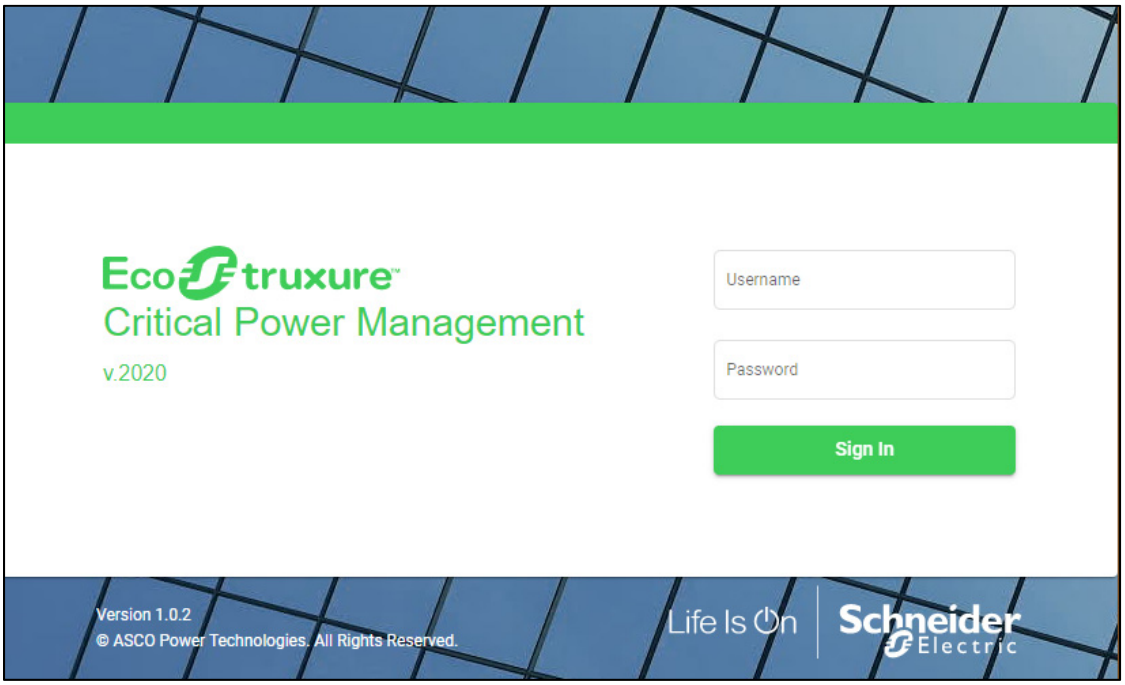


Figure 2. User Login Page

When the correct username and password is entered the Overview Screen will appear.

Interface

The TDI provides a touch interface that offers a comprehensive view of monitored ASCO Transfer Switch with the ability to dive into parameter details (Figure 3).

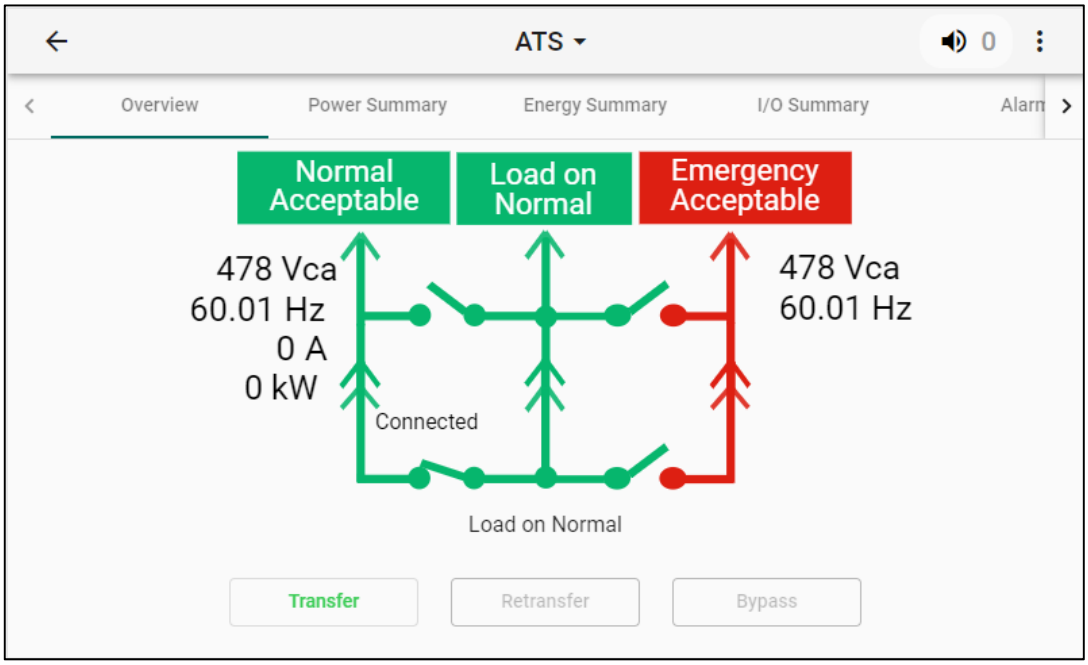


Figure 3. TDI Interface

Main Menu & TDI Navigation

After the user has successfully logged in, the Device screen will appear. The navigation menu represents the configured equipment showing the alarm, device, historical logs, library, trending and configuration.

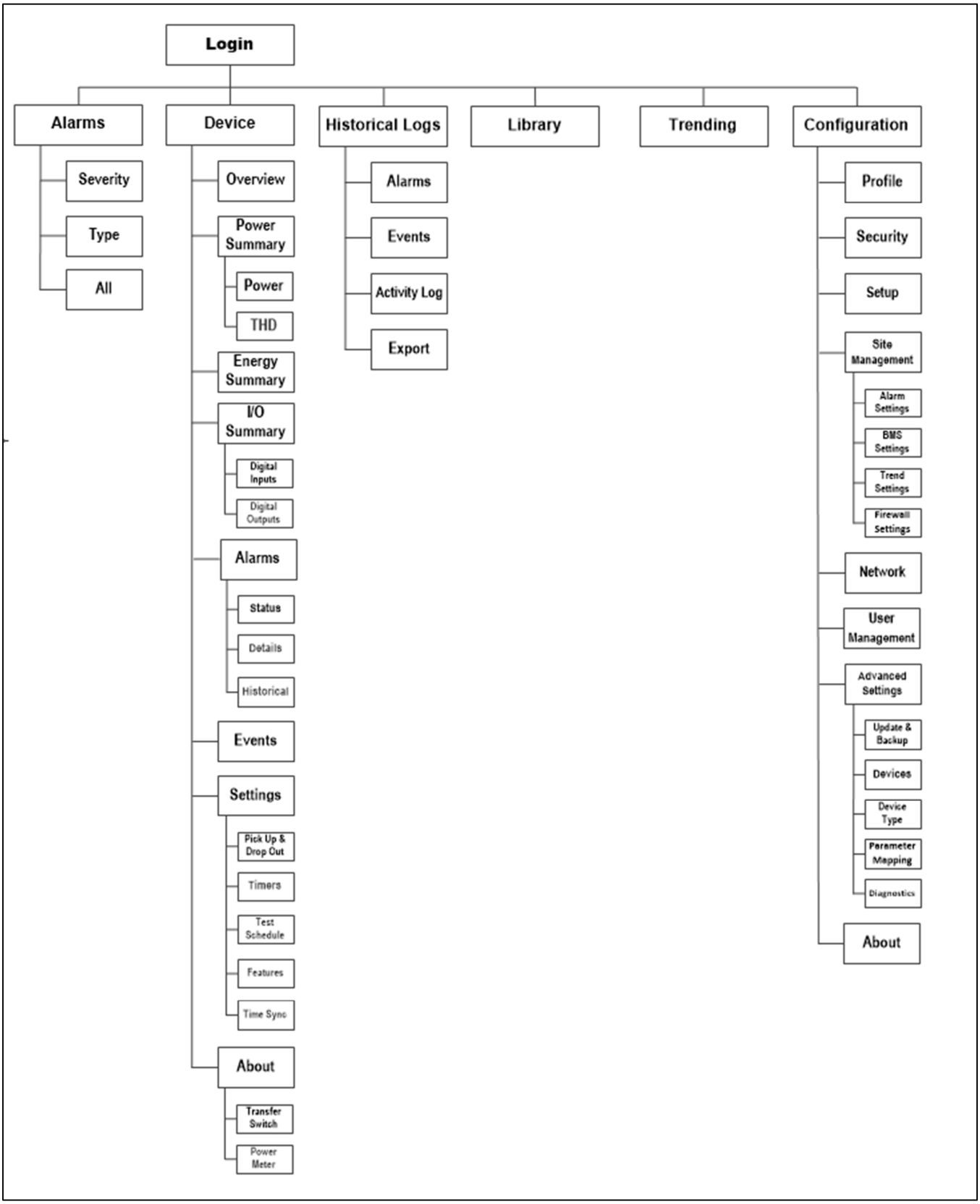


Figure 4. TD Navigation Menu

The *Main Menu* shows basic system information. It is the main menu for the sections of the system. Click the icon to navigate to a section of the system. Depending upon the accessories ordered some icons may not be active.

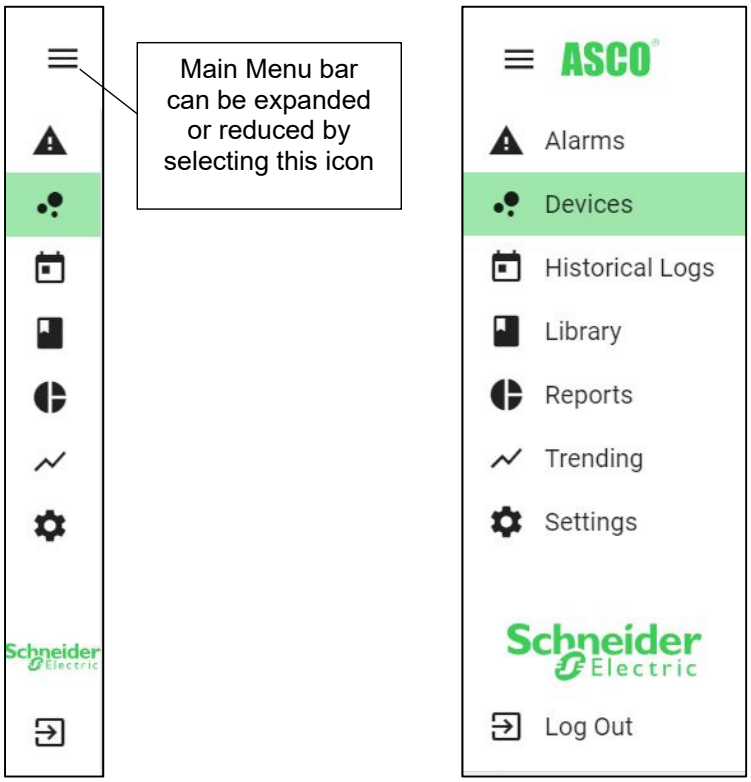


Figure 5. Main Menu

Menu item	Information Displayed	Controls
Alarms	Active Alarms can be viewed by Severity, Type Device or All	
Devices	One-line view and position of ATS, status of sources.	Load transfer retransfer or Bypass
Historical Logs	Alarms, Events or Activity Log or Export	Search, Filter , Acknowledge, Download, or Generate
Library	Operator Manual, Outline Drawings, User Manuals, or any documentation associated with connected devices	Create folder, Edit File(rename) Delete Folder
Reports	Settings- a report containing a snapshot of all system settings at point in time its generated	Delete Generate
Trending	Line graph of power, current, voltage, & frequency trends over various time intervals. Bar graph statistics of how many days sources were acceptable and number of load transfers. If a PQM is used, additional harmonic and phasor diagram of voltage and current relationships.	Configure Delete
Settings	Profile, Security, Setup, Site Management, Network, User Management, Advanced Settings, About	Edit, Change, Restart, Clear, Delete
Log out	Logging out current user	

TCP/IP Configuration

Navigation: >> Settings >> Network

To integrate the TDI onto your network for remote access to the embedded webpages, Modbus, BACNet, SNMP, and Email you will need to configure the Ethernet TCP/IP settings. To configure, go to Network Screen and select the configure icon on the Network Card which will provide a network adapter window for configuring TCP IPv4 settings (Figure 6).

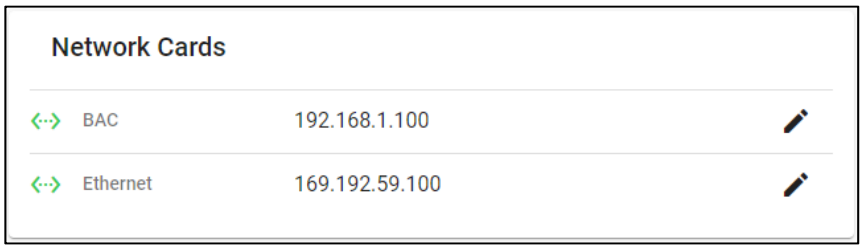


Figure 6. Network Cards

The **Network Adapter** window (Figure 7) includes these sub areas:

Network adapter information including: Adapter Name, Adpater ID, MAC Address and Connection Status.

Enabling **DHCP** (Dynamic Host Configuration Protocol) mode allows the IP address of the TDI to be set by a DHCP server – usually as part of an IS/IT administered network. This is rarely used due to the need for a network to be well defined, and is usually done using static IP addresses. In case DHCP is enabled, contact the network administrator for the assigned IP address and duration policies.

The **IP Address**, **Subnet Address** mask, and **Gateway Address** are network settings that will often be provided by the network manager. The default settings are 169.254.1.70, 255.255.0.0 and 0.0.0.0, respectively. The **DNS Server** is address that provides the names for the server. Further information on changes to these settings should be addressed by the network manager.

Figure 7. Network Adapter Info/Settings

NOTICE

Leave settings as default when possible. Usually the IP Address is all that is required to be changed.

Addresses

The MAC address is located on the outside of the TDI.

Address	Default Address	New Address
IP Address	169.254.001.70	
MAC Address	____:____:____:____:____:____.	The MAC Address cannot be changed by the user

Connecting to Transfer Switch

This section discusses required configuration for TDI to enable communication to the ASCO controller, Ethernet-IO, 5210 Digital Power Meter and/or PM8210 Power Quality Meter (Figure 8).

Navigation: >> Devices

Note: The TDI will ship preconfigured from the factory to monitor the equipment. This is intended for units that have been reset or replaced.

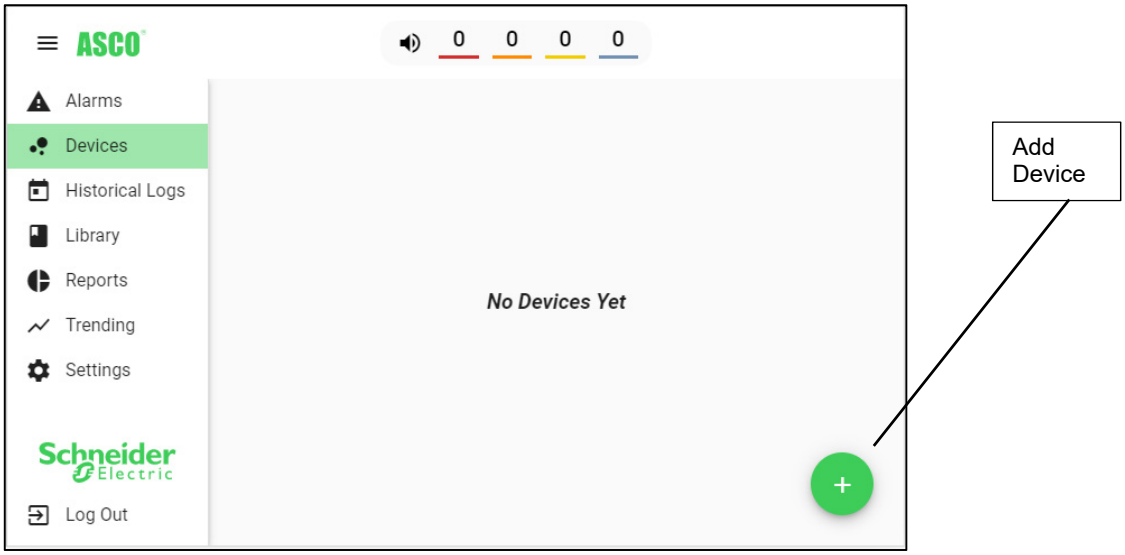


Figure 8. Devices Configuration

To configure the connected transfer switch, go to the Overview Screen and click the "+" symbol to add the device and select **ATS** as the category (Figure 9).

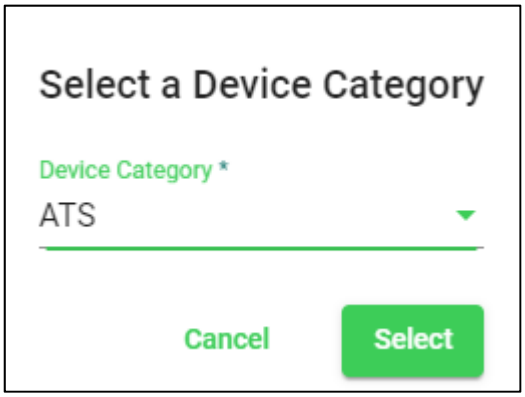
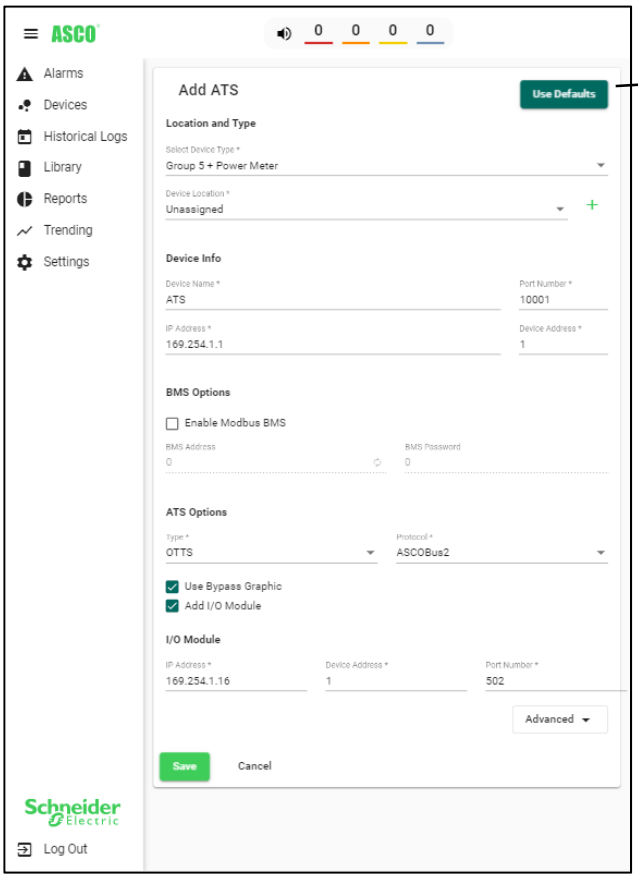


Figure 9. Device Category

Connecting to ASCO Transfer Switch Controller

If present and connected the TDI will need to be configured for an ASCO Group 5 controller with factory default address configurations. This should already be configured by the factory.

