Multilink®
Innovation At Work

Smart Tracker Remote Power Manager

Table of Contents

Table of Contents Continues on Page 2

Contact Us

North America	Europe, Middle East & Africa	Latin & South America
Tel: +1 440 366 6966 Fax: +1 440 366 6802 Email: engsupport@gomultilink.com	Tel: +1 440 366 6966 Fax: +1 440 366 6802 Email: engsupport@gomultilink.com	Tel: +1 954 499 9203 Mobile: +1 305 684 2388 Email: hquinones@gomultilink.com

Visit gomultilink.com for new product releases!

INSTALLATION

Scan QR for website.

Table of Contents

INSTALLATION

Section 1: Critical Safety Issues

Safety Admonishments:

Three different levels of safety admonishments are used within this instruction manual; specifically **DANGER, WARNING,** and **CAUTION.**

Trois niveaux différents d'avertissements de sécurité sont utilisés dans ce mode d'emploi; spécifiquement DANGER, AVERTISSEMENT et ATTENTION.

 **DANGER**

The statement following the **DANGER** heading alerts the equipment user of a potentially life or health-threatening situation unless precautions are taken against it. Admonishments of this nature usually entail the hazards of electrical shock or those encountered that may result in physical injury.

*La déclaration sous la rubrique **DANGER** avertit l'utilisateur de l'équipement d'une situation potentiellement mortelle ou mortelle, sauf si des précautions sont prises contre lui. Les admonistances de cette nature entraînent habituellement les dangers d'un choc électrique ou ceux rencontrés qui peuvent entraîner des blessures physiques.*

 **WARNING** / ***AVERTISSEMENT***

The statement following the **WARNING** heading alerts the equipment user of a condition or procedure that could result in interruption of service to the users or subscribers of the service receiving power from this product.

*La déclaration sous le chapitre **AVERTISSEMENT** avertit l'utilisateur de l'équipement d'une condition ou d'une procédure qui pourrait entraîner une interruption de service pour les utilisateurs ou les abonnés du service qui reçoit l'alimentation de ce produit.*

 **CAUTION** / ***ATTENTION***

The statement following the **CAUTION** heading alerts the equipment user of a condition that could result in damage to the subject equipment or ancillary equipment if care is not exercised during certain maintenance or operating procedures.

*La déclaration suivant la rubrique **ATTENTION** avertit l'utilisateur de l'équipement d'une condition qui pourrait endommager l'équipement concerné ou l'équipement auxiliaire si les soins ne sont pas exercés pendant certaines procédures de maintenance ou d'exploitation.*

SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during installation and operation of the Smart Tracker.

Emergency Shutdown Procedure:

Exercise extreme caution when performing the following procedure. Carry out the steps precisely in the order given to avoid the possibility of personal injury or equipment damage.

Perform the following procedure if the Smart Tracker must be shut down and disconnected on an emergency basis:

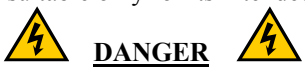
1. Open the upstream Input circuit breaker.
2. Open the Smart Tracker circuit breaker.
3. Disconnect the AC power harness from the rear receptacle of the Smart Tracker.

General Safety Issues:

The Smart Tracker documented in these instructions has been designed, tested, and produced to ensure safe, trouble-free operation. Personnel using or installing this device should completely read and fully understand the following safety instructions. They are provided here as informational guidelines for the continued safety in usage of the product.

Safety Issues of Regarding Installation and Use:

The Smart Tracker has been designed and built to power equipment of matching rated voltage. It is not intended for any other usage and provides output voltages suitable only for its intended application.



This Smart Tracker operates from an AC source ranging from 85 to 154 volts. DO NOT open any covers or panels or attempt to perform any service to the Smart Tracker without first removing and disconnecting AC power. Only trained, qualified personnel should attempt service and repair work on the Smart Tracker.

Ground Fault Protection:

The Smart Tracker does not contain integral ground fault protection. Where such protection is required, the power harness should be connected to a ground fault interrupter (GFI) outlet or to a branch circuit protected by a GFI circuit breaker of proper ratings.

Enclosure Safety Issues:

The enclosure and the Smart Tracker must be installed by qualified technicians or installers only, using appropriate mounting hardware in accordance with local codes and construction practices. The device must be installed within a grounded metal enclosure suitable for accommodating DOT/ITS rack mount equipment.

The outer enclosure housing the Smart Tracker must be of adequate strength to support the device. Additionally, the enclosure must afford adequate ventilation for the device such that a minimum free air space of 52 mm (2 inches) remains around all sides and the top of the device.

Temperature of the air flowing around the Smart Tracker may be rated up to 74° C (165° F). Air intake and exhaust openings within the enclosure must not be less than what is required to maintain this temperature requirement. If these temperature limits are routinely exceeded or ventilation requirements cannot be attained, a suitable forced-air cooling system may be required within the enclosure.

Fig. 1-1 Typical DOT/ITS Smart Tracker Enclosure

Section 2: Introduction

Overall Operation:

The Smart Tracker Remote Power Manager is an IP ready, GPS enabled device that provides remote control over each independent outlet, relay, or input contact. Each of the 8 outlets may be remotely commanded on or off to cycle power to network devices, CCTV cameras, heater mats, or any device that may be attached to the Smart Tracker. 8 relays are also independently controlled to provide alarm notification to traffic controllers. The 8 input contacts may be used to show that an external event has occurred, such as tampering with the enclosure or that a generator is currently activate. All outlets, relays, and input contacts are fully customizable, providing accurate labeling of each outlet and descriptions for their use. When any of the outlet or relay states are changed, the Smart Tracker stores the state of each in the event that unit must be shutdown. Upon power up, the unit will automatically restore power to outlets and relays that were previously active. Embedded in each Smart Tracker is a webpage used to provide the user real-time AC input voltage, total AC current readings, internal and external temperature and humidity conditions, and the ability to monitor 2 external DC voltage sources and state of operation for outlet, relays, and input contacts. Thresholds for various parameters are configurable, allowing for an email notification to be sent to any number of recipients with information regarding the event. GPS location with mapping provides the exact location of each Smart Tracker that is deployed in the field. All events that occur are kept in an event log that can be viewed through any web browser. Built in Scheduler provides repetitive tasks to be accomplished automatically. The Smart Tracker also includes a 2-line LCD and various LEDs to provide local access to parameters and status of currently active outlets, relays, and input contacts.

Primary Voltage:

The Smart Tracker has been designed for operation from standard AC utility lines with an overall voltage range of 85 to 154 volts for 60Hz models. A 15Amp circuit breaker provides power to the device as well as protection from over current conditions.

Hot-Start:

In the event none of the outlets are activated automatically, the Hot-Start feature provides a way to active all outlets from the front panel using the Enter Button. This is a useful feature to allow a user the ability to power multiple devices immediately.

Smart Tracker Features:

- Wide input voltage operating range
- High efficiency for economical line operation
- IP Ready with SNMP, SMTP
- 8 independent 5-15R outlets
- 8 independent output relays
- 8 independent input contacts
- Liquid Crystal Display (LCD) for local parameter information
- Push button for Hot-Start and IP Reset

Unpacking and Inspection:

Before installing this equipment, inspect the Smart Tracker for shipping damage or missing components. If the Smart Tracker or other items were damaged in shipment, file a damage claim with the shipping company and contact a Multilink representative immediately. Be sure to retain the original shipping carton and all packing material for the Smart Tracker until it is certain that a warranty return will not be required.

All Smart Trackers include:

1 Smart Tracker, ready for installation in cabinet
1 AC power cord
4, 8 position terminal blocks
2, 4 position terminal blocks
1 GPS antenna
1 user manual

Missing or Damaged Items:

If items are found to be damaged or missing, contact the shipping company and a Multilink representative immediately. All damage claims must be filed with the shipping company conveying the equipment. A Multilink representative will be able to assist with immediate equipment needs if necessary.

Original Shipping Container:

When returning a Smart Tracker for service, use its original shipping container and all original packing materials. Items damaged as a result of improper packaging will not be covered under provisions of warranty service.

Other Items:

If other items, such as the external temperature and humidity sensor, have been ordered, ensure that those items did not sustain shipping damage. As with the Smart Tracker itself, all damage claims must be filed with the shipping company and a Multilink representative should be contacted immediately.

Section 3: Front Panel Controls, Connections, and Indicators

The front panel of each Smart Tracker contains various connections and indicators. These items are described as follows. See figures 3-1 and 4-1 for connector locations. Further details regarding use of controls and indicators may be found in the ***Startup and Operation*** section of this manual.

Controls:

INPUT CIRCUIT BREAKER: 15Amp circuit breaker protects input and output circuitry and wiring. This circuit breaker is also used as an AC switch to apply and remove input power to the Smart Tracker. LED illuminates when power is active.

ENTER BUTTON: Push button to provide Hot-start and IP reset capabilities. Refer to **Section 5** for user functions.

Connections:

AC INPUT PLUG: C13/C14 plug and receptacle. Rated at 15Amps.

5-15R OUTLETS: 8, 3 wire outlets used to power devices.

OUTPUT RELAY CONTACTS: Phoenix Contact terminal plug. 8 positions per plug. 2 contacts per relay. 12-30 AWG. Tighten to 5.0 lb-in.

INPUT CONTACTS: Phoenix Contact terminal plug. 8 positions per plug. 2 contacts per input. 12-30 AWG. Tighten to 5.0 lb-in. NOTE: Do not exceed 5VDC input.

DC INPUT CONTACTS: Phoenix Contact terminal plug. 4 positions per plug. 12-30 AWG. Rated 0-60VDC. Tighten to 5.0 lb-in.

TEMP/HUMIDITY CONTACTS: Phoenix Contact terminal plug. 4 positions per plug. 12-30 AWG. Tighten to 5.0 lb-in. This is an extra cost item.

GPS ANTENNA CONNECTOR: Mini RF, threaded connector. External antenna.

ETHERNET COMMUNICATION PORT: RJ-45 connector: provides connection to network interface.

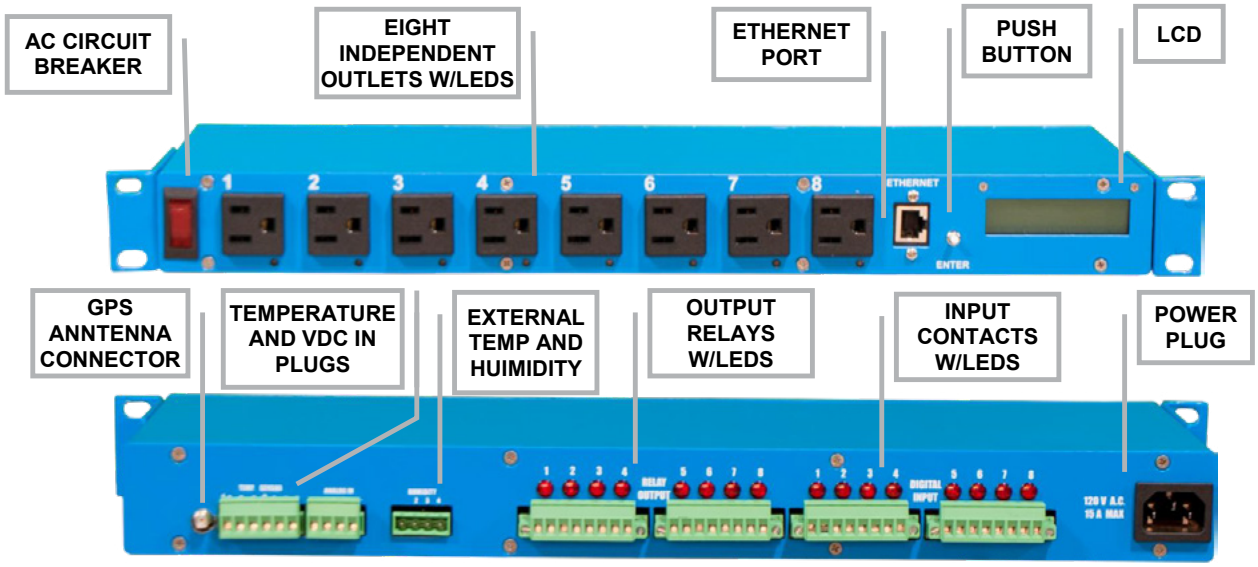


Fig. 3-1 Smart Tracker Front and Rear Detail

Indicators:

Liquid Crystal Display (LCD): The two-line LCD on the front panel of the Smart Tracker serves as the main visual communications device so the user can view a number of operational parameters of the Smart Tracker at any given time. Parameters automatically scroll over the LCD. Further description of the menu tree may be found in the ***Startup and Operation*** section of this manual.

LEDs: Each outlet has a red LED to the lower right corner that is used to indicate active power to that respective outlet of Smart Tracker. Each Relay and Input contact on the back of the Smart Tracker also contains red LEDs to indicate active relays or input contacts. These LEDs are placed between the 2 contacts of each relay or input contact.

Section 4: Installation and Setup

The installation of the Smart Tracker into a rack system or enclosure may be accomplished by connecting the wiring to the appropriate connectors of the Smart Tracker. All power connections on the front of the Smart Tracker can be done using 5-15R pluggable equipment. On the rear panel of the Smart Tracker, each of the terminal plugs use bare copper wiring. Moreover, connectors used in this Smart Tracker mate with accessory harnesses and assemblies designed and manufactured by Multilink Inc. Refer to the ***OPTIONS*** section of these instructions for further information.

In all installations, the following conditions apply and must be observed:

- A service disconnect switch containing over-current protection devices such as circuit breakers or fuses with appropriate AIC (amperes – interrupting capacity) rating should be placed between the AC utility source and the service entrance device for the Smart Tracker. Where used, the disconnect switch must be installed in compliance with all national, state and local codes as required.

- For outdoor installations, the AC utility conductors connected to the Smart Tracker service entrance device shall be physically protected through an appropriate restraining device and conduit, consistent with local codes and practices.

- Permission to mount the Smart Tracker enclosure at any site shall be made in accordance with all legal requirements and local practices of the area.

This Smart Tracker is designed for use in both existing and new ground-mount enclosures. Observe the following procedures during installation of any Smart Tracker.

Preparation:

The Smart Tracker has been factory assembled, tested, and prepared as a complete product ready for installation within a rack system or enclosure. The installer must verify that the correct type of AC power receptacle is installed in the enclosure for the input service and Smart Tracker selected for use at any given site.

