

GRITAUTOMATION®



Hardware Installation

Device Configuration

Operations of GRIT® Systems

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4th Printing, July 2023

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TO OUR CUSTOMERS

Thank you for purchasing your GRIT Automation® system. Please read this manual carefully to ensure that your new products are installed, configured, and maintained correctly.

We're a small company that loves the product we've created, and we're confident you will too! If you ever have any questions or feedback, feel free to contact us at the address below.

GRIT Automation, Inc.
2001 N. Mattis Ave. Suite 7495
Champaign, IL 61822 USA
www.gritautomation.com

Phone - (217) 840-5074
Email - info@gritautomation.com

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GETTING STARTED



Device Power

Attention: Supplying appropriate and sufficient power for your GRIT devices is crucial for optimal performance. Please, carefully read through all power information and recommendations.

Most importantly, remember to unplug or cut the power to any tool you are working on.

Getting Started

Power Requirements

RFiD, Switch charging docks, Gate Control, and Dust Bin Sensor's Strobe Light are all powered with low-voltage power, BUT require different voltages to operate. All low-voltage devices are shipped with 18/2 solid copper thermostat wire.

6v power



6v 1a Power Supply:
A Trigger (or Collector) outputs enough power to operate one RFI device.

GETTING STARTED

9v power



The low-voltage wire can be run from a device to the Power Bank in a "home run" fashion, or, hopped from one Gate Control device to the next on its way to the Power Bank in a "daisy chained" fashion. The Power Bank has two low-voltage jacks, but two sets of wires can be landed in each, if needed.

*Note: These recommendations could slightly increase or decrease based on the frequency with which multiple gates on the same Power Bank open in unison and/or how close to the dust collector the gate is located. Large Gate Control (5'+) devices do use more amperage than the Standard Gate Control (2.5"-4").

Troubleshooting:

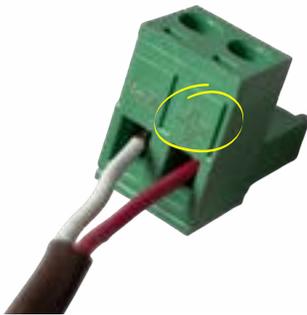
- If gates seem "sluggish", decrease the number of gates that operate synchronously on a single Power Bank. If gates aren't receiving sufficient amps, they lose "throw" power.
- If gates keep "re-setting", you may need to ground your ductwork.

GETTING STARTED

Pay Attention to Polarity

A brief note about the two types of low-voltage connectors used in the GRIT system: Terminals and Jacks. The positive and negative ports for these two connectors are located on opposite sides from each other. When running the low-voltage wire to devices, pay attention to polarity. A good rule of thumb is "Red on Right/Positive." This rule does not hold, however, for the low-voltage jacks found on Switch charging docks, Dust Bin Sensor Strobe Lights , or Power Banks. Refer to the image below.

Low-voltage terminal
- / +



Low-voltage jack
+ / -



GETTING STARTED

GRIT Lock®

The premise of GRIT Lock® is simple: easily lock/unlock tools to increase shop safety. With the use of GRIT Triggers, we are able to not only control the power that reaches your tool, but also, measure the current draw of the machine. Beyond the lock/unlock capability, the system provides an additional safety feature: Emergency Lock. Understanding how GRIT Lock® works and how to fine tune the power profile configuration of each tool/Trigger will ensure the proper current measurement to detect when a tool is running, as well as, optimal response time in the event of an Emergency Lock situation.

Emergency Lock

One of our safety "policies" is that GRIT will NEVER turn off a tool that is running. In the event that the HUB goes offline, someone initiates a system update, or someone is running a tool after the HUB's scheduled lock time, GRIT NEVER CUTS POWER TO A RUNNING TOOL.

An Emergency Lock, or an instance when GRIT will cut power to a tool, is described in the following scenario:

GRIT quickly cuts power to tools left in the 'ON' position prior to that tool's Trigger being unlocked.

Example: The entire shop is locked. Person 'A' walks up to the bandsaw and flips the power switch 'ON'. Since the tool is locked, it will not power on. Mistakenly, person 'A' leaves the tool's power button in the 'ON' position and walks away.

Later, the shop owner enters the shop and unlocks all the tools. When the bandsaw gets the unlock command, the Trigger will switch on the power feeding the bandsaw. As soon as the Trigger unlocks, GRIT immediately checks whether power is flowing. If the Trigger reads power above the activation current level set for the bandsaw, it cuts the power again within 1/60th of a second (1 cycle of AC current). GRIT immediately re-locks the bandsaw and logs an event called 'Emergency Lock'.

GETTING STARTED

You will notice that the LED indicator light will be flashing red. To allow usage of a tool that has been shut off due to Emergency Lock, simply turn off the tool, then press the unlock button again. The LED indicator light on the Trigger will stop flashing red and turn to solid green when it is unlocked and ready for use.

Getting Started

GRIT Lock® and the Importance of Trigger Configuration

The effectiveness of a majority of your GRIT system, including GRIT Lock, is dependent upon properly configuring each tool's Trigger. A Trigger's "job" within the system is, in essence, to measure and control current flow to its tool. All tools vary in the amount of current they pull, the amount they pull when 'on' versus 'running' (i.e., CNCs), the time it takes to reach their full draw (i.e., slow-start router tables), and the consistency with which they pull it while running (i.e., lasers). With your shop's complexity in mind, GRIT has a fully configurable application to completely capture each tool's power profile.

The details for properly configuring Triggers are covered under the Trigger Configuration section.

GETTING STARTED

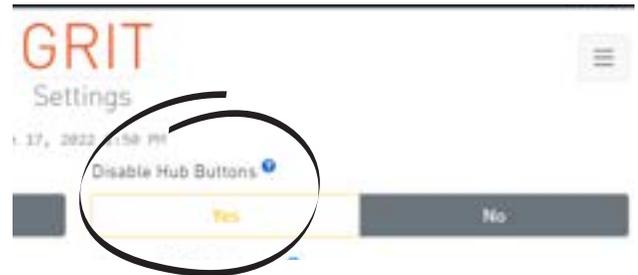
6 Ways to Lock/Unlock Your Tools

Lock/Unlock the entire shop with:

1. The Hub buttons.



*Note: the use of the Hub buttons can be disabled in the Admin section if the Hub is mounted in a location where using the buttons poses a safety concern.



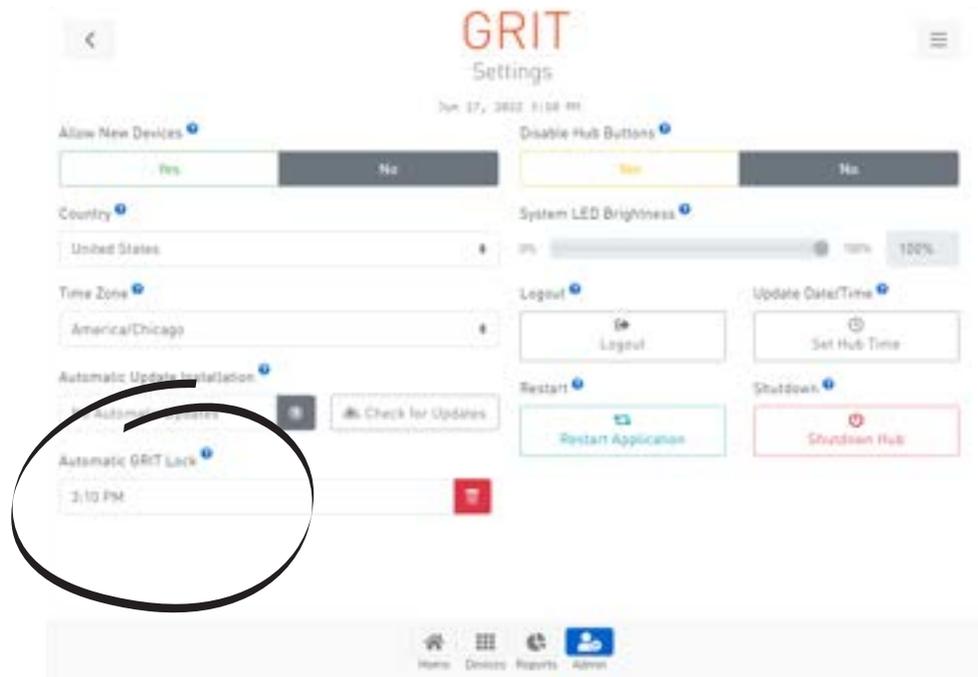
2. The GRIT App Dashboard.



GETTING STARTED

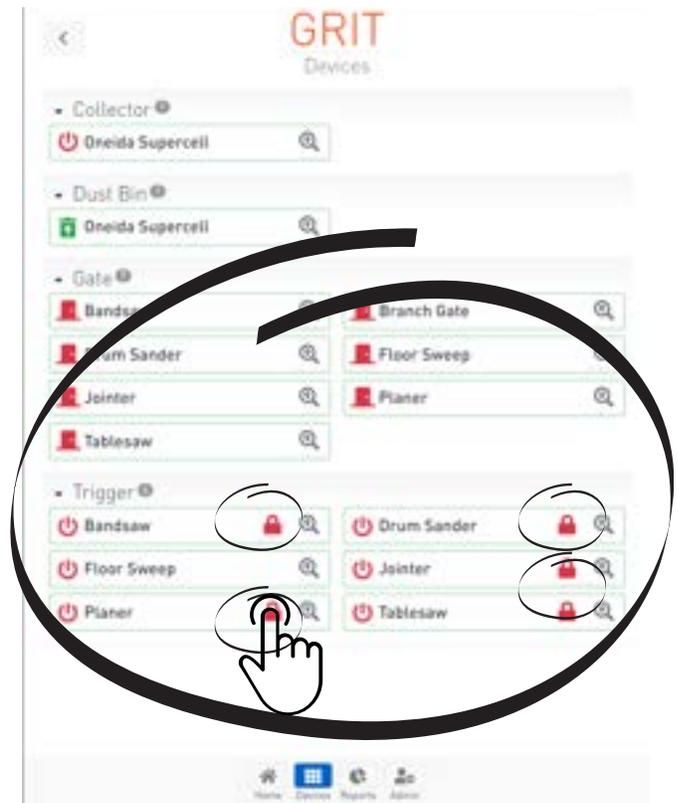
3. The Automatic GRIT Lock setting.

A scheduled system lock can be setup to automatically lock all triggers at the end of the day.



Lock/Unlock a single tool with:

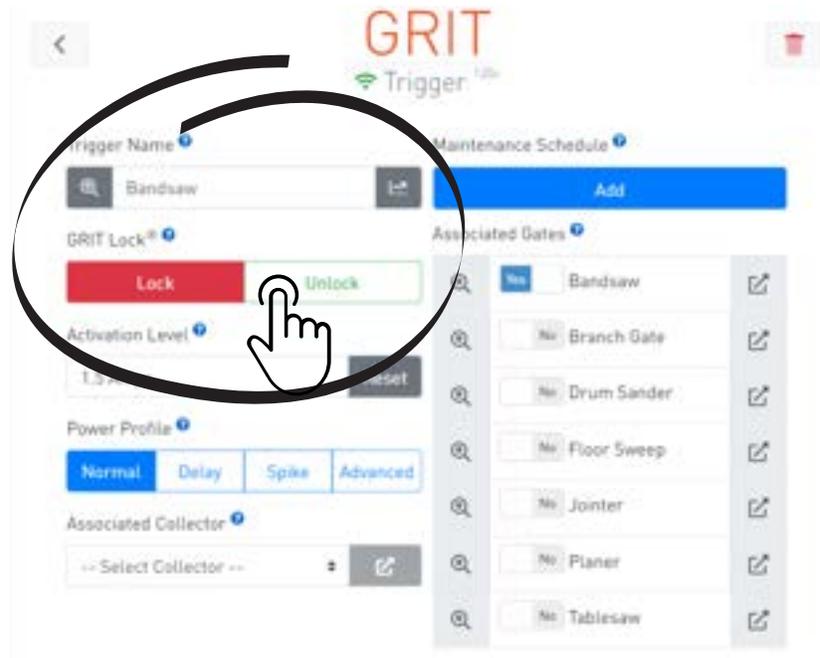
4. The GRIT App Devices screen.



GETTING STARTED

5. The GRIT App Trigger screen.

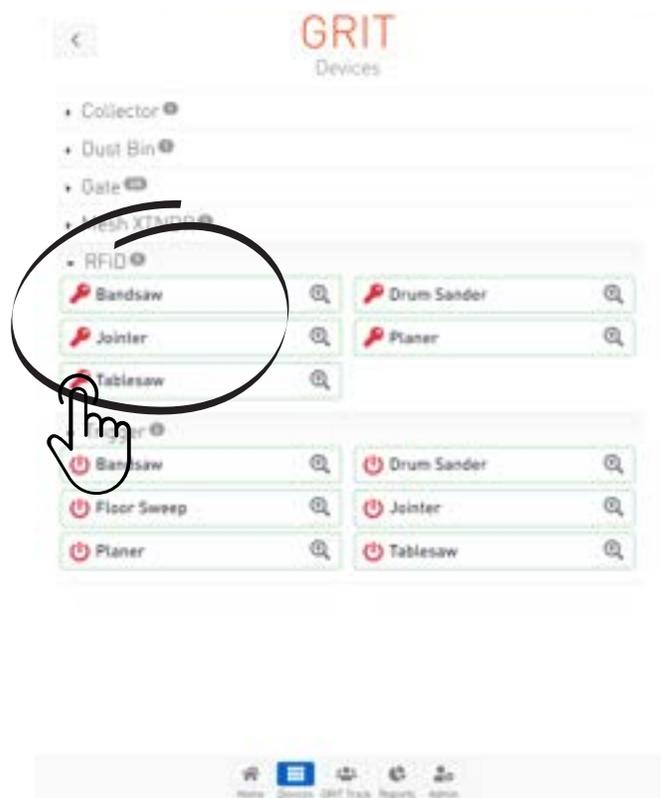
A tool's detailed configuration screen provides a button to toggle the state of that Trigger.



6. GRIT Track[®] RFID devices.

If a tool is outfitted with Access Control, unlock:

- by swiping a RFID card.
- by pressing the key icon in the GRIT App



Initial Setup

The GRIT Hub® is the "brains" of the system and should be installed first.

- Select a location for your Hub that:
 - is centrally located in your shop to support good connectivity with other devices.
 - is located near an ethernet connection or close to your personal Wi-Fi port (if applicable).
 - is located near a 120v outlet.
- The GRIT system does not require internet access to operate, however, in order to access your system remotely and to perform updates, internet access is required and recommended. The two options of accessing the Hub are:
 - **Connect with the Hub via your own local network, or;**
 - **Connect with the Hub via its own projected Wi-Fi***

Plug in the Hub using the provided power supply. Allow the Hub to boot up (can take up to 2 minutes). A QR code is visible on the side display when the Hub is ready for connection.

Choose the connection method you'll be using: Ethernet or the Hub's own Wi-Fi*.

***Note: If planning to connect with your own private Wi-Fi, choose the initial setup option that first connects with the Hub's Wi-Fi. If you switch from the Hub's WiFi to your personal WiFi, wait until you have completed that process to save the App shortcut to your device Homescreen.**

GETTING STARTED

GRIT Hub® Connection Options

Option 1: Connect to GRIT Hub with ethernet

Step 1:

Plug one end of an ethernet cable into the jack located on the bottom of the Hub, and the other end into your personal router or switch.



Option 2: Connect with GRIT Hub Wi-Fi (ensure ethernet is not plugged in.)

Step 1:

Press the button on the left side of the Hub until a QR code labeled 'CONNECT TO HUB WIFI' appears on the display screen.



Step 2:

Scan the QR code with your phone or tablet's camera to join.

(Note: If your phone/tablet has trouble scanning the QR code, you can manually connect):

- Go to the device's W-Fi settings.
- Select the Wi-Fi network that starts with 'grithub-'.
- The password is gritautomation (all one word, all lowercase).

GETTING STARTED

Access the GRIT App

After connecting with the Hub via ethernet or the Hub's own Wi-Fi, it is now time to install the GRIT App. (Remember, if you plan to switch from the Hub's own Wi-Fi to your own personal Wi-Fi connection, wait until that step is completed to save the shortcut to your device as the IP address will change in the process of the switch.)



The GRIT App works on mobile phones, tablets, and PCs. Using the native browser for the mobile device allows for the application to be installed on the home screen.

Apple devices use Safari (not Chrome).

Android devices, use Chrome.

Press the button on the left side of the Hub to display the unique IP address QR code. You can either:

Scan the code with your phone/tablet's camera,
or;

Manually enter the IP address displayed into your device's native browser.



GETTING STARTED

Create GRIT Administrator Account

g GRITAUTOMATION
Create Account

First Name: Last Name:

PIN: Password:

Choose your 4 digit security PIN 8 characters minimum

Mobile Phone: Email:

Continue

The 'Create Account' screen will appear after you access the GRIT App IP address.

g GRITAUTOMATION
Create Account

First Name: Last Name:

PIN: Password:

Choose your 4 digit security PIN

Mobile Phone: Email:

Continue

Complete this form with the information of the main administrator or shop owner.

The 4-digit PIN can be used to login to the GRIT account in the future, as well as, used on the SignOn kiosk, if applicable.

This is a novel PIN, so no other user can select a duplicate PIN.

Press 'Continue' once you complete all fields.



GETTING STARTED

Switch from Hub WiFi to Personal WiFi

Getting Started



Step 1:
If you would like to continue using the Hub's own WiFi, press 'No'.
If you would like to switch from the Hub's own WiFi to your own personal WiFi network, press 'Yes'.

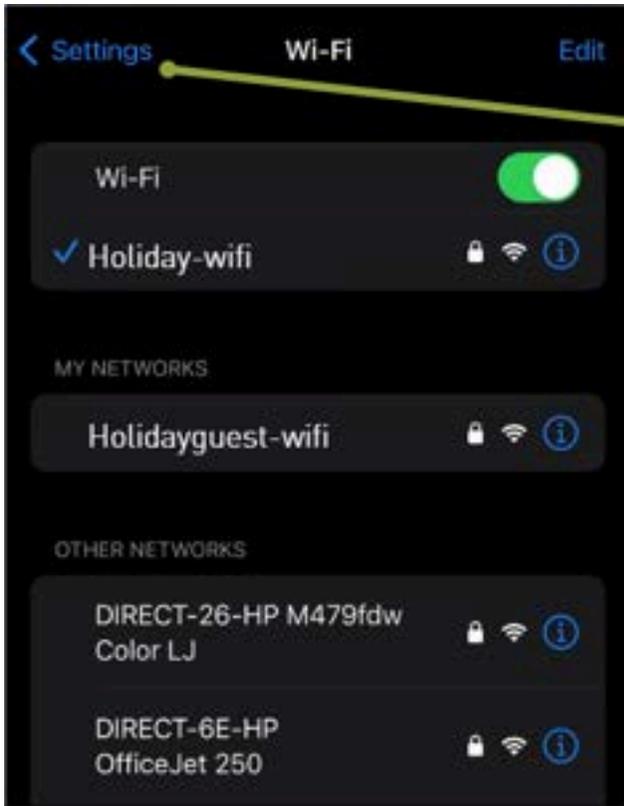


Step 2:
Select your preferred WiFi network from the list of Available Networks. If you do not see yours in the list, press 'Refresh'.
Once selected, enter your WiFi password. Take care to enter the password correctly.
Press 'Next'.



Step 3:
This screen will display when the connection has switched to your personal WiFi network.

GETTING STARTED



Step 4:

Go to your phone/tablet's Settings and make sure your device is on the same WiFi network you selected for your Hub.



Step 5:

Press the button on the side of the Hub until you see the QR code for the new GRIT App IP address.

Scan with your phone/ tablet's camera or enter the IP address into your native browser's search window.

***Please note: If you enter the wrong password during the WiFi setup, press and hold the button on the side of the Hub for 10 seconds to delete the WiFi settings and start again.**

GRIT HUB® + APP

GRIT Hub®

The Hub is the 'brains' of your system and all other GRIT devices communicate through its Mesh Network. All data collected from the system is stored locally.



GRIT HUB® + APP

Installation

The GRIT Hub® can be installed anywhere as long as it can connect to a single device to form the GRIT Mesh Network. However, the following should be considered to avoid having to move it later.

- The more centrally located the GRIT Hub®, the better.
- If your system will be connecting to your local network via ethernet cable, ensure that its placement makes this connection easy.
- If your system will be connecting to a local Wi-Fi network, make sure it is placed with good signal strength.
- If your shop has any thick concrete walls or thick metal walls that separate portions of the space, try to position the Hub central to this barrier. This will ensure the best communication between the areas. If your space has many rooms spread over large distances you may need to purchase the GRIT Mesh Xtndr device to bridge the long distances.
- If your system will not be using GRIT Track® (RFiD), physical access to the hub should be considered to limit access by unauthorized persons (i.e., In a locked closet or office). If your system includes GRIT Track® (RFiD), the GRIT Lock® buttons on the front of the device are not used.
- Access to 120v power is required to power the GRIT Hub®.

When mounting the Hub make sure it has no obstructions that might hinder the communication with the GRIT Mesh Network.



Step 1:
Attach the Hub to the wall.
If the Hub is not to be mounted on a wall, it can lay flat on its back, on a high shelf.

GRIT HUB® + APP

GRIT HUB® Installation



Step 2:
Screw on the antenna and position it pointing up.