The 5170 QEM will need to be configured for concentrating the data from the Group 5 Controller and 5210 DPM that the TDI will monitor. You will need the 5170 QEM's IP address for configuration and the serial address of the devices connected to the 5170 QEM if they have been changed from the default (Figure 10).



Places default factory configuration for Group 5 Controller with load mounted Digital Power Meter and factory configurations for connecting to the IP and serial settings of the 5170 QEM.

Figure 10. Controller Connection Screen

Clicking **Use Default** auto populates the configuration with the factory default settings used by the connected devices. If the equipment is not set to factory default or you wish to manual configure please do the following.

Select the controller and meter configuration type. The 7000 Series uses the Group 5 Controller and if a meter is connected that will need to be selected as the paired with the controller, see below figure for an example (Figure 11).

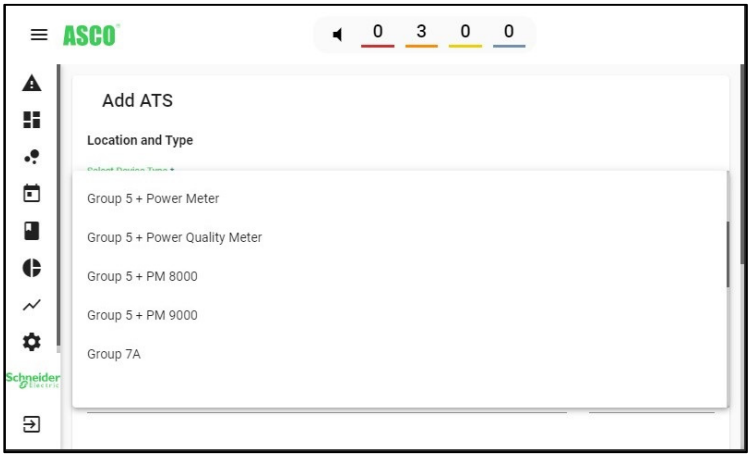


Figure 11. Controller Type

Select the device location. An already configured location can be selected from the drop down or a new one can be added by selecting the plus icon (Figure 12).

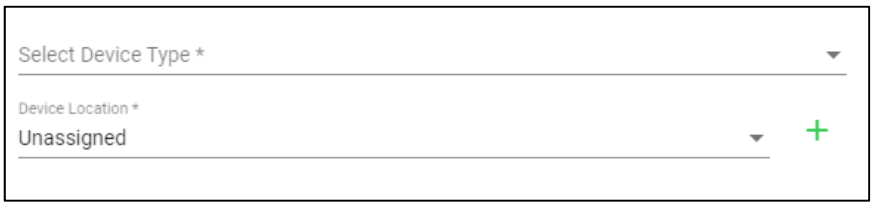


Figure 12. Controller Location

When adding a new location, a parent location can be assigned (Figure 13).

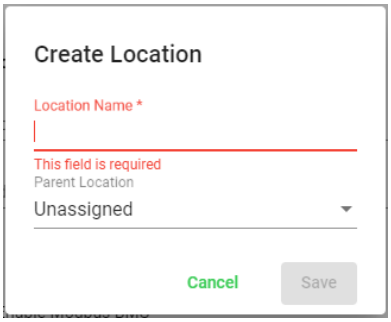


Figure 13. Create Location

Device Info is used to configure the connection the 5170 QEM (Figure 14).

Device Name provides the name that shall be displayed on the TDI screen.

IP Address is the address of the 5170 QEM, the default is 169.254.1.1.

The **Port Number** is the port that the QEM provides ASCOBus to the TDI, the default is 10001.

The **Device Address** is serial address configuration for the QEM, the default address is 1.

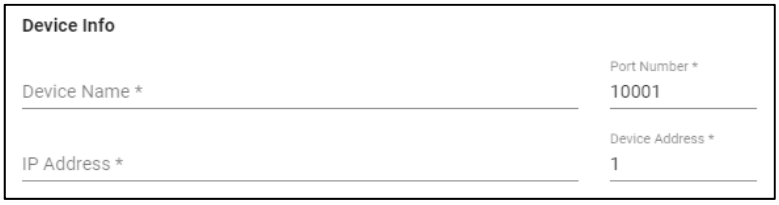


Figure 14. Device Info

BMS Option is how the configuration for providing Modbus data to a third-party monitoring system (Figure 15).

Enable Modbus BMS turns that functionality on and auto configures the **BMS Address** and **BMS Password**, those settings can be manually changed.

Figure 15. BMS Option

ATS OPTION Is the configuration for the Group 5 controller being monitored (Figure 16).

Type is used to configure the transition type.

The **Protocol** determines the what protocol the QEM provides information to the TDI. It is defaulted to **ASCOBUS**.

Use Bypass Graphic to enable monitoring and annunciation of an ASCO Bypass-Isolation Transfer Switch when equipped with a corresponding 5112 Ethernet-IO module for bypass monitoring.

Add I/O Module enables communication to the

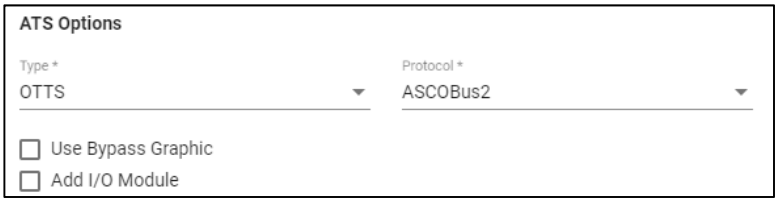


Figure 16. ATS Option

When **Add I/O Modules** is selected, the options for connecting to 5112 E-IO are available (Figure 17).

IP Address is the IP address of the connected E-IO.

Device Address is the serial address of the E-IO which is always configured for 1.

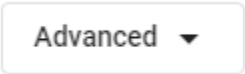
Port Number is the TCP port number of the E-IO. It is defaulted to 502.

Device

Figure 17. I/O Module

Advanced

Selecting the Advanced button provides further configuration settings (Figure 18).



PT Ratio and CT Ratio are configurable.

The name for the different sources as they appear on the screen can be configured on the **Normal Text**, **Emergency Text**, and **Load Text** fields.

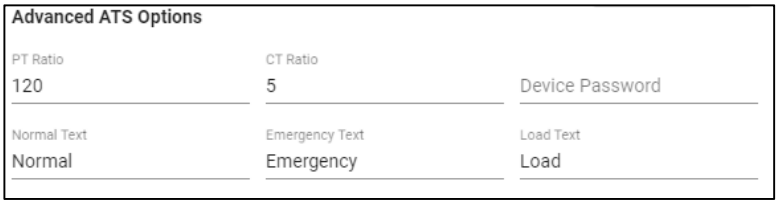


Figure 18. Advanced ATS Options

Equipment Summary provides data for the transfer switch being monitored (Figure 19).

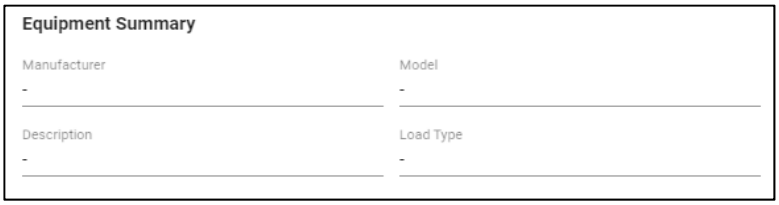


Figure 19. Equipment Summary

Ratings is used to provide details about the transfer switch. **KW Rating**, **Voltage Rating** & **Current Rating** does not affect TDI functionality (Figure 20).

Figure 20. Ratings

Maintenance Mode is used to temporarily disable alarming and email.

Disable Alarm Notification is used to permanently disable alarm notification

Figure 21. Maintenance Mode/Disable Alarm Notification check boxes

Alarm Configuration

The alerts configurations affect the notification for the TDI screen and email. Any enabling or disabling affects all notification functions for that alert. The option for alerts will vary depending on the monitoring of configured equipment (Figure 22).

When the TDI is configured for monitoring a Transfer Switch controller the below screen will be available with the alarms selectable by checking the options.

Navigation: Settings >> Site Management >> Alarm Settings

Alarms can be configured by going into the alarm screens and clicking the configuration icon which will take you to the alarm configuration screen (Figure 23).

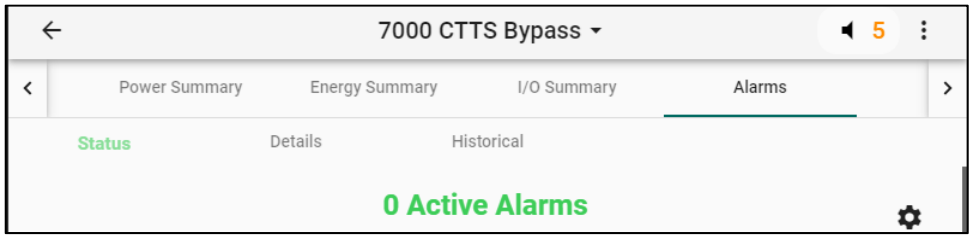


Figure 22. Alarms Status

Selecting each alarm will provide the configuration.

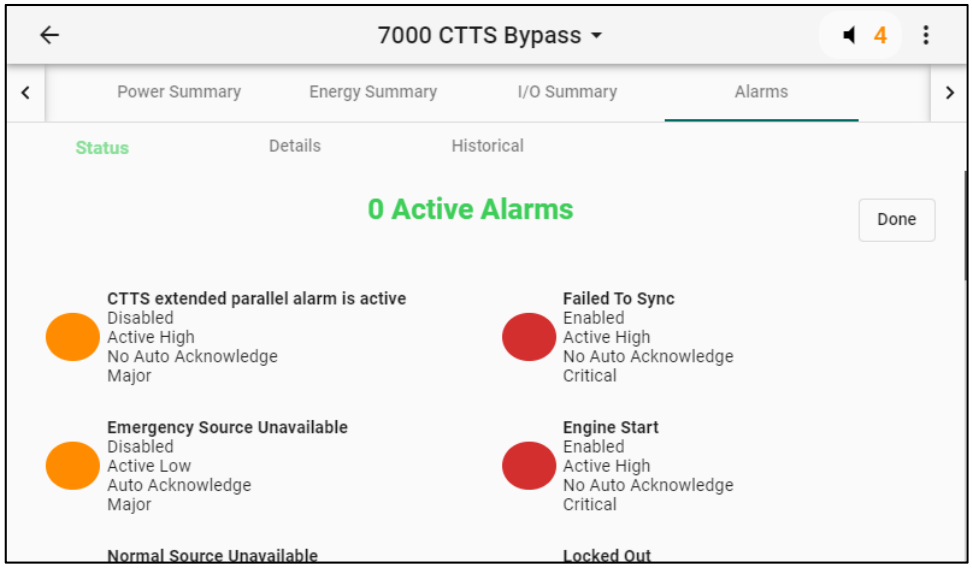


Figure 23 Alarms Configuration

Edit Alarm for each alarm parameter is configurable (Figure 24).

Enabling will provide the functionality.

Active High will set the parameter as alterable based on the Note: The equipment shall ship preconfigured from the factory to monitor the equipment. This is intended units that have been reset or replaced units.

Email Notification Configured alarms will generate an email notification.

Severity sets the level of each alarm. The severity impacts the interface and alerting functionality of each alarm on the TDI screen, Email and logs. Each alarm is placed with a factory default setting:

- **Critical** – Most severe and provides immediate email notification.
- **Major** – Medium level alarm and is placed on consolidated email notification.
- **Minor –** Low level alarm and is placed on consolidated email notification.
- **Event –** Not an alarm and is only placed on the logs. No form of notification is provided.

Display Name is the name used on the TDI screen and email notification. Alarms names have factory defaults.

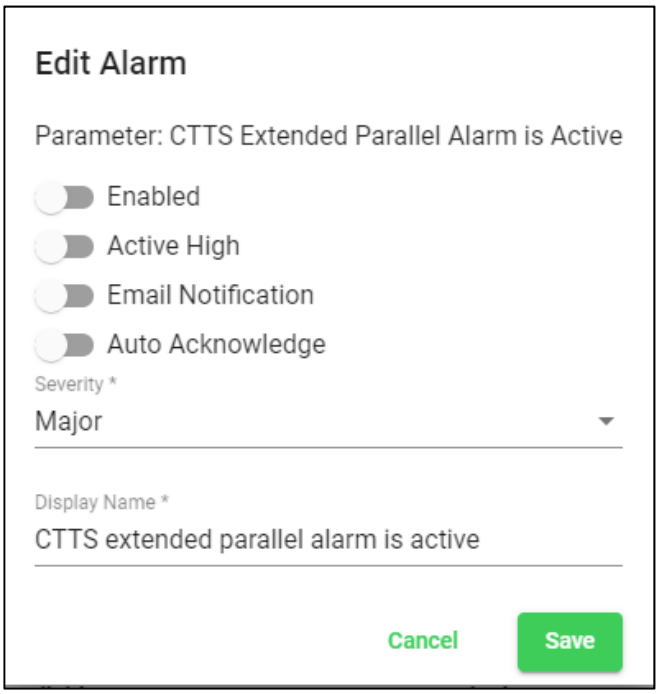


Figure 24. Edit Alarm

Email Configuration

Email (SMTP) Interface

Note: Even though the TDI provides email alerts it is recommended that the user uses the 5170 QEM for alerts.

The Simple Mail Transport Protocol (SMTP) facilitates the sending of email alerts to users when alarms occur. The TDI may be configured to provide mail through a local network email server using the server's IP address, email address and password if authentication is required. Usually the IS/IT department that handles the network servers needs to be contacted to connect to the local mail server.

TDI Recipient Support

The TDI can send emails to all configured users. This is done within the **User Management Screen**. All the emails sent include the same text and alert data: *name, location, alarm type*, and *time*. Emails are sent based upon alert that is selected from the alarm configuration.

Email Configuration and Interface

For the email to work, the TDI must be connected/configured to a host device (router, gateway server) actively connected to the Internet. You need to enable SMTP mode and assign the IP address of the host device as the gateway IP address of the TDI under the **Network Screen.**

Emails are used for providing alarm notification to the configured users (Figure 25).

Navigation: >> Settings >> Setup

Mail Server is used to connect to an email server or email service that the TDI then pushes to configured recipients.

Server Credentials are required the configuration is used to enter the User Name and Password.

Sent From Address is the email address that the recipients will get the address from.

SMTP Auth Required enables the entry of user name and password.

TLS Enabled is turned on when an email service or server that requires certificates is used.

Figure 25. Email Configuration

By selecting **Edit Mail Server** a popup is provided to enter the **Mail Server Address** and **SMTP Port Number** (Figure 26).

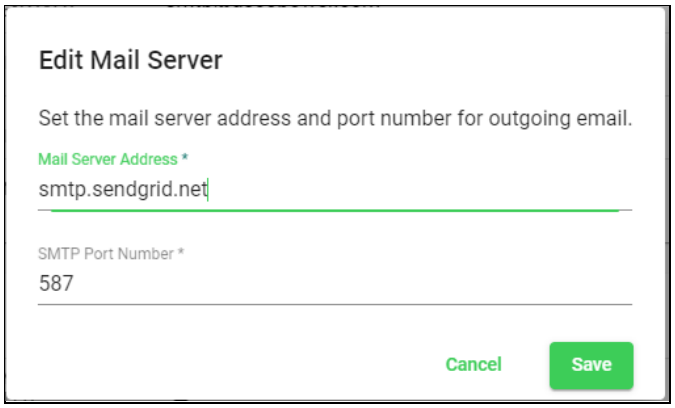


Figure 26. Edit Mail Server

By selecting **Server Credentials** a popup is provided to enter the **Mail Server Username** and **Mail Server Password** (Figure 27).

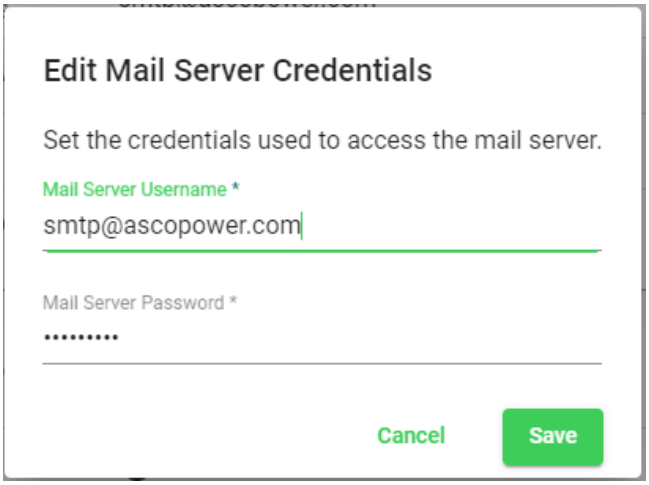


Figure 27. Server Credentials

Trend Configuration

Navigation: Settings >> Site Management >> Trend Settings

Parameter for Modbus monitoring are configured in this screen (Figure 28).