Grounding:

Safety ground and earth ground connections must be in place for the Smart Tracker and enclosure for both personal safety and operational considerations. During Smart Tracker and/or enclosure installation, the following grounding connections must be provided or verified.

CAUTION

Failure to provide and connect adequate safety and earth grounds at each installation site may result in improper Smart Tracker operation or permanent damage to the Smart Tracker itself. Grounding facilities and connections must conform to appropriate national codes and/or local practices.

1. The AC utility conductors installed in the service entrance box must contain a safety ground conductor. The Smart Tracker installer should verify that this grounding conductor is in place, having been installed along with the AC utility input.
2. A separate enclosure ground wire must be connected between the enclosure ground lug and an earth ground connection provided by a ground rod installed at the Smart Tracker site. In most cases, one copper or copper-clad steel ground rod of 2.5 meter (8 feet) length driven into the earth will be sufficient to provide the ground connection required. In some instances, a more elaborate grounding method (such as a ring ground) may be required; however, this may be dictated by state or local codes and depends on conductivity of the soil within the installation area.
3. The dead metal of the service entrance box **must** be bonded to the metal enclosure that houses the Smart Tracker. Additionally, the ground bar within the service entrance box should be bonded to the metal enclosures; however, this requirement may be subject to local codes and practices.
4. The grounding wire connected between the Smart Tracker enclosure and the earth ground rod should be no smaller in area than 13 mm² (6 AWG) copper. Both ends of the ground wire should be sealed with an appropriate anti-oxidation compound.
5. An optional ground bonding wire of the same size as specified in Step 4 above may be connected between the optional ground lug at the left side of the Smart Tracker chassis and earth ground where such connection enters the external system enclosure. Refer to the **OPTIONS** sections for more information

Placement in the Enclosure:

This Smart Tracker has been designed primarily for use within a cabinet or enclosure offering protection from outdoor weather, entry of excessive dust, dirt or moisture, and from unauthorized contact by untrained personnel. If used in a controlled environment, the Smart Tracker may be located within an indoor equipment cabinet or may be mounted on a rack shelf.

The Smart Tracker should be mounted on a ventilated shelf that allows free air circulation, especially around the front panel of the Smart Tracker cabinet. Clearance of at least 1RU or 1.75 inches must be maintained around all surfaces of this Smart Tracker for unobstructed airflow. Temperature of the air entering the Smart Tracker should not exceed 74°C (165° F). System de-rating will occur at 55°C. See Specifications.

Wiring:

Install the Smart Tracker according to the following procedure. Refer to Figs. 3-1 for control and connector positions.

1. Operate the AC line circuit breaker in the service entrance box to the OFF position. Ensure that the branch circuit breaker chosen to protect the AC receptacle for the Smart Tracker is operated to the OFF position if necessary.
2. Operate the Input circuit breaker on the front panel of the Smart Tracker to the OFF or RESET (O) position.
3. Attach the AC power cord to the receptacle on the rear of the Smart Tracker.
4. Attach the GPS Antenna to the connector on the rear of the unit.

5. If using the output relays, input contacts, or DC voltage inputs, wire them accordingly.
6. Connect an Ethernet cable to the Ethernet receptacle on the front panel of the Smart Tracker.

Initial installation and wiring is now complete. Verify all connections on the front panel of the Smart Tracker are securely in place.

Section 5: Startup and Operation

The Smart Tracker is ready to be placed into operation after it has been installed in its rack or enclosure and all input and output connections have been made. Ensure that AC input power is available to the Smart Tracker receptacle then perform the following steps in sequence. When started, the Smart Tracker will go through a 30 second initialization period to restore previously stored states of outlets or relays.

CAUTION

The following steps in the startup procedure MUST be performed exactly as presented; otherwise, permanent damage to the Smart Tracker may result. Observe the LED indicators and the LCD as a guide when performing the startup procedure.

1. Verify that all connections and initial wiring is complete, as previously outlined and described.
2. Operate the utility AC circuit breaker serving the Smart Tracker to the ON position.
3. Operate the Input circuit breaker to the ON position on the Smart Tracker and the Smart Tracker will begin its initial start up procedure.
4. The LCD backlight will illuminate and begin to display operating parameters after initialization is complete.
5. If outlet states have been previously stored, the respective outlets will automatically turn on as indicated by their respective LED.
6. If no outlets are active, press and hold the Enter Button for 3 seconds and release to activate the Hot-Start feature, which will turn on all 8 outlets.
7. Verify that equipment that is attached to the Smart Tracker is now powered.

Front Panel LCD Menus:

Operating parameters of the Smart Tracker are indicated in the various menus available on the Liquid Crystal Display (LCD) located on the front panel of the Smart Tracker. All menus automatically scroll to show pertinent information.

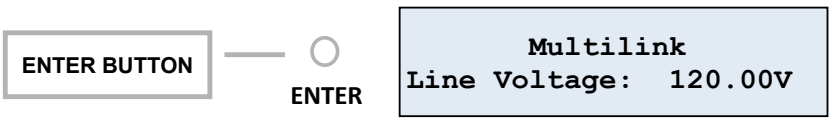


Fig. 5-1 LCD and Enter Button

LCD Screen:

The LCD assembly chosen for the Smart Tracker has been designed for use in a wide temperature range. As such, the characters displayed on the screen should be visible under nearly all temperature conditions. The user may note that under hotter than normal conditions, the characters may fade and become less distinct as compared to those viewed at lower temperatures. The faded characters are temporary.

Menu Options and Descriptions:

```
      MULTILINK
VOLTAGE:       120.50V
```

AC Input Voltage. This is the voltage available to the outlets for their individual use.

```
      MULTILINK
CURRENT:         5.5A
```

Total AC Current. Total current draw off all outlets currently active.

```
      MULTILINK
TEMPERATURE:    75.00F
```

Internal Temperature. This is the internal temperature of the unit. Values can display in either Fahrenheit or Celsius, configurable through the webpage.

```
      MULTILINK
HUMIDITY:      32.00%
```

Humidity. Displays the internal ambient humidity of the unit.

```
 DATE:  18-02-15
 TIME:  12:30:00
```

Date and Time. The date and time are set automatically using SNTP.

```
      MULTILINK
IP:  192.168.1.210
```

IP Address: The currently assigned IP address of the unit. DHCP is enabled by default to automatically assign IP addresses. Static IP addresses may be configured through the webpage. This address may be reset using the Enter but-ton when held for more than 10 Seconds.

Enter Button Functionality

The Enter button provides the user with two options for local control of the Smart Tracker. When the Enter button is pressed and held for a particular length of time, the Smart Tracker will react appropriately to the user input as described below.

Hot-Start All Outlets: This feature can be activated by pressing and holding the Enter button for 3-5 seconds and then releasing. All outlets should turn off and on to provide AC power to each outlet.

IP Reset: In the event the IP address must be reset, press and hold the Enter button for a minimum of 10 seconds. The LCD will halt operation and begin to auto-scroll after 30 seconds. The factory IP address will then be displayed.

Section 6: Web User Interface

Embedded in each Smart Tracker is a webpage that is used to view and configure all outlets, relays, input contacts, and other necessary system and network parameters. The webpage provides a summary of all parameters and operating states of each outlet, relay, and input contact, all on one easy-to-navigate page. Additional pages for network, email, and unit configuration are also available. Each feature of the embedded webpage will be described in this section. Each Smart Tracker is IP ready with DHCP to provide ease of installation and for access to the Smart Tracker. DHCP will automatically assign an IP address to each Smart Tracker in use. Otherwise, local Ethernet connection instructions are included below for local monitoring and configuration.

Configuration:

Each Smart Tracker is factory configured for DHCP to automatically assign the IP address and subnet mask to each unit. When the IP address is established, the user may access the Smart Tracker using its assigned by typing in its IP address in any web browser. The Summary Page should now be visible to the user.

Local Ethernet Connection:

The following instructions shall be used to locally connect to the Smart Tracker. These instructions assume that the proper operating conditions exist to allow the Smart Tracker to operate. Additionally, these instructions assume use of Windows based machines. Please follow the instruction below to locally connect to the Smart Tracker. Refer to the **Troubleshooting** section for network communication and connection problems.

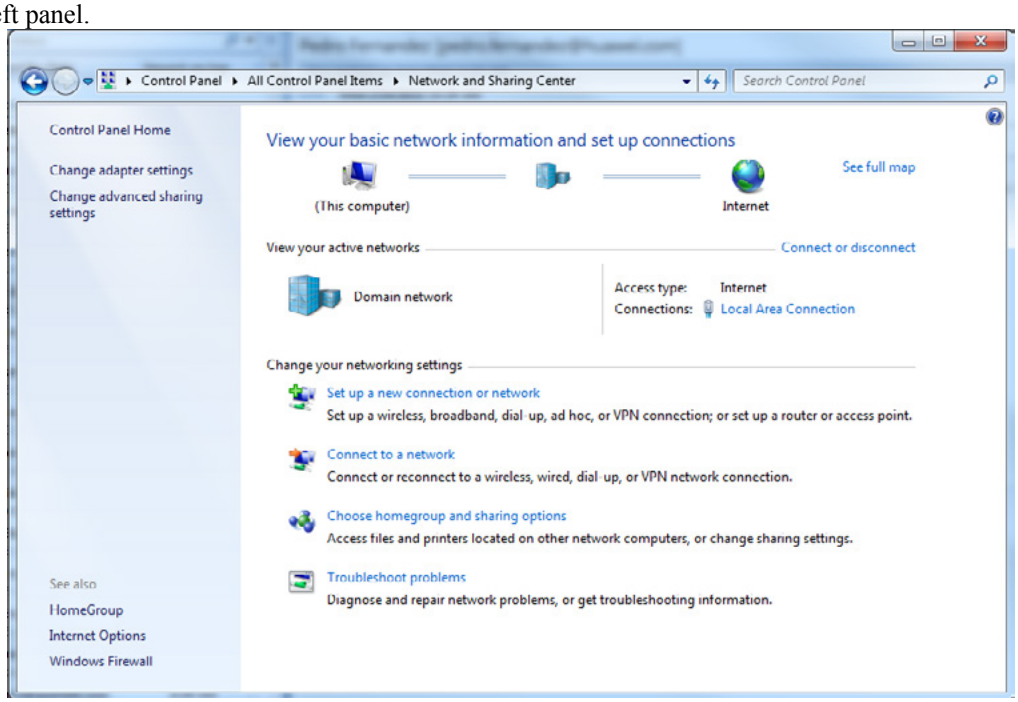
1. With the Smart Tracker operating, connect a straight-through Ethernet cable to the "Ethernet" port on the front panel. If the unit is not operating, refer to **Section 5** for "Startup and Operations".

2. Connect the opposing end of the Ethernet cable to the Ethernet port of the Desktop or Laptop machine.

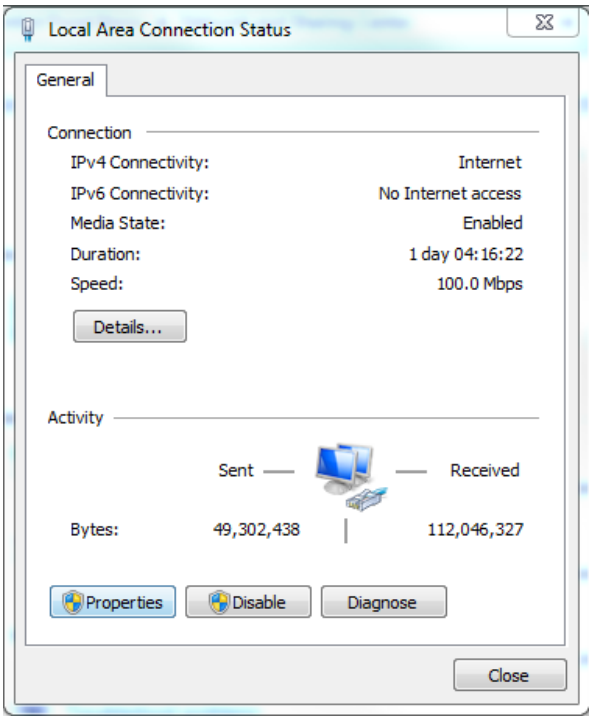
3. Verify the current IP address of the unit using the LCD. Since DHCP is the default, the network card of the desktop or laptop may assign a viable IP address. If this is not the case, press and hold the Enter button on the unit for 10 seconds to set the factory default. The factory default IP address of the Smart Tracker is 192.168.1.210.

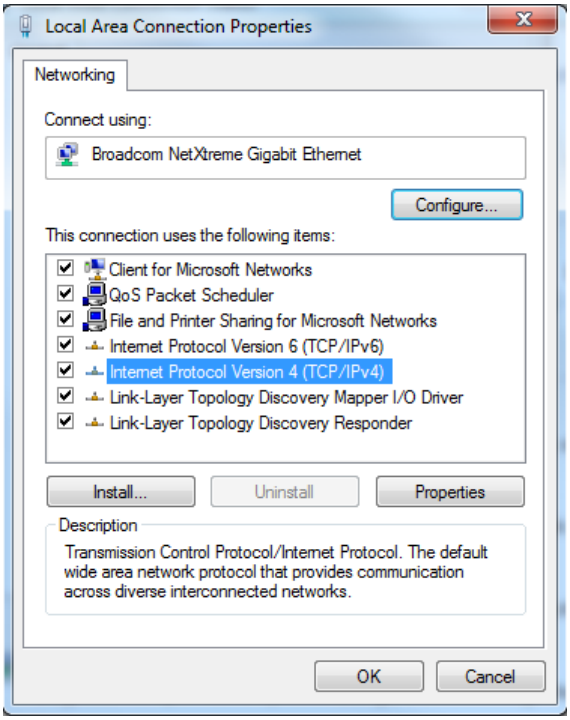
4. The desktop or laptop's network interface card must be configured to the same IP range as the Smart Tracker in order to access the embedded webpage.

5. Navigate to the Control Panel, “Network and Sharing Center”, and select “Change adapter settings” from the left panel.