Step 3:
Plug the supplied 5v 4a power adapter into the jack on the bottom of the Hub, then into a 120v wall outlet.



Step 4:
If you are using an ethernet cable to connect to your local network, plug one end into a router or switch, and the other end into the jack on the bottom of the Hub.
(Cat5 cable not supplied.)

GRIT HUB® + APP

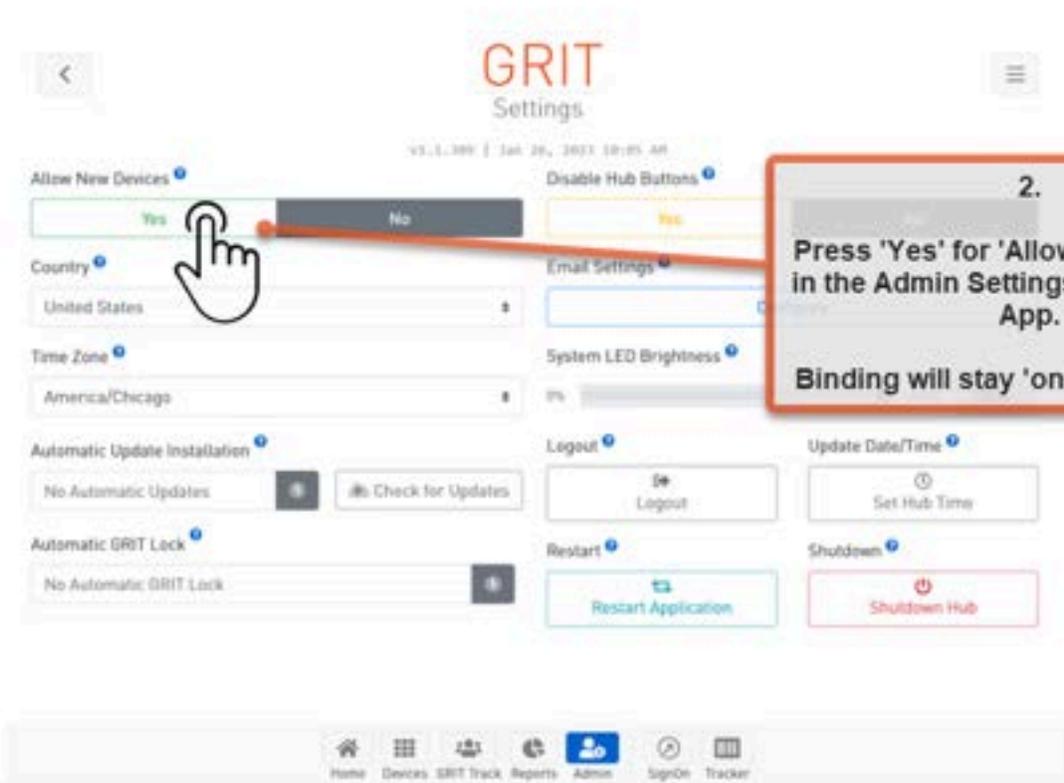
Bind Devices

After physically installing the other GRIT devices in the shop, you must Bind the devices to the Hub.

There are 2 Ways to Bind Devices*



1.
Press the center 'Bind' button on the front of the Hub. It will illuminate in solid blue when binding is activated.
Binding will stay 'on' for 5 minutes.

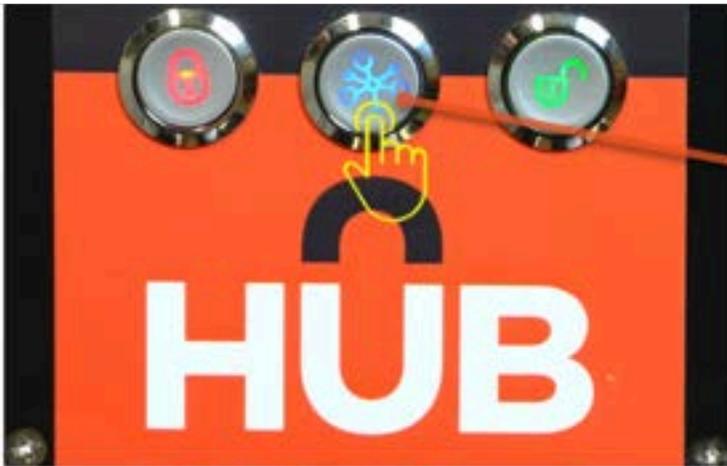


2.
Press 'Yes' for 'Allow New Devices' in the Admin Settings section of the App.
Binding will stay 'on' for 5 minutes.

GRIT HUB® + APP

*Bind Devices: Multi-Hub Environment

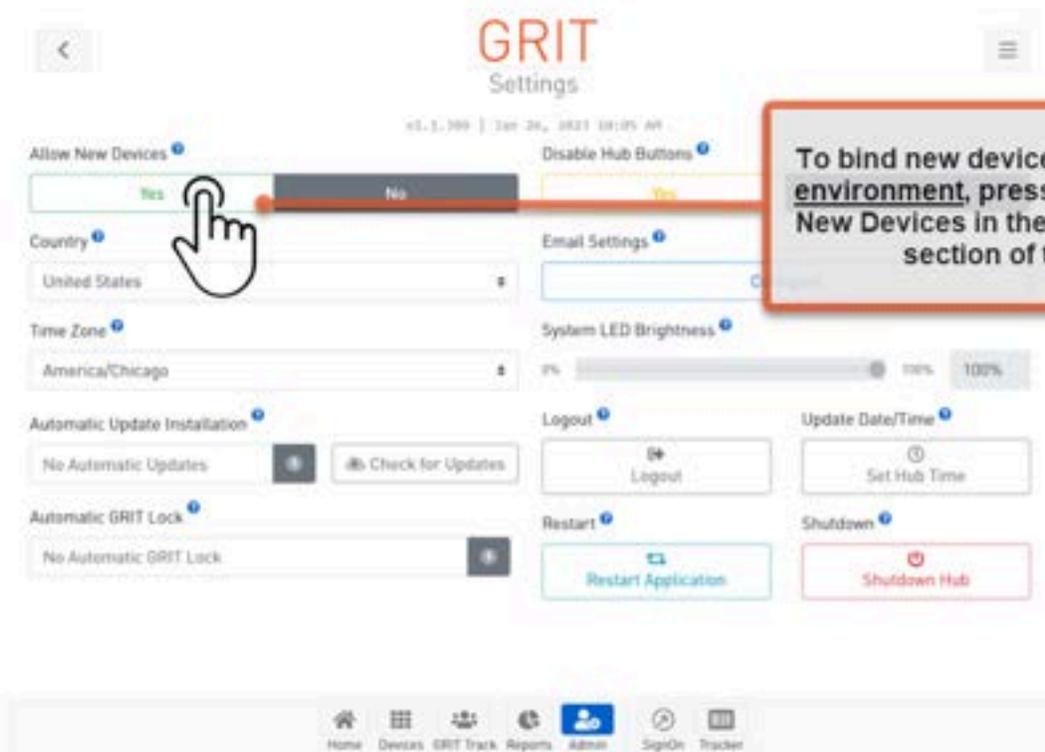
After physically installing the other GRIT devices in the shop, you must Bind the devices to the Hub. If there is another Hub that is close enough to yours to hear projected messages over the mesh network, your Hub will slightly alter its binding process to keep the systems separated.



When you are in an environment where there are multiple HUBs present, the 'Bind' button on the front of the HUB will no longer enable new devices to bind.

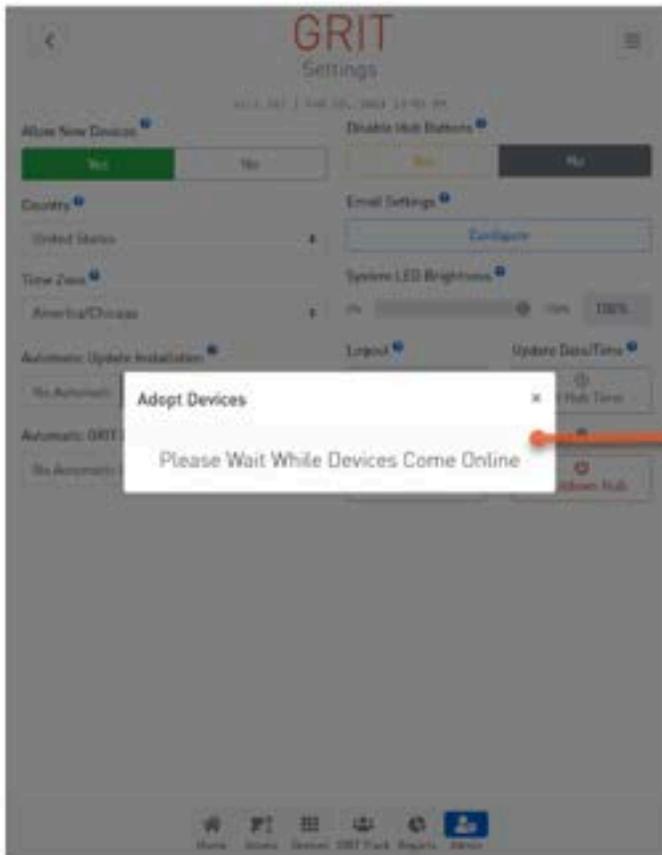
When pushed, it will FLASH blue (rather than being solid) indicating that you must use the App to bind.

GRIT App
Bind Devices

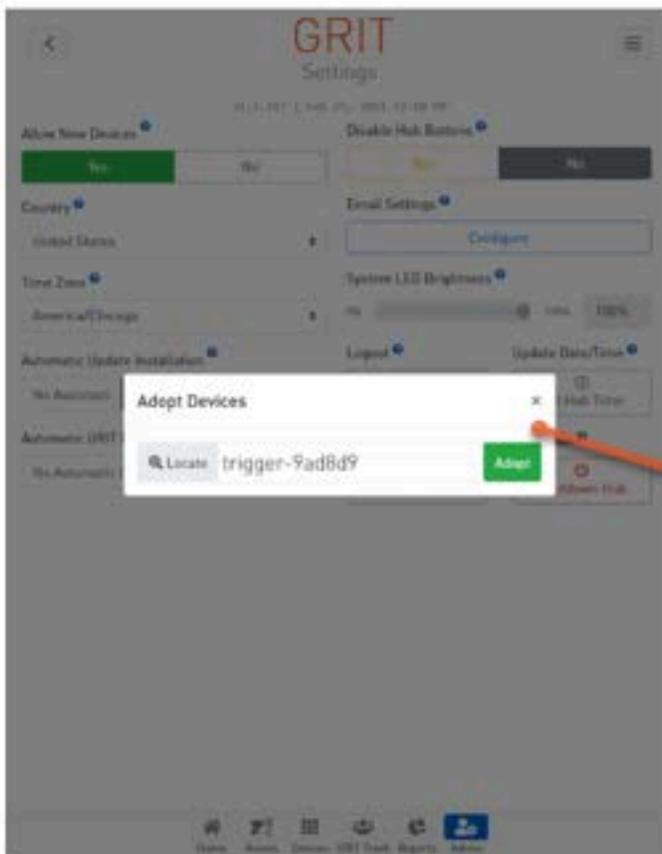


To bind new devices in a Multi-Hub environment, press 'Yes' for 'Allow New Devices' in the Admin Settings section of the App.

GRIT HUB® + APP



After pressing 'Yes', a popup window will appear. If there are no devices waiting to bind, you will see this message.



After pressing 'Yes', a popup window will appear. If there are new devices waiting to bind, you will see this message.

Press 'Adopt' for each device you would like to bind to your HUB.

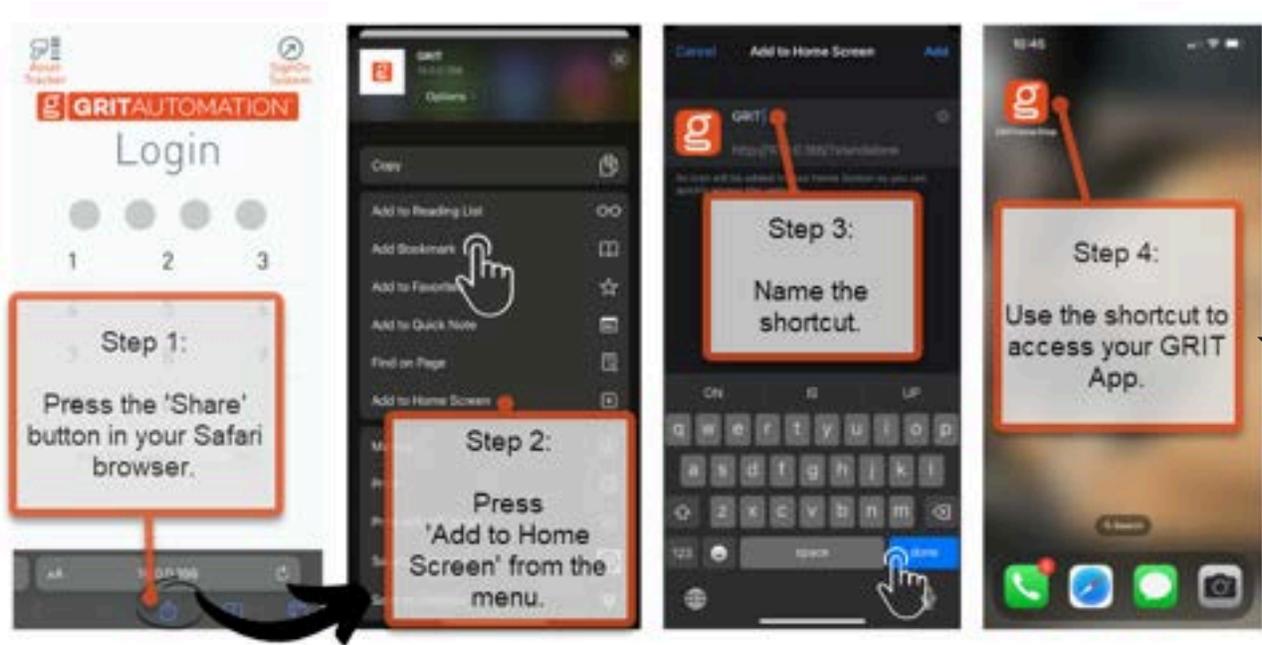
Be sure to only 'Adopt' devices that are present in your shop, to eliminate the chance that you bind a device from a nearby shop.

GRIT App

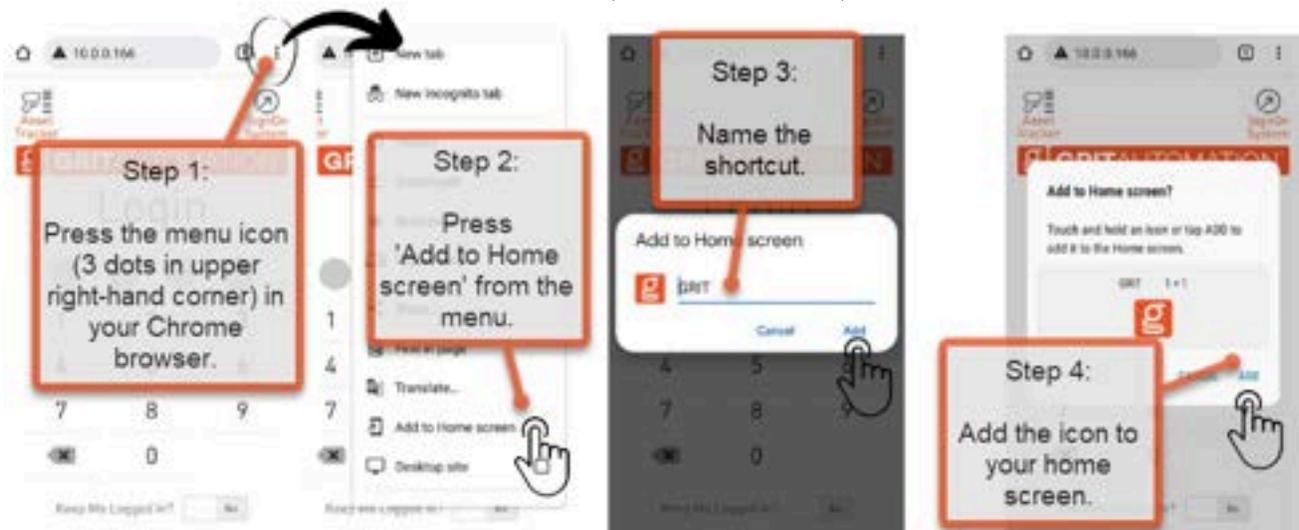
After connecting with your Hub and creating your GRIT administrator account, save the GRIT App shortcut to your Home Screen(s) for easy future access. Be aware that the network your phone/tablet/PC is on must be the same network used by your Hub. You will not be able to access the App from a different network.

Save App to Home Screen

iOS (use Safari)

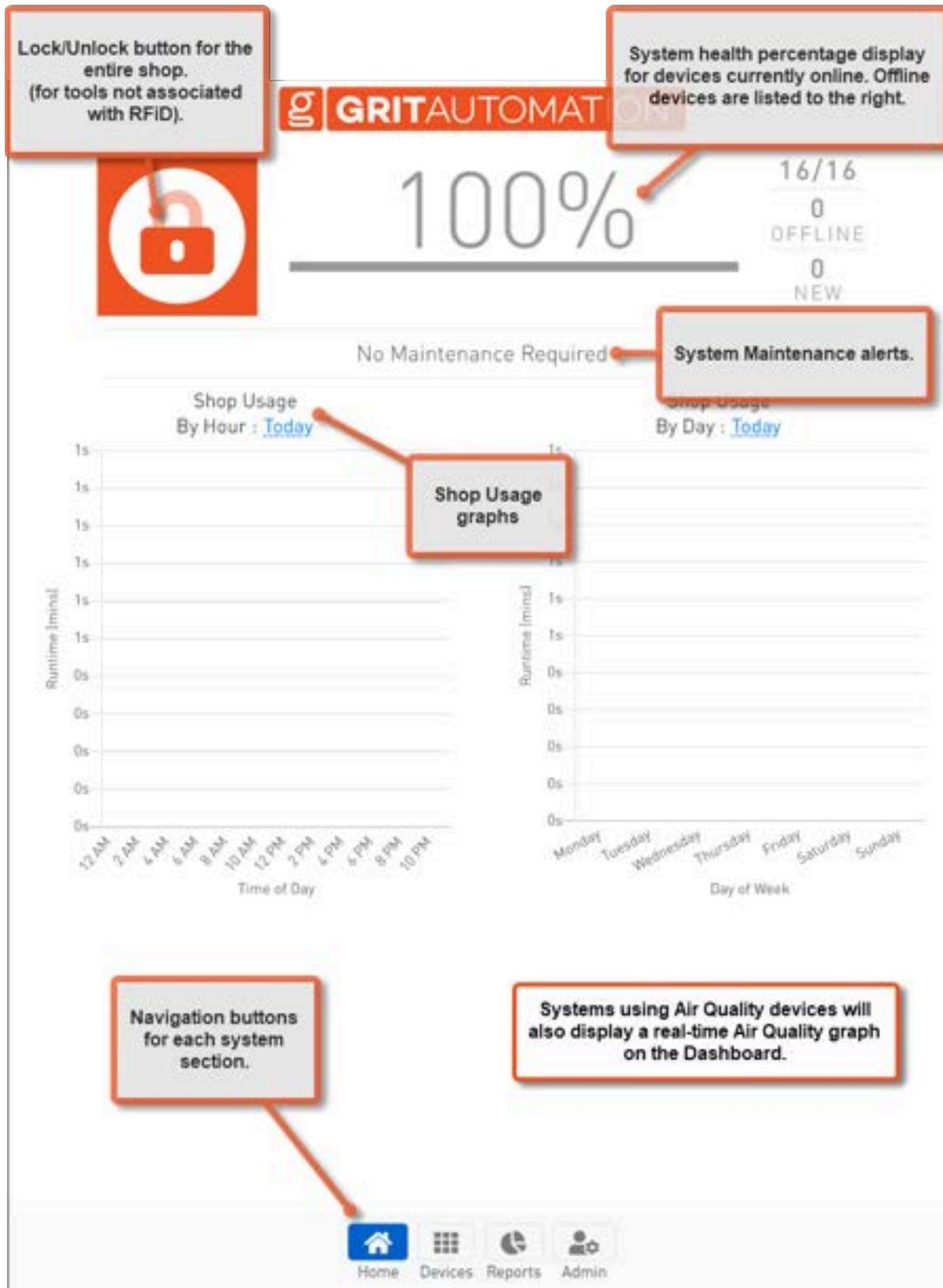


Android (use Chrome)