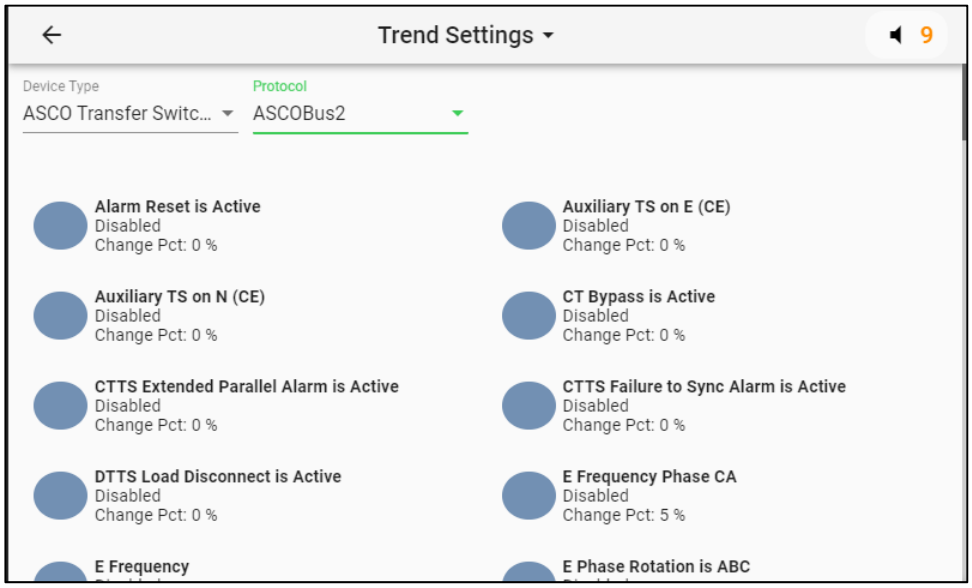


Figure 28. Modbus Trend Parameters

Selecting a parameter will provide the Edit Trend Parameter popup for configuration (Figure 29).

Enabled initiates trending of a parameter.

Daily Parameter TBD

Change % determines the change percentage that results in the parameter logging.

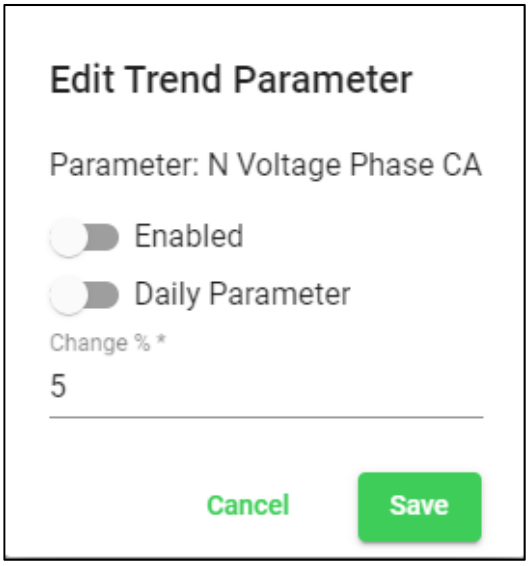


Figure 29. Edit Trend Parameter

BMS Configuration

Navigation: Settings >> Site Management >> BMS Settings

Parameter for Modbus monitoring are configured in this screen (Figure 30).

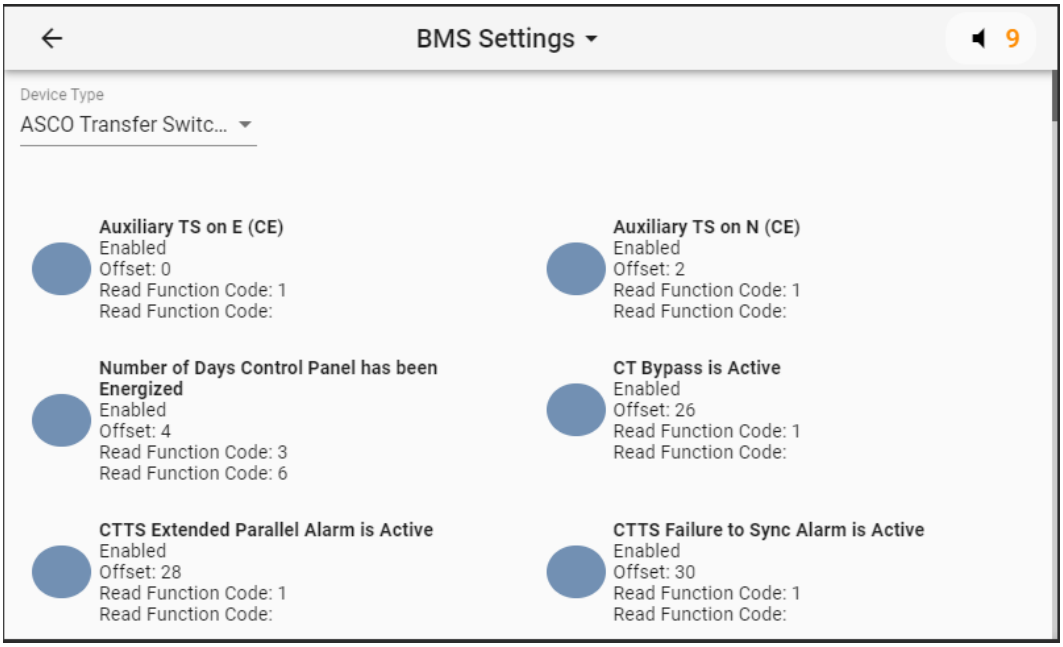


Figure 30. BMS Settings

Clicking on each parameter gives you the ability to make settings changes. A user can enable or disable a parameter (Figure 31).

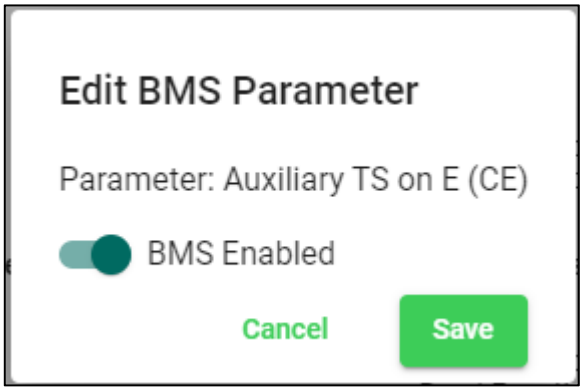


Figure 31. Edit BMS Parameter

Protocol Configuration

Modbus Protocol

Note: Even though the TDI provides Modbus support it is recommended that the user uses the 5170 QEM.

TDI supports Modbus once you have enabled Modbus. The TDI can act as a Modbus server to provide data to a Modbus client.

Accessing Modbus Data

Accessing parameters by Modbus requires three settings over TCP/IP: the IP Address, the TCP Port device address, and the Modbus Register number.

The IP Address is required to allow a master the ability to communicate to the TDI.

BACnet Protocol

TDI supports BACnet once you have enabled BACnet.

The TDI can act as a B server to provide data to a BACnet client. Because the TDI acts as a data concentrator, the data from devices are constantly updated and available in the TDI.

Accessing BACnet Data

Accessing parameters by BACnet requires three settings over TCP/IP: the IP Address, the TCP Port device address, and the BACnet Register number.

The IP Address is required to allow a master the ability to communicate to the TDI.

Simple Network Management Protocol (SNMP)

Note: Even though the TDI provides SNMP support it is recommended that the user uses the 5170 QEM.

The Simple Network Management Protocol (SNMP) was created to monitor and manage network devices and hosts. Because of its simplicity it has also been used to monitor other devices (like the TDI). SNMP is disabled by default.

A Management Information Base (MIB) file allows a SNMP client the ability to understand the structure and availability of the managed data in a network device (in this case, the TDI). The MIB file is available through ASCO Customer Care and the ASCO Power Technologies public website.

TDI Support

The TDI acts as a SNMP agent, providing data to a SNMP Manager on demand. The TDI supports the GET, GETNEXT, GETBULK, TRAP, and RESPONSE commands (SNMP v1 and v2). The TDI does not support the SET or INFORM commands and it does not support SNMP v3.

SNMP Configuration and Interface

NOTICE

You can configure a maximum of three (3) SNMP managers. All the managers must have the same settings for GET & TRAP ports; as well as with their GET & TRAP community names.

Configuring the SNMP master to view traps is master systems dependent and needs the following information:

- The IP address of the TDI
- The MIB file:

The TDI and the SNMP master(s) should be on the same network.

NOTICE

Communication protocols are accessible on a network, therefore best practices should be used to transfer sensitive information and to prevent unauthorized access.

Monitoring Protocols Configuration

Navigation: >> Settings >> Setup

Protocols are used to provide data to third party monitoring system. The user can individually select "Enable" or "Disable" to achieve the desired functionality (Figure 32):

Modbus Enabled turns on the Modbus protocol.

BACnet Enabled turns on the BACnet protocol.

SNMP Enabled turns on the SNMP protocol.

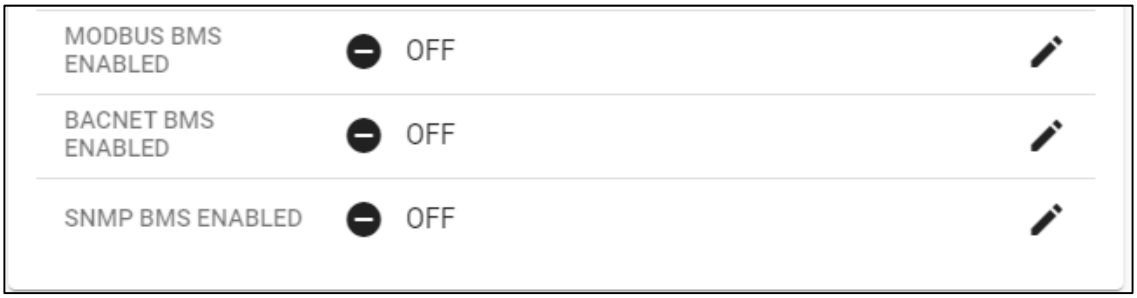


Figure 32. Monitoring Controls

User Management and Security

Overview

Your ASCO product is equipped with security-enabling features.

These features arrive in a default state and should be reviewed and modified for your specific requirements. Please note that disabling or modifying settings within the scope of these individual features can impact the overall security robustness of the device and ultimately the security posture of your network in either positive or negative ways. Review the security intent and recommendations for the optimal use of your device's security features.

Products are hardened to increase security robustness. This is an ongoing process consisting of secure development practices, inclusion of security features and testing at our security test facilities. Following system hardening best practices is also necessary to help ensure your overall system security.

Compliance

ANSI/ISA 62443 (formerly ISA-99) consists of standards, technical reports and related information that define procedures for implementing secure Industrial Automation and Control Systems (IACS). This collection was additionally submitted to IEC as input for the development of IEC 62443.

IEC 62443 defines cybersecurity standards for multiple industries and lists cybersecurity protection methods and techniques. Certification according to IEC 62443, provided by independent agencies, depends upon not only the standards but also the certifying agency's process including test methods, surveillance audit policy, public documentation policies, and additional aspects of their particular process.

Security Features

Your device comes with security features that you can configure to help protect against unauthorized configuration and access to your device's data through its user interfaces or communications.

Authentication

The TDI or mobile application includes 4 levels of user privileges and authentication verified independently and locally.

The TDI supports LDAP & IT Active Directory authentication services, additionally coordinating authentication with an ASCO critical power management system (if available) to simplify and manage user credentials.

128-Bit Encryption

The communication link between the display and the ASCO 5170 Quad Ethernet Module utilizes the Advanced Encryption Standard (AES) 128-bit encryption to protect communications between the two devices.

Security recommendations and best practices

Recommended security configuration settings help improve security on your display.

- Ensure that your TDI requires a password for configuration through the display or communications
- Configure users and passwords to help control access to your display.
- Configure the protocol lockouts to help minimize access to your TDI.
- Enable advanced security on your TDI.
- Disable communications for all unused network ports and protocols.
- Change the connection ports from their default values wherever possible.
- Save a copy of your display's settings in a secure location for future reference or troubleshooting.
- Set your display's time synchronization source to a secure communications port and disable time synchronization on all other ports.

Resetting password

The following recommended password best practices help to improve security on your TDI.

- Change your display's password from the default value.
- Make your display's passwords as complex as possible.
  NOTE*: Make sure that the user password you enter is compatible with the software used to communicate with your device.*
- Schedule regular changes to your display's passwords.
- Record your display's passwords in a secure location.

HTTPS

Certificates

The display supports the secure hypertext transfer protocol HTTPS for remote mobile applications through self-certification. .

Active Directory Service Configuration

Navigation: >> Settings >> Setup

Configuration for network configured users to access the TDI (Figure 33).

Enable Active Directory turns on this function.

Server Address will be the network address for the server.

Port is the port number on the TDI that the active directory server is able to access.

Base DN is used to tell the TDI where to look for credential information on the active directory server.

SSL Enabled turns on encryption for remote clients.

Authentication Required enables the authentication requirement for the connection to the server.

Administrator Group, **Supervisor Group**, **Control Group** & **Monitoring Group** is used to produce the list of groups available on the directory server.

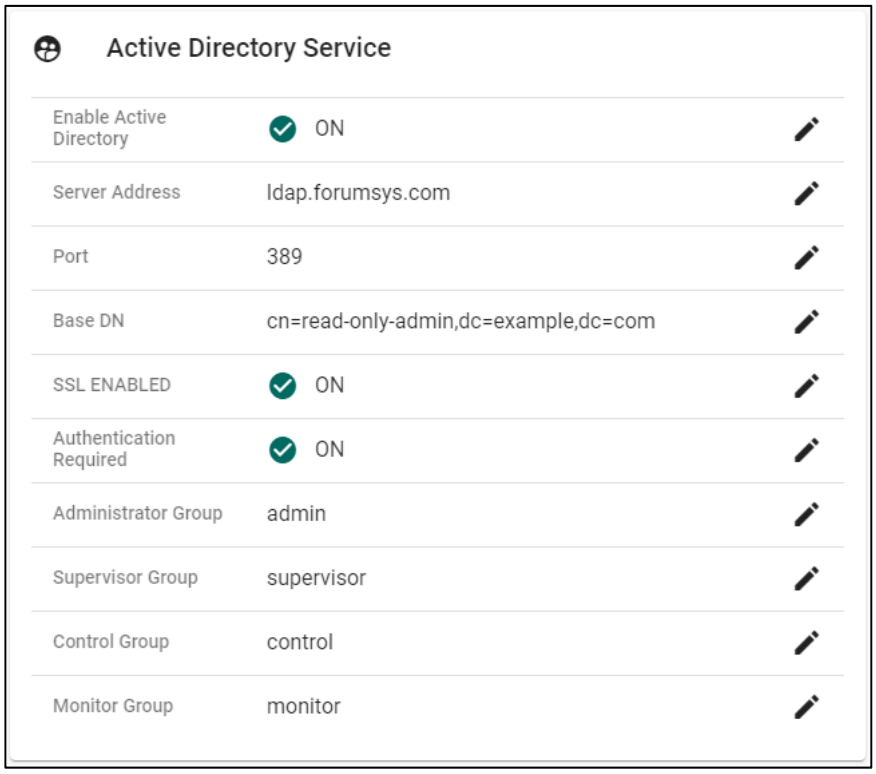


Figure 33. Active Directory Service

Clicking on each group will give the ability to enter the **AD Authentication User Name** and **AD Authentication Password** (Figure 34)**.**

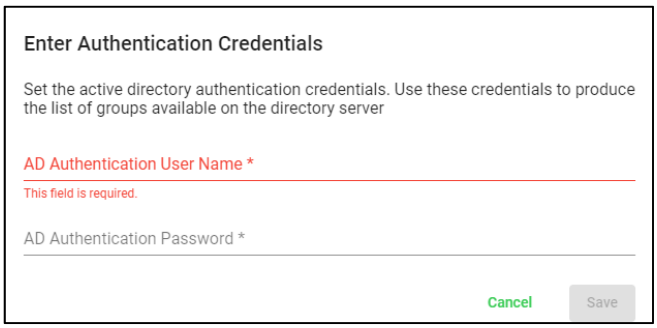


Figure 34. Enter Authentication Credentials

User Management

Navigation: >> Settings >> User Management

The User Management screen is used to add, delete and configure other users besides the user that is already signed in (Figure 35).

Selecting the **+** icon will add a new user.

The pencil icon will allow a user to configure an existing icon (Figure 36).

The delete icon will remove Status provides information regarding the two factor authentication.

Signing In provides **Password** change option and enabling of **2 Factor Authentication**.

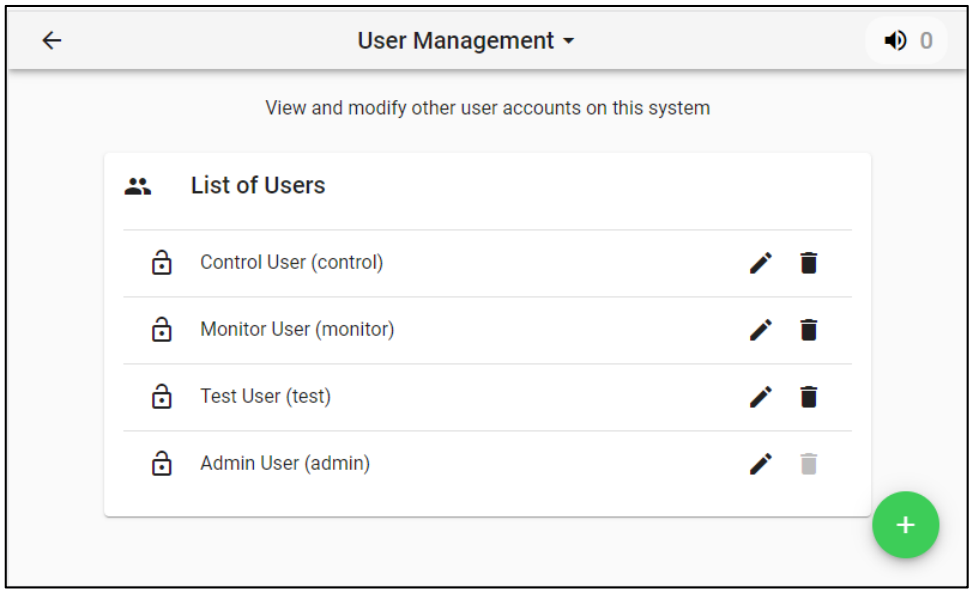


Figure 35. User Management

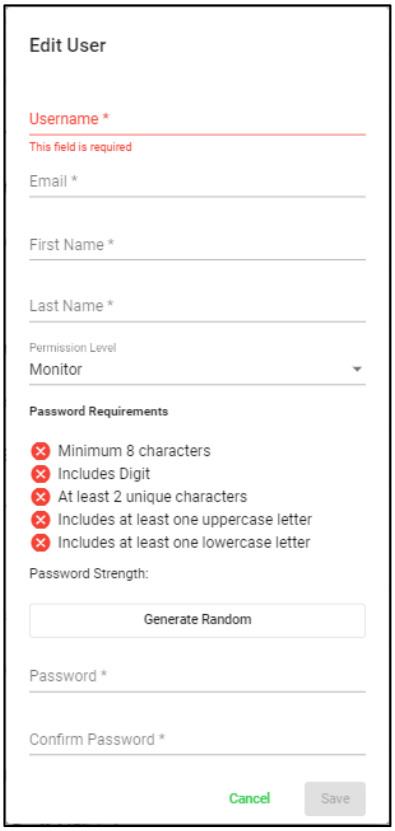


Figure 36. Edit User

Access Levels and Passwords

The TDI has three different levels of web page user access privileges. The importance of these levels varies based on the interface method that is selected. The TDI is shipped with three preset usernames and default passwords. The three usernames cannot be changed. All three passwords can be changed by the **admin** level user. All three users (monitor, control, admin) can change their own password.