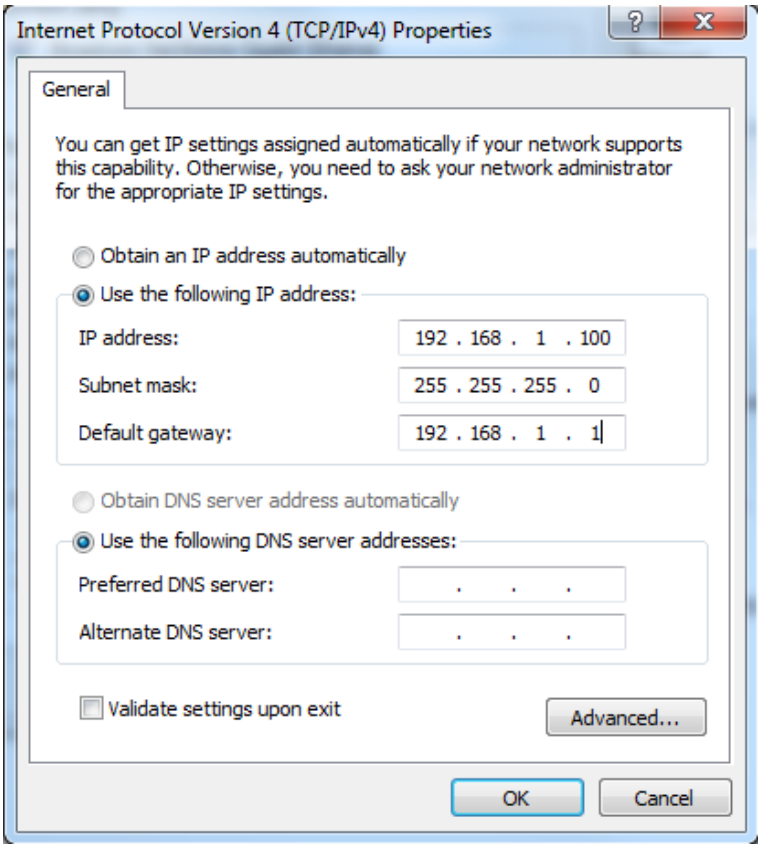
6. Left click on the “Local Area Connection” and select “Properties”. Click to highlight “Internet Protocol Version 4 (TCP/IP) and click the “Properties” button below.





7. Highlight the "Use the following IP Address" radio button and enter an IP Address in the range of the currently assigned IP address of the Smart Tracker. Be sure not to enter an identical IP address in this textbox. For example; if the Smart Tracker is assigned 192.168.1.210, the user may enter 192.168.1.100 in the textbox.

8. Enter the appropriate subnet mask and gateway if it has not already been auto-filled. For example; if 192.168.1.210 is the IP Address, the Subnet mask would be 255.255.255.0.



9. Select the "OK" button and then select "Close" on the previous window. The computer's network interface card may now begin communication with the Smart Tracker.

10. Open a preferred web browser and enter the IP address of the Smart Tracker in the address box. The Summary Page should now be displayed.

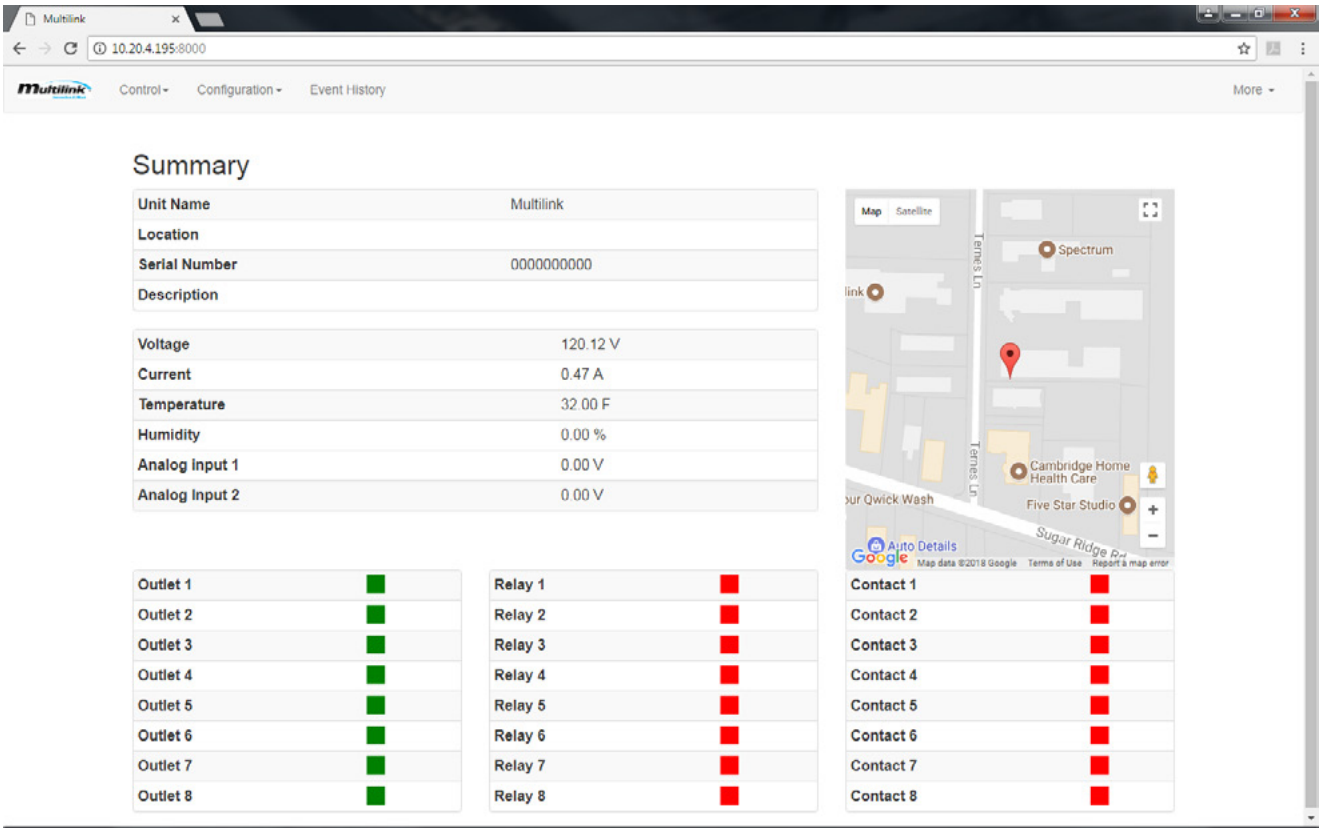
Webpage Description:

Upon establishing connection to the embedded webpage of the Smart Tracker, the user is presented the Summary Page. This page provides all operating parameters currently enabled for use and the state of each outlet, relay, and input contact. GPS mapping is also included on this page to show the location of the Smart Tracker.

Additional configuration pages reside along the top of the webpage. These pages require user authentication to access Control and Configuration pages for each Smart Tracker. In the following sub-sections, each page and feature of the Smart Tracker will be shown and described.

Summary Page:

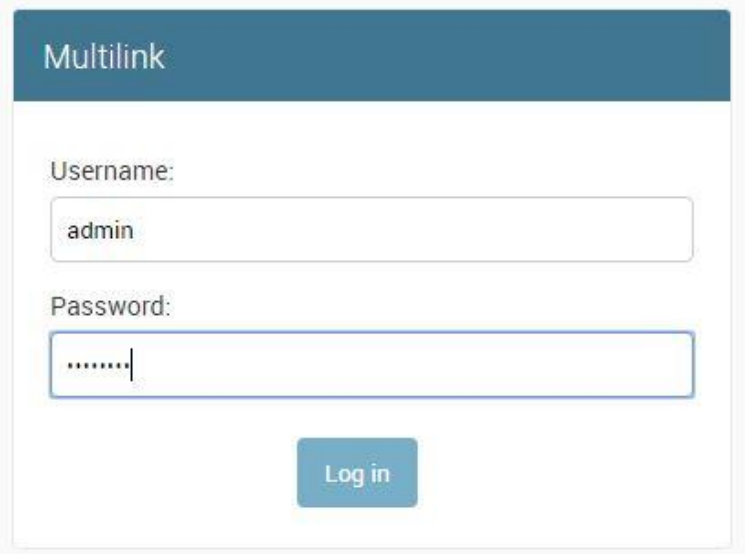
The Summary Page provides status-at-a-glance for all outlets, relays, input contacts, operating parameters, and pertinent information regarding the specific unit being addressed. An interactive map showing the GPS location of the unit is also displayed. A Green or Red box next to the outlet, relay, and input contact label names indicates the current state of the respective outlet, relay, or input contact. Green indicates active or ON, Red indicates inactive or OFF.



Beneath the address box resides a row of tabs or pages that may be viewed in order to control the outlets and relays, configure the unit, or change network settings. At any time, the user may return to the Summary Page by clicking the "Multilink" logo in the upper left corner.

User Log-in and Authentication:

When navigating away from the Summary page, the user will be required to log-in in order to control or configure any features of the Smart Tracker. When clicking on the "Control" tab and selecting "Outlets", for example, the user will be prompted with a log-in screen, as shown below.

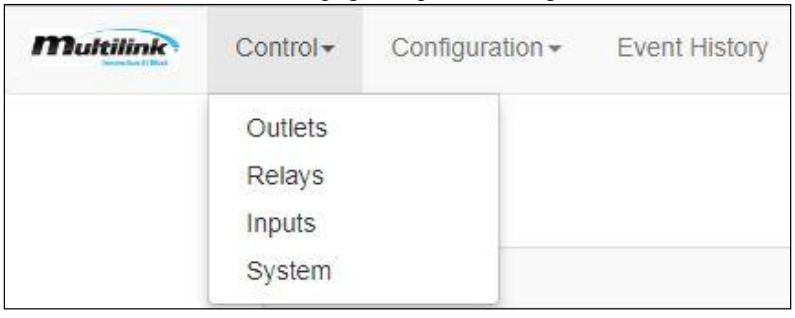


The default **username** for the Smart Tracker is "**admin**". The default password is "**gpc1gpc1**".

Once this information has been entered, click the "Log in" button and the user may navigate to any page with full access to control and configure the Smart Tracker.

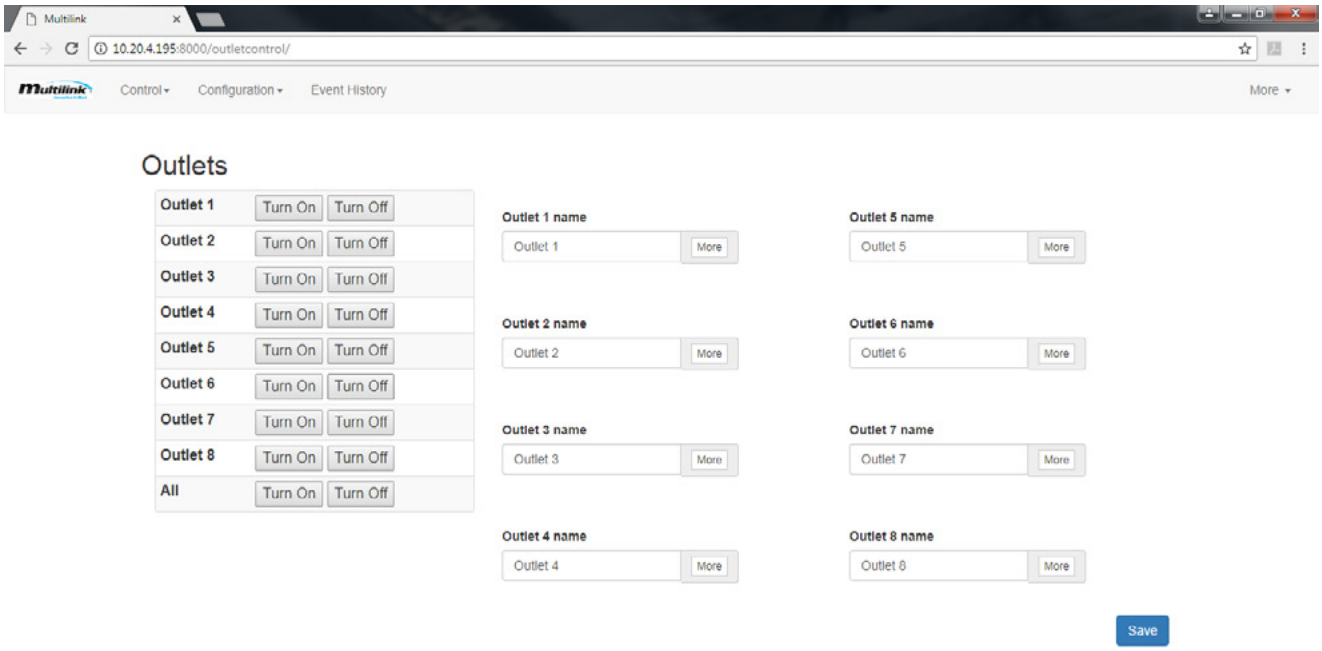
Control Tab:

When clicking the Control tab, a drop down list appears with four options: Outlets, Relays, Input Contacts, and System. Each of these pages provides a means of controlling and configuring respective options, with the System page providing Shutdown and Restart functions. These pages require user log-in authentication to access.



Outlets Page:

The Outlets page allows the user to independently control each of the 8 outlets. The user may select to turn ON or OFF any or all of the outlets. Textboxes are included to allow the user to rename each outlet for the specific piece of equipment that is attached to each outlet. Outlet information and action textboxes are also included to provide more description for each outlet if necessary.

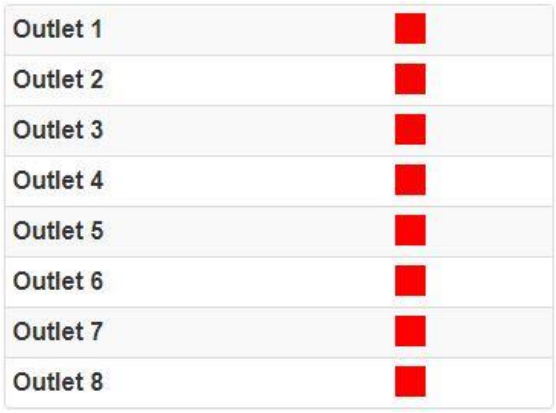


Controlling Outlets:

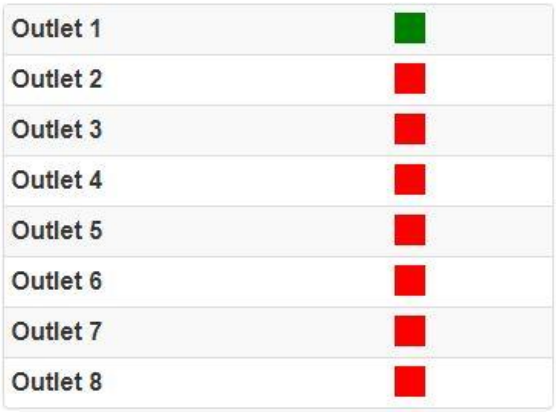
To change the state of an outlet, select an outlet and click its respective "Turn ON" or "Turn OFF" button. The user may also choose to change the state of all 8 outlets at once by clicking the respective "ALL" buttons.