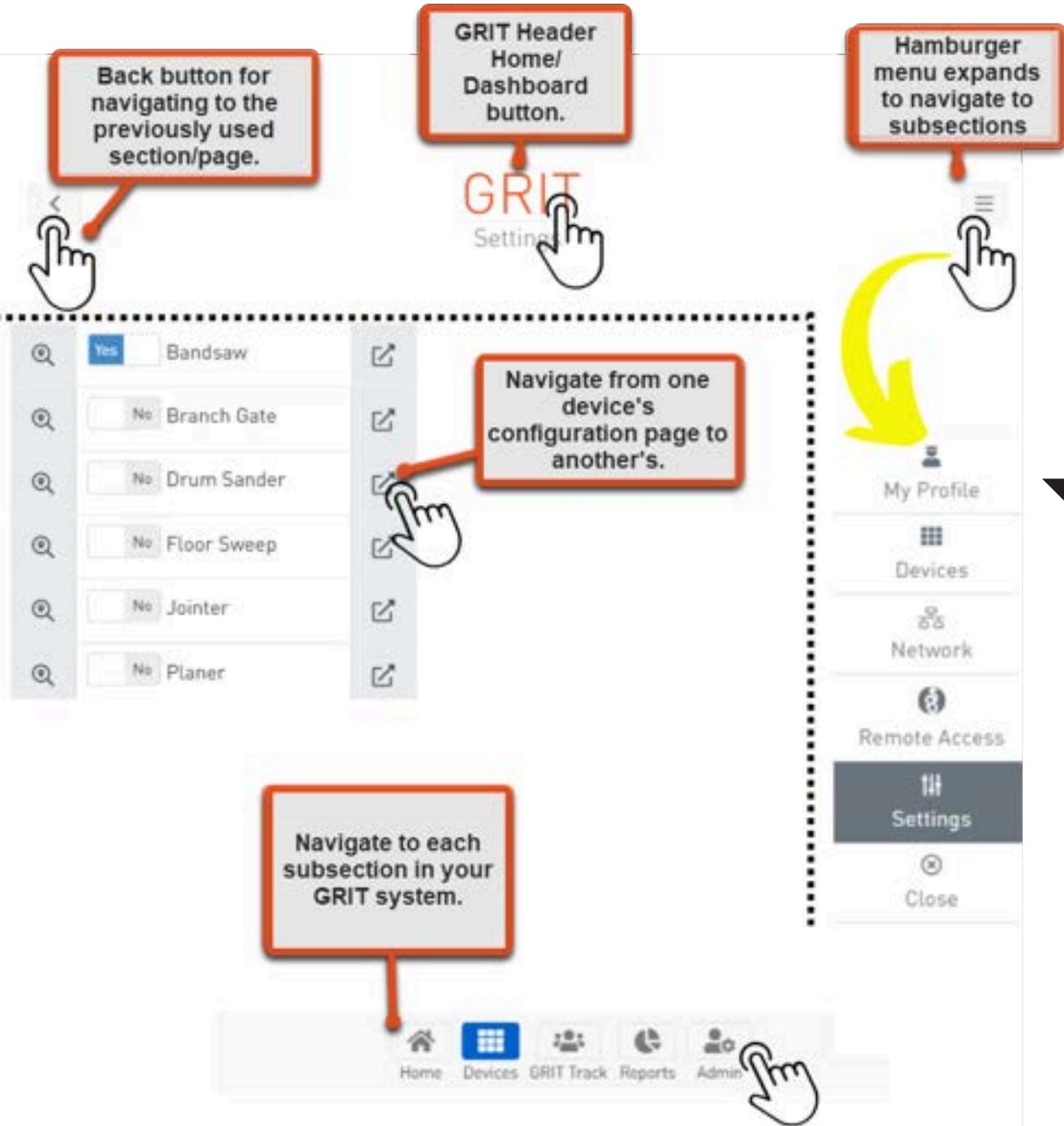
GRIT HUB® + APP

Common GRIT App Functionality Dashboard



GRIT HUB® + APP

Navigation



GRIT App
Functionality

GRIT HUB® + APP

Icons



Locate button makes device LED lights flash



Displays Green/Red to indicate online/offline status



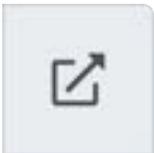
Display device graph



Hamburger menu to expand subsection options



Gives more in depth information about a field



Navigate to another device detail page



Indicates dropdown menu



Delete/Replace device



Displays Red/Locked or Green/Unlocked



Displays Red/Closed or Green/Open



Note: Any icon with these gray dots underneath is a clickable button

GRIT HUB® + APP

Devices Page Overview

The number displayed by each device category indicates the number of that device type bound with the system. A fraction 4/5, for example, would mean that one device is not online.

GRIT
Devices

▼ Collector ¹

collector-dc7451

▼ Dust Bin ¹

dustbin-dc59f0

▼ Gate ⁵

gate-c00e94

gate-c1e31b

gate-fd040

gate-70d20

gate-c00e6c

gate-c00d90

gate-c00e80

▼ Trigger ⁵

trigger-107536

trigger-97b716

trigger-edb3e3

switch-c71e94

trigger-8099e

trigger-98acf5

Generic names are assigned to each device until manually changed during configuration.

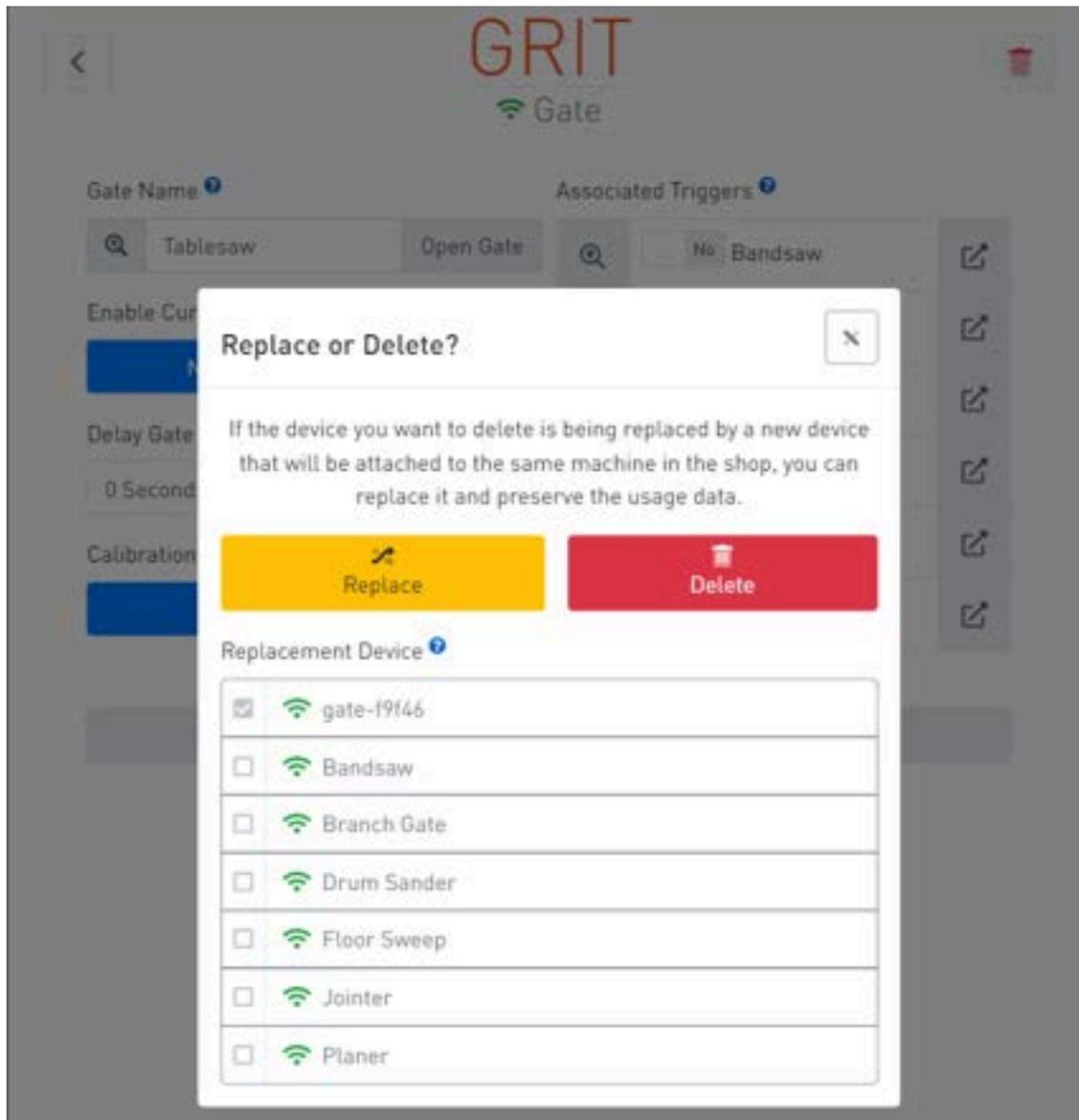
Clicking on a device listed will take you into that device's detail page for further configuration.

GRIT App
Functionality

Home Devices Reports Admin

GRIT HUB® + APP

Replace/ Delete Device

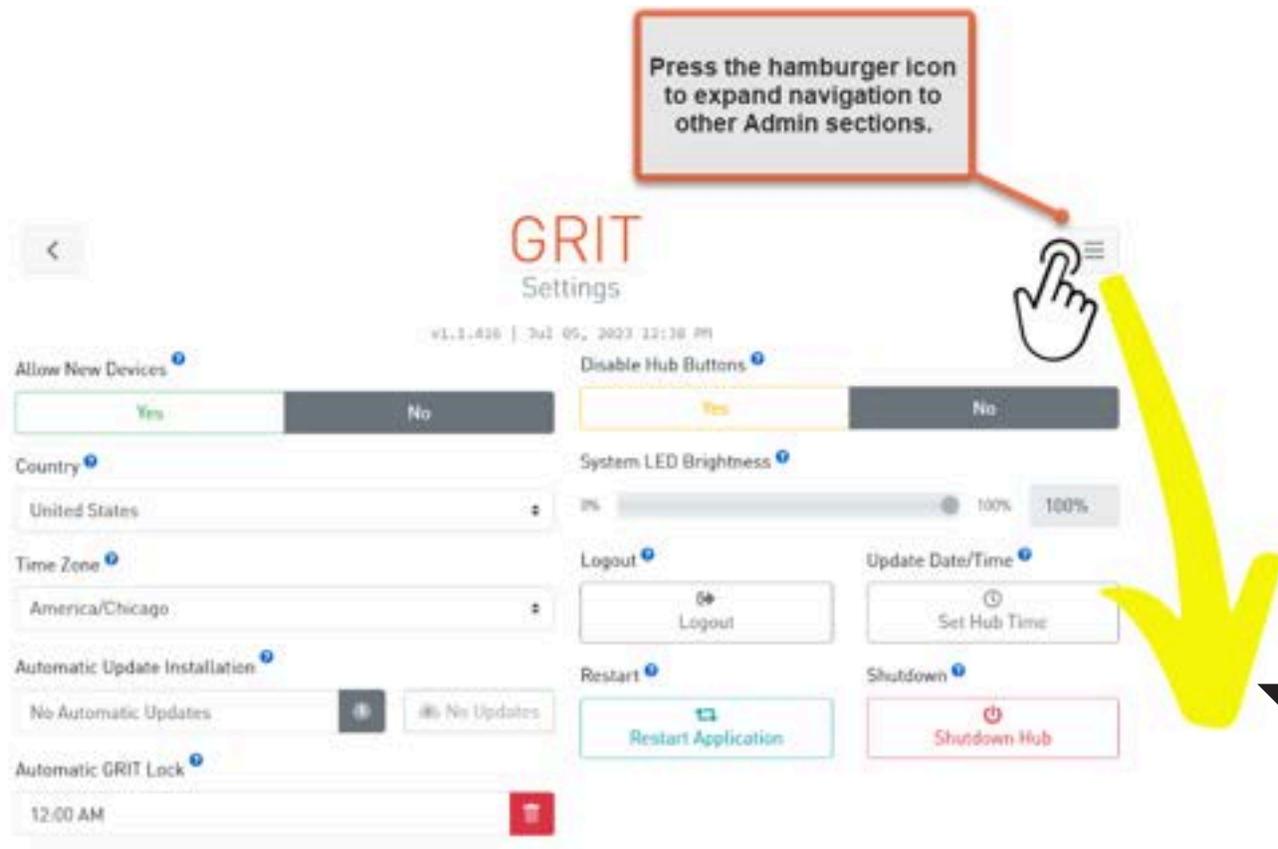


- **To Delete** a device, go to the device's detail page and press the trash icon. Then select 'Delete'.
- **To Replace** a device with a new one on the same machine, physically remove the old device then install and Bind the new device. Go to the old device's detail page and press the trash icon. Then select the newly installed device in the Replacement Device list and press 'Replace'. GRIT will rename the new device with the old device's name. All historical data from the old device

GRIT HUB® + APP

Administration

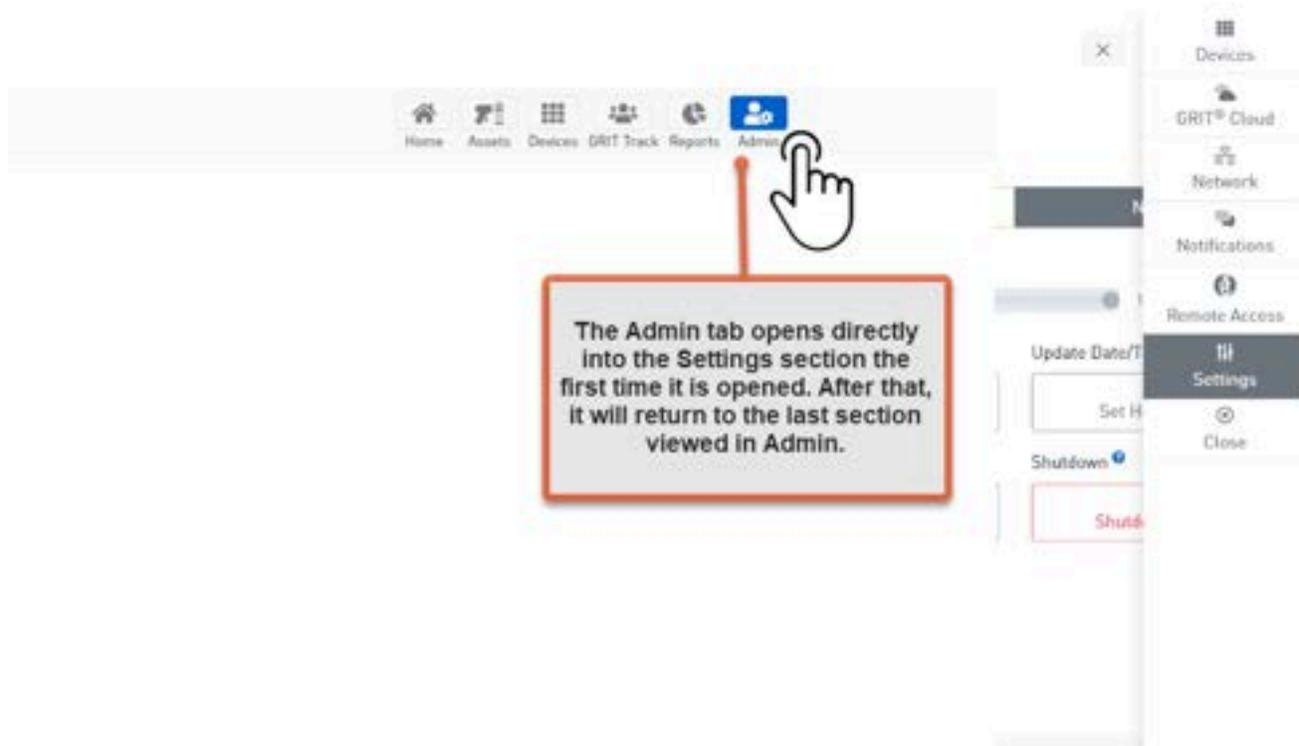
Press the hamburger icon to expand navigation to other Admin sections.



The screenshot shows the 'GRIT Settings' page. At the top right, there is a hamburger menu icon (three horizontal lines). A callout box with an arrow points to this icon, containing the text: 'Press the hamburger icon to expand navigation to other Admin sections.' The settings page includes sections for 'Allow New Devices', 'Country', 'Time Zone', 'Automatic Update Installation', 'Automatic GRIT Lock', 'Disable Hub Buttons', 'System LED Brightness', 'Logout', 'Restart', 'Update Date/Time', and 'Shutdown'.

GRIT App
Functionality

The Admin tab opens directly into the Settings section the first time it is opened. After that, it will return to the last section viewed in Admin.



The screenshot shows the 'Admin' navigation menu. At the top, there is a horizontal bar with icons for Home, Assets, Devices, GRIT Track, Reports, and Admin. A callout box with an arrow points to the Admin icon, containing the text: 'The Admin tab opens directly into the Settings section the first time it is opened. After that, it will return to the last section viewed in Admin.' The Admin menu is expanded, showing a list of options: Devices, GRIT® Cloud, Network, Notifications, Remote Access, Settings (highlighted), and Close.

GRIT HUB® + APP

My Profile

The 'My Profile' page in the Admin tab should be completed with the shop owner or main administrator's information. This page is only present for GRIT systems without GRIT Track® RfID. For systems utilizing RfID, all profile information is located under the GRIT Track tab.

The screenshot shows the 'GRIT My Profile' page with the following fields and callouts:

- First Name:** Bobby
- Last Name:** Holiday
- PIN:** ****. Callout: "Set a unique, 4-digit PIN for logging in." Below the field is the text "Choose your 4 digit security PIN."
- Password:** [Redacted]. Callout: "Choose a login with you email address and password, or, use this password in the event that you forget your PIN." Below the field is the text "8 characters minimum".
- Mobile Phone:** [555] 555-5555. Callout: "Enter your mobile phone number for maintenance alerts and forgotten password/PIN."
- Email:** bobby@holiday.com

At the bottom of the page is a navigation bar with icons and labels for Home, Devices, Reports, and Admin.

Network

The Network page in the Admin tab is used to check internet connection status and connect the Hub with a local WiFi network.

The screenshot shows the 'Network' page in the GRIT App. At the top, there are three status cards: 'Internet' (Connected), 'Ethernet' (10.0.0.88), and 'GRIT Cloud' (Not Available). Below these are input fields for 'WiFi Network Name' and 'WiFi Password', a 'Save' button, and a 'Clear' button. To the right, there is a list of 'Available Networks' including 'Holiday-net1', 'Holiday-Guest', and 'DIRECT-6E-HP OfficeJet 250'. A 'Refresh' button is located below the list. A navigation bar at the bottom contains icons for Home, Devices, Reports, and Admin.

Internet Connection Status

Network connection method (Ethernet vs. Wi-Fi) display, including the Hub IP address (same as displayed on the Hub display screen).

Internet
Connected

Ethernet
10.0.0.88

GRIT Cloud®
Not Available

WiFi Network Name

WiFi Password

Save Clear

Available Networks

- Holiday-net1
WPA2
- Holiday-Guest
WPA2
- DIRECT-6E-HP OfficeJet 250
WPA2

Refresh

If connecting through local Wi-Fi, select your Network Name from the list of Available Networks and enter your Network password. Then, press 'Save'. The option to 'Disconnect' is given if connected via Wi-Fi to a local network.

If your desired network is not displayed in the Available Networks list, press 'Refresh' to scan available networks again.

GRIT HUB® + APP

Remote Access

The screenshot shows the 'Remote Access' configuration page in the GRIT Hub application. It includes several callout boxes:

- WireGuard VPN:** WireGuard VPN opens the location where you can install WireGuard on a phone, tablet, or computer.
- VPN Subdomain:** VPN Subdomain sets the custom subdomain that is used to access your GRIT Hub via the WireGuard VPN. An example would be `shopname.grithubapp.com` or `lastname.grithubapp.com`.
- Search:** Search to filter who has been given Remote Access.
- Reporting Token:** Reporting Token Access Token.
- Remote Assistance:** Remote Assistance allows for temporary access into your GRIT Hub. The access will automatically expire 1 hour after the invite has been sent. To achieve the remote assistance functionality, the system will create a temporary admin user account and remote access permissions.
- List of users and Access Tokens with Remote Access:** List of users and Access Tokens with Remote Access.

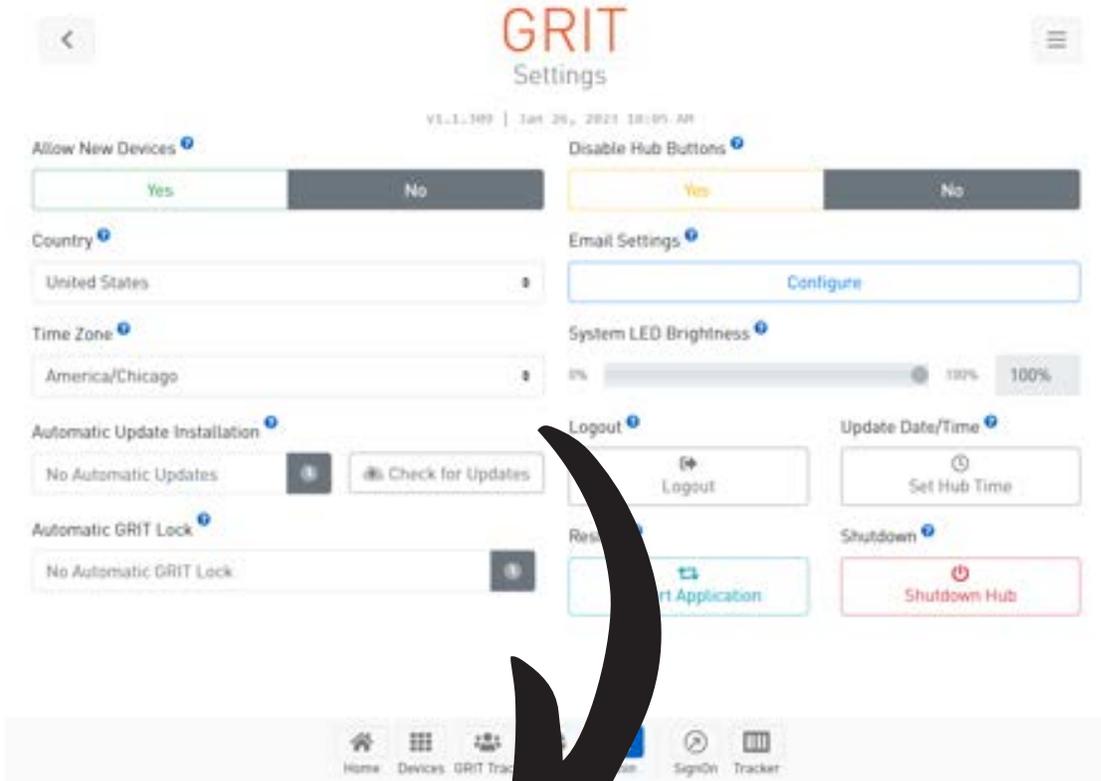
The interface includes the following elements:

- WireGuard VPN:** A button labeled 'Install'.
- VPN Subdomain:** A text input field containing 'subdomain.grithubapp.com' and a 'Save' button.
- Remote Assistance:** A text input field containing 'remote.help@gritautomation' and an 'Invite' button.
- Reporting Token:** A section with a 'Reporting Token' label and an 'Access Token' sub-label, along with edit and delete icons.
- Search:** A search bar with a magnifying glass icon and a plus sign.
- Navigation Bar:** Located at the bottom, it contains icons and labels for 'Home', 'Devices', 'GRIT Track', 'Reports', 'Admin', 'SignOn', and 'Tracker'.