All TDI default passwords for different access levels must be changed upon initial login. When the Change User Password screen appears, the new password must be 8 to 16 characters in length, and be a combination containing at least one each of the following: a-z, A-Z, 0-9 and special characters (-=[]\;,./~!@#$%^&*()_+{}|:<>?). Choose a password that is easy to remember but hard to guess.

If a user enters a wrong password three times, that username is locked out for three minutes.

Username (lower case) cannot be changed	Access Level	Default Password (upper case)
monitor	View access: can only view status and webpages, and change monitor password.	N/A
control	Control access: in addition to monitor priveledges, control users can transfer, retransfer and bypass time delays if control has been enabled by the administrator.	N/A
supervisor	Full access: users can set passwords, upgrade firmware, change TDI and other various settings. User can not control the transfer switch	N/A
admin	Full access: in addition to control and monitor priviledges, admin users can set passwords, upgrade firmware, change TDI and other various settings.	PowerQuest5

NOTICE

Be sure that users to whom you give control access are those persons that you want to be able to control the electrical system.

How to Change a Password

Navigation: >> Settings >> User Management

While in *Edit Mode* for the Configuration Screen, select the Advanced tab and click the ***Change User Password*** button (Figure 37). In the ***Change User Password*** window), type the *Username* (admin), the *Old password*, the *New password*, and *Confirm New* ***Password***. Then click **Save**, and a message should indicate that the password was changed. Passwords will also be resettable from the hard-reset button located on the module hardware itself.

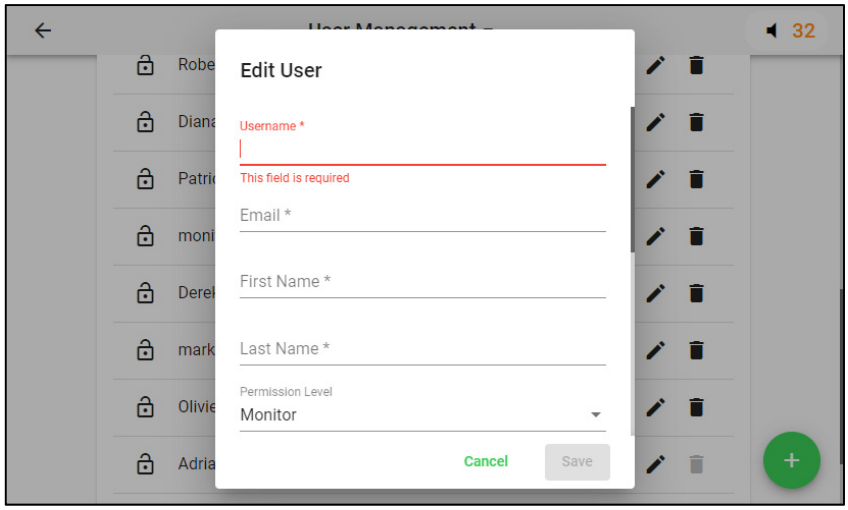


Figure 37. Change Password

Security Configuration

Navigation: >> Settings >> Security

Used to configure the access of the currently logged in user: (Figure 38).

Status provides information regarding the two factor authentication.

Signing In provides **Password** change option and enabling of **2 Factor Authentication**.

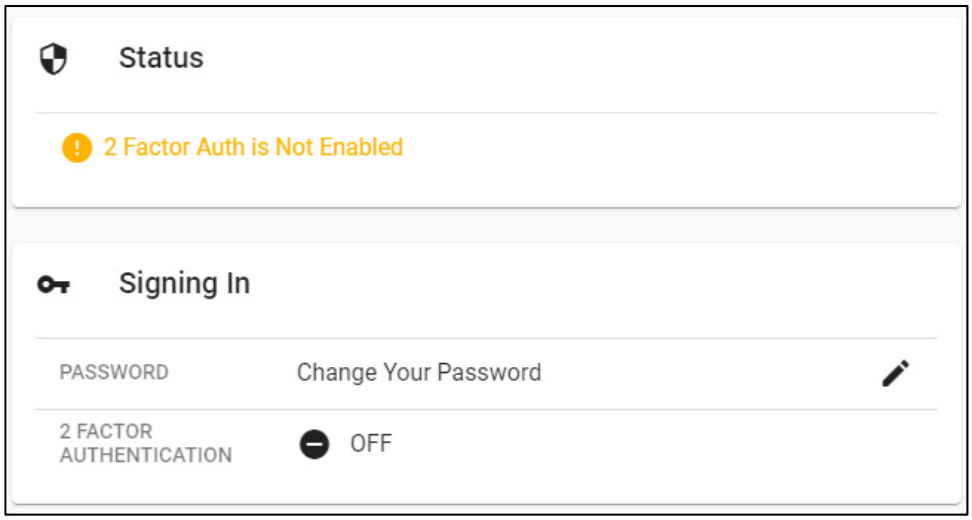


Figure 38. Security Configuration

Selecting the Password Configuration provides the currently logged in user the ability to change the password (Figure 39).

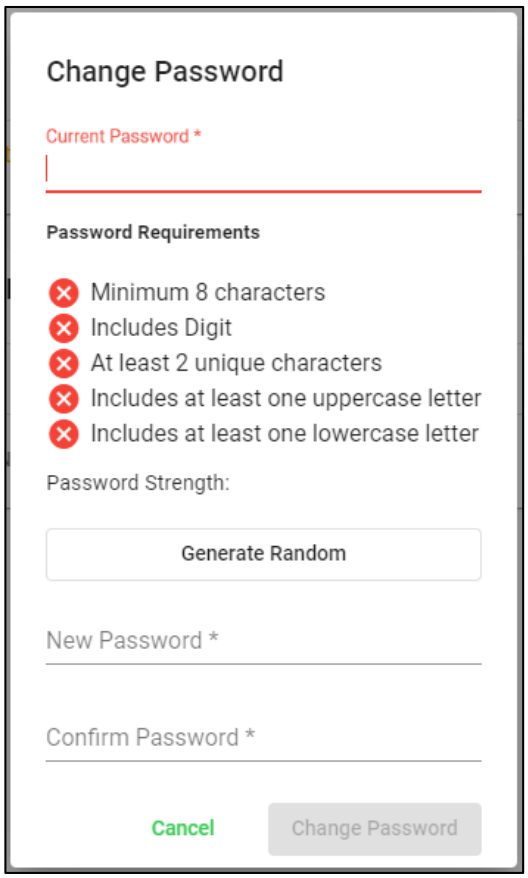


Figure 39. Change Password

Selecting **Multi Factor Authentication** provides a QR code for login that requires the user to enter a quote with a phone app (Figure 40).

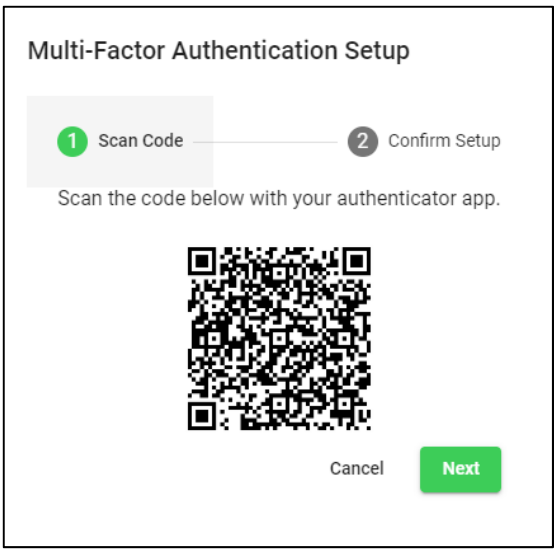


Figure 40. Multi Factor Authentication-QR Code

After you scan the phone with the authentication app, a number key will be generated. Click NEXT and you'll be prompted to enter the authentication code (Figure 41).

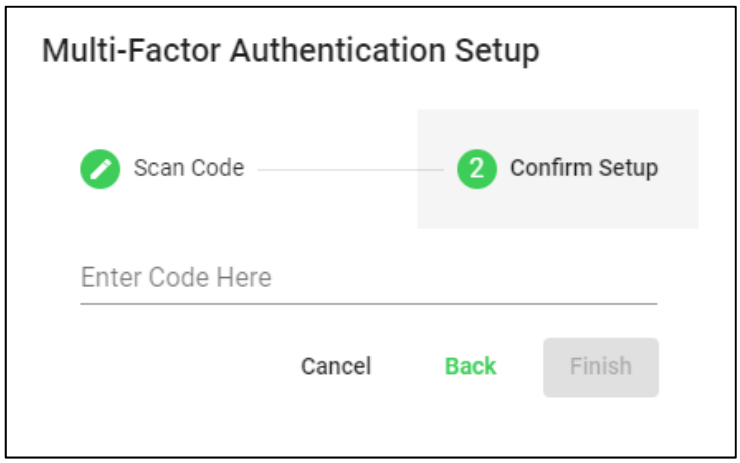


Figure 41. Multi Factor Authentication-Confirm Setup

Once two factor authentication is enabled the status will change as shown below (Figure 42).

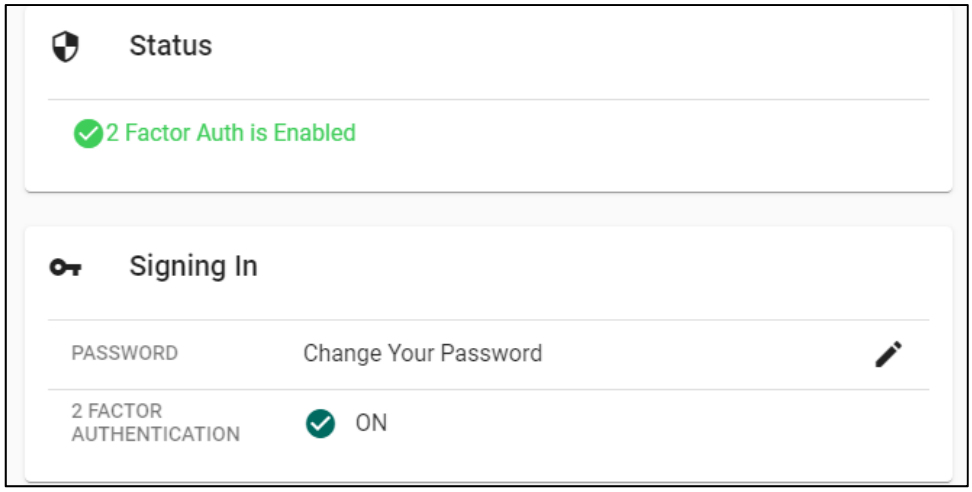


Figure 42. 2 factor authentication enabled

Once the Multi-Factor is enabled the user will be prompted to provide the authentication code from the authenticator app (Figure 43).

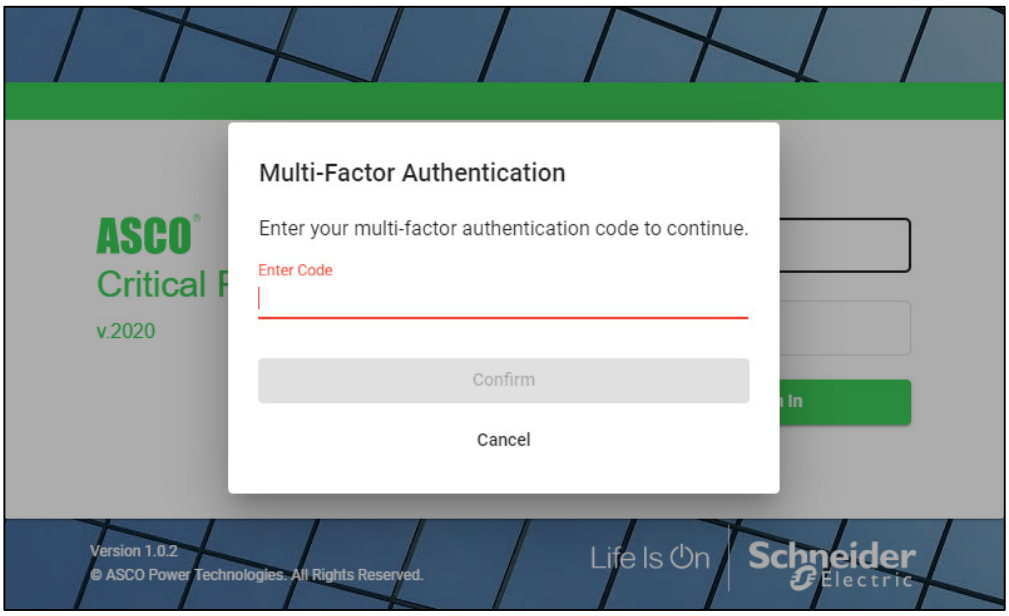


Figure 43. Authentication Enter code popup

Inactivity Timeout Configuration

Navigation: >> Settings >> Setup

When users are inactive the users are automatically logged out. The timer for the inactivity is configurable for the different access levels (Figure 44).

Figure 44. Inactivity Timeout Screen

Selecting the configuration of a role will give the user the ability to configure the timeout for each user in minutes (Figure 45).

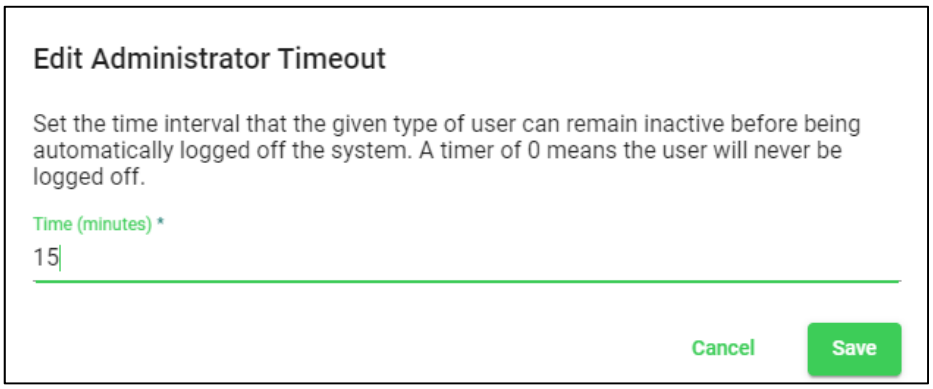


Figure 45. Edit Administrator Timeout

Data Encryption

Navigation: >> Settings >> Setup

The **AES Mode** encryption port and the ability to enable AES Encryption is used in conjunction with an ASCO Power Technologies monitoring solution, BMS, or SCADA system to add additional security. Both the TDI and the Ethernet master must use the same 128 bit encryption key and communicate using the same port. Usually, particularly on LANs, this feature is not used. On some international non-encrypted versions these settings will not be available. The key is generated by an external monitoring system and loaded into the TDI. This function is disabled by default and to enable, go to the Ethernet Module Configuration Screen in Edit Mode and select the IPv4 tab and enable for the required TCP port. To configure the AES Key, go to the Ethernet Module Configuration Screen in Edit Mode and select the Advanced tab (Figure 46).

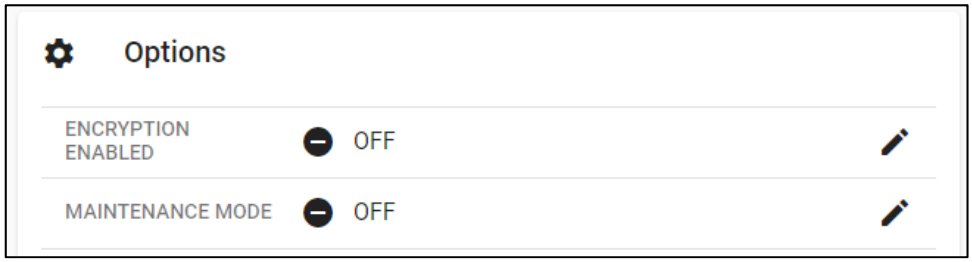


Figure 46. Data Encryption Options

Customer Configuration

Navigation: >> Settings >> Setup

This screen configures user screens:(Figure 47).

Customer Name is displayed on reports. **Site Name** is displayed on the reports.

Customer Address is displayed on the reports. **Customer Logo** is displayed on the reports.

Figure 47.Customer Configuration

System Configuration

Navigation: >> Settings >> Setup

This screen configures user screens (Figure 48):

Maintenance Mode is used to temporarily disable alarming and email.

Encryption Enabled enables AES-128 for the TDI.

Reload Interface resets the screen and will require a reload.

Reload All Clients performs a reset on the TDI screen and any remote user.

Reset To Factory Default will restore all settings to factory defaults.

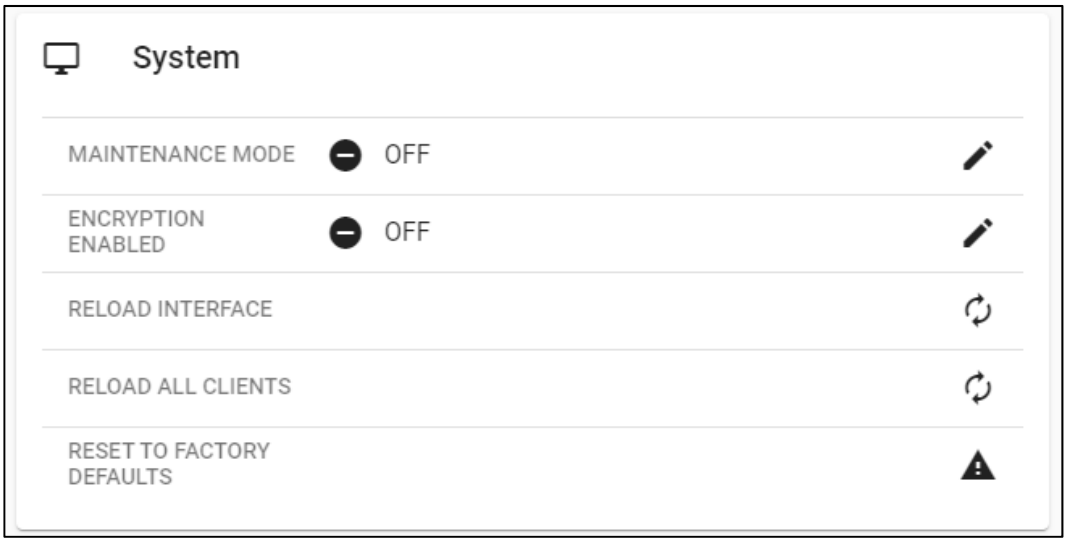


Figure 48. System Configuration

Database Backup Schedule Configuration

Navigation: >> Settings >> Setup

Stores the database (Figure 49):

Modbus Enabled turns on the Modbus protocol.