In the following screen shots, Outlet 1 is used as an example. All subsequent outlets will act in the same manner. When turning ON Outlet 1, the user is prompted with a message asking if they want to perform the action.

Click "Turn on" and the outlet will turn on. If Outlet 1 was previously on, it will remain on. After clicking "Turn on", the Summary page will now display a Green Active indicator. Additionally, the LED for Outlet 1 will also be lit on the front of the unit.



Before turning ON



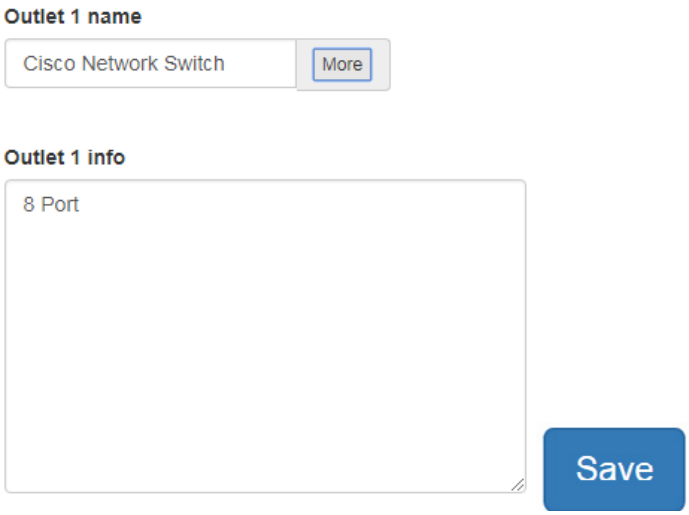
After turning ON

The user will also be prompted when turning OFF Outlet 1. Click "Turn off" and the outlet will turn off. If Outlet 1 was previously off, it will remain off. After clicking "Turn off", the Summary page will now display a RED Inactive indicator. Additionally, the LED for Outlet 1 will also be off on the front of the unit.

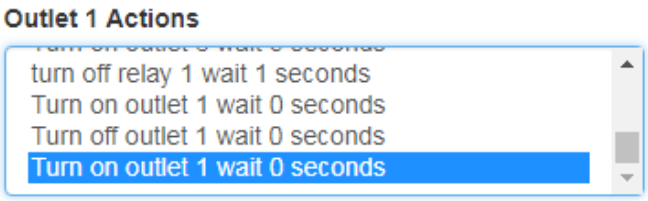
Before turning OFF | After turning OFF

Renaming Outlets:

To rename any one of the outlets and provide additional information, the user may type a new name into the text box for the respective outlet. Information may be included to describe the piece of equipment attached to outlet 1.



The Outlet Actions box includes tasks that the user has created that are to be performed under a schedule. Each action may be selected by using the mouse to click on and highlight the action that is to occur. Additional actions may take place by holding the Ctrl key (Command key for Mac) and clicking additional actions.

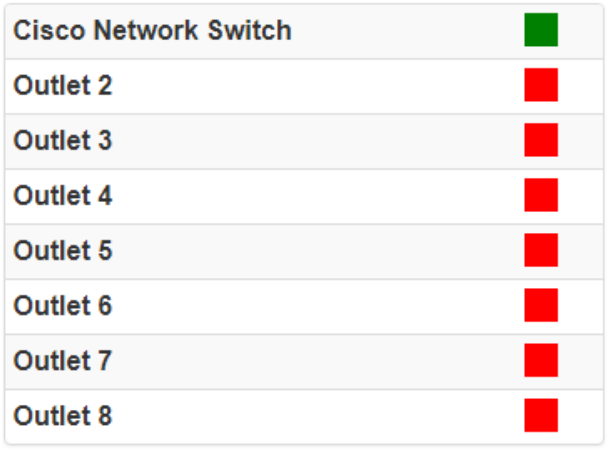


Be sure to click the "Save" button to save the action(s) that each outlet will perform. Please refer to the Create Action, Create Schedule, and Create Task portions of this user manual for descriptions of creating actions, schedules, and tasks.

Saving Outlets Changes:

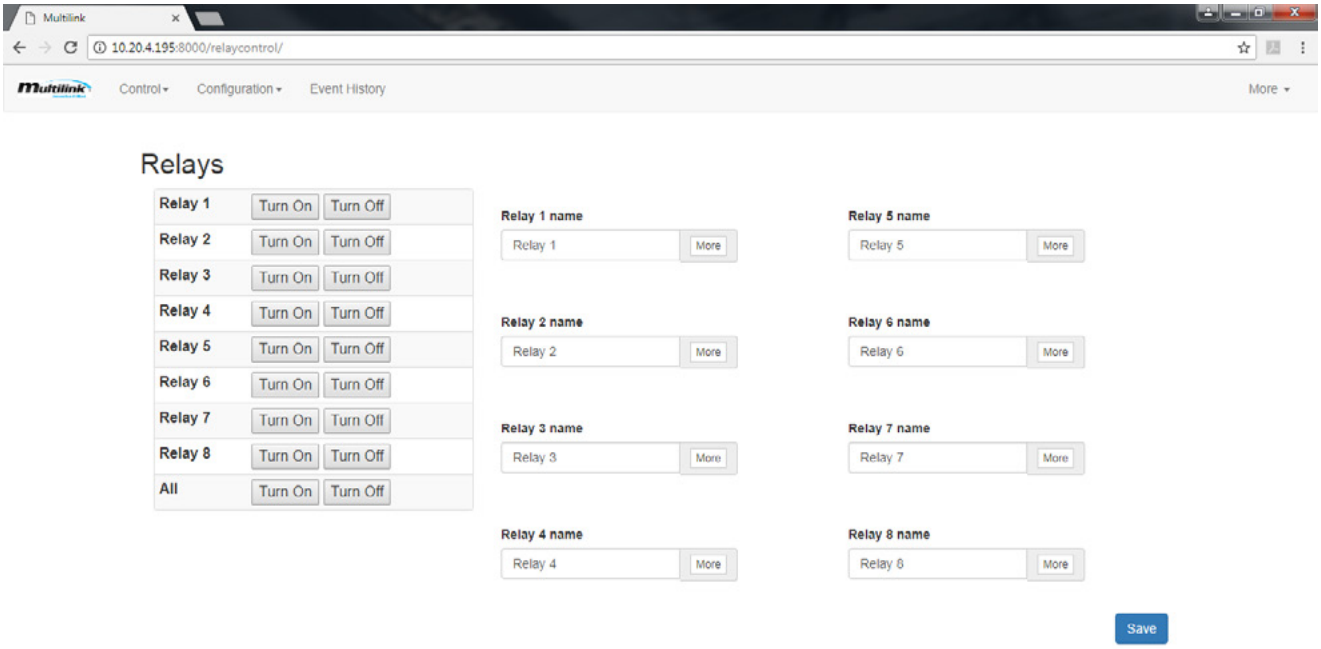
Click the "Save" button to save any changes. When the "Save" button is clicked, all text boxes will illuminate GREEN to indicate the changes have been saved. Changes made to any name or configuration item of the Smart Tracker will also illuminate GREEN to indicate the changes have been saved.

After saving changes, the new name for Outlet 1 will be displayed on the Summary page. Any changes also made to relays, input contacts, or unit configuration will also be displayed on the Summary Page.



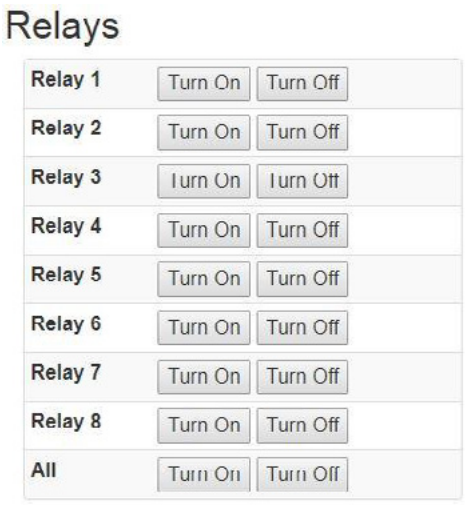
Relays Page:

The relays are used to provide a low or high impedance signal that may be used by a traffic controller or device as indication that a specific event or action has taken place. Each relay has 2 mating contacts for which to attach wiring.



Controlling Relays:

To change the state of a relay, select a relay and click its respective "Turn ON" or "Turn OFF" button. The user may also choose to change the state of all 8 relays at once by clicking the respective "ALL" buttons.



In the following screen shots, Relay 1 is used as an example. All subsequent relays will act in the same manner. When turning ON Relay 1, the user is prompted with a message asking if they want to perform the action.

Click “Turn on” and the relay will turn on. If Relay 1 was previously on, it will remain on. After clicking “Turn on”, the Summary page will now display a Green Active indicator. Additionally, the LED for Relay 1 will also turn on the rear of the unit.

Before turning ON

After turning ON

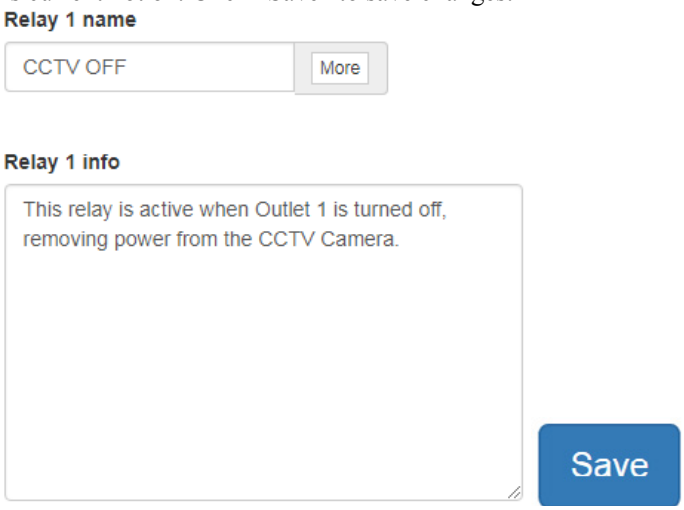
The user will also be prompted when turning OFF Relay 1. Click “Turn off” and the relay will turn off. If Relay 1 was previously off, it will remain off. After clicking “Turn off”, the Summary page will now display a RED Inactive indicator. Additionally, the LED for Relay 1 will also be off on the rear of the unit.

Before turning OFF

After turning OFF

Renaming Relays:

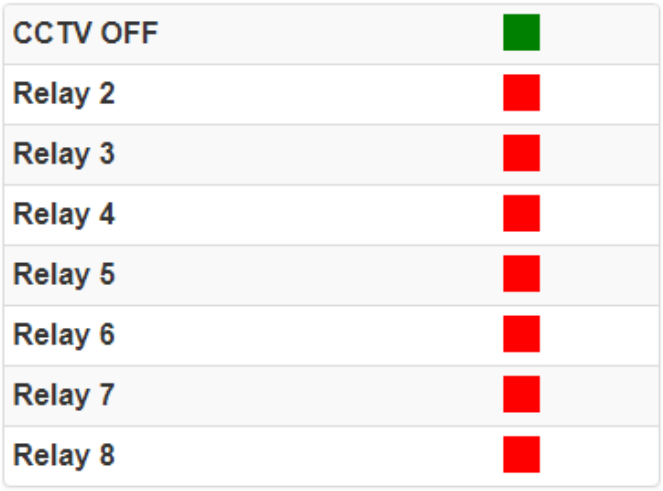
To rename any one of the relays and provide additional information, the user may type a new name into the text box for the respective relay. Click the "More" button to expand an additional textbox that may be filled with information that describes the reason why the relay is active. For example, if Outlet 1 is turned off, Relay 1 may be turned ON to indicate that a CCTV camera is current not on. Click "Save" to save changes.



Saving Relay Changes:

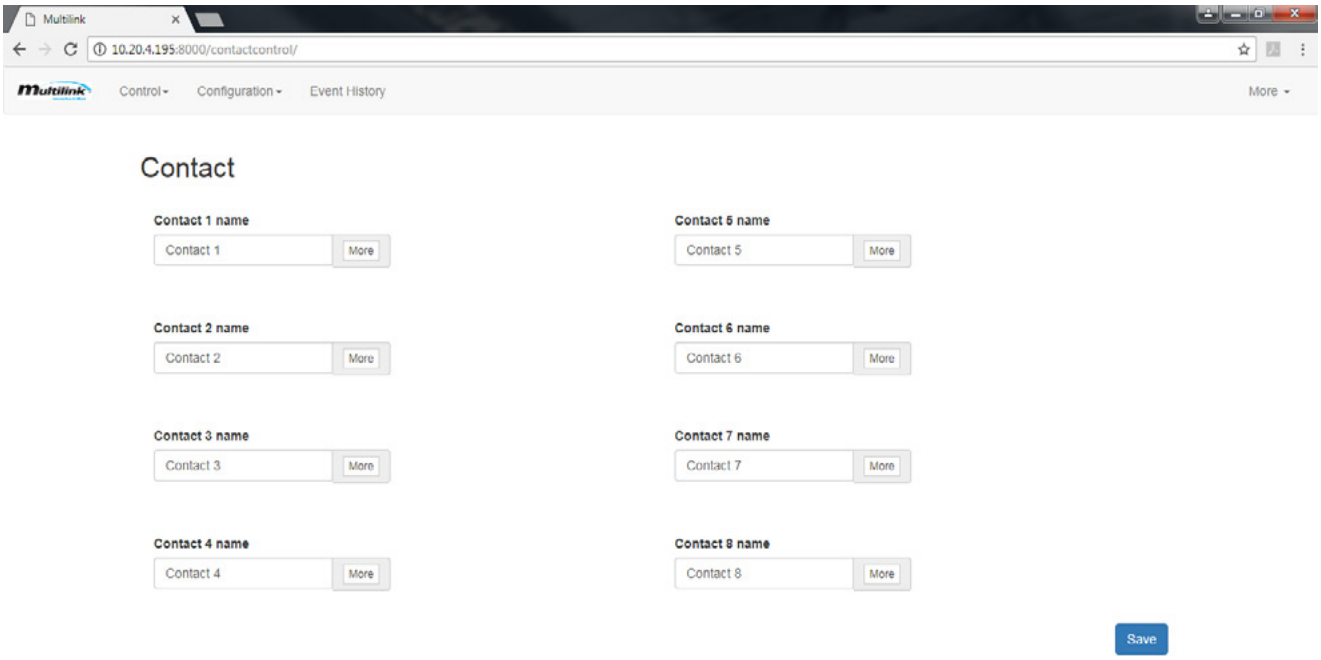
Click the "Save" button to save any changes. When the "Save" button is clicked, all text boxes will illuminate GREEN to indicate the changes have been saved. Changes made to any name or configuration item of the Smart Tracker will also illuminate GREEN to indicate the changes have been saved.