GRIT HUB® + APP

Settings

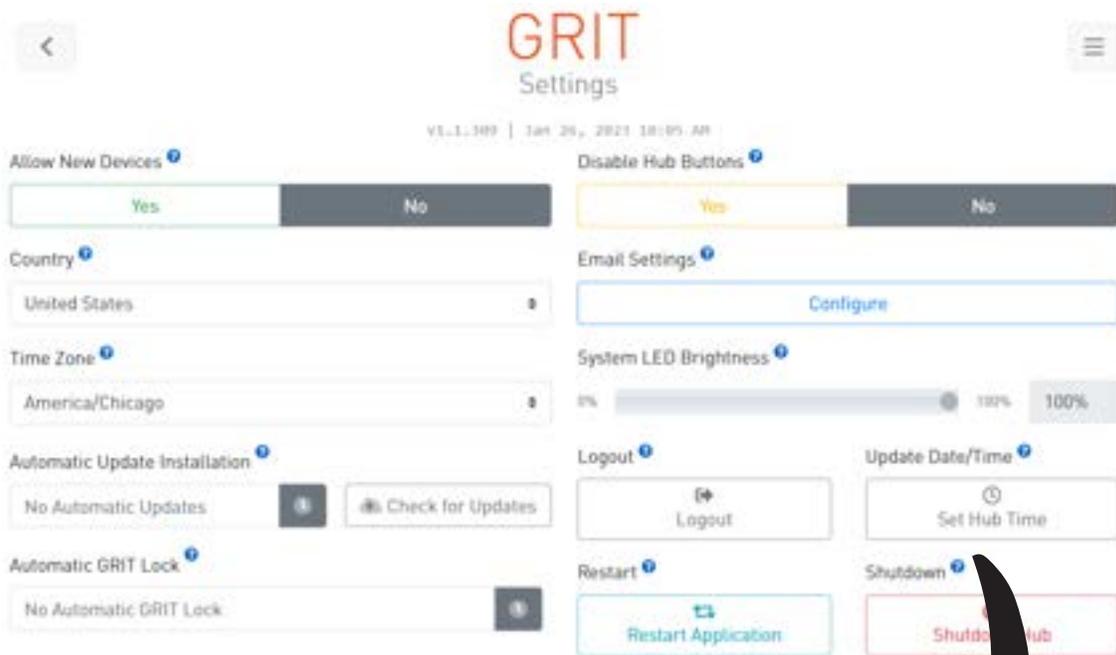
The Settings page in the Admin tab is used to manage key elements of your GRIT system.



GRIT App



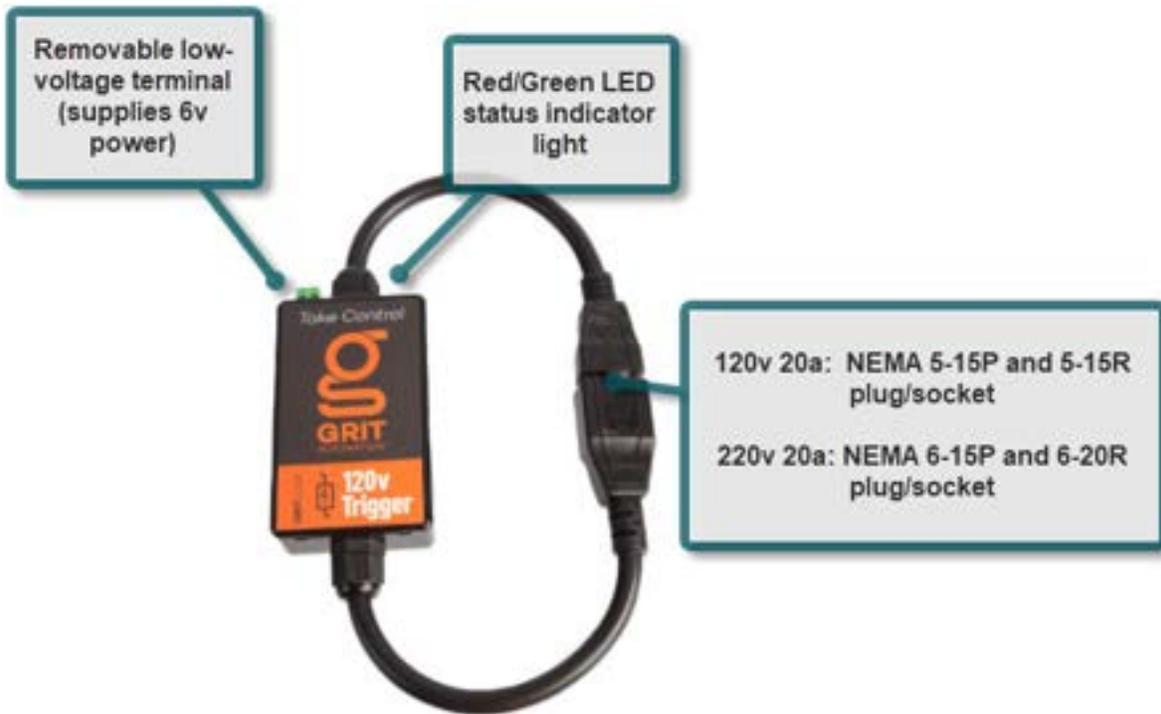
GRIT HUB® + APP



TRIGGERS

Standard 120v and 220v (up to 20a) Triggers

The GRIT Trigger creates a virtual barrier between tools and unauthorized users. This hardware component of GRIT Lock® technology is able to monitor and control the power that reaches your tool.

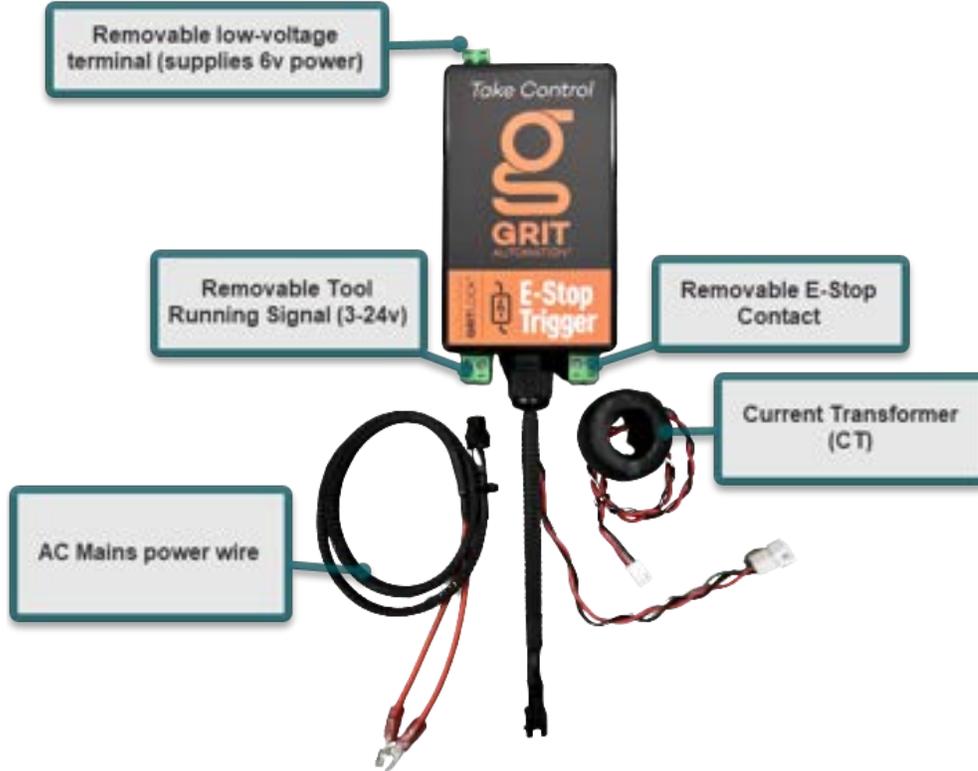


Triggers
Installation



TRIGGERS

E-STOP Trigger



Installation Overview

The E-Stop Trigger is a versatile device to measure whether your tool is running. It has various installation options based on your machine and which components are most accessible.

Installation consists of three primary steps:

Step 1: Power the GRIT E-Stop Trigger Device

- use the AC Mains power wires from the GRIT device.

Step 2: Measure Whether the Tool is Running

- Option 1: use the CT from the GRIT device to measure the tool's current, or;
- Option 2: wire the Removable Tool Running Signal from the GRIT device inline with the tool's running signal.

Step 3: Control the Tool's Power

- Option 1: wire the Removable E-Stop Contact from the GRIT device inline with the tool's emergency stop button, or;
- Option 2: wire the Removable E-Stop Contact from the GRIT device inline with the low-voltage wire that controls the tool's contactor coil.

TRIGGERS

This is an example of a completed E-Stop Trigger installation where the user installed the device into their CNC. If the E-Stop device doesn't fit inside your machine, you may need to drill a hole through the contactor box to pass the wires through. Then, mount the E-stop with provided VHB tape.

Step 1:

They've connected the two AC wires.

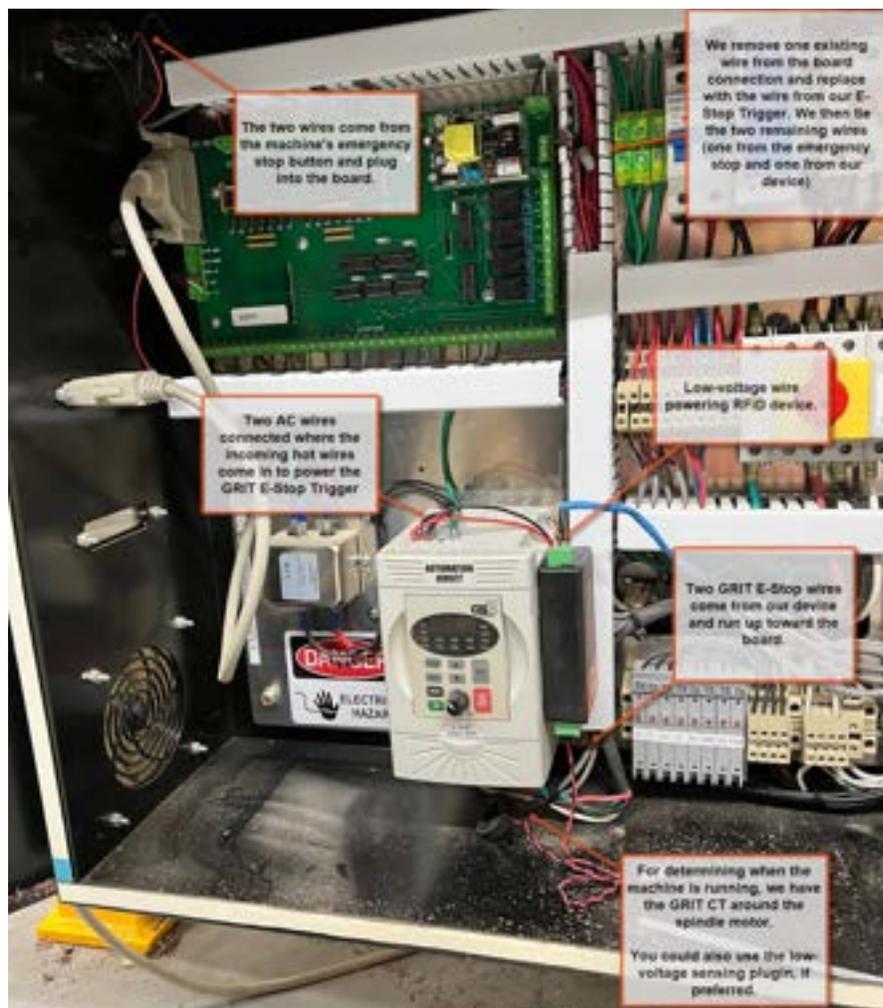
Step 2:

They've measured whether the tool is running with the CT around the spindle motor wire.

Step 3:

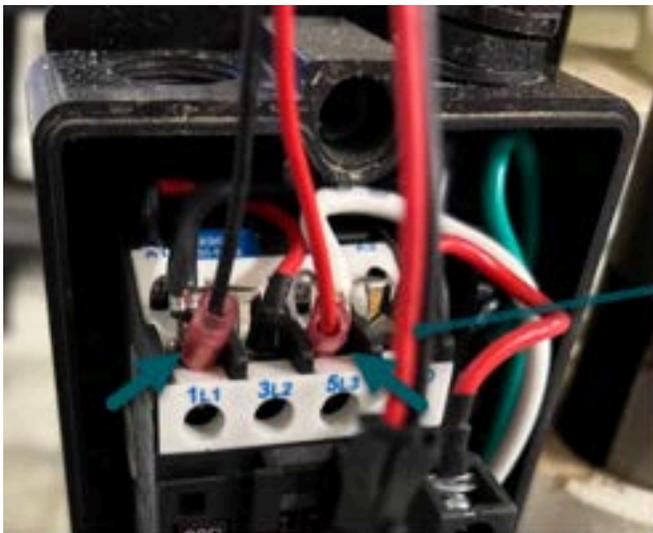
They've controlled the tool's power by wiring inline with the tool's emergency stop button.

Please note that it is possible to install this device without wiring inline with the emergency stop or the contactor coil, but none of the GRIT Lock safety features would be available if you skip the third step, so we do not recommend this.



TRIGGERS

Step 1: Power the GRIT E-Stop Trigger Device



Step 1:
Connect the AC Mains power wires to 110v- 240v AC power by landing the fork connectors into the contactor's terminals with the first two incoming hot wires.



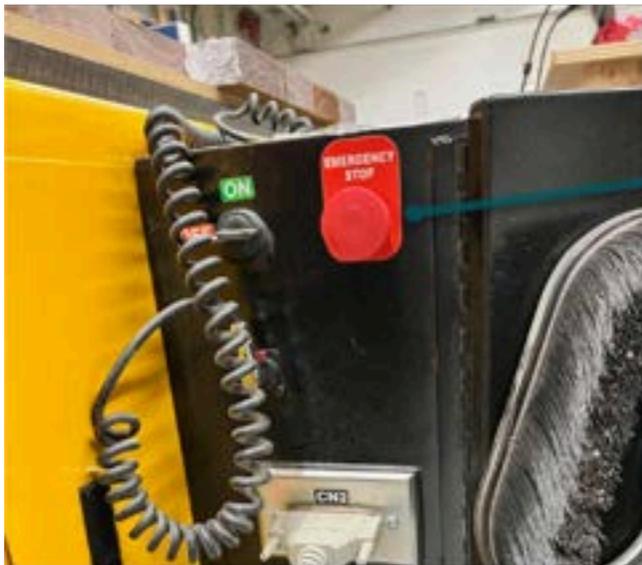
Step 2:
Connect the other end into the black terminal coming from the bottom of the E-Stop Trigger.

TRIGGERS

Step 3: Control the Tool's Power



Option 1: Wire Inline with the Emergency Stop Button



If your machine has an Emergency Stop button, open up the machine and find the two wires leading from the back of the button.



Follow those wires to find their connection on the board.

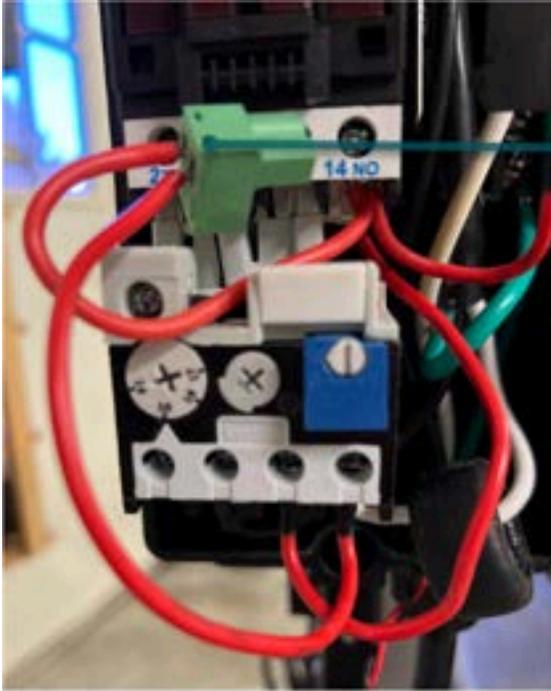
Remove one of the wires from the board, and land it in one side of the E-Stop Contact green terminal. If that wire is not long enough to reach the trigger, connect an extra length of wire with a wire nut.

Next, run an extra segment of wire from the other side of the green terminal and land it where the other wire had been on the board.

TRIGGERS

Option 2: Wire Inline with the Contactor Coil Power Wire

The purpose of this installation choice is to break the connection powering the contactor's magnetic coil.



Find a wire that is going to the contactor's coil. The Removable E-Stop Contact green terminal should then be wired in series with that existing wire (-/+ side does not matter).



Plug the E-Stop Contact green terminal back into the bottom right-hand side of the E-Stop Trigger.

Triggers
Installation

TRIGGERS

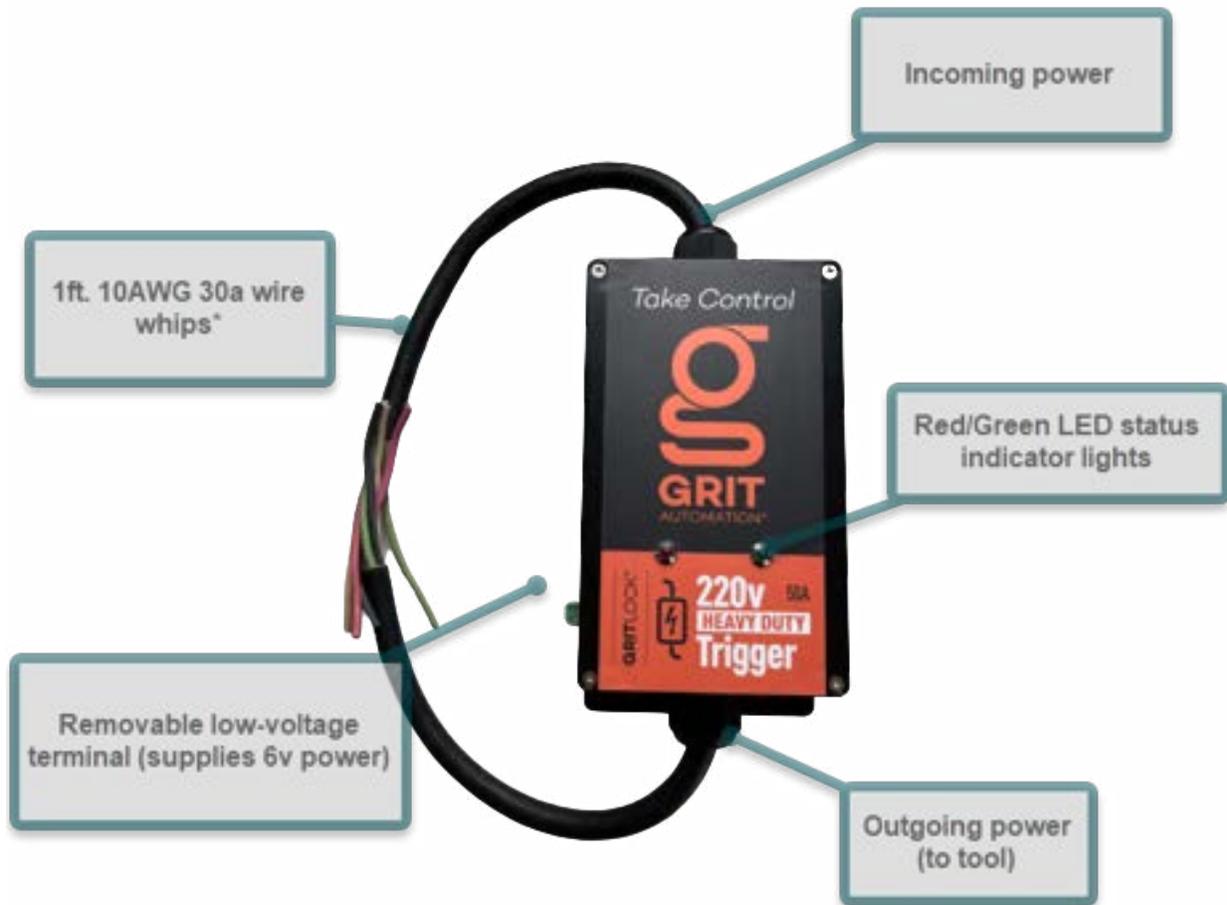


Complete the installation by attaching the E-Stop Trigger with provided VHB tape.