BACnet Enabled turns on the BACnet protocol.

SNMP Enabled turns on the SNMP protocol.

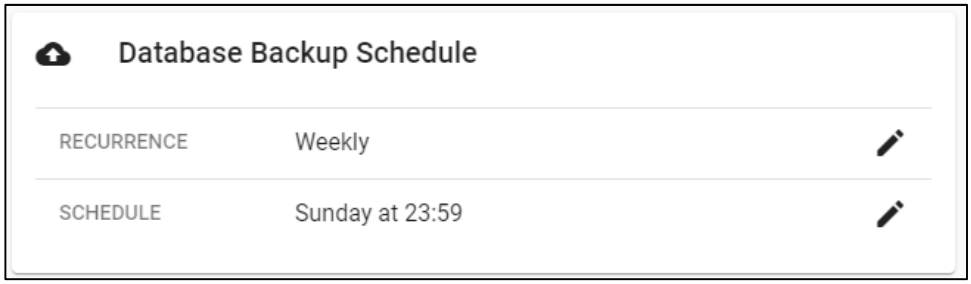


Figure 49. Database Backup Schedule

Login Screen

The entering of login password and branding will be done on this screen (Figure 50).

It also shows branding and application version number.

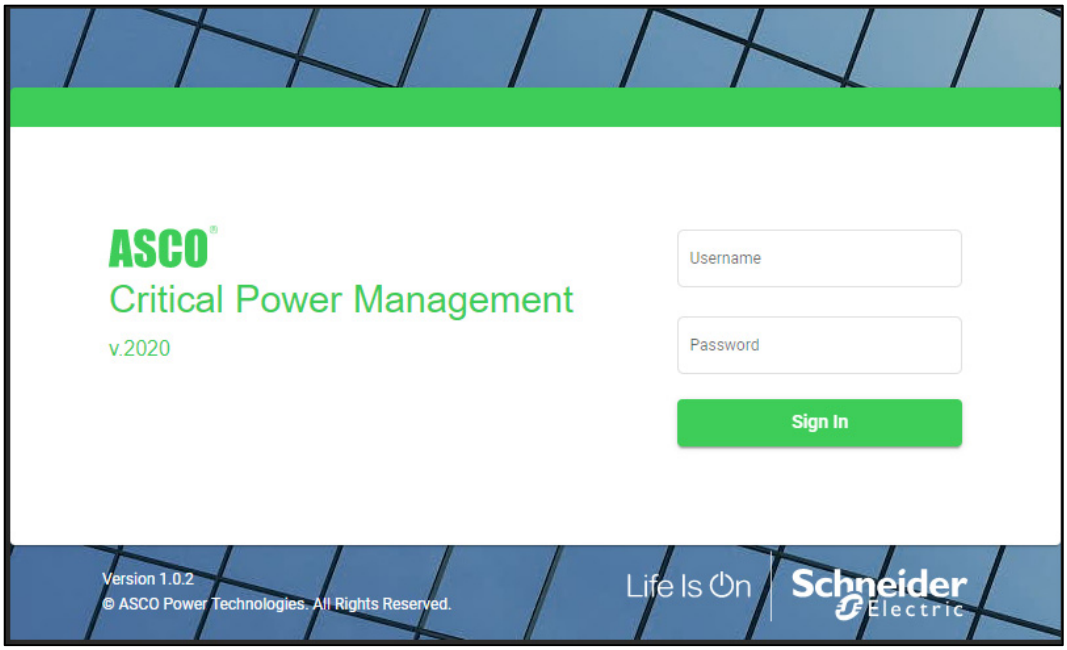


Figure 50. Login Screen

Opening Screen

The opening screen is the switch one-line diagrams of devices (Figure 51) The column to the left is the Main Menu bar and its options (see Main Menu Screen for details). The devices available can be viewed by scrolling down. To view more detailed device information for a specific device, click on the one-line diagram.

To Add Device, select “+”

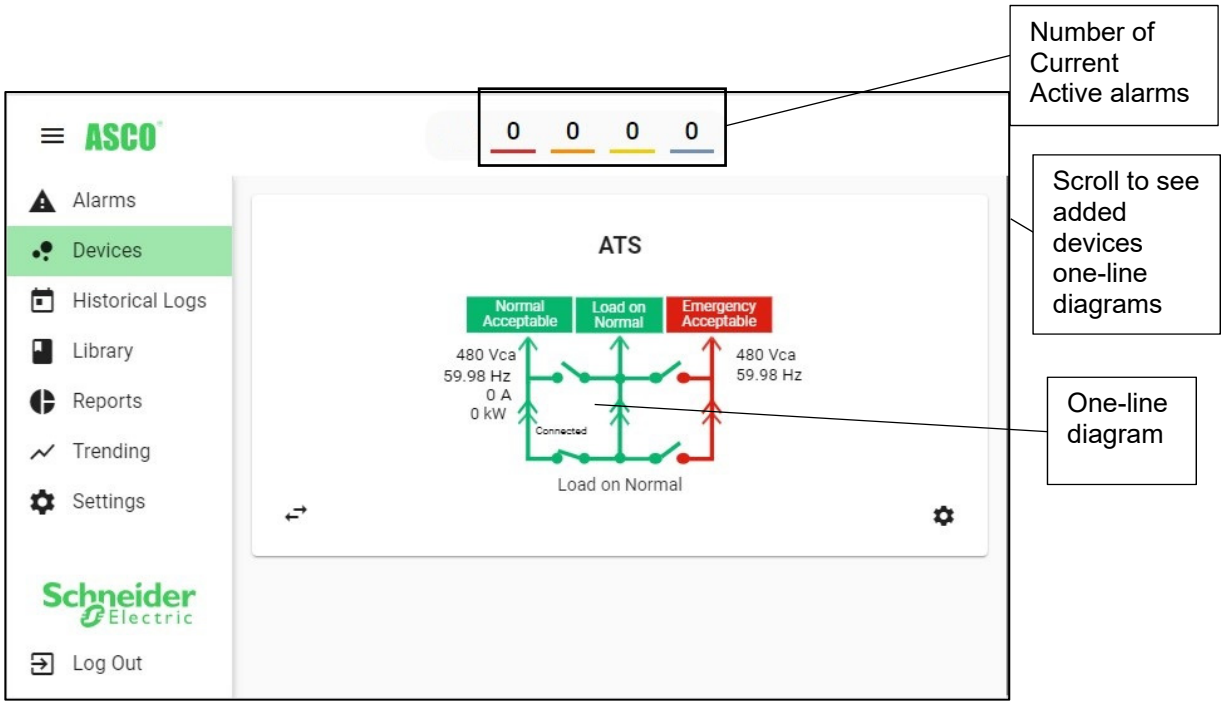


Figure 51 Login Screen

Devices Screen

The Devices Screen shows the graphical representation of the transfer switch and provides the ability to transfer, retransfer and time delay bypass (Figure 52).

This is the default screen when a user logs in.

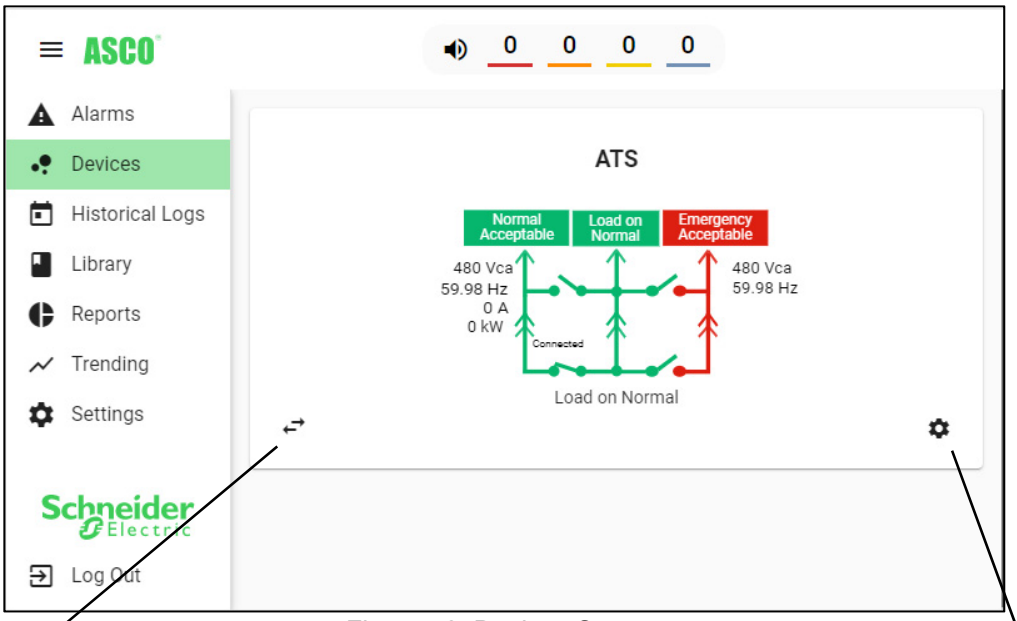
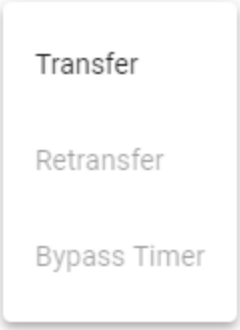
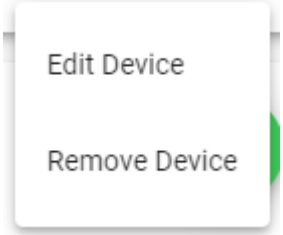


Figure 52. Devices Screen

Clicking the ⇄ icon will provide the control operations options.

Clicking ⚙ the icon provides the user the ability to configure or delete the monitored transfer switch.





Details Screen

The details screen provides a depth of information categorizing the information into different tabs.

The menu includes seven tabs: Overview, Power Summary, Energy Summary, I/O Summary, Alarms, Events, Settings and About. Click on the tab to navigate a section based upon Clicking on the one-line diagram will display basic system information of the transfer switch or the accessories available.

Overview Tab

This tab provides data as shown on the overview screen. Provides a oneline diagram that represents an ASCO Transfer Switch and a Bypass-Isolation Transfer Switch. The user will be able to transfer, retransfer and bypass an active time delay.

Select the Overview tab to show device overview and Key Indicators details for transfer switch or other devices on the TDI. Another device can be selected by clicking the drop-down arrow next to the device name and choosing from the list.

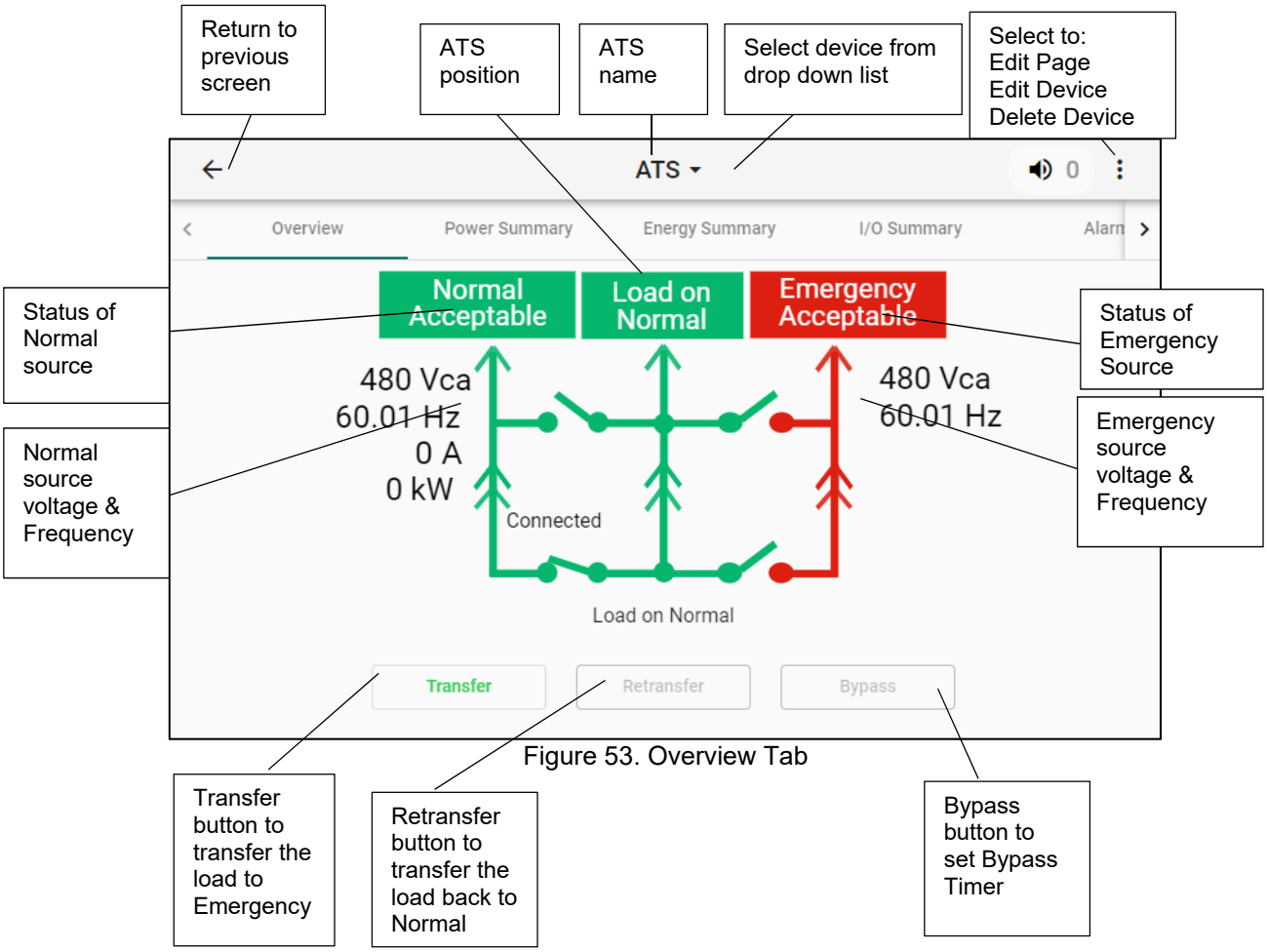


Figure 53. Overview Tab

Note: Be sure that conditions are safe for load transfer, retransfer or bypass. If you do not have Admin access level, you will have to enter a control password.

Item	Content
Device Overview	Shows a one-line diagram of the transfer switch and its details. It includes the status of the sources (voltage & frequency) and the load. The load can be transferred to the other source, if available, by tapping Transfer button.
Key Indicators	Shows parameters and values of selected device (ATS, ATB, Controller, Gen, Power Manager, Power Meter or PQM

Power Summary Overview Tab

Power Summary Overview tab provides data for power, current and voltage parameter (Figure 54). Click the Power Summary tab to show details in sub-tabs: Power and THD (total harmonic distortion).

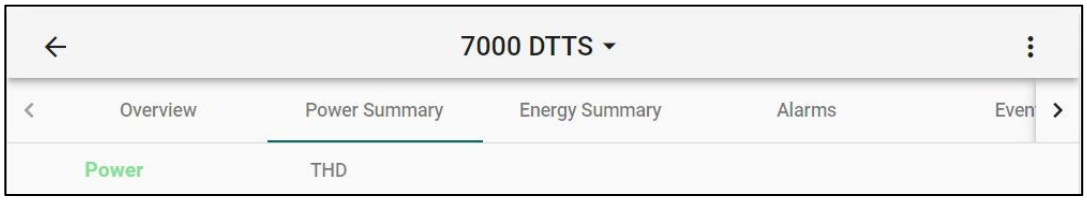


Figure 54. Power Summary Overview Tab

Item	Content
Power	Shows key load details including power, current and voltage. This includes PF, apparent power (KVA), KVAR, power factor
THD	Shows the THD in percent for current and voltage on each phase. (Power Meter or Power Quality Meter is required)

Energy Summary Tab

Energy Summary tab to show the energy consumption and kW demand screen (Figure 55). The energy is displayed in KWH, KVAH, KVAR for both normal and emergency sources and total since a specific date and time. The maximum KW demand is indicated with the date and time it occurred. Admin users can reset the energy consumption, maximum kW demand, date, and time, if necessary, by clicking reset icon.