After saving changes, the new name for Relay 1 will be displayed on the Summary page. Any changes also made to input contacts, or unit configuration will also be displayed on the Summary Page.



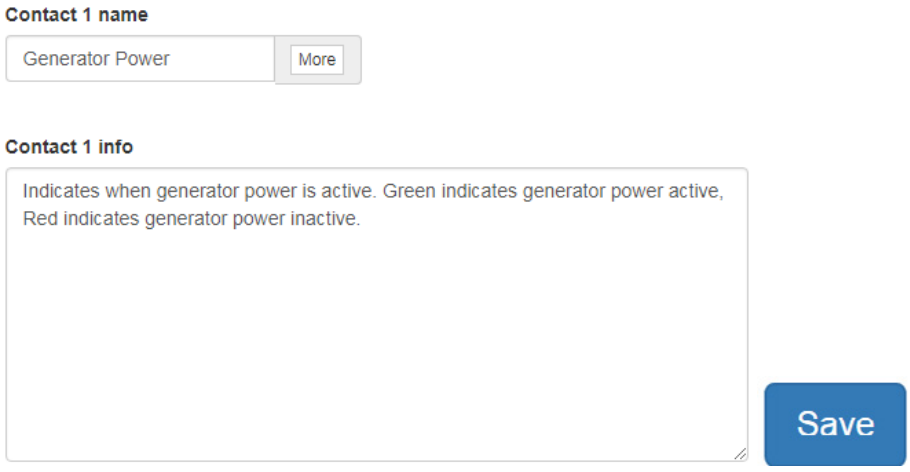
Inputs Page:

The inputs are used to indicate the state of an event or action that is external to the Smart Tracker, such as a generator system being activated. Each input has 2 mating contacts for which to attach wiring. When continuity is present between the matching contacts, the input will indicate GREEN on the Summary page. If no continuity is present between mating contacts, the input will indicate RED.



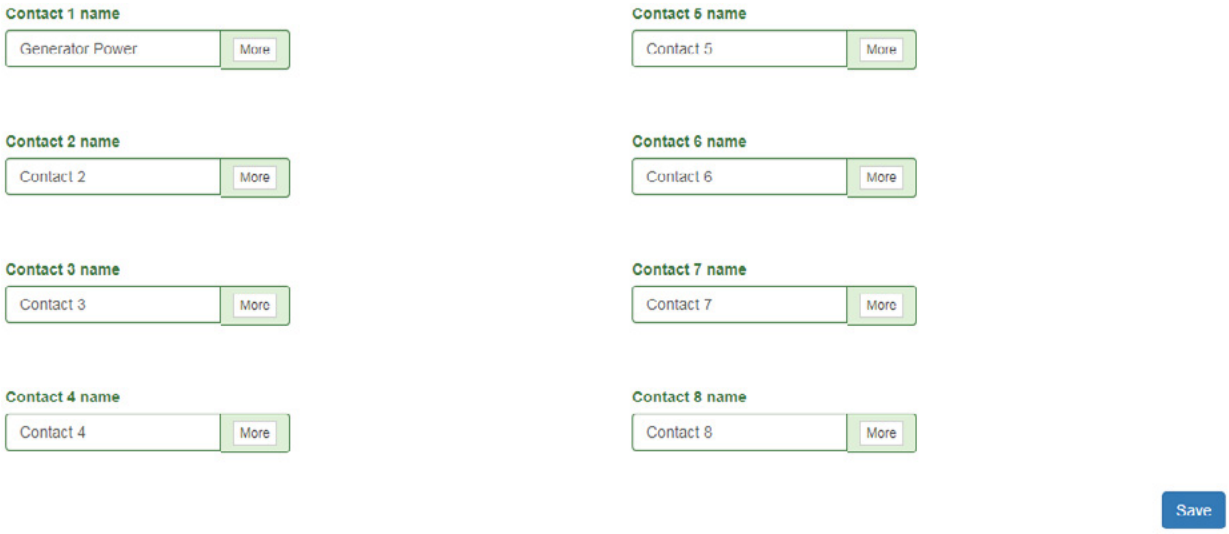
Renaming Inputs:

To rename any one of the inputs and provide additional information, the user may type a new name into the text box for the respective input contacts. Click the "More" button to expand an additional textbox that may be filled with information that describe the input. For example, Input 1 may be used to indicate the presence of generator power. Click "Save" to save changes.



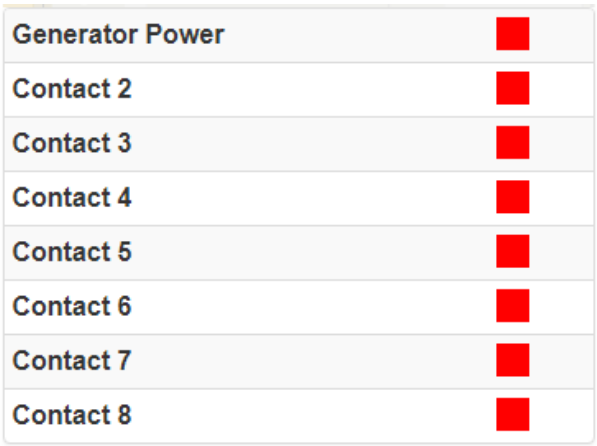
Saving Input Changes:

Click the "Save" button to save any changes. When the "Save" button is clicked, all text boxes will illuminate GREEN to indicate the changes have been saved. Changes made to any name or configuration item of the Smart Tracker will also illuminate GREEN to indicate the changes have been saved.

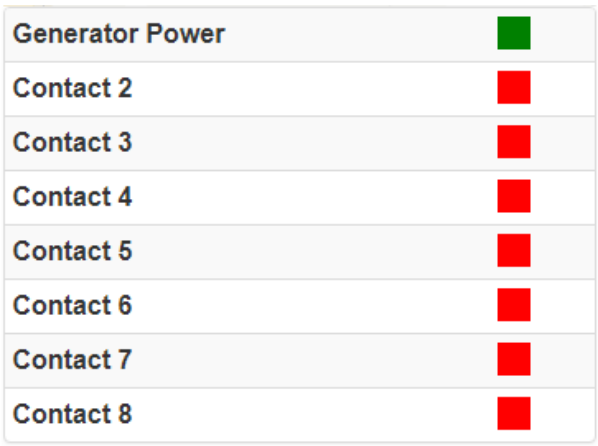


Input Indicators:

When the mating contacts for any input have continuity, the state of the input will change on the Summary page. Continuing with the example, if generator power is active, Input 1 will indicate GREEN. Additionally, the LED for Input 1 will illuminate on the rear of the unit. Otherwise it will indicate RED as described in the info textbox and the LED will be off.



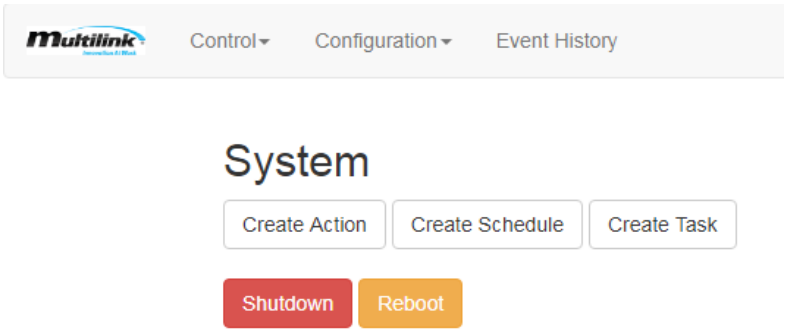
Generator Power (Input 1) Inactive



Generator Power (Input 1) Active

System Page:

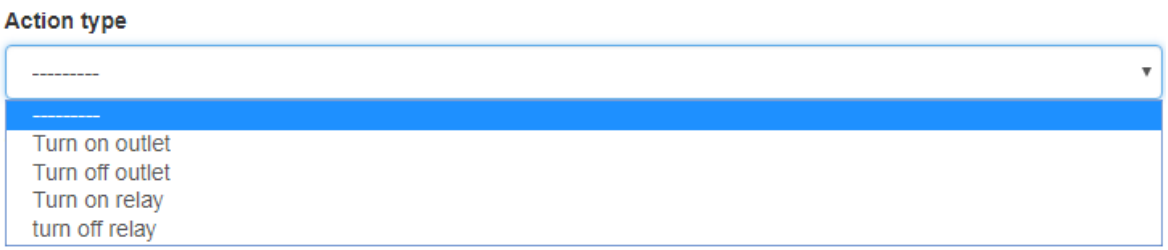
In the System tab, the user can setup scheduled tasks and remotely shutdown the operating system of the Smart Tracker. This feature allows for authorized remote shutdown prior to disconnecting the Smart Tracker from AC power. All outlets, relays, and network connectivity will become inactive. This feature does not remove AC power from the Smart Tracker due to the presence of the physical AC circuit breaker on the front of the unit. The Reboot can be used to restart the Smart Tracker if necessary.



Create Action:

The user can create custom action events for the outlets and relays to respond to based on a scheduled task. The action types include turn ON and turn OFF functions for both the outlets and relays. The user can specify which corresponding outlet or relay to have the action applied to as well as a delay time for the action to occur. These action events are stored for later use when scheduling tasks.

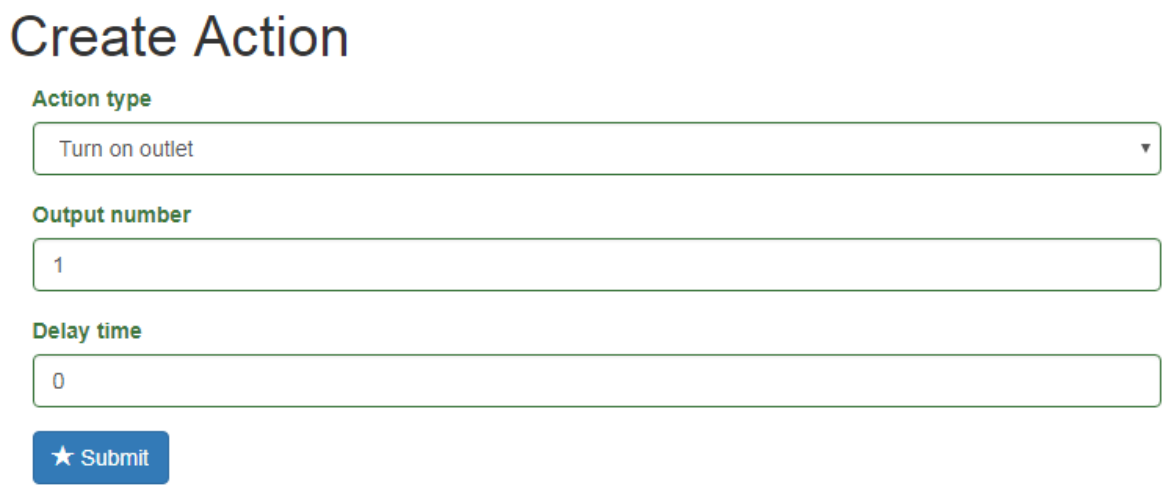
Click the action type dropbox to show a list of actions to select. There are 4 options to choose from.



Select the output number of the corresponding outlet or relay the action is to be applied to.

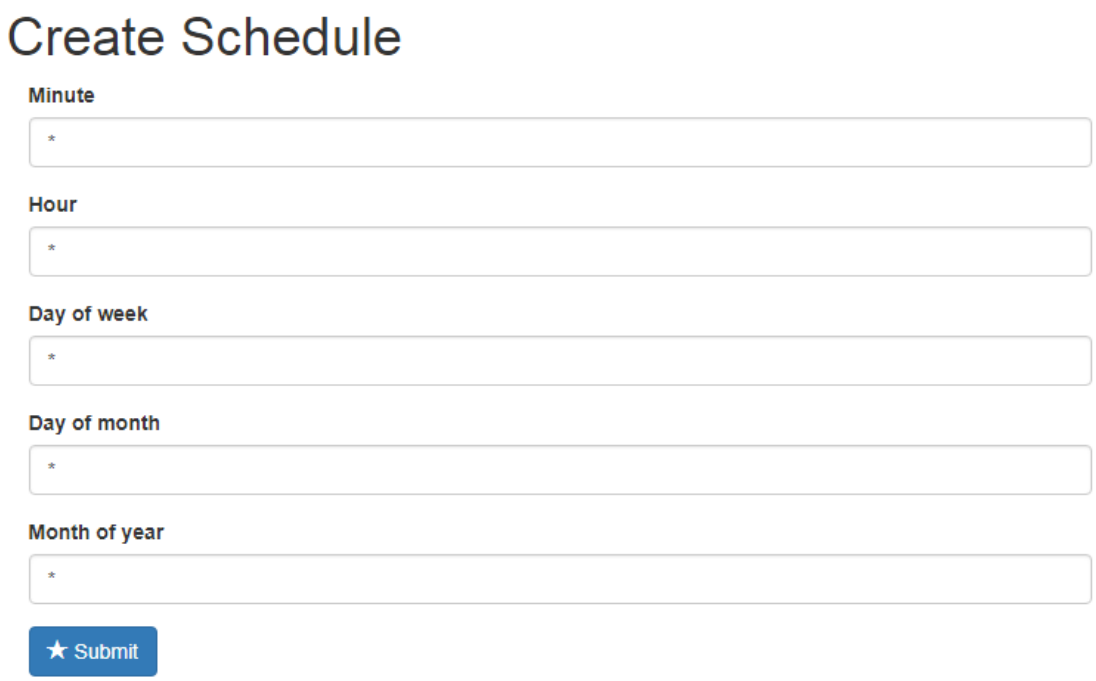
If a time delay is required, the user can input the delay, in seconds, for which the action will be delayed. If a 5 minute delay is required, the user would input 60 seconds. If no delay is required, then the user would input 0 seconds.

Be sure to click “Submit” to save the new action event for future use. All textboxes will turn green to indicate the save has been made.