TRIGGERS

Standard 220v Heavy Duty (up to 35a) Trigger



Triggers
Installation

*Note: The 220v Heavy Duty Trigger does not come with a plug or socket end attached to the wire whip since tools with this power profile vary widely. The supplied wire whip is rated up to 35a. Customer is responsible for purchasing and wiring appropriate plug/socket or larger gauge wire for their purposes.

Installation

Follow the instructions provided with your chosen plug/socket. Once wiring is complete:

1. Plug your tool into the GRIT Trigger device.
2. Plug GRIT Trigger device into the wall.

TRIGGERS

Industrial 220v Single Phase Trigger



Installation

*Note: We recommend all electrical installation be performed by a licensed electrician. Wire whip, mounting hardware, chase nipple, and FMC connector are not included.

See page 52 for installation instructions for the Industrial 220v 1PH and Industrial 208v 3PH Triggers.

TRIGGERS

Industrial 208v 3 Phase Trigger



Triggers
Installation

Installation

*Note: We recommend all electrical installation be performed by a licensed electrician. Wire whip, mounting hardware, chase nipple, and FMC connector are not included.

TRIGGERS

Industrial 220v 1PH + 208v 3PH Trigger Installation



Step 1:

Turn off the breaker leading to the tool.
Disconnect the power wires feeding the tool.

Step 2:

Mount the trigger near the incoming power drop. That may mean attaching the trigger to the wall or the tool itself.

Step 3:

Use one of the existing knockouts, or drill a hole in the back of the enclosure to align with the existing hole where power is already being run to the tool.

Insert and tighten a chase nipple.

Step 4:

Measure and cut the conduit, if needed.

TRIGGERS



Step 5:
Cut a hole for the incoming power or use one of the existing knockouts.



Step 6:
Insert an FMC Connector and feed the incoming wires through the opening.



Step 7:
Secure the incoming conduit.

Triggers
Installation

TRIGGERS



Step 8:

Cut the incoming wires to length, mark with colored electrical tape.

Strip and land the first incoming hot wire in terminal 3 with the Black wire connected to the PCB.

Strip and land the second incoming hot wire in terminal 5 with the White wire connected to the PCB.

If there are three hots coming in, land the third wire in terminal 7.



Step 9:

When landing the outgoing power in the contactor, be sure to keep the wires in line with the incoming wires.

Put the first outgoing hot wire through the CT. Strip and land in terminal 4.

Strip and land the second outgoing hot wire in terminal 6.

If there are three hots, land the third wire in terminal 8.

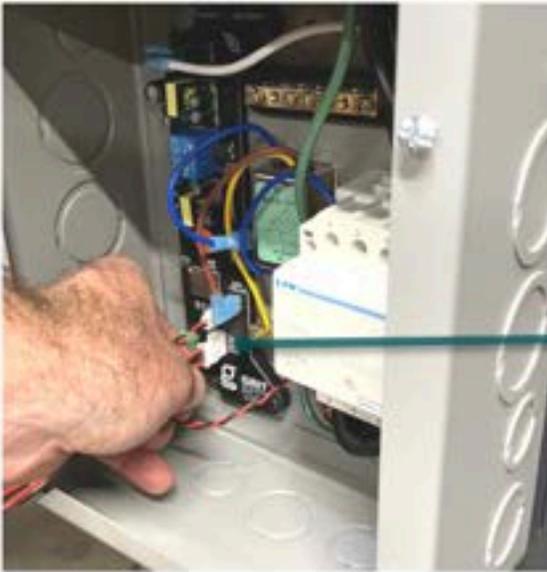


Step 10:

Cut the incoming ground wire to length and land in the ground terminal (see green arrow). Repeat with the ground wire leading into the tool.

If there is a neutral wire, land in one of the black/gold terminals (see orange arrow).

TRIGGERS



Step 11:
Plug the LED indicator light harness (attached to the lid) into the PCB.



Step 12:
To power an RFID device from an Industrial Trigger, insert the black push-in connector into a small knockout.



Step 13:
Cut, strip, and land low-voltage wire(s) into the low-voltage terminal located on the PCB.

Triggers
Installation

TRIGGERS



Step 14:
Replace and secure the lid.



Step 15:
Re-land the wires leading into the tool.
Turn on the breaker leading to the tool.

TRIGGERS

Industrial 480v 3 Phase Trigger



Triggers
Installation

Installation

*Note: We recommend all electrical installation be performed by a licensed electrician. Wire whip, mounting hardware, chase nipple, and FMC connector are not included.

TRIGGERS

Industrial 480v 3PH Trigger Installation



Step 1:

Turn off the breaker leading to the tool.
Disconnect the power wires feeding the tool.

Step 2:

Mount the trigger near the incoming power
drop or breaker.

Use one of the existing knockouts, or drill a
hole in the enclosure to align with the hole
where power is already being run to the tool
and the incoming power.



Step 3:

The Industrial 480v 3PH Triggers contain a
transformer used to power the GRIT PCB. For
480v power, use the Black wire and the light
Grey wire.



Step 4:

Land the Black wire on a prong of L1 and the
light Grey wire on a prong of L2.

TRIGGERS



Step 5:

Cut the incoming wires to length, mark with colored electrical tape.

Strip and land the first incoming hot wire in the screw terminal L1 (in front of the Black wire landed from the transformer).

Strip and land the second incoming hot wire in the screw terminal L2 (in front of the light Grey wire landed from the transformer).

Strip and land the third incoming hot wire in the screw terminal L3.



Step 6:

Insert and tighten a chase nipple through a knockout.

Insert the outgoing wires leading to/from the tool.



Step 7:

Put the first outgoing hot wire through the CT. Strip and land in terminal T1.

Strip and land the second outgoing hot wire in terminal T2.

Strip and land the third outgoing hot wire in terminal T3.

TRIGGERS



Step 8:

When landing the outgoing power leading to the tool in the contactor, be sure to keep the wires in line with the incoming wires.



Step 9:

Plug the LED indicator light harness (attached to the lid) into the PCB.



Step 10:

To power an RFID device from an Industrial Trigger, insert the black push-in cable connector into a small knockout.

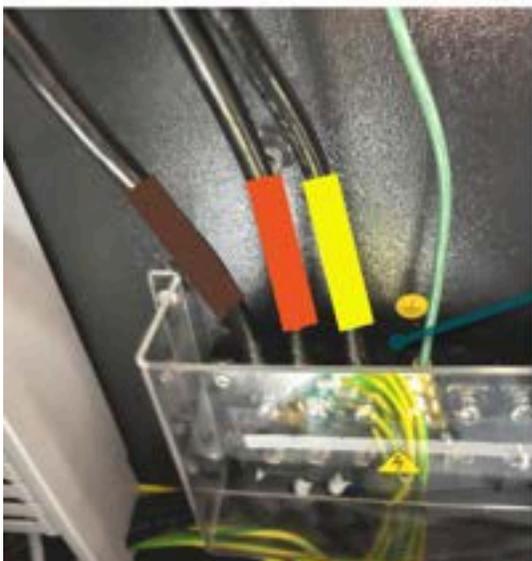
TRIGGERS



Step 11:
Cut, strip, and land low-voltage wire(s) into the low-voltage terminal located on the PCB.



Step 12:
Replace and secure the cover.



Step 13:
Re-land the wires leading into the tool.
Turn on the breaker leading to the tool.

Triggers
Installation

TRIGGERS

Trigger Device Configuration with Associated Collector Device

Each installed Trigger has its own detail configuration page in the GRIT App. As mentioned in the GRIT Lock® section of the manual, it is essential that each Trigger be carefully configured for its specified tool.

The screenshot shows the configuration page for a GRIT Trigger. The page is titled "GRIT Trigger 220v" and features several sections:

- Trigger Name:** A search bar containing "Tablesaw" and a "Show" button. Callout: "Rename the device, usually with the name of the tool it is associated with."
- GRIT Lock®:** Two buttons, "Lock" (red) and "Unlock" (green). Callout: "Lock and Unlock this tool."
- Maintenance Schedule:** An "Add" button. Callout: "Manage maintenance schedule reminders for this tool."
- Associated Gates:** A list of gates with checkboxes and edit icons. Callout: "Configure the gate or gates that will open when this tool is running." The list includes: No Belt/Disc Sander, No Drum Sander, No Edge Sander, No Floor Sweep, No Jointer, No Left Branch, No Planer, Yes Right Branch, No Spindle Sander, Yes Tablesaw, No gate-2c18a2, No gate-8330a7, No gate-3d7f8b.
- Activation Level:** A slider set to "1.50 Amps". Callout: "Set the power required for this tool to be considered 'ON' by the GRIT."
- Power Profile:** Four buttons: "Normal" (selected), "Delay", "Spike", and "Advanced". Callout: "Specify how the tool acts when it gets turned on to ensure GRIT Lock functions properly. See Power Profile section for more detail." A red warning icon is next to this callout.
- Associated Collector:** A dropdown menu showing "V3000" and an edit icon. Callout: "Configure the collector that will turn on when this trigger is running."

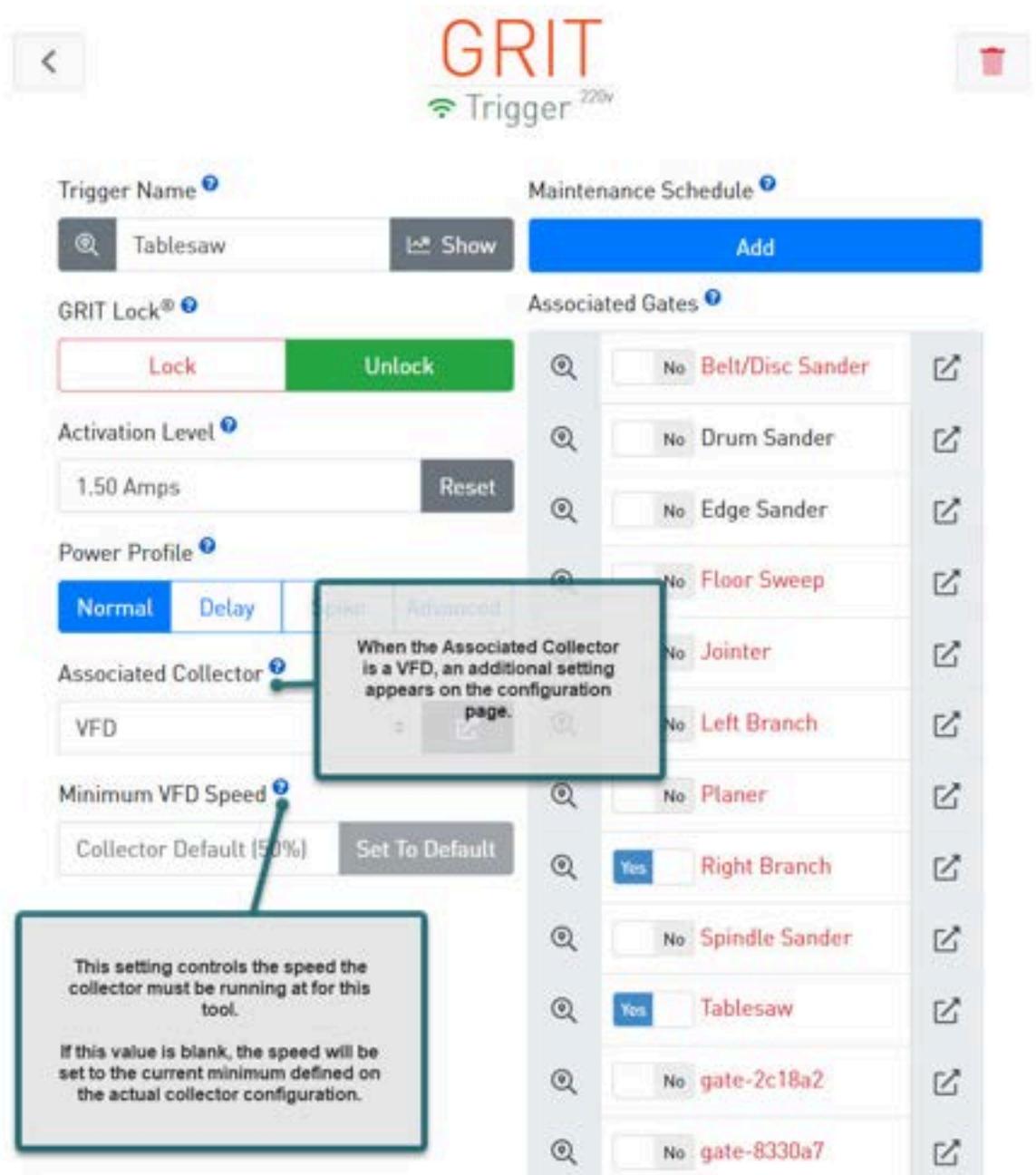
The bottom navigation bar includes icons for Home, Devices, Reports, Admin, SignOn, and Tracker.

TRIGGERS

Trigger Device Configuration with Associated VFD Device

Each installed Trigger has its own detail configuration page in the GRIT App. As mentioned in the GRIT Lock® section of the manual, it is essential that each Trigger be carefully configured for its specified tool.

The trigger configuration page has the following differences when associated with a VFD device rather than a Collector device.



Triggers
Configuration

TRIGGERS



Activation Level and Power Profiles

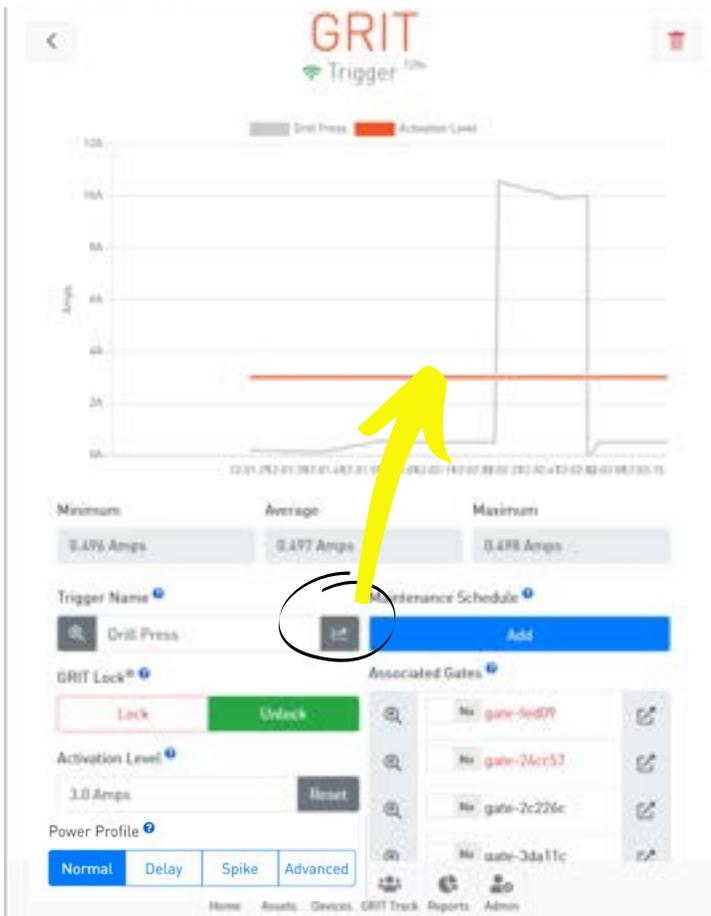
Correctly setting each tool's Activation Level and Power Profile in the trigger's detail configuration screen is essential to the overall functioning of the GRIT system. When GRIT Lock® can accurately assess whether a tool is running, the system can turn on an associated dust collector, open associated blast gates, and quickly initiate an Emergency Lock, but only if the tool's power is accurately captured in its configuration settings.

To further clarify, if the Activation Level is telling GRIT what level to check for, the Power Profile setting tells GRIT when and how to check.

Normal



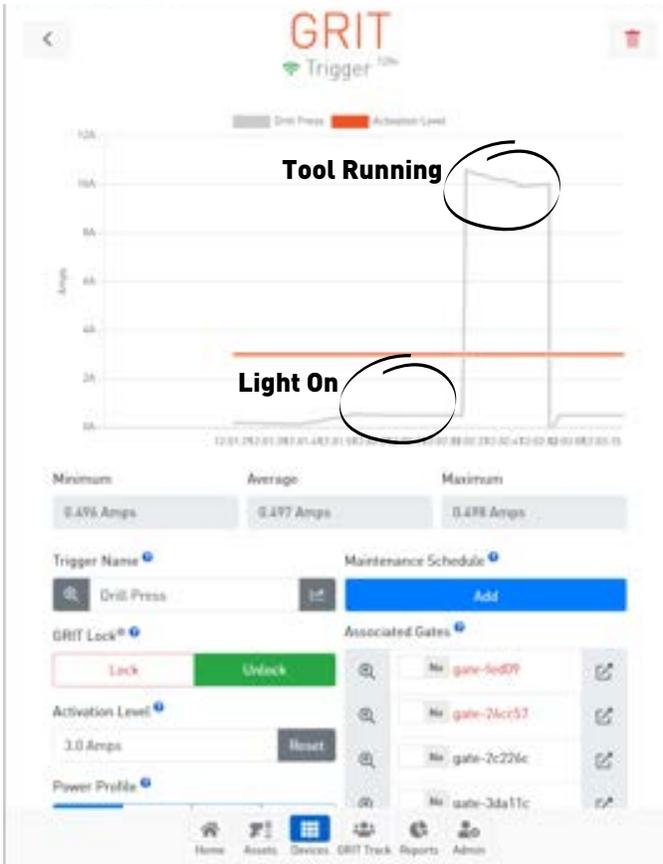
Tools that roar to life as soon as they are powered on have a "Normal" power profile. To properly configure this type of tool, look at its power graph.



For a tool to be considered running in the GRIT system, the current draw has to exceed the value set for the Activation Level.

In this example the Activation Level is set to 3.0 Amps with the drill press pulling ~10 Amps consistently when running. Setting the Activation Level anywhere between 1.0 Amp and 9.0 Amps would allow GRIT to accurately determine when this tool is running.

TRIGGERS



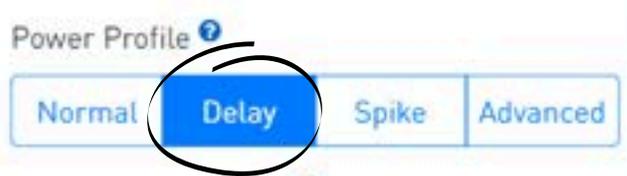
This particular drill press has a light that draws about .5 Amp when the trigger is unlocked but the tool is not yet running.

If there is an aspect of the tool that draws power even when it is not running, be sure to set the Activation Level above that amp level. This is to avoid the system thinking the tool is running when it is merely operating other components (i.e., a light, a computer, etc.).

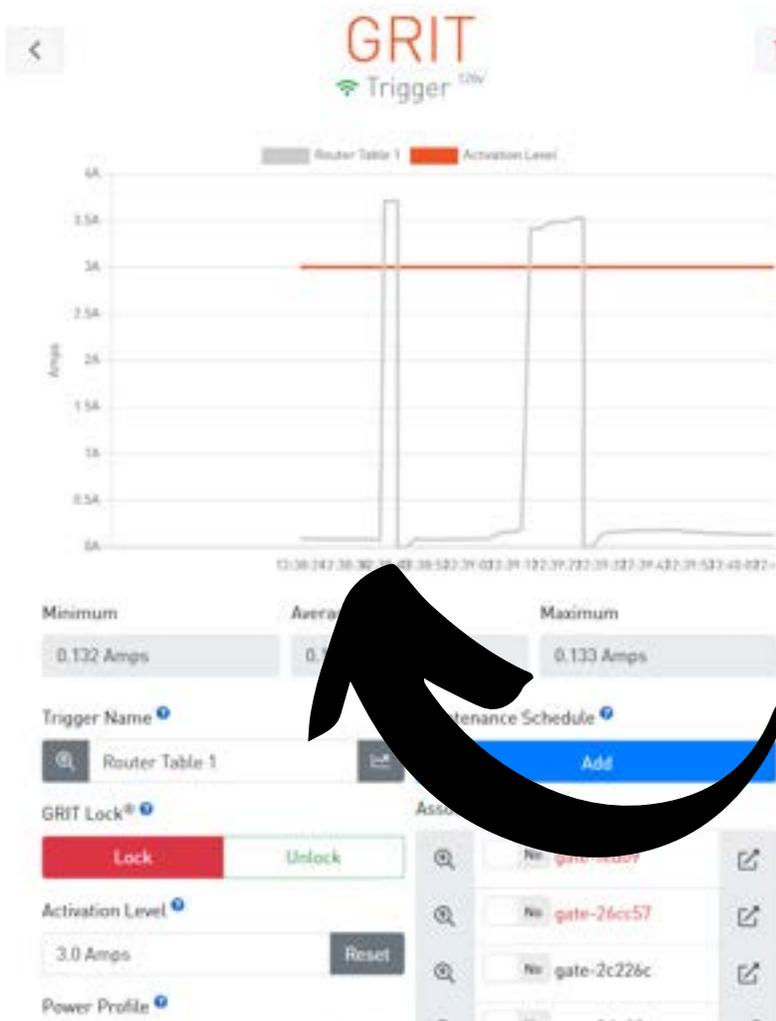
Note: Some incandescent lights actually pull a great amount of power when they are turned on from a cold state. Keep this in mind when setting your Activation Level.