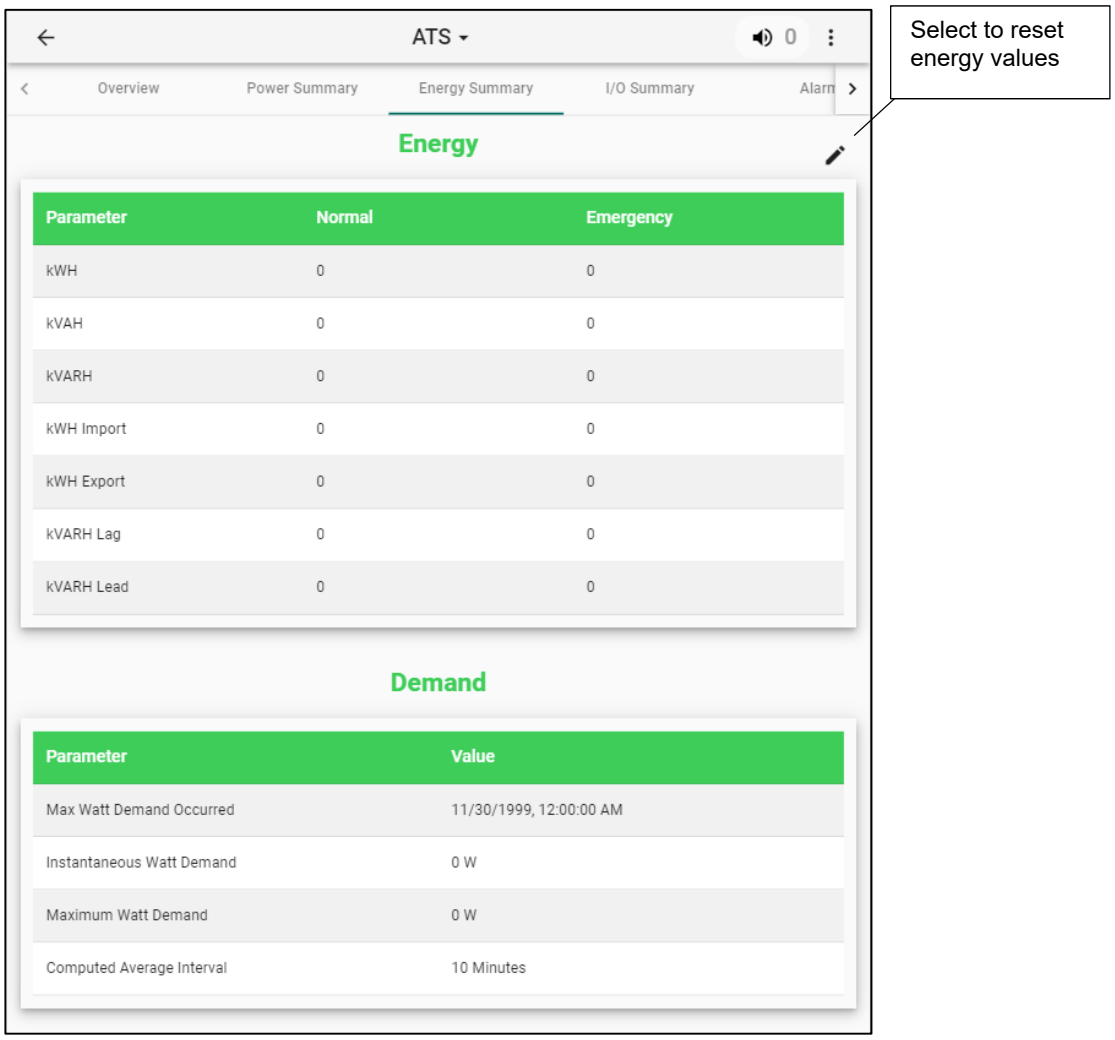
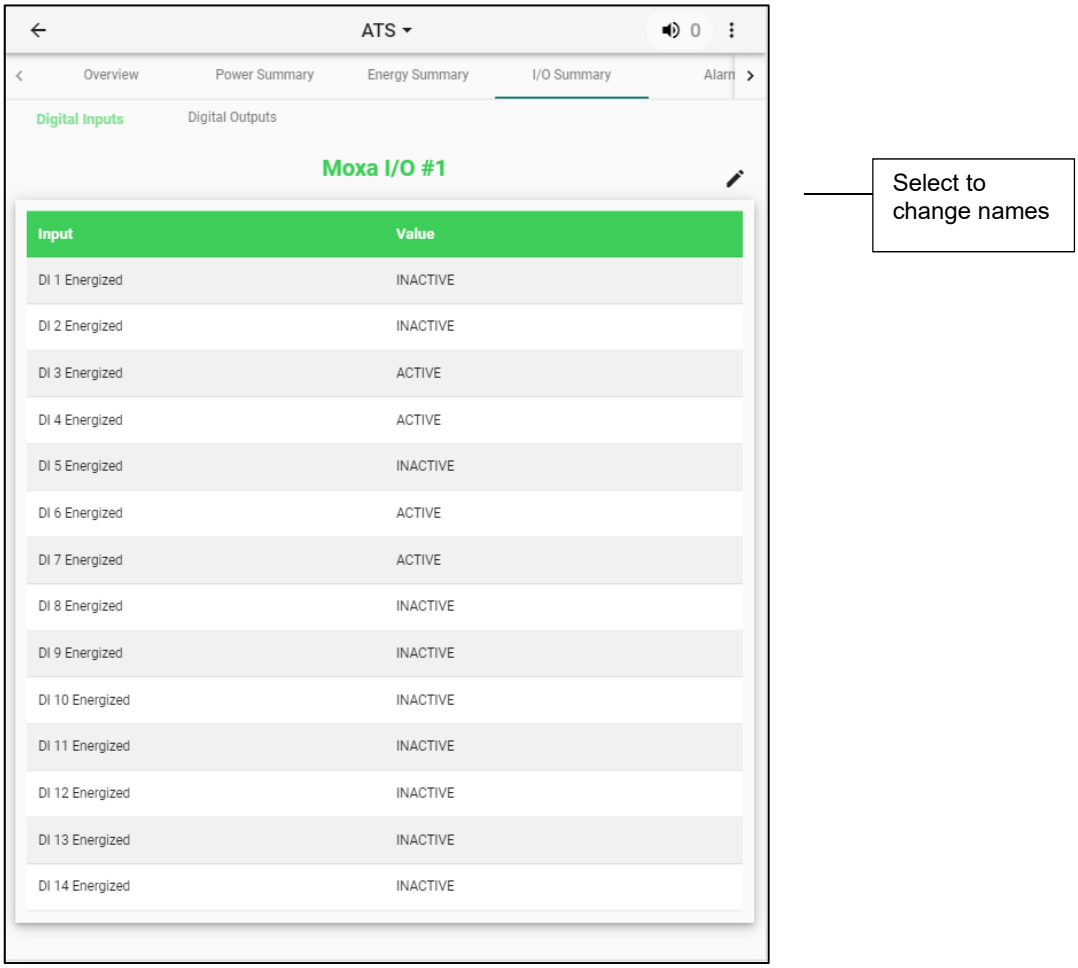


Figure 55. Energy Summary Tab

I/O Summary Tab

IO Summary tab are displayed as either input (Figure 56) or output (Figure 57). Click the I/O Summary tab to show details for Digital Inputs and Outputs. An IO Module is required for these inputs and outputs. Labeling is configurable.

Digital Inputs



Input	Value
DI 1 Energized	INACTIVE
DI 2 Energized	INACTIVE
DI 3 Energized	ACTIVE
DI 4 Energized	ACTIVE
DI 5 Energized	INACTIVE
DI 6 Energized	ACTIVE
DI 7 Energized	ACTIVE
DI 8 Energized	INACTIVE
DI 9 Energized	INACTIVE
DI 10 Energized	INACTIVE
DI 11 Energized	INACTIVE
DI 12 Energized	INACTIVE
DI 13 Energized	INACTIVE
DI 14 Energized	INACTIVE

Figure 56. I/O Summary Input

Digital Outputs

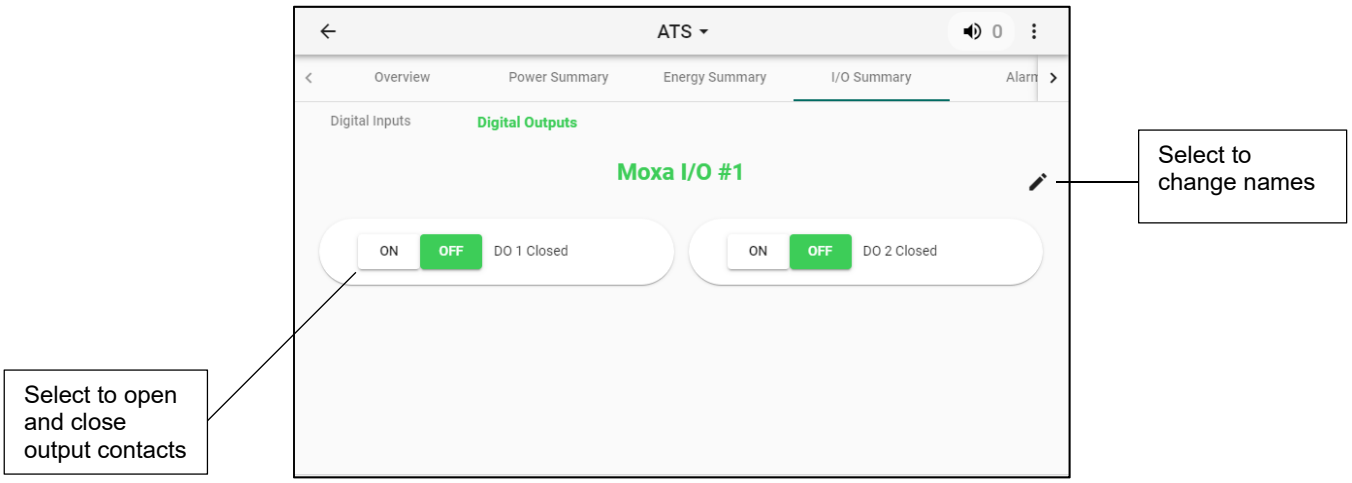


Figure 57. I/O Summary Output

Alarms

The TDI display shows an alarm icon if detecting an active alarm condition. Such as an error or an event that falls outside of normal operating conditions. Alarms are typically setpoint-driven and can be programmed to monitor certain behaviors, events or unwanted conditions. Click the Alarms tab to show details of Status, Details and Historical alarms (Figure 58).

Alarms Status

Active Alarms shows all alarms whether they are active or inactive. The status of device alarms is available under this tab. Alarms can be edited by clicking on Setting Icon. You can view and acknowledge active alarms and historic alarms and events through the display.

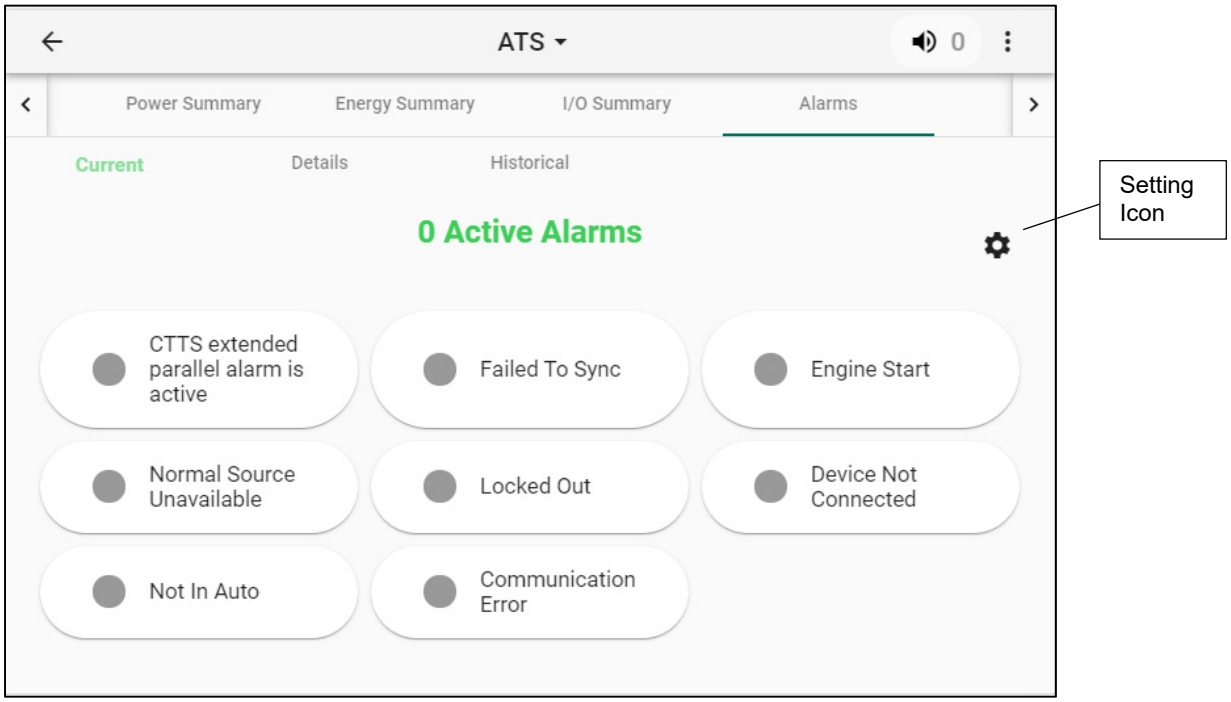


Figure 58. Alarms Tab

After clicking on Setting Icon, Select alarm and edit parameters In Edit Alarm box and select Save. Select Save again to get back to first screen (Figure 59).

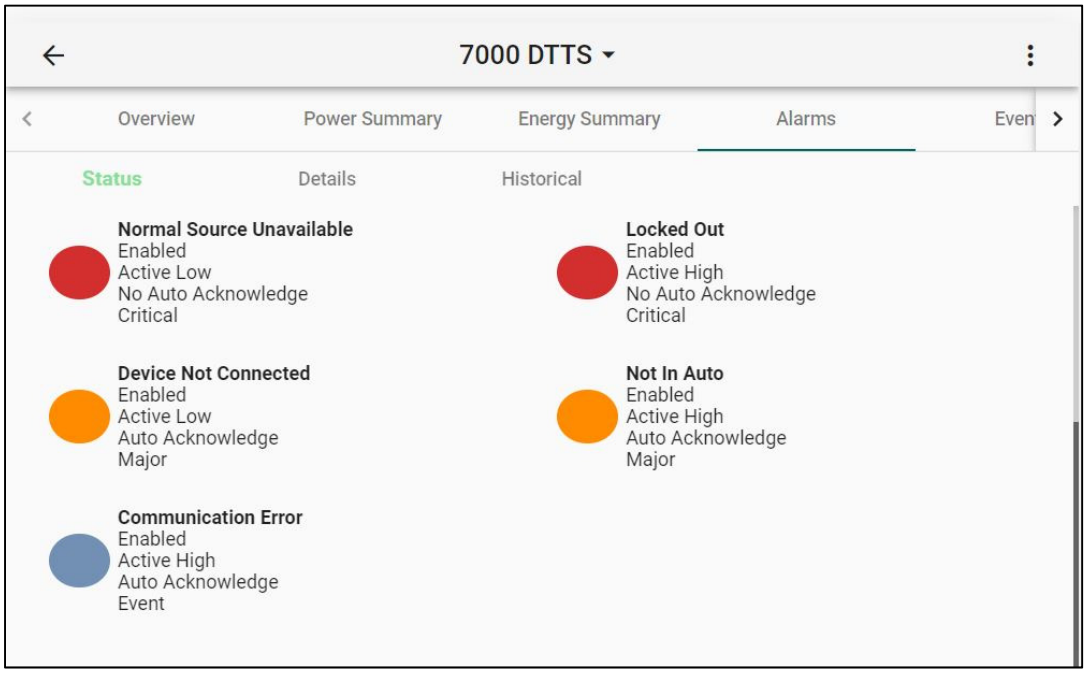


Figure 59. Alarms Status Tab

Alarms Details

All Current Alarm Details are displayed under Details tab (Figure 60). To acknowledge any current active alarm, click on alarm and click on check icon.

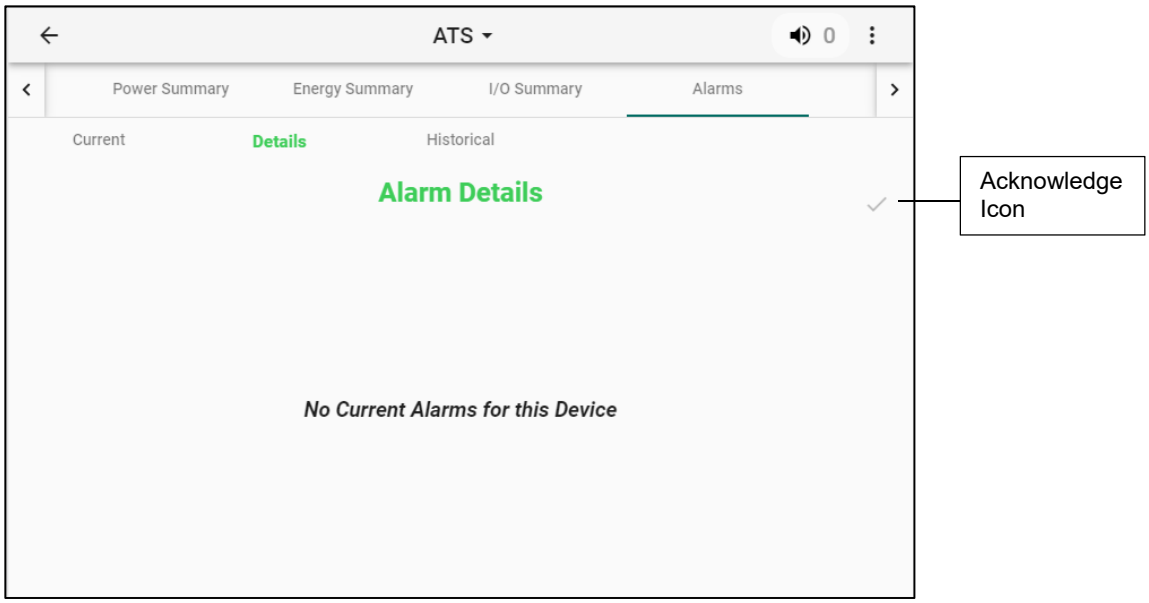


Figure 60. Alarms Details Tab

Historical Alarms

Historical Alarms are displayed under Historical tab, sorted upon most recent list first (Figure 61). Historical: alarm conditions are previously existed but the condition has since returned to a non-alarm state. To acknowledge alarms that were auto-acknowledged, click on check icon.