Create Schedule:

Creating a schedule can be accomplished by clicking the "Create Schedule" button and entering information regarding the time at which action events occur. Multiple schedules can be created and saved for later use. The current schedule format follows the Linux based CronTab syntax format. It will be described below for ease of use and include examples. Future versions of the webpage will provide a clear and concise scheduling format that is intuitive and simplified for an enhanced user experience.



There are 5 textboxes that are shown; Minute, Hour, Day of Week, Day of Month, and Month of Year. Each of these text boxes has a format to it for the user in input specific data for the specified textbox. Please review the table below for specific format options.

Textbox	Allowed Values
Minute	0-59
Hour	0-23
Day of Week	0-7 Can also use full Day name
Day of Month	1-31
Month of Year	1-12 Can also use full Month name

An **asterisk *** in any of the text boxes stands for "first through last", or that every valid value entered in any of the textboxes will be executed. For instance, if an event is to occur every month of the year, place an asterisk in the Month of Year textbox.

Each textbox can be used to show a range or a list. A **Range** is a set of 2 numbers separated with a hyphen, such as '1-5'. A **List** is a set of numbers separated by a comma, such as '1,2,3,4,5'. For any of the textboxes, a user can input a list of times, days, or months for which an event will occur.

Minute (0-59) represents each minute. If the users wishes for an event to occur every half-hour, the user will input "30"

Hour (0-23) represents each hour of the day based on the 24-hour clock. If an event is to occur at Noon every day, the user will input "12".

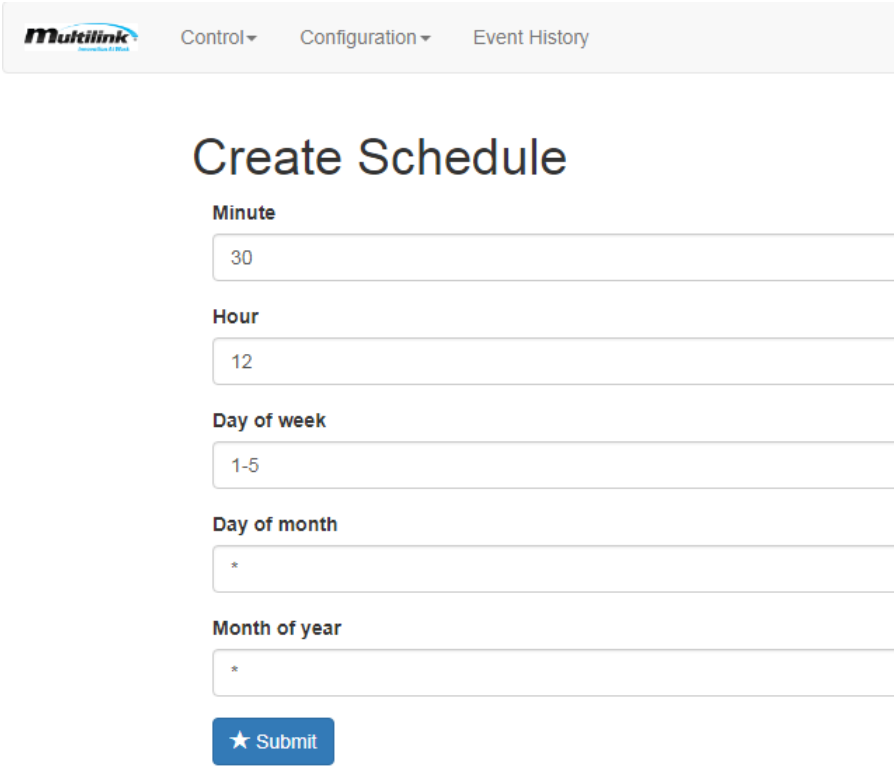
Day of Week (0-7) represents the days of the week. Monday is represented by the number 1, while Friday is represented by the number 5. Sunday is represented by both 0 and 7. Additionally, the user can use the full name of the day they wish for an event to occur.

Day of Month (1-31) represents the days of the month. The user can input a specific day of the month for an event to occur.

Month of Year (1-12) represents the months of the year. January is represented by 1, while December is represented by 12. Additionally, the user can use the full name of the Month they wish for an event to occur.

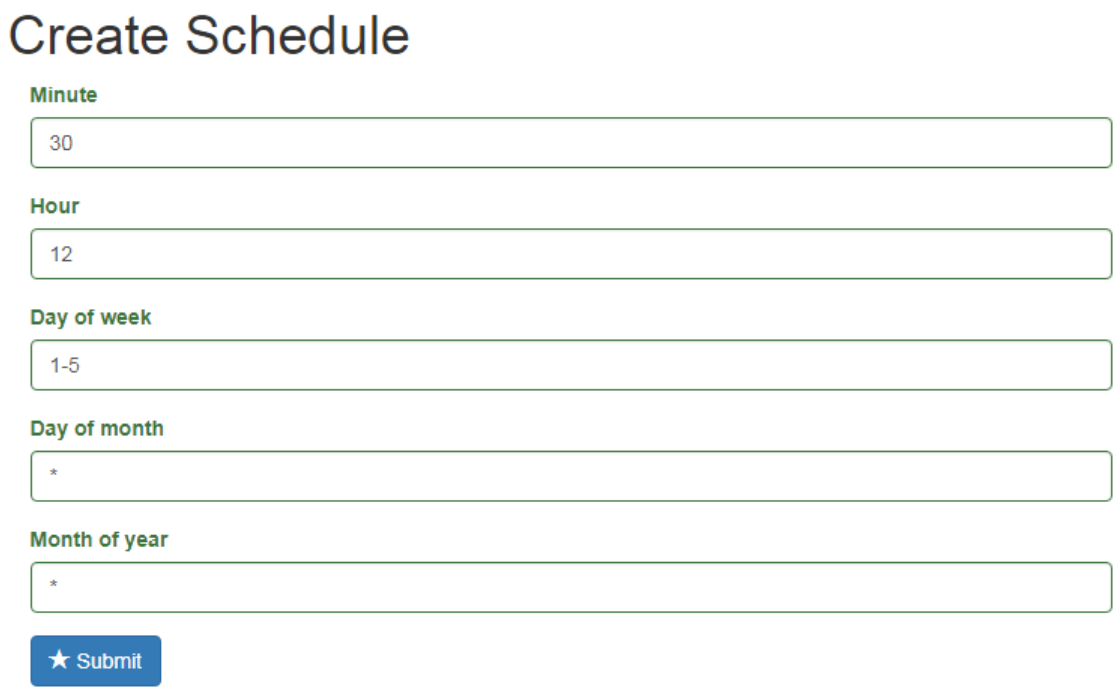
Example:

If the user wishes to have an event occur at 12:30PM every busy day of the week (Monday through Friday), for every day of the month, and for every month of the year, the user will input the values for each respective textbox below.



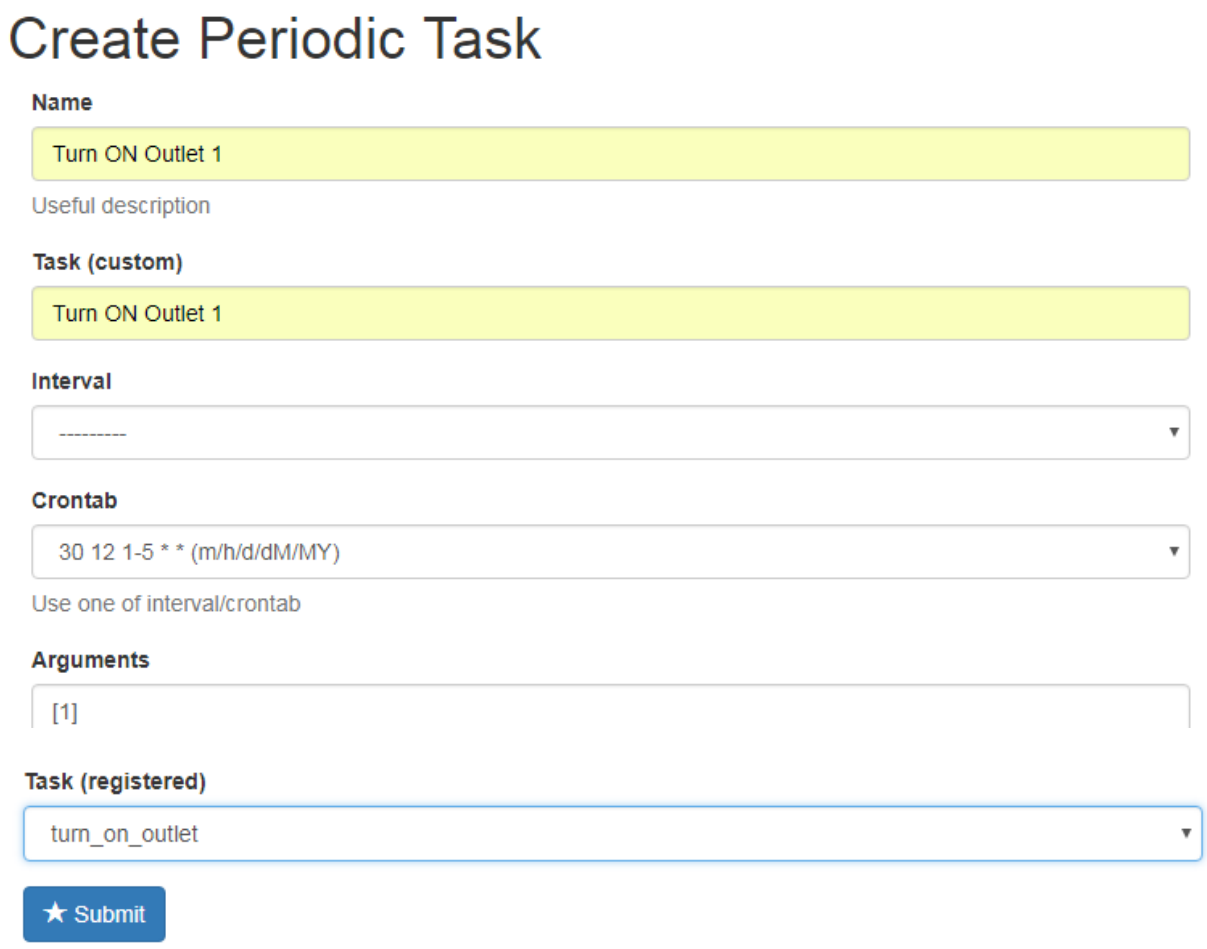
This will create a schedule for events to occur 12:30PM, Monday through Friday, all year long. The asterisk in "Day of Month" and "Month of Year" allow the scheduled event to occur regardless of the date of the day.

Be sure to click the “Submit” button to save the schedule for future use. All textboxes will turn green when the changes have been saved. The schedule will be available to select in the “Create Task” section of the System webpage.



Create Task:

The user can create periodic tasks under the "Create Task" page. This page provides many entry options but the main user inputs will be outlined below using only the Name, Task (Custom), Crontab, Arguments, and Task (registered) as they are the only required fields to be used. The user can name a task, provide a useful description, select a previously made schedule, which outlet or relay is affects, and the specific task to occur.



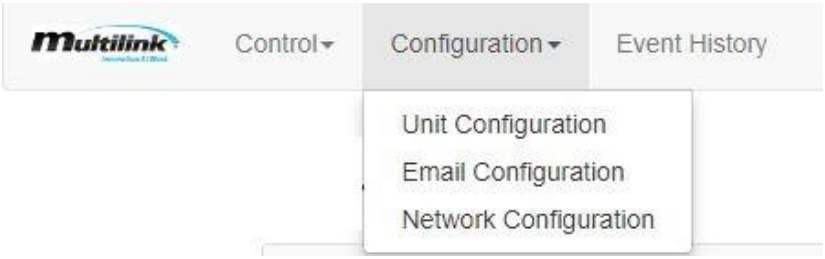
Under the Task (registered) list, the user can select the corresponding action that Outlet 1 will perform. In this example, we will turn ON outlet 1. Once the user has entered these 5 pieces of information on this page, be sure to click the "Submit" button to save all changes. All textboxes will turn green to indicate the changes have been saved.

In order for the newly created task to be placed in action, the user must enter the Outlets or Relays pages, click the "More" button, and select the task in the "Actions" text box. Please refer to the Outlets or Relays section of this User Manual for more information regarding these scheduled tasks.

Future versions of the webpage will include means for correcting and removing actions.

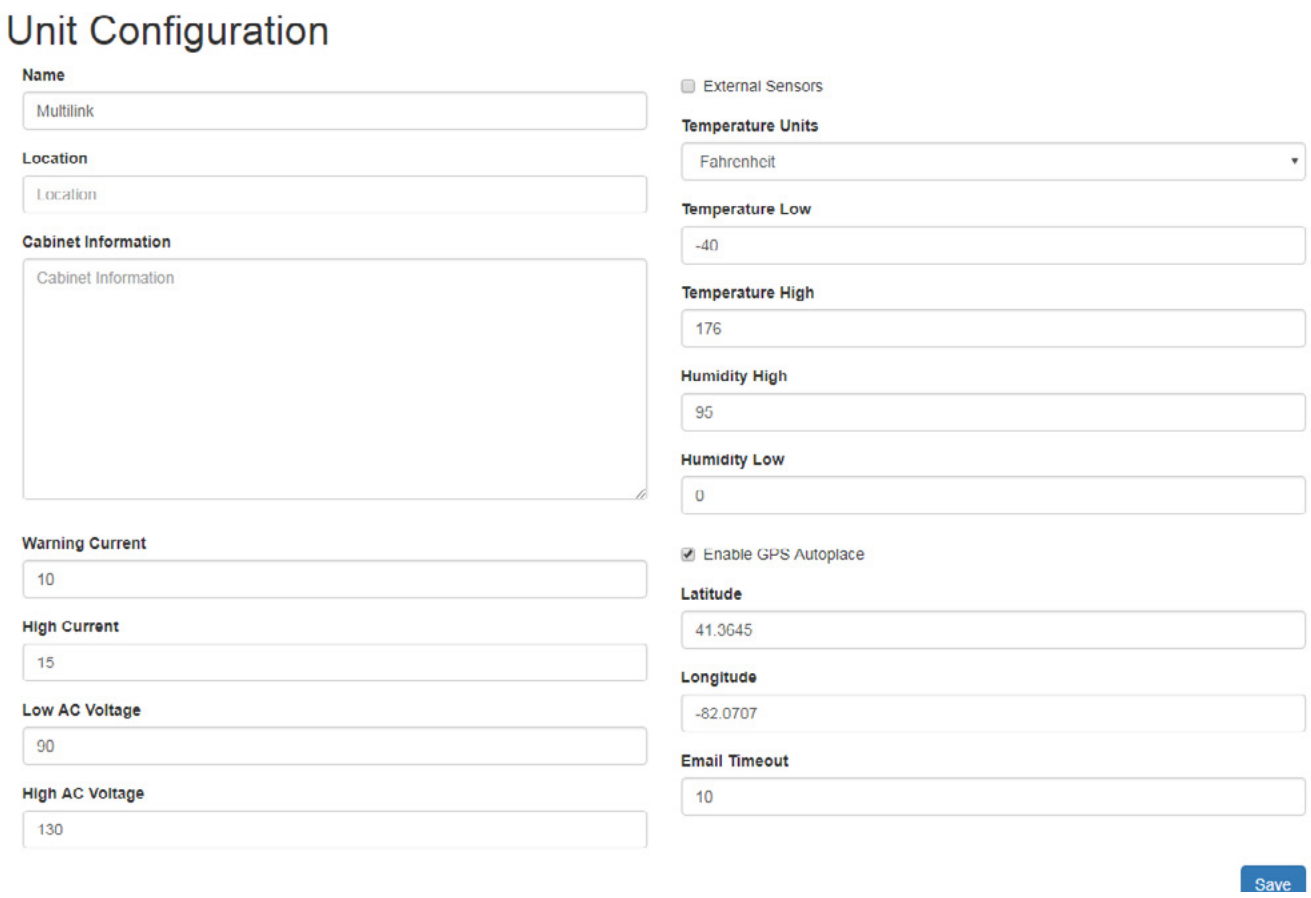
Configuration Tab:

The Configuration tab includes 3 pages for Unit, Email, and Network configurations. Each of these pages provides the user with configurable parameters in order to setup or enhance the operation of each Smart Tracker. Each of the pages is shown and described below.