TRIGGERS

Delay



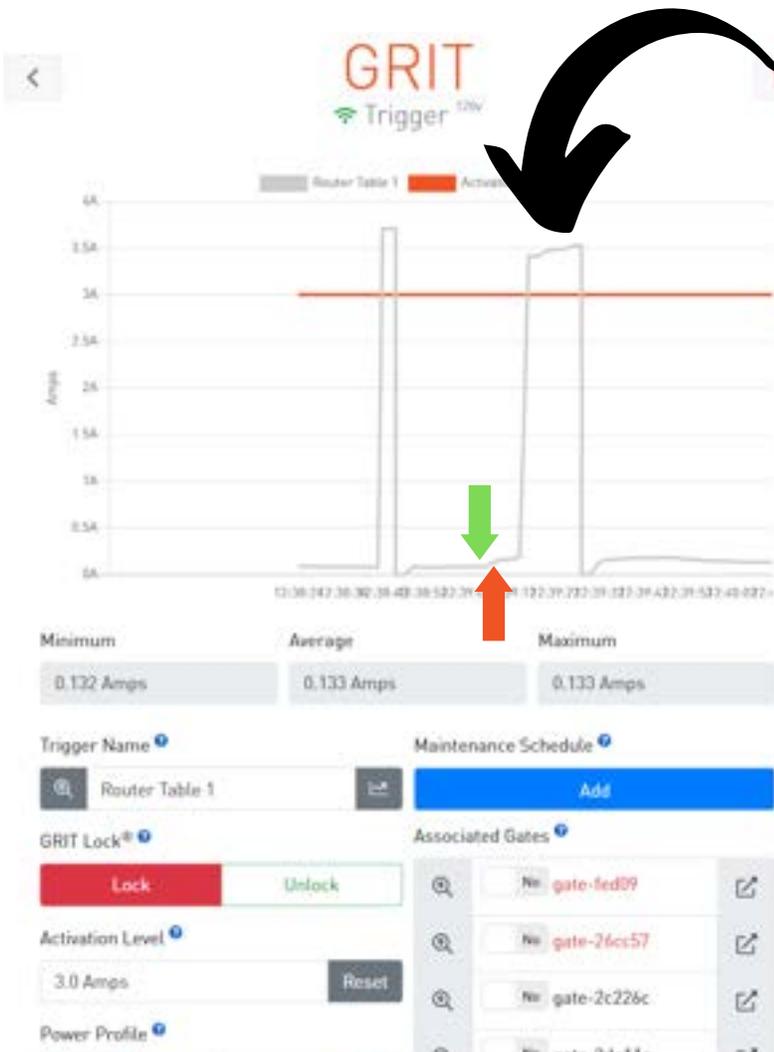
If the tool in question is a router table with a soft start motor, there is a chance that the "Normal" Power Profile might miss the current draw being above the Activation Level immediately after the tool is unlocked. For tools that have a slow or soft start, the trigger should be set to "Delay" for the Power Profile. This setting adds a sub-second pause before measuring the current, allowing the motor to begin pulling power.



This power graph shows a tool with a slow start motor which requires the Delay Power Profile setting.

The first spike was captured with the Power Profile set to Delay. The system waited 100ms before checking if the tool's power draw was above 3.0 Amps, which was enough time for the motor to reach its full current draw.

TRIGGERS



The second spike on the graph was captured with a Normal power profile setting. The green arrow shows when the tool was turned on, the orange arrow indicates when GRIT checks whether the tool is pulling power above the set Activation Level.

When a slow start motor is not configured with a Delay Power Profile, the system immediately measures the current after the trigger is unlocked. Because of the time it takes a slow start motor to ramp up to full speed, the system misses the accurate information that the tool is running.

This would impact not only the system turning on an associated collector or opening associated blast gates, but would impact the system's ability to initiate an Emergency Lock, if needed.

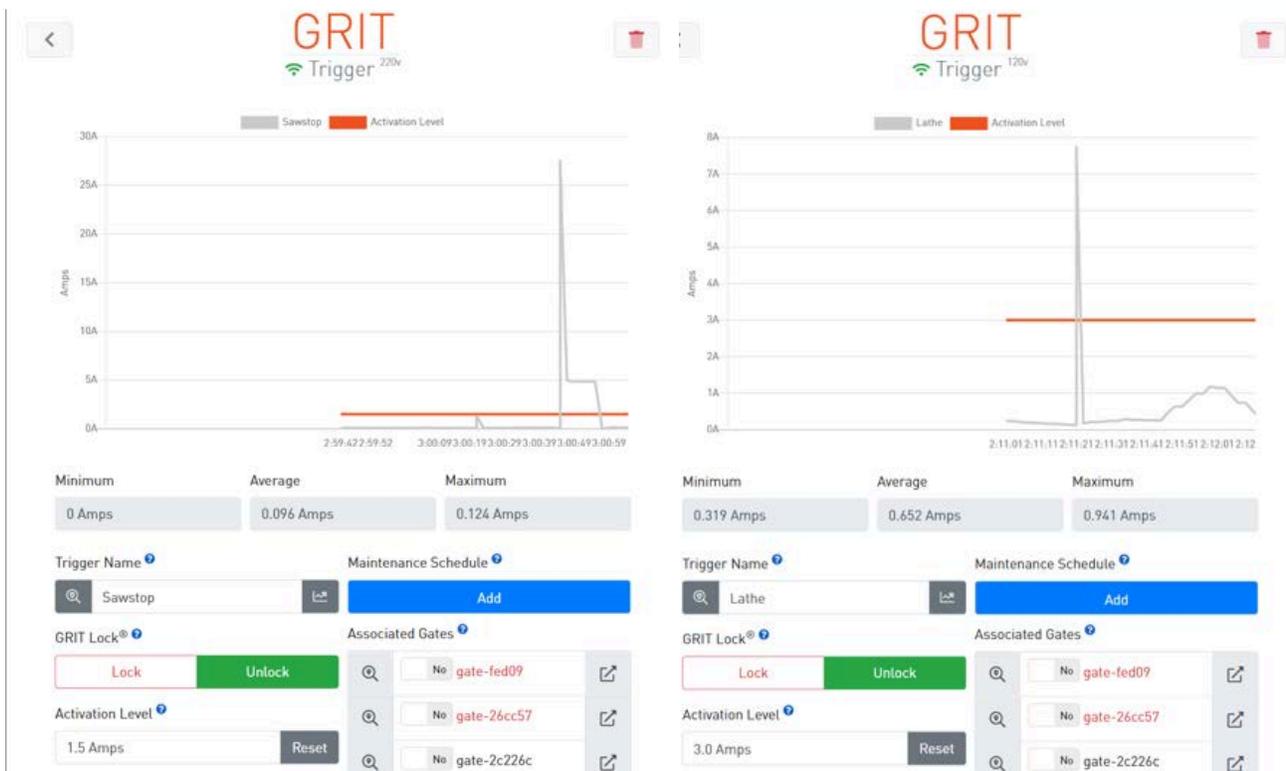
TRIGGERS

Spike



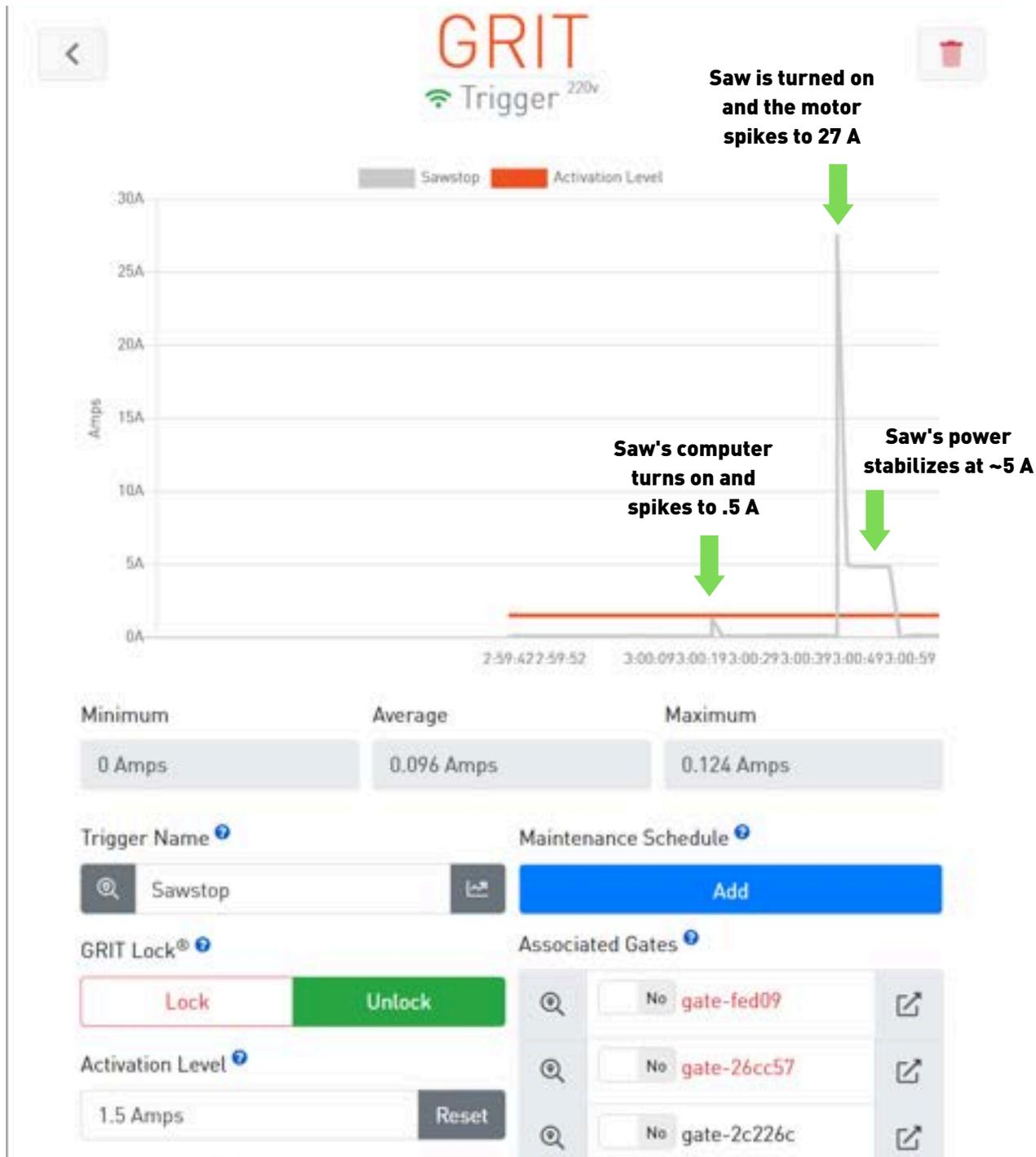
A "Spike" power profile is used for tools that have a huge inrush of current when they are unlocked. An example of this would be a wood lathe with a single phase to 3 phase converter. These will have a huge inrush as capacitors are charged. During this initial inrush, we don't want to measure until the spike has settled down or the system will incorrectly think the tool is on and re-lock it and log an Emergency Lock.

Here are two examples with spikes in the power graph: A Tablesaw and a Lathe. The SawStop can be configured with a Normal power profile and a higher Activation Level. The Lathe, however, requires a Spike Power Profile and a lower Activation Level.



TRIGGERS

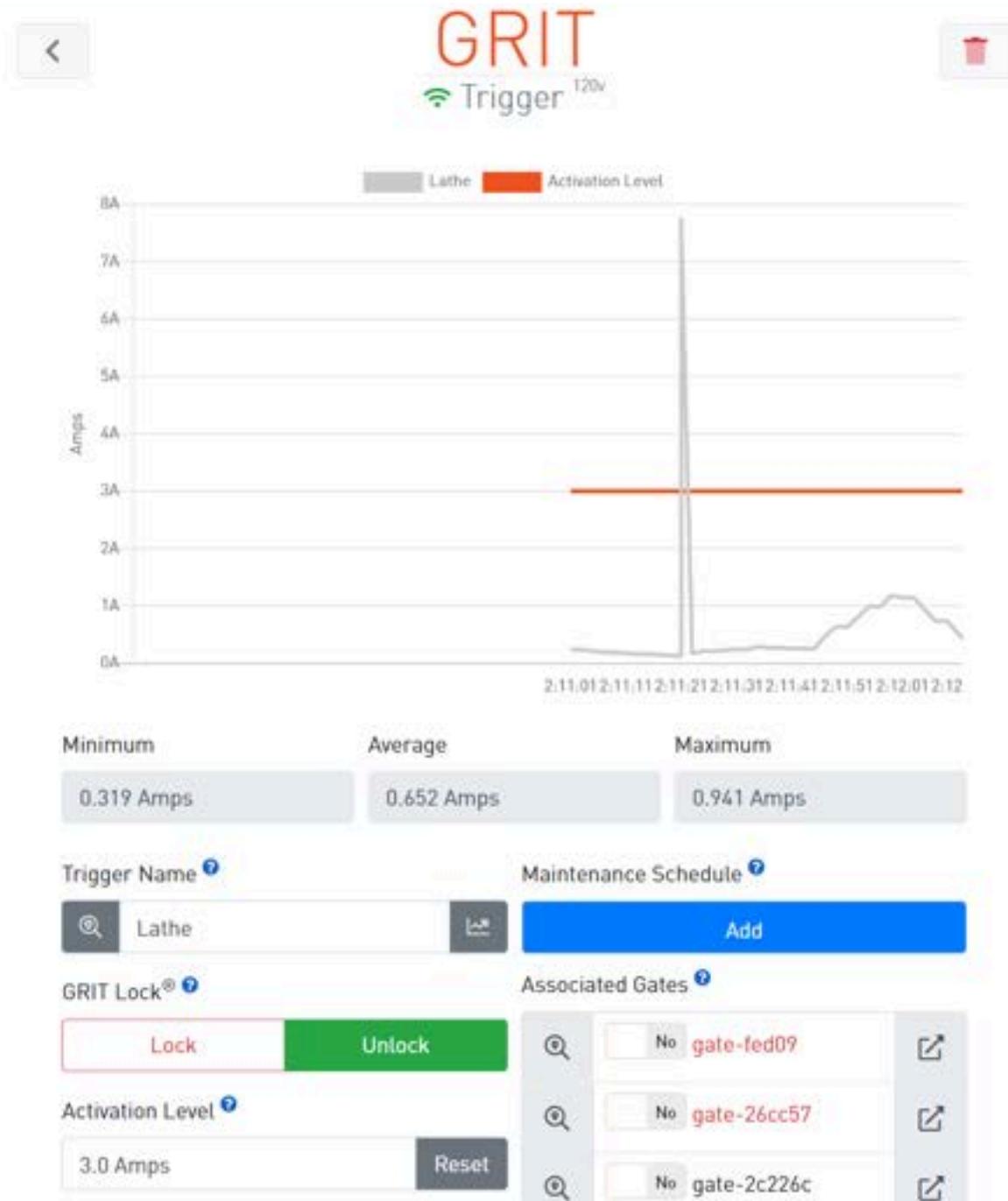
Although the Tablesaw has a power spike when the trigger is unlocked, it does not need to be configured with a Spike power profile because the inrush spike level is still less than when the saw is actually running. Configure this trigger with a Normal power profile and increase the Activation Level to 1.5 Amps (higher than the computer spike but lower than the consistent current draw when the saw is running).



Triggers Configuration

TRIGGERS

The lathe, however, requires a Spike power profile because the spike level is higher than the level of current when the lathe is running. The system must then wait until after the initial spike to determine if the tool is running. Configure this trigger with a Spike power profile and lower the Activation Level to .3 Amps.



TRIGGERS

Advanced

Power Profile [?]

Normal Delay Spike **Advanced**

Activation Delay [?] 1

0 Seconds

Deactivation Delay [?] 2

0 Seconds

Unlock Measurement Delay [?] 3

0sec 3sec 0 ms

The Advanced power profile setting is for finetuning how the trigger operates. If none of the other preset settings accurately capture the tool's specific power startup timing/levels, you can set all of them manually in Advanced. This will show three new settings: Activation Delay, Deactivation Delay and Unlock Measurement Delay.

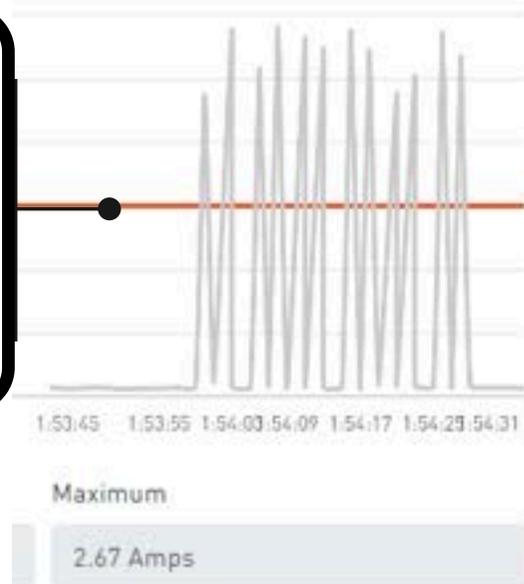
Two machines that frequently require "Advanced" power profiles are CNC machines and Lasers.

1. The Activation Delay setting controls how long the trigger needs to sense the current flowing before the attached device/tool is considered running. This setting is used when a tool such as a CNC machine might cause a current spike when the gantry moves, but this should not send out the messages to open gates and turn on the collector. Only when the current level sensed is above the Activation Level setting and for the amount of time specified here, should the tool be considered running. The same applies for how long the tool needs to be without current to be considered off. The system uses this to understand when to turn on an associated collector, air quality device, and move associated gates.

TRIGGERS

2. The Deactivation Delay setting controls how long the trigger needs to not sense the current flowing before the attached tool is considered off. This setting is used when a tool might cause repeated on/off current spikes (e.i., CNC or laser). The desired functionality is that these quick power spikes should not be viewed as lots of on/off commands, but instead wait for the current to stop flowing for the length of time specified in this setting before considering the tool to be off.

Example: A power graph of a laser would show the need for a Deactivation Delay setting set above 0 sec. so that the system does not think the machine is no longer running each time the laser stops firing.

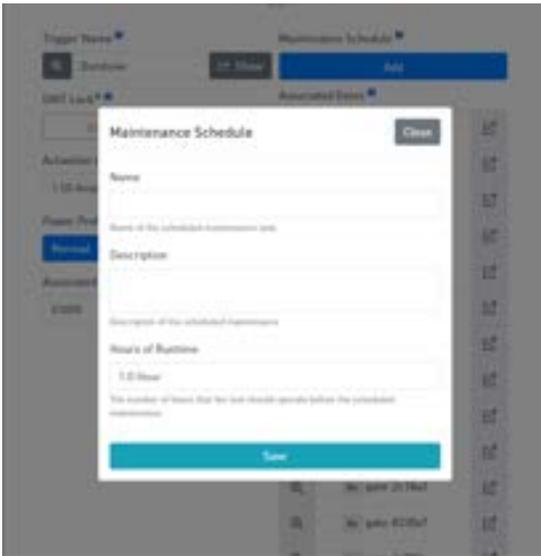


3. The Unlock Measurement Delay* setting controls how long the trigger will wait between unlocking and measuring the current from the attached tool. For instance, some tools have a soft start that require this value be set above zero. If you find that GRIT is not correctly sensing a tool that was left in the ON position when the trigger is unlocked, this value needs to be adjusted higher. The higher the value, the longer GRIT will wait before checking for current flow.

***Be aware, the downside of this setting is that if it is set too high, it will allow a tool to unintentionally run longer than it would need to during an Emergency Lock situation.**

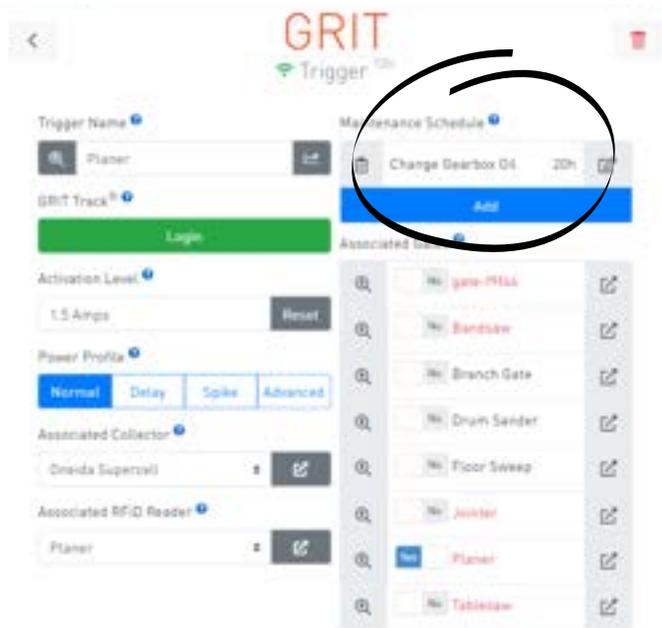
TRIGGERS

Maintenance Schedule



Set tool-specific maintenance tasks. Alerts for maintenance are displayed on the GRIT Dashboard after the configured number of hours has been reached. Optionally, email/SMS can be sent and can be specified in the Admin Settings.