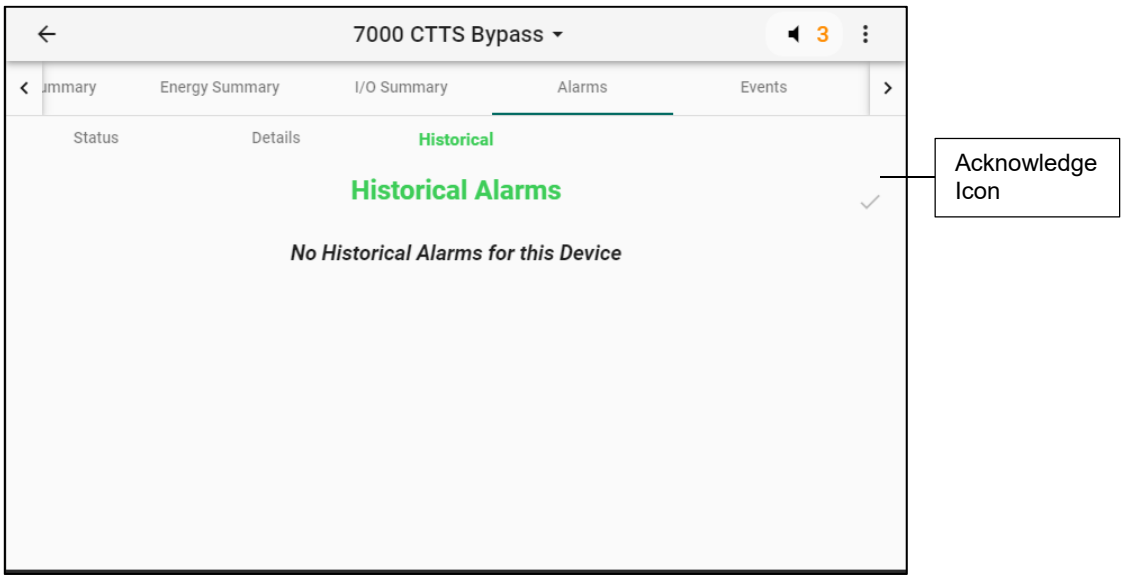
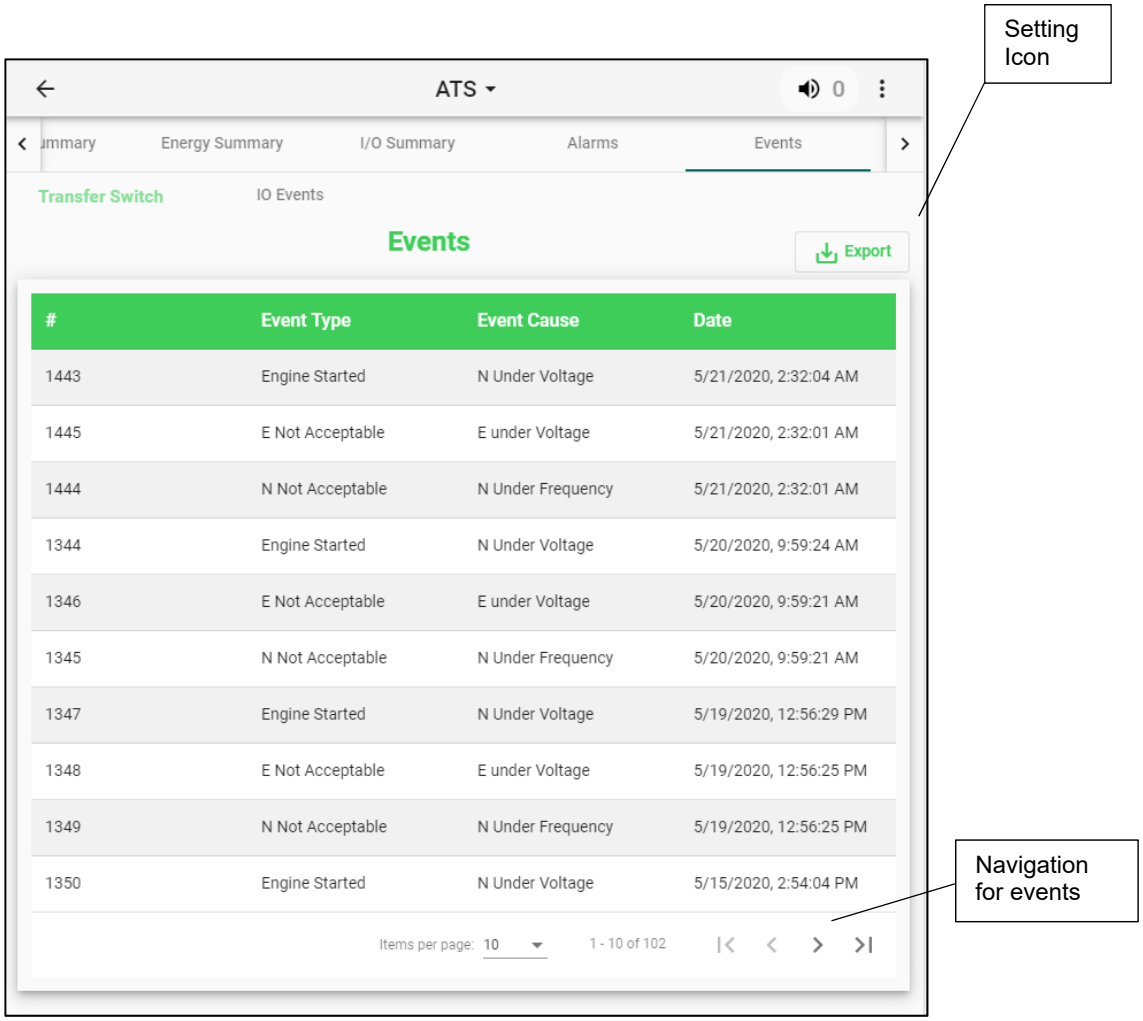


Figure 61. Historical Alarms Tab

Events

ATS Events tab to show transfer switch events that have occurred in date/time order (Figure 62). Navigation arrows on right display past events. Refer to the Group 5 Controller User's Guide 381333-126 for a list of events logged, event types, and reasons.



#	Event Type	Event Cause	Date
1443	Engine Started	N Under Voltage	5/21/2020, 2:32:04 AM
1445	E Not Acceptable	E under Voltage	5/21/2020, 2:32:01 AM
1444	N Not Acceptable	N Under Frequency	5/21/2020, 2:32:01 AM
1344	Engine Started	N Under Voltage	5/20/2020, 9:59:24 AM
1346	E Not Acceptable	E under Voltage	5/20/2020, 9:59:21 AM
1345	N Not Acceptable	N Under Frequency	5/20/2020, 9:59:21 AM
1347	Engine Started	N Under Voltage	5/19/2020, 12:56:29 PM
1348	E Not Acceptable	E under Voltage	5/19/2020, 12:56:25 PM
1349	N Not Acceptable	N Under Frequency	5/19/2020, 12:56:25 PM
1350	Engine Started	N Under Voltage	5/15/2020, 2:54:04 PM

Figure 62. Historical Alarms Tab

User can download the event file by selecting the highlighted event and pressing the download icon. The Download pop up box will appear (Figure 63).

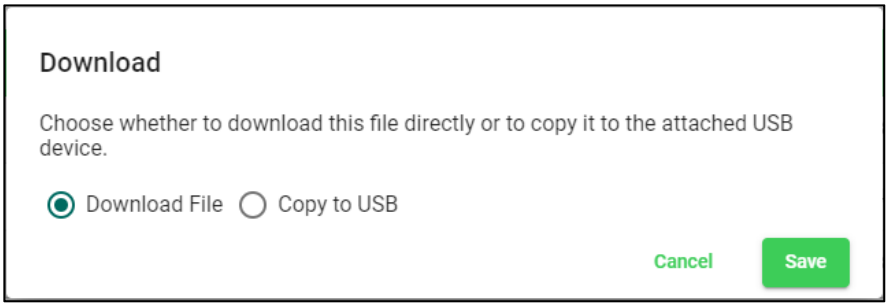


Figure 63. Download pop up box

Settings

Admin level users can configure settings of a transfer switch controller. User will be able to view a full log of all events taken directly from the transfer switch controller. Information is viewable to all users.

Admin level users can configure settings of a transfer switch controller. User will be able to view a full log of all events taken directly from the transfer switch controller. Information is viewable to all users.
Click the Settings tab to show details in: Pick Up & Drop Out, Timers, Test Schedule, Features and Time Sync.

Sub -tab	Information Displayed	Controls
Pickup & Dropout	Normal & emergency voltage and frequency pickup & dropout	Edit
Timers	Standard Pre/Post Signal and CTTS/DTTS settings	Edit
Test Schedule	Test Schedule (schedule enabled, with/without load transfer, day, duration, start and run time)	Edit
Features	Standard and Inphase features	Edit
Time Sync	Synchronization between TDI display and transfer switch controller	Edit

Pick Up & Drop Out

Click On Pickup & Dropout under the Settings tab (Figure 64). This displays value and nominal percent values for normal and emergency. Admin level users can change the standard voltage and frequency pickup and dropout settings in the Group 5 controller. To edit settings, click on pencil, select a pickup or dropout setting, increase or decrease the value, and click Save.

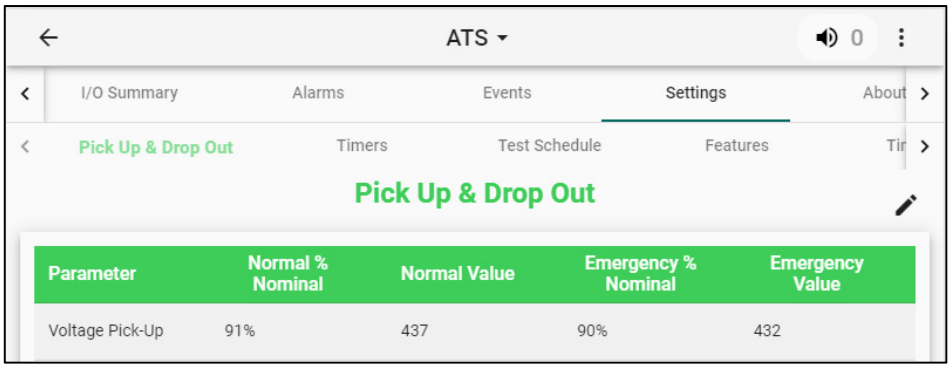


Figure 64. Pickup & Dropout

Refer to the Group 5 Controller User's Guide 381333-126 for the pickup and dropout default settings and range of settings.

Timers

Click On Timers under the Settings tab (Figure 65). Admin level users can change the Standard, Pre/Post Signal, CTTS/DTSS time delay settings in the Group 5 controller. To make changes click on pencil for select setting, increase or decrease the timer setting, and click/touch Save.

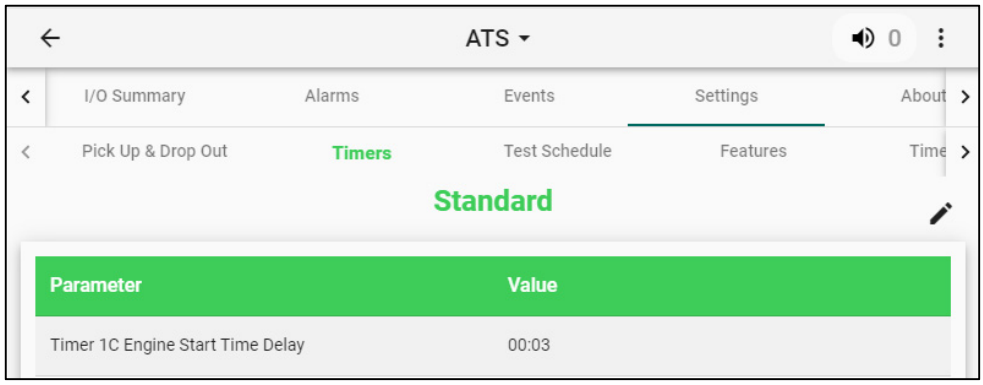


Figure 65. Timers

Refer to the Group 5 Controller User's Guide 381333-126 for the pickup and dropout default settings and range of settings.

Test Schedule

Click On Test Schedule under the Settings tab (Figure 66). Admin level users can change up to five Test Schedule(s) settings, including day, duration, start and run time by clicking on pencil icon for select Schedule Number, modifying options and click Save.

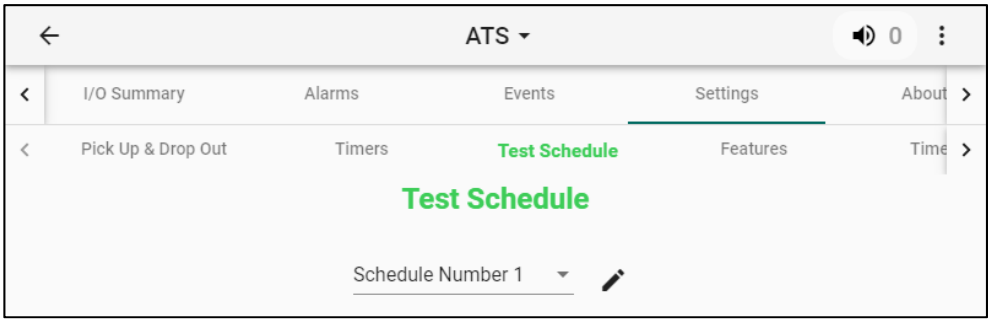


Figure 66. Test Schedule

Features

Click On Features under the Settings tab (Figure 67). Admin level users can change the standard feature settings in the Group 5 controller. To make a change click on pencil, edit the feature, the new setting, and Save. Some features that are for a specific type of transfer switch cannot be changed.

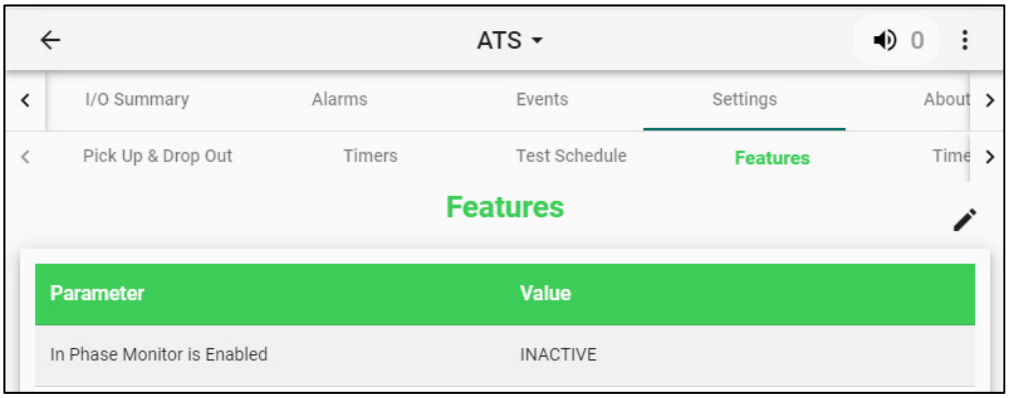


Figure 67. Features

Time Sync

Click On Time Sync under the Settings tab (Figure 68). Only Admin users can edit this screen. The TDI's clock can be set to automatically synchronize with a server To synchronize with a server, click Sync Time button. The TDI will synchronize the time of the devices connected to it every six hour.

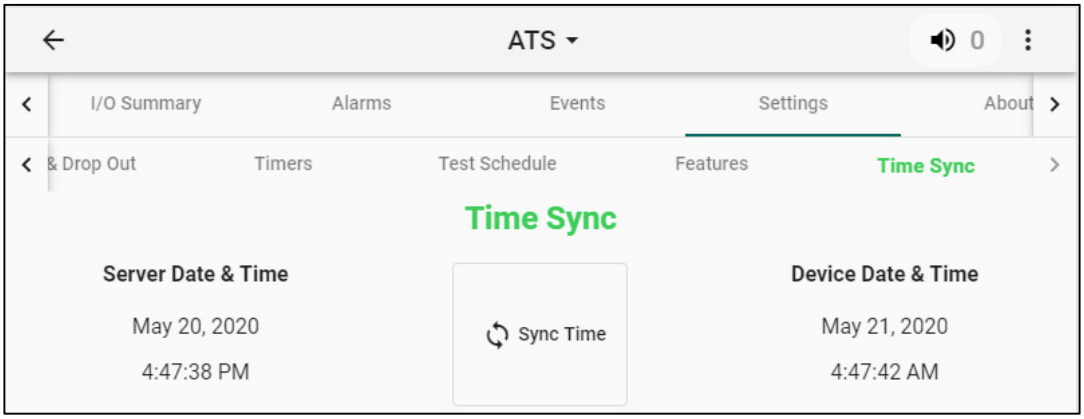


Figure 68. Time Sync

About

Displays configuration information for the transfer switch and internal components (Figure 69).

Sub -tab	Information Displayed
Transfer Switch	Parameters/Values for Device Info, Ratings, Statistics and Settings
Power Meter	Parameters/Values for Device Info, Ratings and Settings
IO Device	Parameters/Values for Device Info and Settings

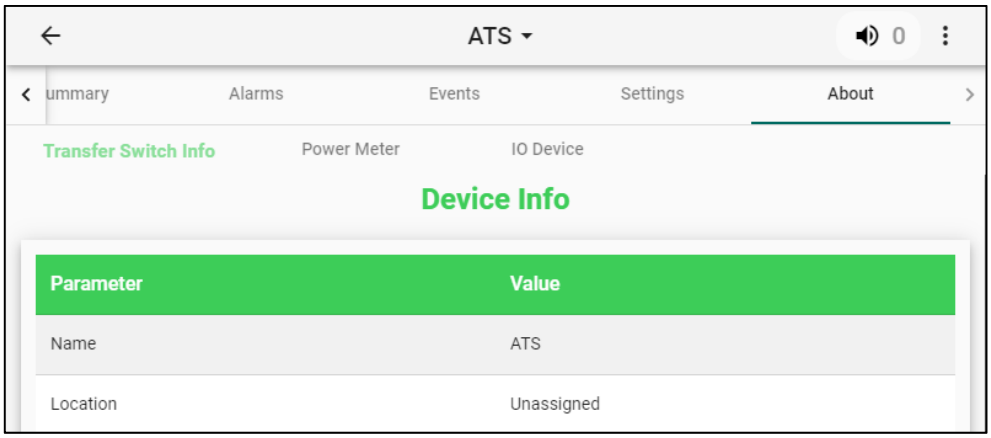


Figure 69. About Information

Alarm

Alarms show current alarm status and details of an ATS Automatic Transfer Switch. Alarms can be viewed by the following categories: Severity, Type, Device or All

Alarm Categories	Information Displayed
Severity (Figure 70)	Status levels of active alarms: Critical, Major, Minor, Event
Type	Active alarms base on type of error message
All (Figure 71)	Summary of All Alarms: Alarms Name, Device, Occurred Date, Acknowledged date and Acknowledged By

Severity

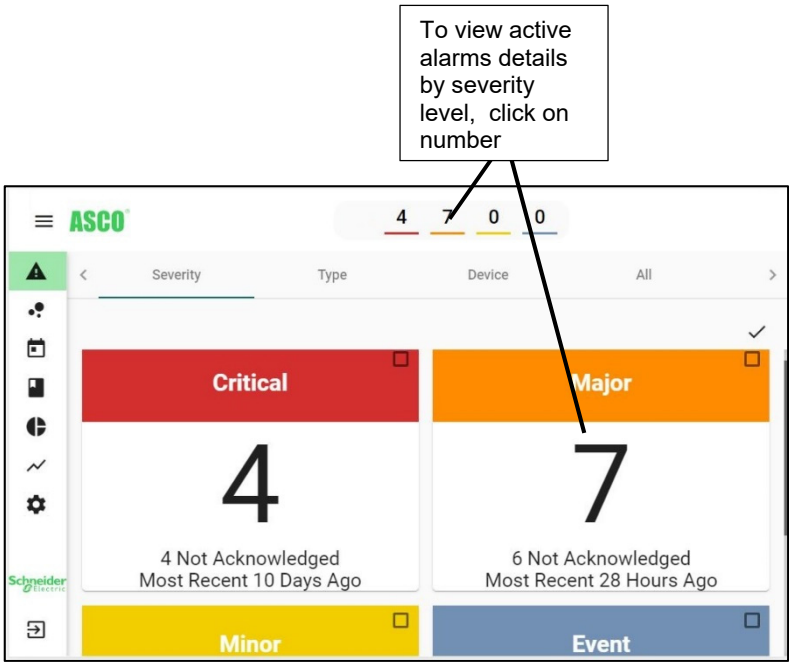


Figure 70. Alarm by Severity

All

A summary view of all active alarms (Figure 71). To keyword search alarms, select Search Icon. To Filter Alarms, based upon certain criteria, select Filter icon, choose options and click Apply. To download a file of all active alarms, select Export Icon (choose Download Csv file or copy to USB) and select Save.