Unit Configuration Page:

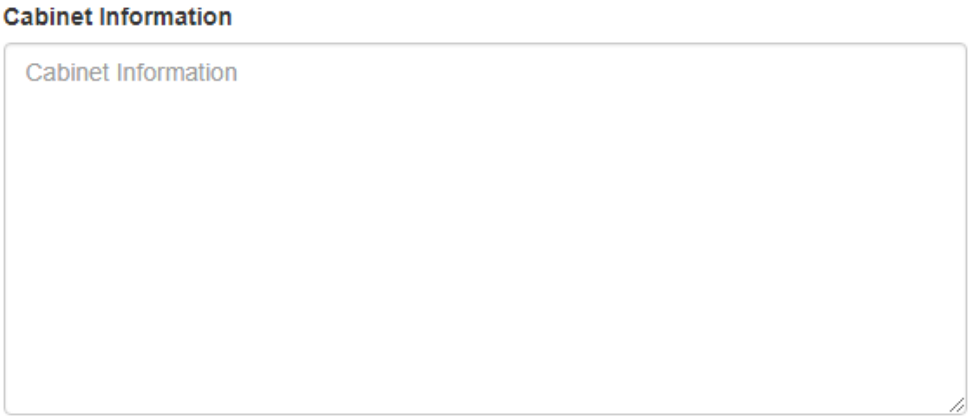
The Unit configuration page allows the user to modify the Smart Tracker's information, operating attributes, and GPS location information. It allows the user to edit the high and low threshold points for voltage, current, temperature, and humidity. If an external temperature and humidity sensor has been purchased, the option to enable this feature is also found on this page. Changes can be saved to any item by clicking the "Save" button. Each of these items and its use is described below.



Name: This text field may be changed to reflect the organization who owns the unit, for example.

Location: Used to expand on the location of the device. For example: 1st and Main, behind a bush.

Cabinet Information: Used to describe the cabinet and the equipment that may reside inside the enclosure.



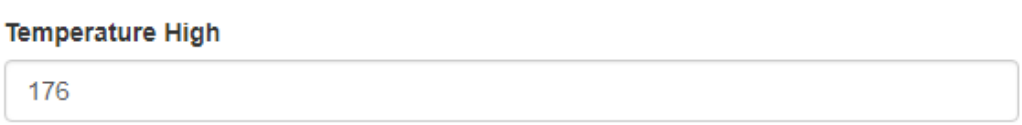
Warning Current: This threshold can be adjusted to indicate the total current draw has exceeded its warning value. When this occurs, the Smart Tracker will send an email notification to the list of recipients.

High Current: This threshold can be adjusted to indicate the total current draw has exceeded its High value. When this occurs, the Smart Tracker will send an email notification to the list of recipients.

Low AC Voltage: This threshold can be adjusted to indicate when in AC input voltage has exceeded its low threshold value. When this occurs, the Smart Tracker will send an email notification to the list of recipients.

High AC Voltage: This threshold can be adjusted to indicate when in AC input voltage has exceeded its high threshold value. When this occurs, the Smart Tracker will send an email notification to the list of recipients.

Temperature High: This threshold can be adjusted to indicate when the internal temperature of the Smart Tracker has exceeded its high threshold value. When this occurs, the Smart Tracker will send an email notification to the list of recipients.



Temperature Low: This threshold can be adjusted to indicate when the internal temperature of the Smart Tracker has exceeded its low threshold value. When this occurs, the Smart Tracker will send an email notification to the list of recipients.

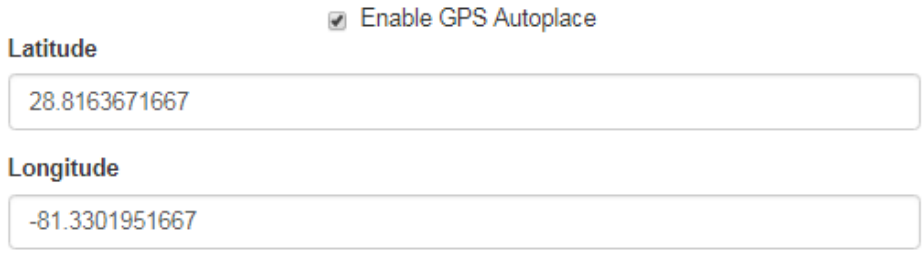
Humidity High: This threshold can be adjusted to indicate when the internal humidity of the Smart Tracker has exceeded its high threshold value. When this occurs, the Smart Tracker will send an email notification to the list of recipients.

Humidity Low: This threshold can be adjusted to indicate when the internal humidity of the Smart Tracker has exceeded its low threshold value. When this occurs, the Smart Tracker will send an email notification to the list of recipients.

Temperature Units: Allows user to change the unit of measure for the temperature. Values for the temperatures on the Summary page and LCD will be reflected when the unit of measure is changed.

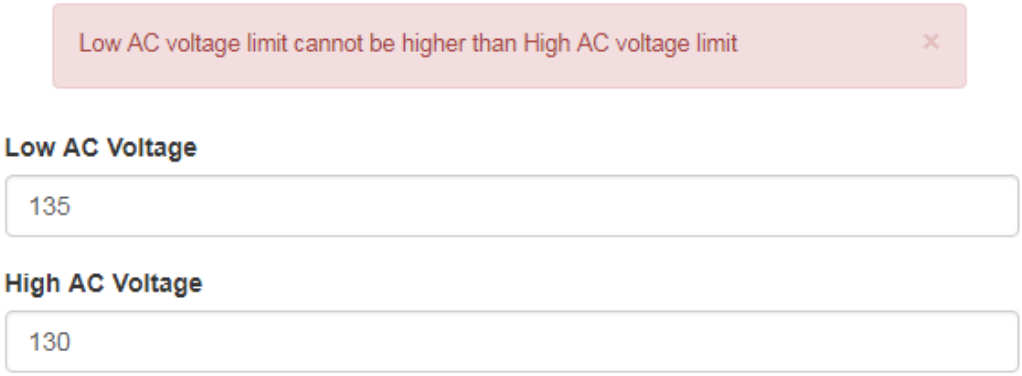
Enable External Sensors: When enabled, the Summary page will display 2 additional parameters, the external temperature and humidity. This is an optional feature and will not display the external values unless the feature is enabled and external sensors are in use.

Enable GPS Autoplace: This feature allows the GPS to receive a signal provided by the external antenna and places the Smart Tracker at its location on the Summary page map. When the GPS is not capable of "autoplacing" itself due to lack of reception, the user may disable this feature and manually input latitude and longitude coordinates.



Error Messages:

In the event that certain criteria are not met when the user changes the threshold values for current, voltage, temperature, and humidity, the user will be prompted with an error message upon saving changes. This message reports the reasons why the last change or changes were not saved. Values that violate these criteria will revert to the previously saved value when the unit configuration page is reloaded. For example, the Low AC voltage limit should not exceed the High AC voltage limit.

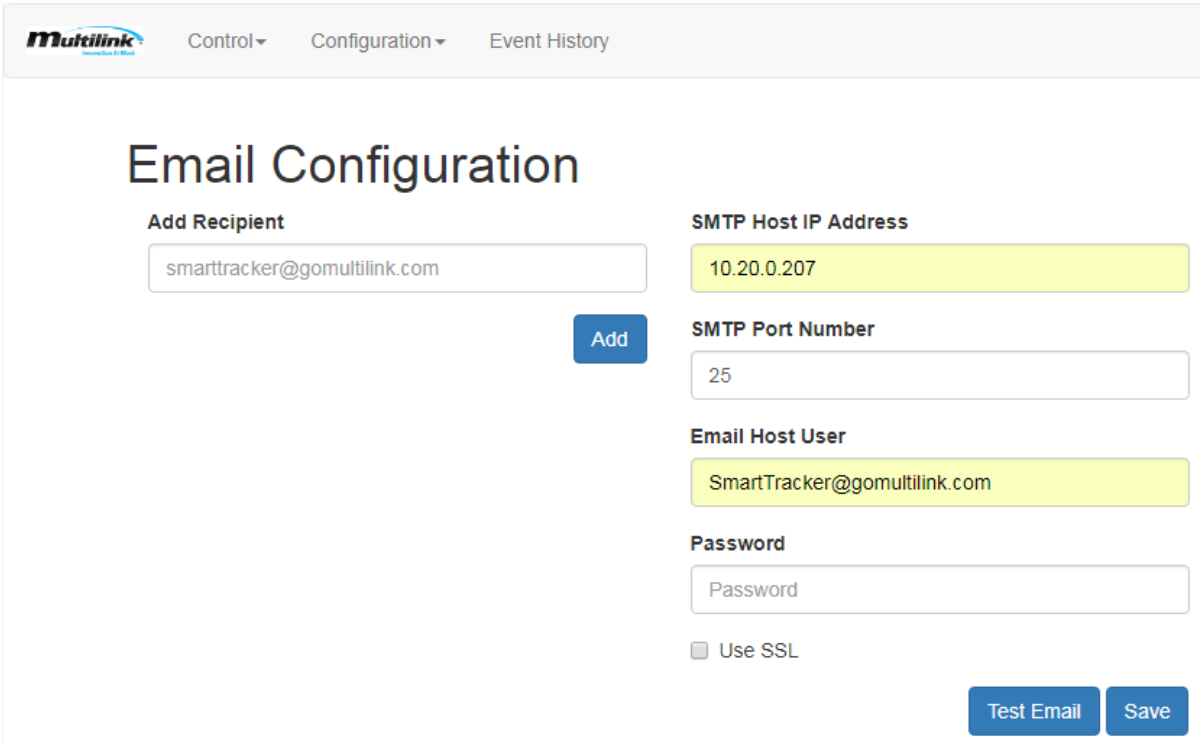


Saving Unit Configuration Changes:

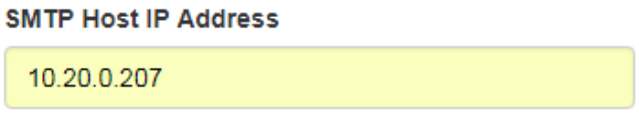
Be sure to click the "Save" button at the bottom of the page to save all changes. As with the Outlets, Relays, and Inputs pages, all textboxes and fields will illuminate GREEN to signify the changes have been saved.

Email Configuration Page:

In this page, the user can configure and test the email notification feature. Email notifications require SMTP information to be input in order for the Smart Tracker to send emails. This information can be requested from the Network Administrator of the user's network. The user can test the connection to verify the connection has been established. Each text field is described below with information and an example for setting up email notification and recipients.

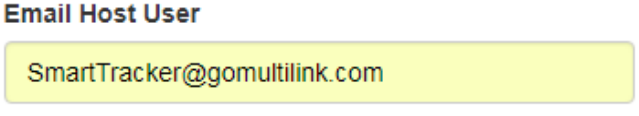


SMTP Host IP Address: This text field is the SMTP host for which emails will be transmitted. This could be an IP address or a domain name. In this example, an IP address for the host's email server is used.



SMTP Port Number: This text field is the SMTP port from which emails will be transmitted. In this example, Port 25 is the authorized TCP port that is used for email.

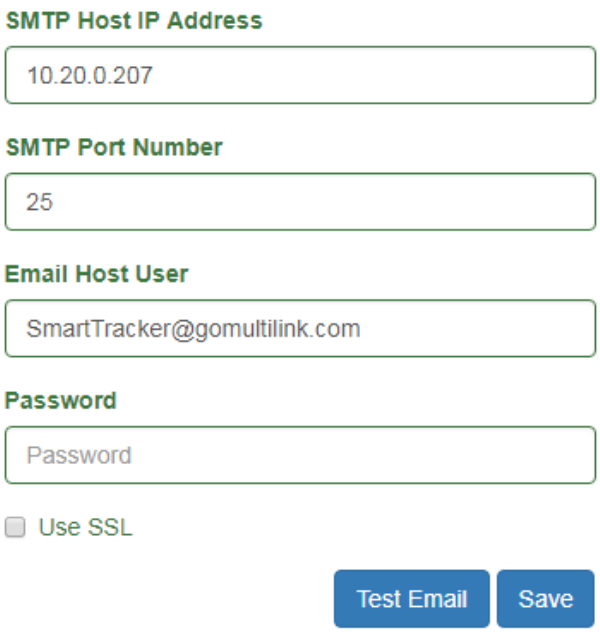
Email Host User: This text field is used for the Smart Tracker's email address. The user may change the Smart Tracker email address. In this example, the username portion of the email address is "SmartTracker" and the domain portion is @gomultilink.com.