Example: A Maintenance Schedule has been set for this Planer to Change the Gearbox Oil after 20 hours of runtime. The time remaining will update after each use of the planer. Once the 20 hours has passed it's red and negative.



Triggers Configuration

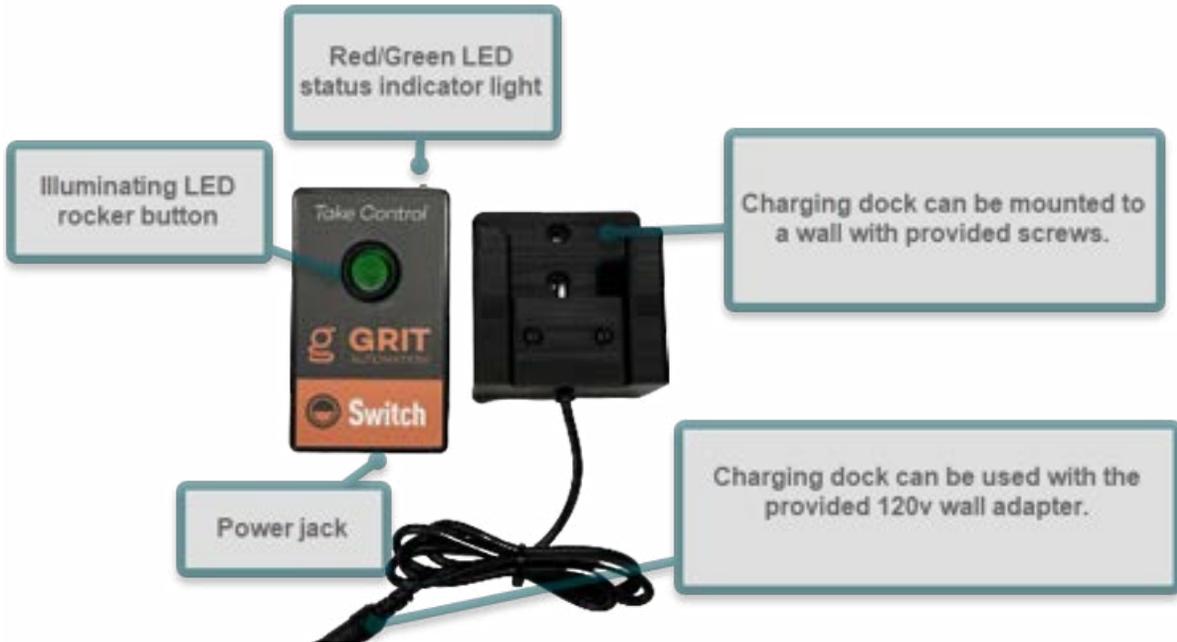


Example: Maintenance alert on Dashboard.

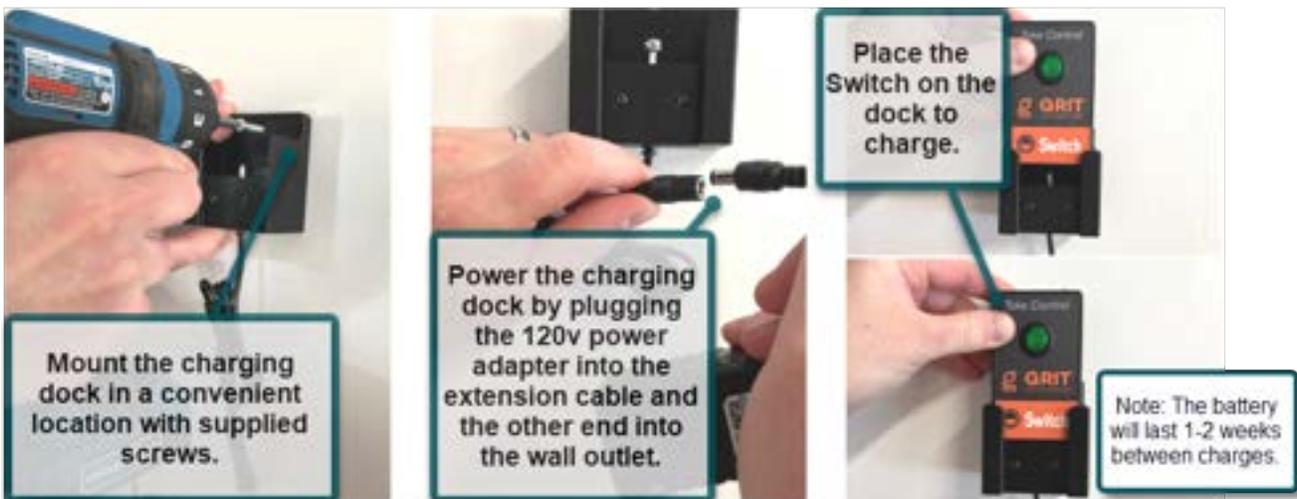
TRIGGERS

GRIT Switch

The GRIT Switch is a wireless trigger that can be configured exactly the same as other triggers, except instead of having the tool activate the collector, the toggle switch does. These are often used for a shop's floor sweep or for a work station that has rotating tools or wood lathes.



Installation



TRIGGERS

Switch Device Configuration

GRIT Trigger SWITCH

Trigger Name: switch-8c9575

Battery Level: Plugged-In/Charged

Associated Collector: collector-9ace5b

Associated Gates:

- No Belt/Disc Sander
- No Drum Sander
- No Edge Sander
- No Floor Sweep
- No Jointer
- No Left Branch
- No Planer
- No Right Branch
- No Spindle Sander
- No Tablesaw
- No gate-2c18a2
- No gate-8330a7
- No gate-3d7f8b

Callouts:

- Trigger Name:** If you press Locate, the Switch will beep and flash when on the charging dock, but will take up to 30 seconds for the device to wake up and beep if it is operating on battery only.
- Associated Gates:** Configure the gate or gates that will be opened when this Switch is on.
- Trigger Name (Field):** Rename the device with the name of the tool it is associated with.
- Battery Level:** Battery Level is displayed or the charging status, if on its dock.
- Associated Collector:** Configure the collector that will turn on when this Switch is on.

Triggers
Switch

COLLECTORS

120v and 220v Collectors

The GRIT Collector device controls dust collectors. It can be linked to triggers and will turn on/off automatically.



Installation



Step 3: Turn on your collector's manual switch (not pictured).

COLLECTORS

MagSwitch Collectors



Installation

The installation options for your MagSwitch Collector are listed below. You will need the following tools to complete:

- Power drill with step bit
- Flathead screwdriver (provided)
- Phillips screwdriver

Option 1: Oneida Collector with Oneida remote module

Option 2: Contactor with motor starter*

Option 3: Laguna Collector

*If the contactor enclosure is large enough, the MagSwitch Collector device can be put inside. If it cannot fit in the enclosure, the knockout must be at least 5/8".

COLLECTORS

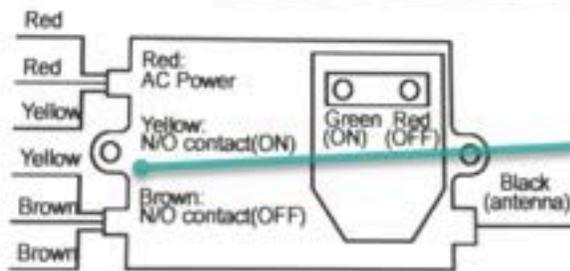
Option 1: Onedia Collector with Oneida remote module



Step 1: Remove the Cover.

If you have a Gorilla Pro, only remove the top cover to the VFD.

RG7 Remote Control Voltage: AC 220-240V



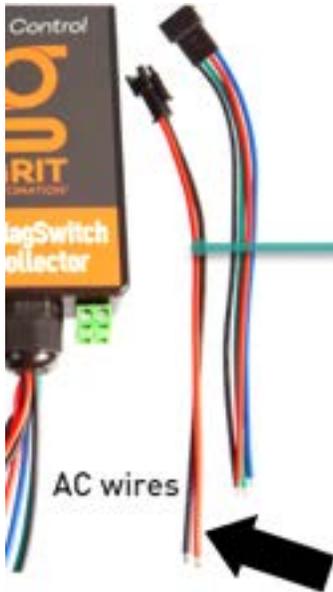
Step 2: Connect the Control Wires

Replace the yellow wires from the existing remote module with the **BLACK** and **GREEN** control wires from the MagSwitch device (side does not matter).

Then, replace the brown wires from the existing remote module with the **RED** and **BLUE** control wires from the MagSwitch device (side does not matter).

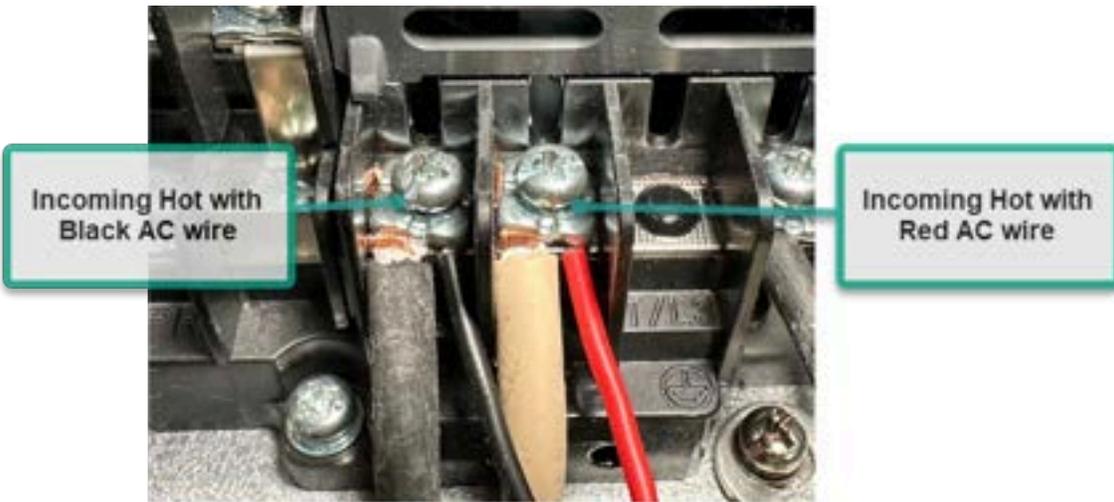


COLLECTORS

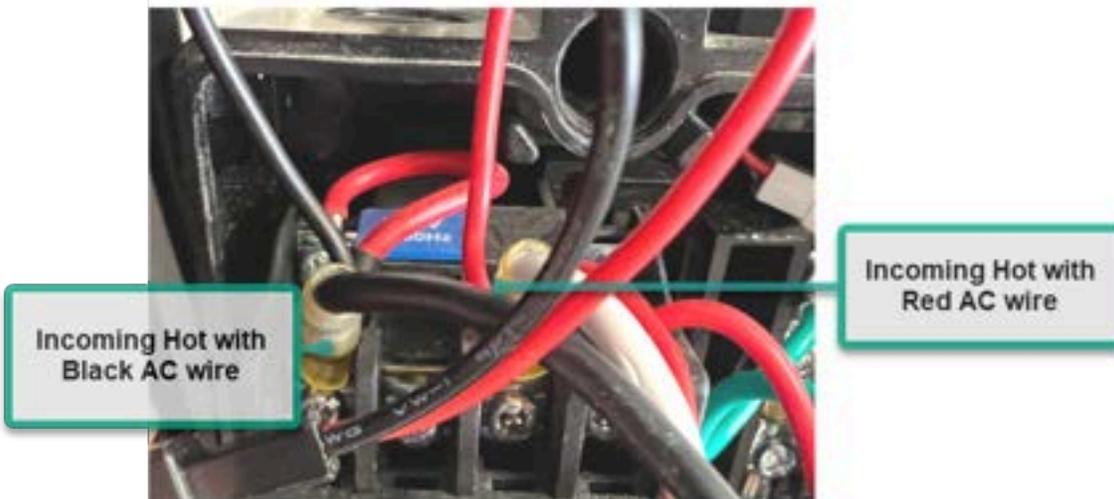


Step 3: Connect the AC Wires

To power the MagSwitch device, install the **BLACK** and **RED** AC wires with the incoming hot wires in the contactor (side does not matter).



Pictured: Oneida Gorilla Pro



Pictured: Oneida Supercell

COLLECTORS



Step 4: Install the Current Transformer (CT)

Unscrew ANY ONE OF THE outgoing load wires. Pass the wire through the middle of the CT and place back into its same terminal. Screw to secure.



Pictured: Oneida Gorilla Pro



Pictured: Oneida Supercell

COLLECTORS



Step 5: Connect the Installed Wires to the MagSwitch Device.

Connect the AC wires, Control wires, and CT.

Step 6: Replace the Cover.

Replace the contactor cover and mount the MagSwitch device with provided VHB tape, if desired.



Pictured: Oneida Gorilla Pro



Pictured: Oneida Supercell

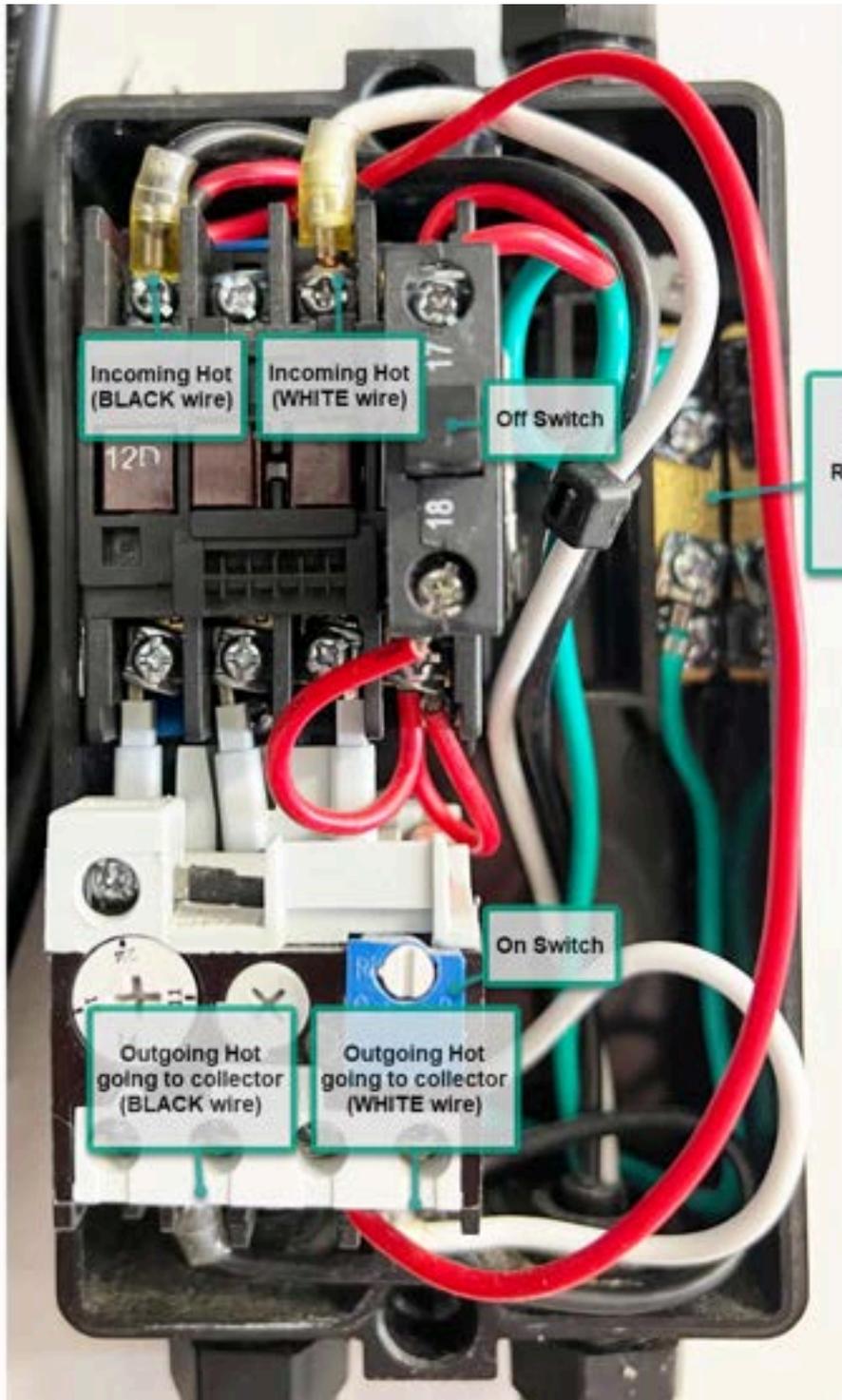
COLLECTORS

Option 2: Contactor with Motor Starter

Installation Video



SCAN ME



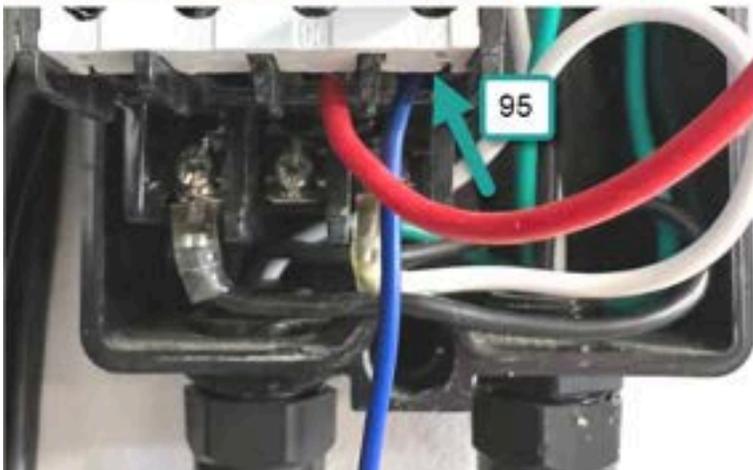
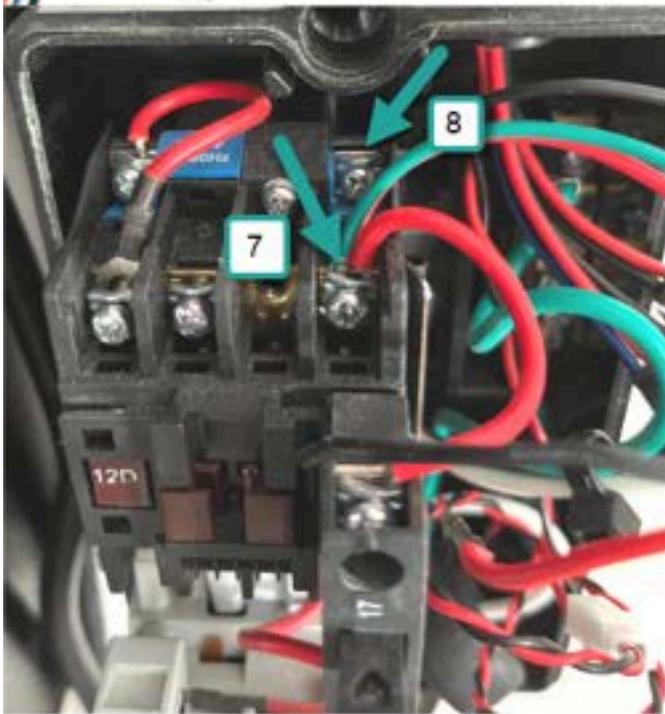
COLLECTORS