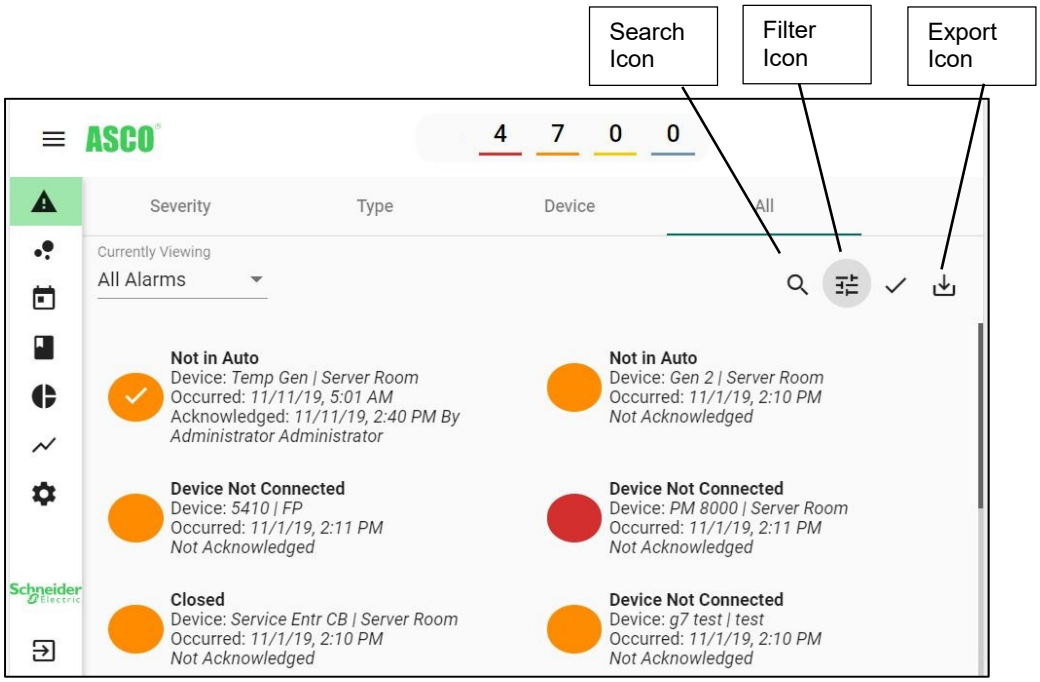


Figure 71. All Alarms Screen

Acknowledging Alarms

To Acknowledge all active alarms, select the Check Icon. To acknowledge certain alarms under Severity Type or Device, select check box and then the check Icon (Figure 72).

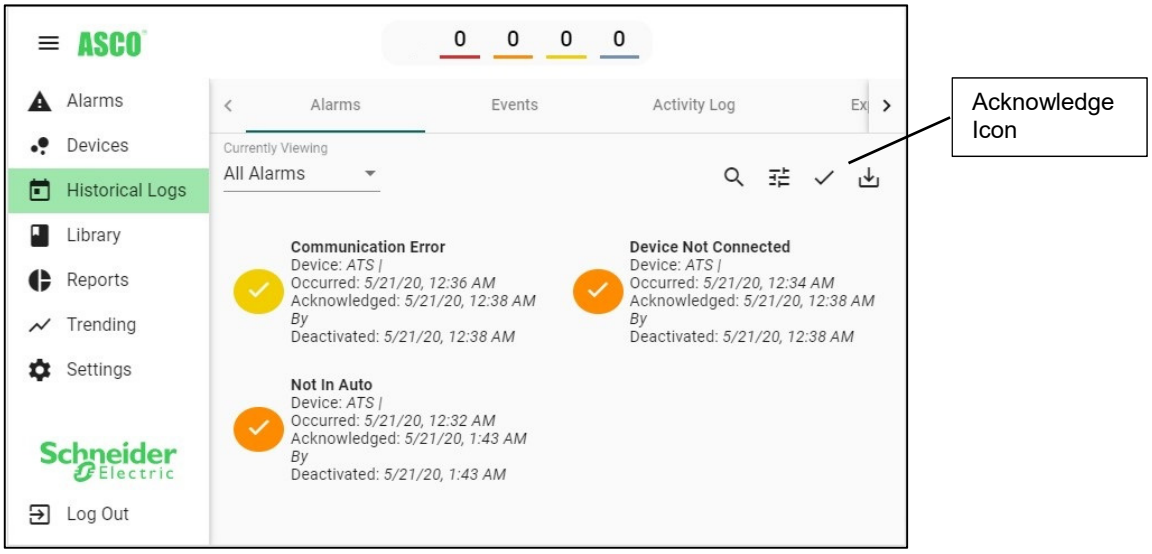


Figure 72. Acknowledging Alarms Screen

Filter through different fields to find alarms (Figure 73).

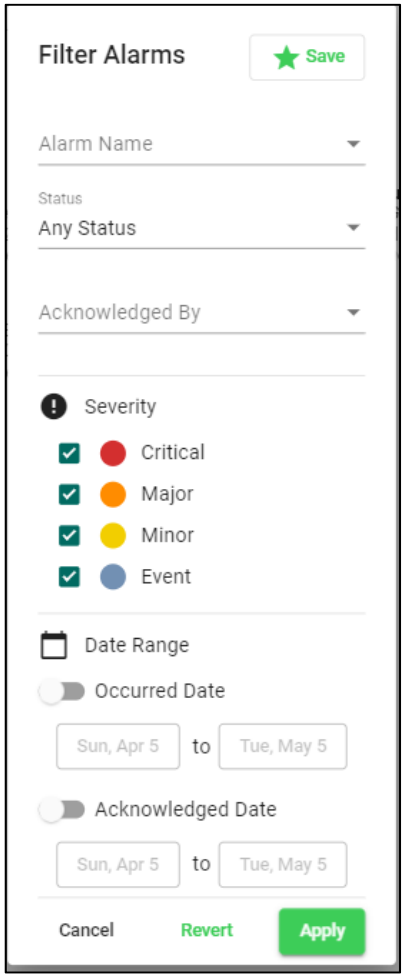


Figure 73. Filter Alarms

Historical Logs

Historical Logs Tab allow users to view and download logs (Figure 74). They can download Alarms, Events, and Activity Log. Under Export a user can individually download the Historical Alarms, Events and Trending databases.

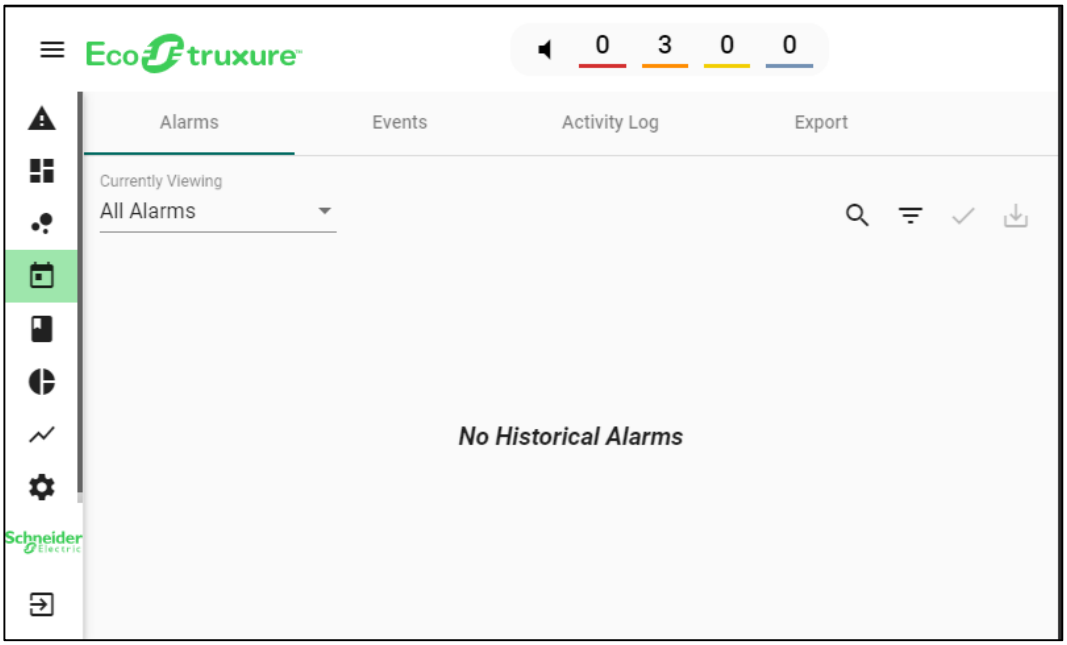


Figure 74. Historical Logs

Library

Repository for files that can be uploaded or downloaded for viewing. Library Tab allows all level users to upload user guide and required documentation to the TDI.(Figure 75).To upload files, select "**+**" then Upload and choose files to add. File names can be edited by selecting the pencil icon and files can be removed by selecting the delete icon.

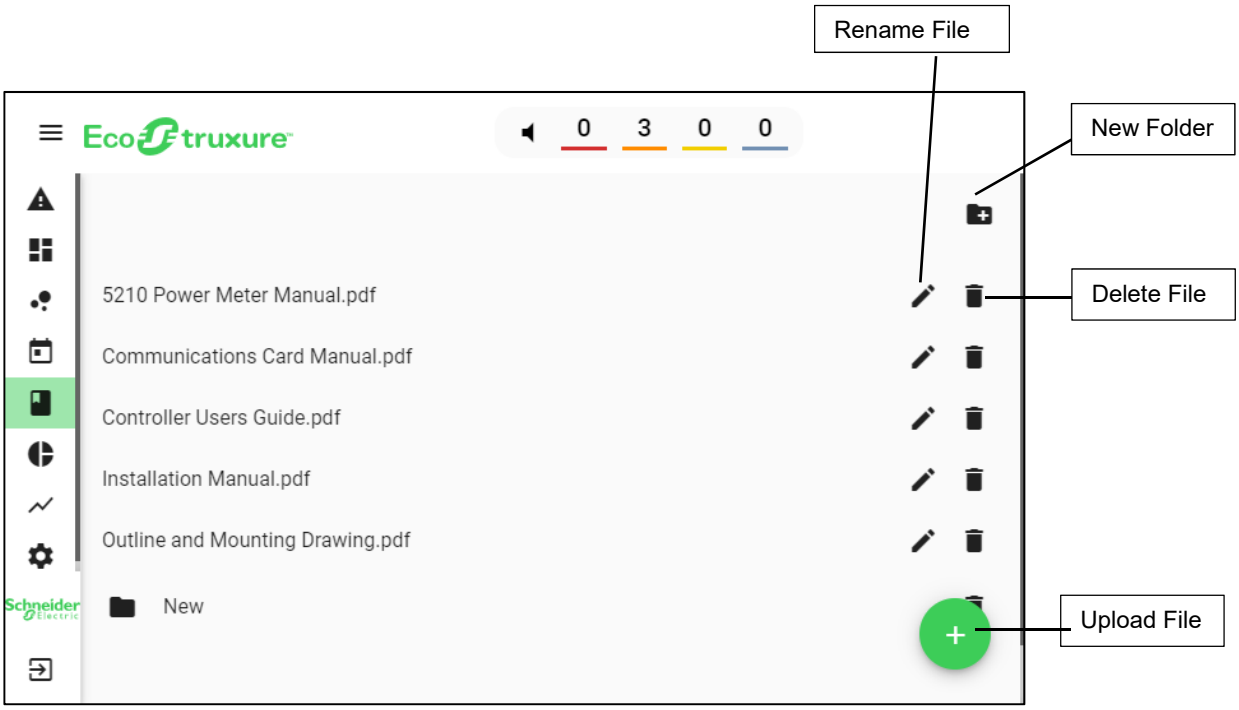


Figure 75. Library Tab

Trending

Trending Tab to show several types of graphical representations (Figure 76). The detail slider can be used to view the exact parameter at an instantaneous moment. Slide it to the desired time and view the values at the right of the screen. Additionally, the time scale can be adjusted by moving the slider and selecting a new interval.

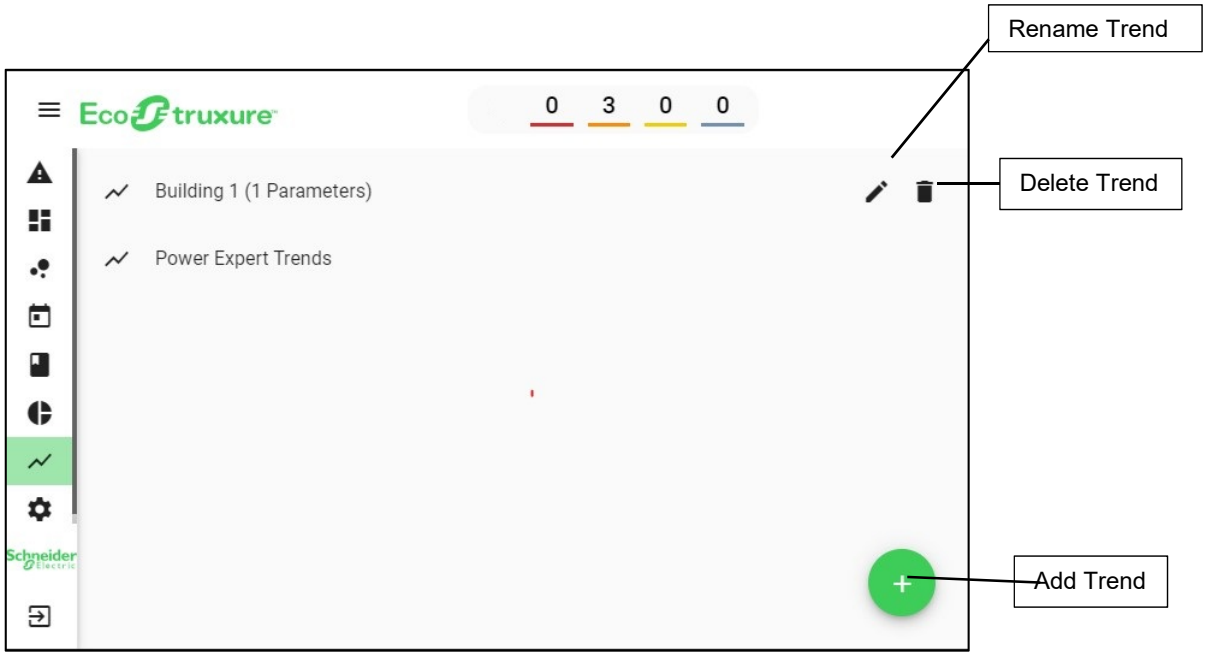


Figure 76. Trending Tab

Trend View

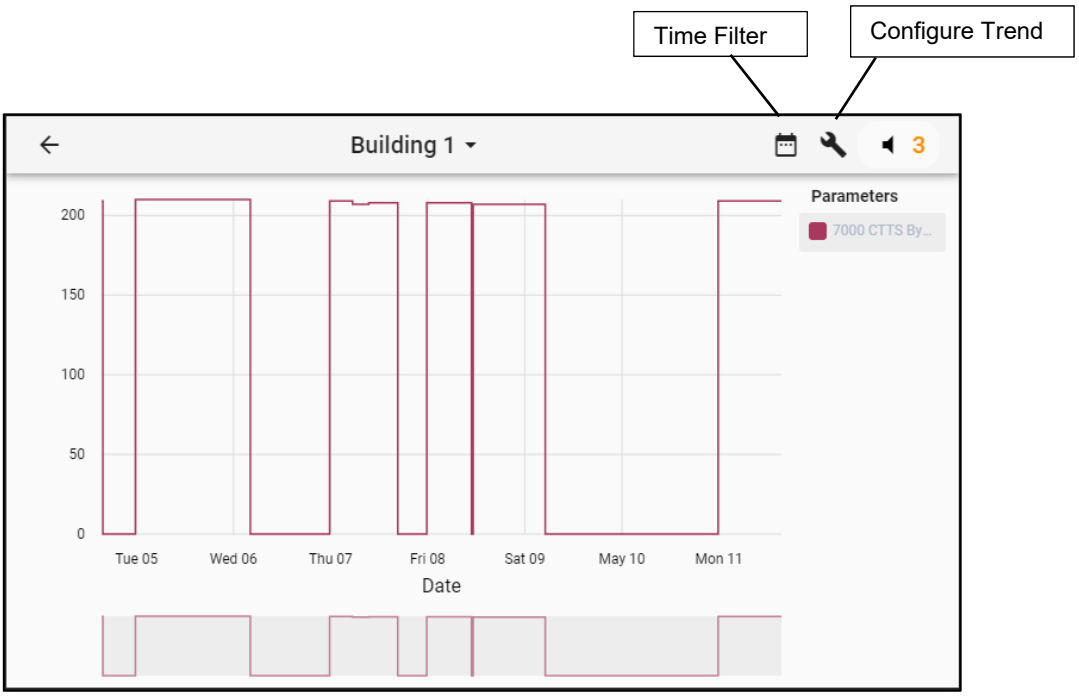


Figure 77 Trending Tab

INDEX

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