Password: This text field is used for user authentication, if required, by the SMTP email host. The "Use SSL" and a valid email address and password must be established by the network administrator for this field to be used.

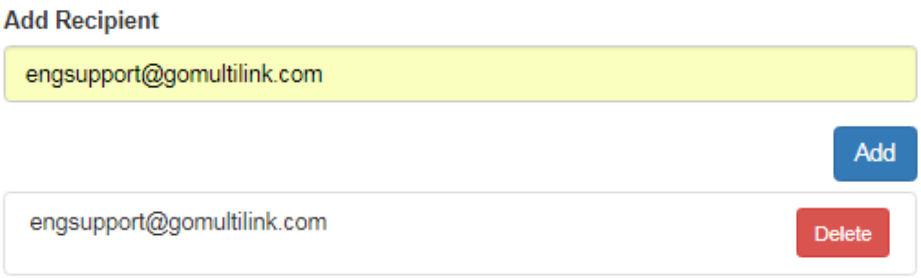
Saving Email Configuration Settings:

When all information is input, click the "Save" button to save all changes. As with previous pages, all textboxes and options will illuminate GREEN to indicate the changes have be saved.



Adding Email Notification Recipients:

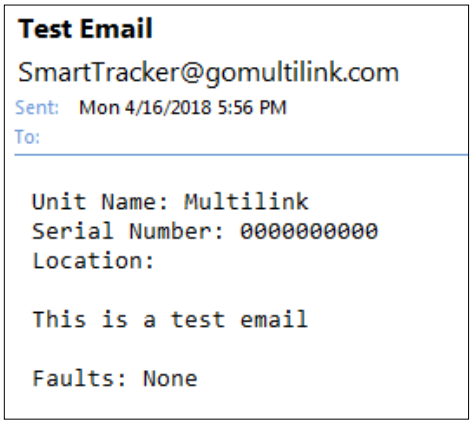
The user is required to add at least one recipient in order to test and receive email notifications. There is no limit on the number of email recipients. Enter a valid email address into the "Add Recipient" textbox and click the "Add" button to add the email address to the list. The list will display below the textbox.



To remove any one of the recipients from the list, click the "Delete" button and the email address will automatically be removed. The list of recipients will now receive any email notifications that may be sent from the Smart Tracker.

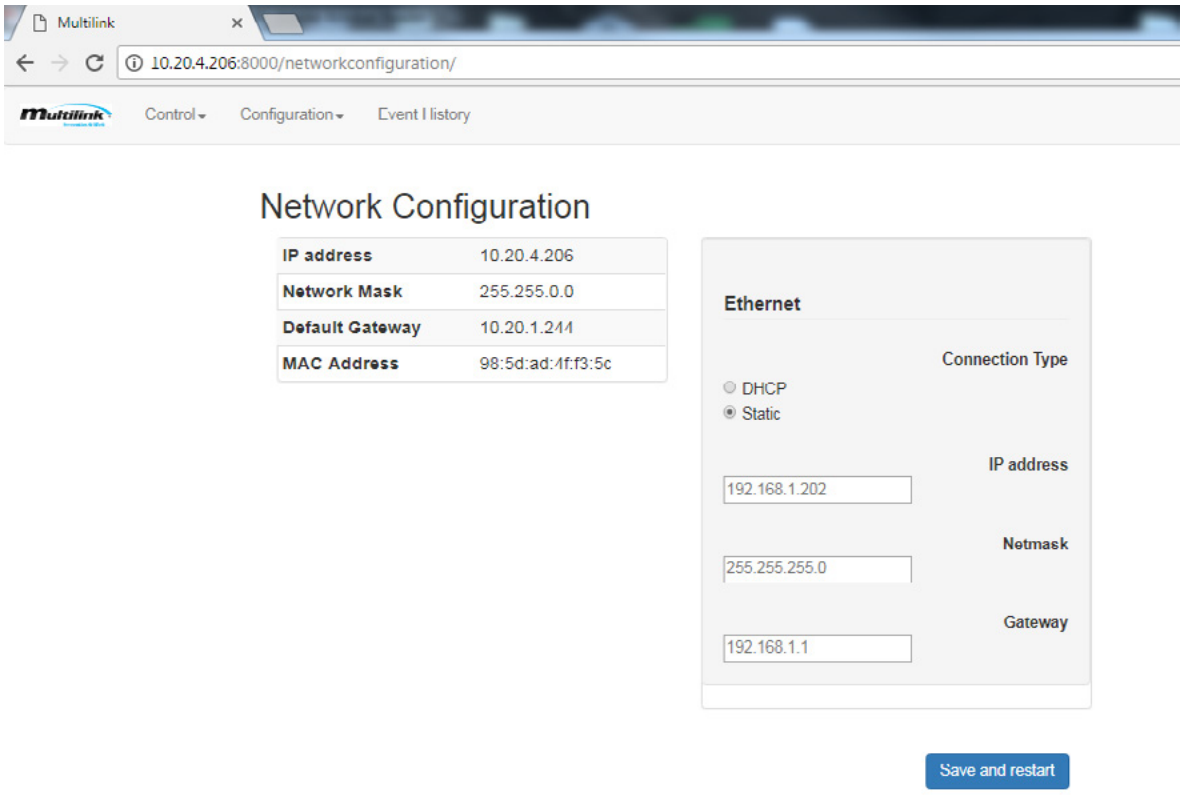
Testing the Email Notification Connection:

With a valid email recipient added, the user may test the connection to the SMTP host by clicking the "Test Email" button on the page. If the information provided is correct, the recipient will receive a test email from, in this example, SmartTracker@GoMultilink.com.



Network Configuration Page:

The Smart Tracker is designed to utilize DHCP to acquire its network configuration from the network's DHCP server. Once established, the IP address, subnet mask, and default gateway is stored for display and use. When configured, the IP address will also display on the LCD. A static IP address, subnet mask, and gateway may also be configured.



Current Network Configuration:

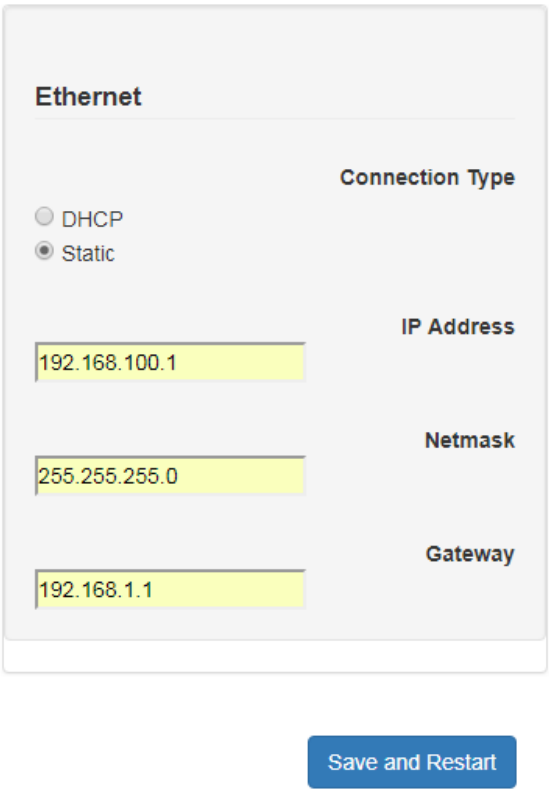
Once a connection to the DHCP server has been established, the current IP address, subnet mask, and gateway will be displayed on this page. The MAC Address of the Smart Tracker is also listed on this page.

IP address	10.20.4.206
Network Mask	255.255.0.0
Default Gateway	10.20.1.244
MAC Address	98:5d:ad:4f:f3:5c

Configure Static IP Address:

The user may change the network configuration to a static IP address by selecting the "Static" radio button and filling in the three textboxes. The gray addresses in the textboxes are used to show valid formats for each textbox.

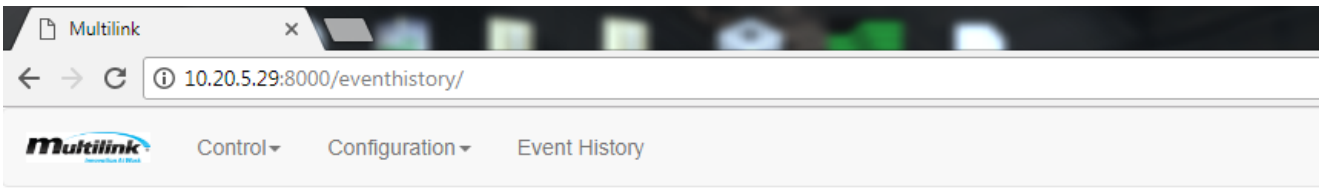
Note: Take care to verify that the static IP address chosen is not currently in use and the appropriate subnet mask and gateway are configured for the IP address selected. The example below shows the factory default IP address, subnet mask, and gateway for the Smart Tracker.



Click the "Save and restart" button to store the changes and allow the Smart Tracker to reboot. Once the unit restarts, the user may address the unit through the new static IP address. The user may also change the Static IP address back to using DHCP by selecting the DHCP radio button and clicking "Save and restart".

Events Page:

All events that occur in each Smart Tracker are found under the Events Page. When the state of an outlet, relay, or input changes, the date and time of that event are recorded. A description of each event will also be listed. Up to 200 events may be viewed at a time, with the oldest event being cleared when a new event occurs.



Event Log

Timestamp	Event
2018-02-14T14:34:53.655728Z	turn off relay 6
2018-02-14T14:34:51.719470Z	turn off relay 2
2018-02-14T14:34:47.146448Z	turn off outlet 6
2018-02-14T14:34:45.396390Z	turn off outlet 4
2018-02-14T14:34:43.728389Z	turn off outlet 1
2018-02-14T14:34:39.968405Z	turn on all outlets
2018-02-14T14:34:17.698037Z	Input 0 opened
2018-02-14T14:34:17.530638Z	Input 0 closed
2018-02-14T14:34:11.792049Z	Input 2 opened

Section 7: Smart Tracker Shutdown

The Smart Tracker can be shutdown at anytime. During shutdown, the user will observe that the LCD is active. The Smart Tracker contains a circuit that allows the unit to save the operating state, send any email notifications if required, and then safely shutdown the operating system.

Observe the following procedure:

1. Operate the Input breaker to the OFF (O) position or operate the circuit breaker serving AC utility power to the supply to the OFF position.

2. All outlets, relays, indicators, and the backlight will turn off. The LCD will remain powered for up to 20 seconds to allow the Smart Tracker to safety shutdown.

When the LCD becomes inactive, the unit is fully shutdown.

Section 8: Options

The Smart Tracker supports the use of an external temperature and humidity sensor that may be purchased as extra cost times. Below is a list of additional options that are available to the Smart Tracker to expand its functionality.

172-004-20 – Smart Tracker external temperature and humidity sensor.

035-006-11 - Ground lug kit.

Section 9: Troubleshooting

This troubleshooting guide has been designed to help quickly locate and resolve common problems. The table assumes normal operation and configuration of the Smart Tracker at any given time. If the problem cannot be resolved, replace the Smart Tracker with a known good unit or call Multilink Inc. for support.

Operating Conditions	UPS LED/LCD Status	Corrective Action
Smart Tracker did not start	LCD backlight OFF No outlets powered	• Verify AC power cord is plugged into the receptacle of the unit. • Verify upstream AC circuit breaker is closed and AC power is available. • Verify AC circuit breaker on Smart Tracker is turned on and the switch is illuminated.
No power to outlets	All outlet LEDs OFF	• Outlets may be turned on remotely or by pressing and holding the Enter button for 3-5 seconds to turn on. • If no outlets can be forced on, remove Smart Tracker and replace with a known good unit.
No Ethernet connectivity	IP address reads 0.0.0.0 Cannot connect to Smart Trackers embedded webpage	• Verify Ethernet cable is appropriate for use and that it is attached to a functioning network device. • Verify that the network configuration settings are correct. • Verify desktop or laptop's network adapter settings are correct and within the same IP range as the unit.
LCD screen inoperable	Backlight may be on but no text or incorrect text is visible	• Verify temperature of the unit. High temps will cause character fading. • Verify if unit response to Hot-Start. If not, remove unit and replace with a known good unit.
Webpage Unformatted	Webpage images and table placement are distorted	• Verify that the Smart Tracker clock on the LCD matches the clock of the connected computer.

Section 10: Smart Tracker Specifications

The specifications of the Smart Tracker are listed below.

Parameter	Specification	Notes
Mechanical/Environmental		
Dimensions	1.75” x 7.0” x 19.0” (HxDxW)	
Weight	5Lbs	
Mounting	Rack or Shelf	
Operating Temperature	-37° to +74°C	-34° to 165°F
Humidity	0 to 95%	Non-condensing
Input		
AC circuit breaker	15 Amp	Illuminates when ON
Power Cord	125VAC/15A	C13 to 5-15R
Phase	Single phase	3-wire
Operating Voltage	120VAC Nominal	85V to 154V operating range
Frequency	60Hz Nominal	±5%
DC Inputs	2 inputs	0-60VDC
Digital Inputs	8 inputs	5VDC/10mA Switching
Output		
Power Outlets	8	5-15R plugs
Relays	8	10A Max/250VAC Switching
Phases	Single phase	3-wire
Voltage	120VAC nominal	Output voltage matched to Input voltage
Rated frequency	60Hz	Output frequency match to Input frequency
Current Capacity	15Amp	
Voltage waveform	Sine wave	
Load power factor	0.97	
Communication		
Network Connectivity	Ethernet 10/100/1000 BASE –T	
Protocols	TCP/IP, UDP, SMNP, SNTP, NTCIP	
Connection	RJ45	
Safety Standards		
Standards	NEMA TS2-2003, FCC Part A	

Multilink®

Innovation At Work

Scan QR for website.

Multilink, Inc
580 Ternes Ln
Elyria, OH 44035
Tel: (440) 366-6966
Fax: (440) 366-6802

facebook.com/GoMultilink twitter.com/GoMultilink youtube.com/GoMultilink

Contact Us

North America	Europe, Middle East & Africa	Latin & South America
Tel: +1 440 366 6966 Fax: +1 440 366 6802 Email: engsupport@gomultilink.com	Tel: +1 440 366 6966 Fax: +1 440 366 6802 Email: engsupport@gomultilink.com	Tel: +1 954 499 9203 Mobile: +1 305 684 2388 Email: hquinones@gomultilink.com

Visit gomultilink.com for new product releases!