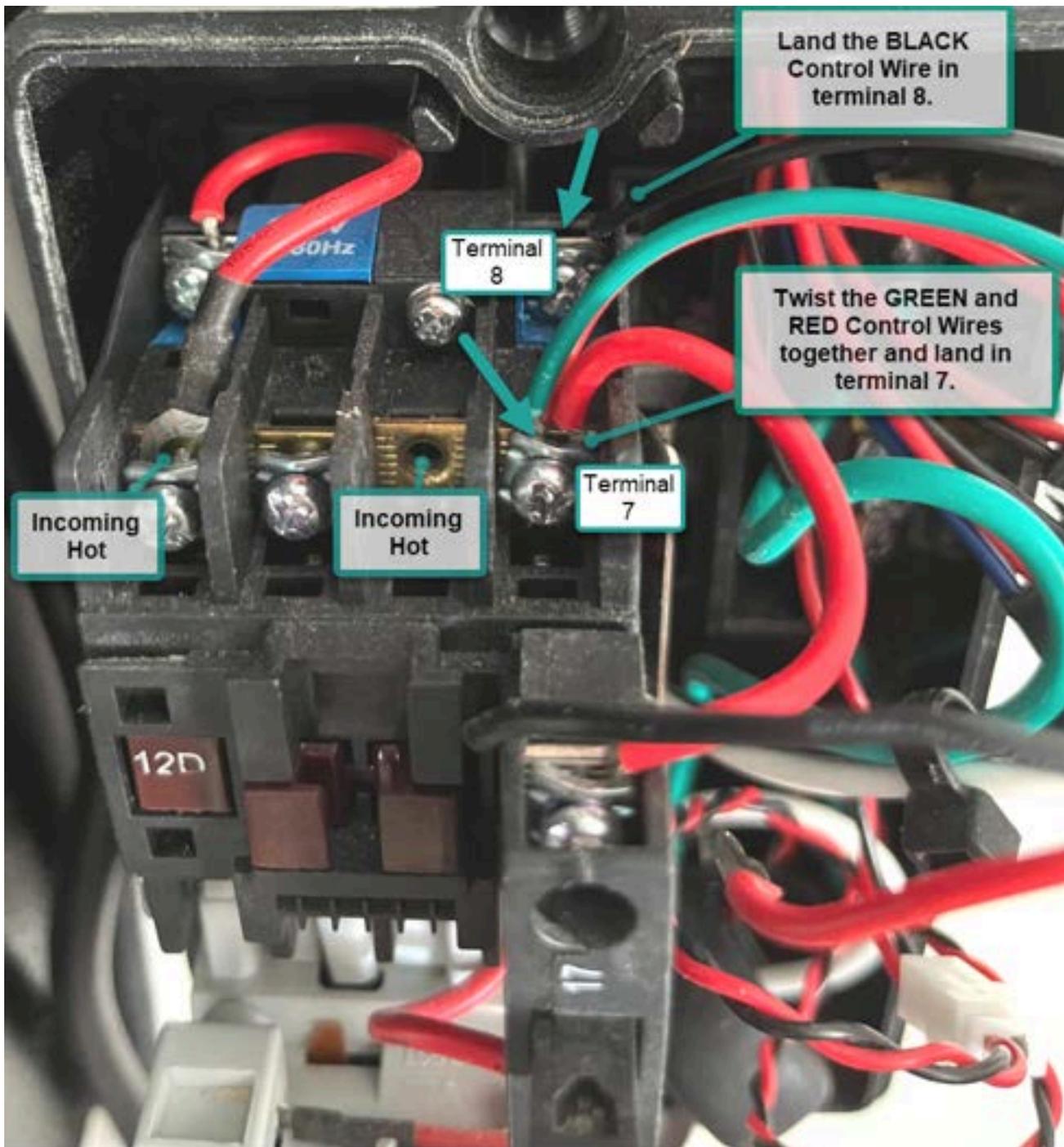
Control wires

Step 2: Connect the Control Wires

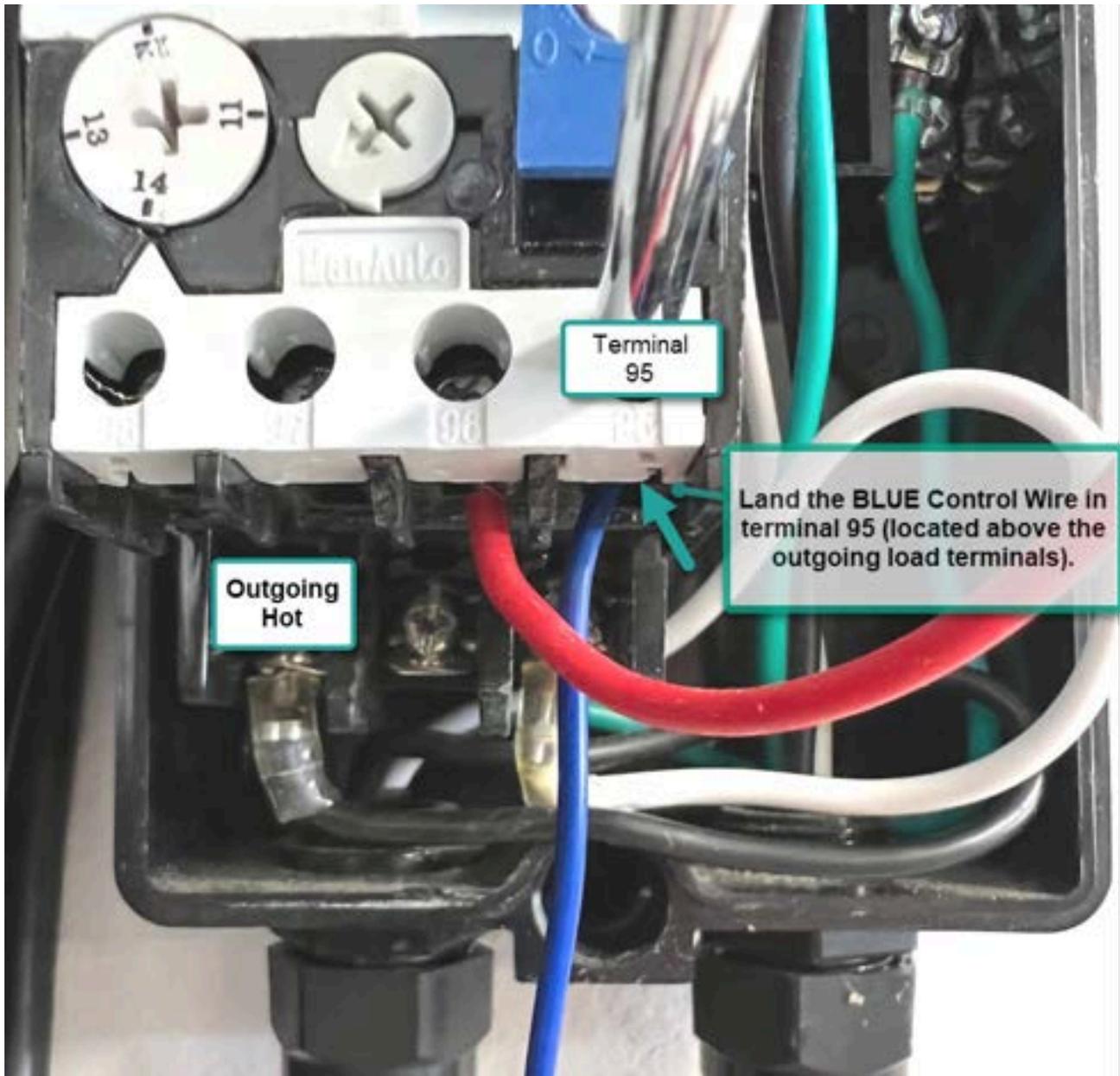
The control wires for this installation option will be landed in terminals 7 and 8 at the top of the contactor and in terminal 95 at the bottom of the contactor.



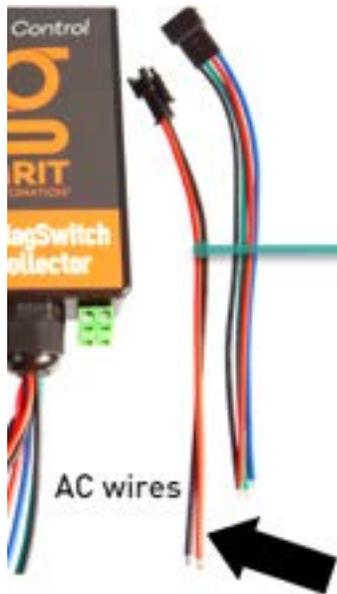
COLLECTORS



COLLECTORS

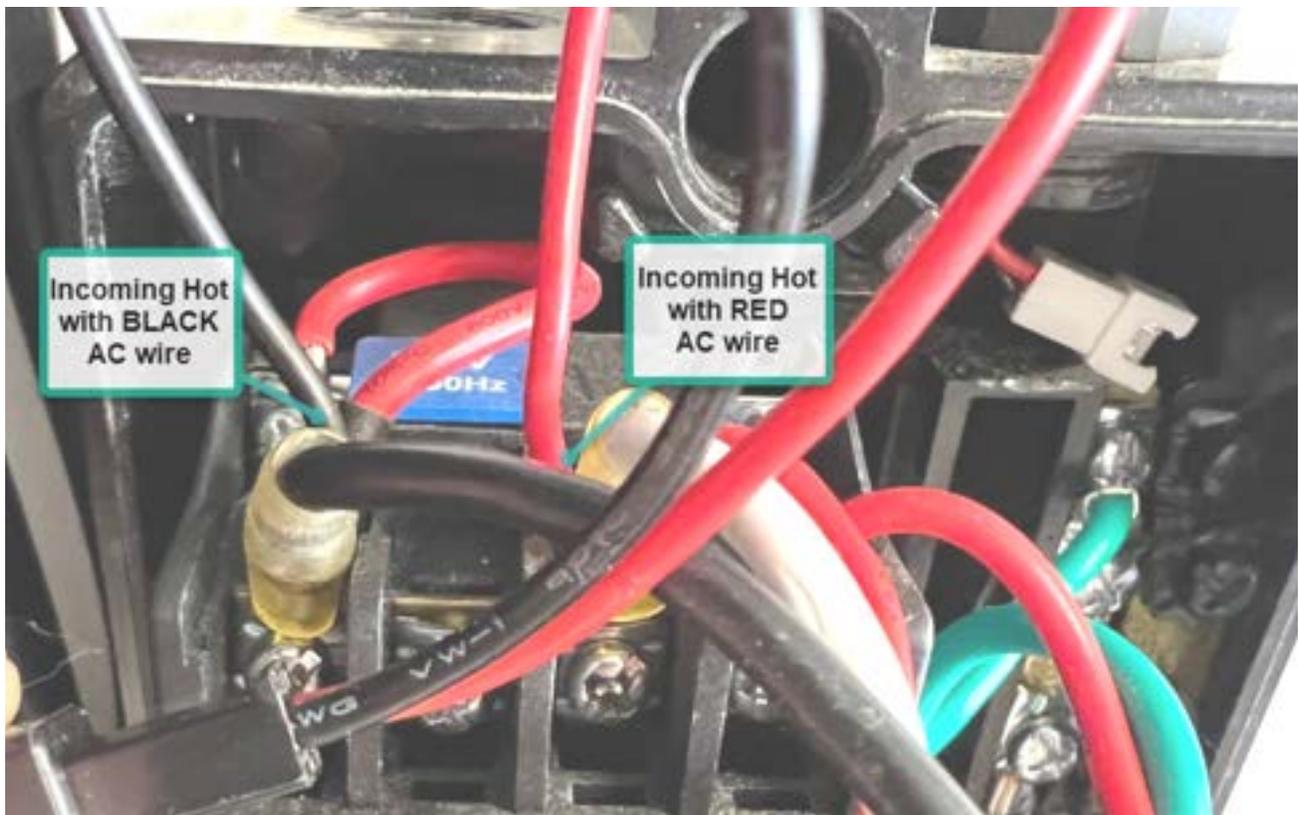


COLLECTORS



Step 3: Connect the AC Wires

To power the MagSwitch device, install the **BLACK** and **RED** AC wires with the incoming hot wires in the contactor (side does not matter).



COLLECTORS



Step 4: Install the Current Transformer (CT)

Unscrew ANY ONE OF THE outgoing load wires. Pass the wire through the middle of the CT and place back into its same terminal. Screw to secure.

Current Transformer (CT)



COLLECTORS



Step 5: Connect the Installed Wires to the MagSwitch Device.

Connect the AC wires, Control wires, and CT.

Step 6: Replace the Cover.

Replace the contactor cover and mount the MagSwitch device with provided VHB tape, if desired.



Pictured: Oneida Gorilla Pro



Pictured: Oneida Supercell

COLLECTORS

Option 3: Laguna Collector

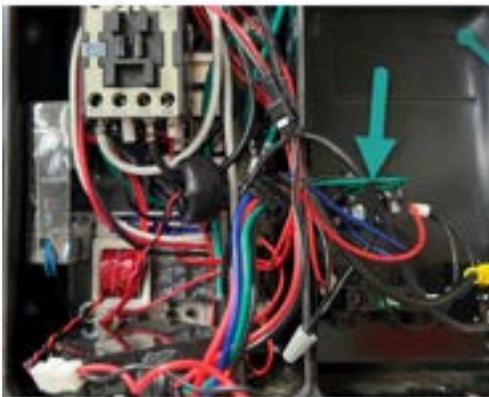
Installation Video



SCAN ME



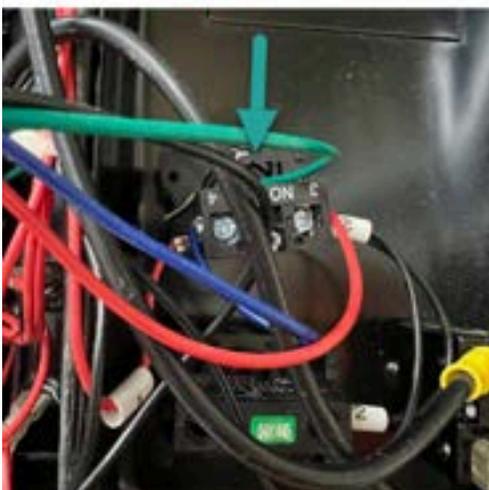
Step 1: Open the Cover.



Step 2: Connect the Control Wires.

Replace the brown wires from the existing remote module with the **BLACK** and **GREEN** control wires from the MagSwitch device (side does not matter).

Replace the yellow wires from the existing remote module with the **RED** and **BLUE** control wires from the MagSwitch device (side does not matter).

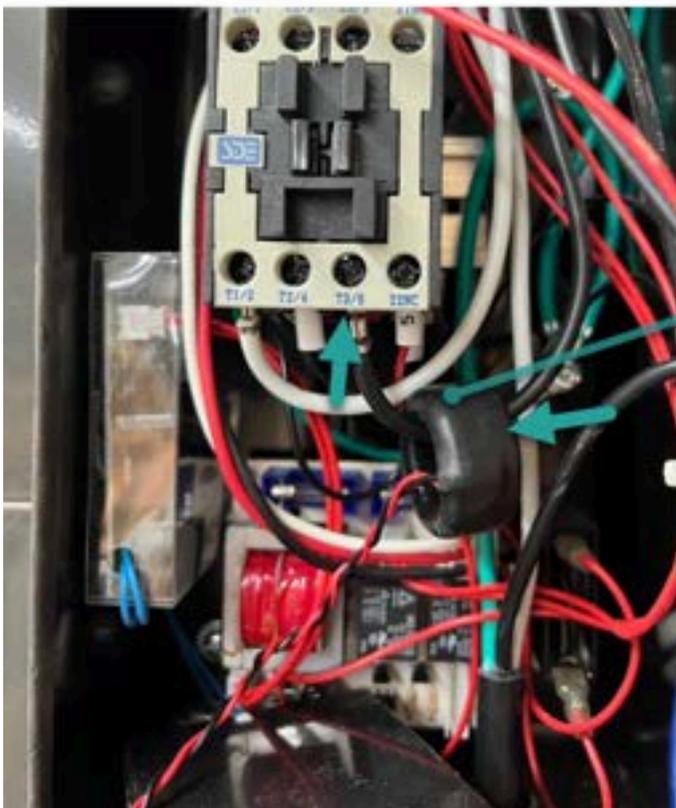


COLLECTORS



Step 3: Connect the AC Wires

To power the MagSwitch device, install the **BLACK** and **RED** AC wires with the incoming hot wires in the contactor (side does not matter).



Step 4: Install the Current Transformer (CT)

Unscrew **ANY ONE OF THE** outgoing load wires. Pass the wire through the middle of the CT and place back into its same terminal. Screw to secure.

COLLECTORS



Step 5: Connect the Installed Wires to the MagSwitch Device.

Connect the AC wires, Control wires, and CT.



Step 6: Close the Cover.

Mount the MagSwitch device with provided VHB tape and close the cover.

COLLECTORS

Collector Device Configuration

The screenshot shows the configuration page for a collector device in the GRIT system. The interface includes a search bar for the collector name (V3000) and a list of associated triggers. The configuration options are as follows:

- Collector Name:** V3000
- Associated Triggers:** A list of triggers with checkboxes for activation. The 'Spindle Sander' and 'Tablesaw' triggers are currently checked.
- Turn On:** A green button to activate the collector.
- Relay Operation Type:** Momentary (selected) or Latching.
- Delay On Timer:** 0.0 Seconds
- Delay Off Timer:** 4.0 Seconds
- Minimum Run Timer:** 0.0 Minutes
- Minimum Open Gates:** 0 Gates

Callout boxes provide detailed instructions for several settings:

- Collector Name:** Rename the device with the name of the collector it is associated with.
- Associated Triggers:** Configure the trigger or triggers that will cause the collector to be turned on.
- Relay Operation Type:** Select how the relay operates to turn the collector on. Most collectors operate with a momentary operation.
- Delay On Timer:** Set the number of seconds the collector should wait to turn on after an associated trigger has been activated. If no gates need to be changed, the collector will immediately turn on. This setting gives the system a chance to move the gates first when a collector is too powerful. The LED on the Collector will flash green to indicate that it has received the message to turn on.
- Minimum Open Gates:** Set the minimum number of gates for this collector. The system finds all gates connected to this collector through the associated triggers and ensures that the number of gates that are open is at least this number.
- Minimum Run Timer:** Set the number of minutes the collector must run after it has been turned on. The timer for this feature starts when the collector first turns on.
- Delay Off Timer:** Set the number of seconds the collector should wait to turn OFF after all associated triggers have been deactivated. The LED will flash red to indicate that it has received the message to turn off.

The bottom navigation bar includes icons for Home, Assets, Devices, Reports, and Admin.

COLLECTORS

VFD Device Configuration

The screenshot displays the VFD Device Configuration interface. The main configuration area includes:

- Collector Name:** VFD Collector (with a callout: "Rename the device with the name of the collector it is associated with.")
- Minimum VFD Speed:** 50% (with a callout: "Set the minimum speed for this VFD.")
- Maximum VFD Speed:** 100% (with a callout: "Set the maximum speed for this VFD.")
- VFD Configuration:** AutomationDirect :: GS1 (with a callout: "Configure how your device communicates. Select your VFD model or select 'Custom' if your model is not listed.")
- Associated Dust Bin Sensor:** -- Select Dust Bin Sensor -- (with a callout: "Set the number of seconds the collector should wait before turning on after an associated trigger is activated.")
- Delay On Timer:** 0.0 Seconds
- Delay Off Timer:** 4.0 Seconds (with a callout: "Set the number of seconds the collector should wait before turning off after all associated triggers have been deactivated.")
- Minimum Run Timer:** 0.0 Minutes
- Minimum Open Gates:** 1 Gate (with a callout: "Set the number of minutes the collector must run after it has been turned on.")
- Number Of Tools For Max Speed:** 3 Tools (with a callout: "Set the number of tools that must be running for the VFD to operate at specified maximum speed.")
- Associated Triggers:** A list of triggers with checkboxes: No Belt/Disc Sander, Yes switch-8c97de, No switch-8392eb, No Drum Sander, No Edge Sander, No Floor Sweep, No Jointer, Yes L, No Planer (with a callout: "Configure the trigger or triggers that will cause the collector to be turned on.")

Navigation icons at the bottom include Home, Devices, GRIT Track, Reports, and Admin.

GATE CONTROL

Gate Control

The GRIT Gate Control device attaches to an existing metal blast gate to automatically open and close the gate when an associated tool is turned on/off.



**For Step-by-Step
Instructions,
Watch our
Installation Video**

Installation Tool Requirements

You will need the following tools to complete installation:

- Power drill with 5/32" drill bit (provided)
- Drill Guides (provided)
- Flathead screwdriver (provided)
- H2 Driver bit (provided)
- 7mm Socket driver (provided)
- Phillips screwdriver
- Wire stripper



SCAN ME

GATE CONTROL

Orientation

GRIT Gate Control devices, when powered properly, operate in any orientation. Some placement considerations can be made, however, to assist in their best performance.

- If you notice strain when opening/closing, consider mounting the actuator so that:
 - the arm operates parallel to the floor, or;
 - the arm opens up toward the ceiling.



Gate Control
Installation

GATE CONTROL

Blast Gate Preparation

To avoid having your gate bind or get stuck, we recommend taking a few minutes to prepare your gate for automation.



Step 1:
Take a file and knock down the sharp corners of the slide.



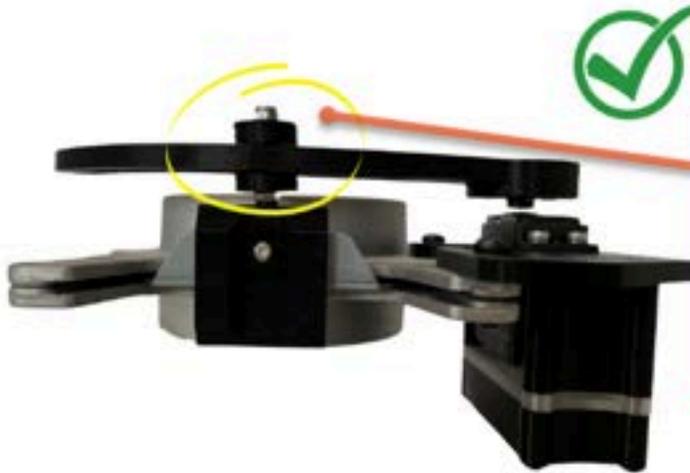
Step 2:
With a fine sand paper, smooth along the edges of the slide to remove any burs.

Please note: These two steps performed on the part of the slide that is visible when fully extended should provide the smooth gliding surface necessary for automation. If at any point you experience binding of your gate or it seems to get "off track" we recommend that you either completely remove the slide to perform the same steps on the back edges and corners and/or apply a small amount of lubricant to the slide. We have had success with the CRC 3-36 Multi-Purpose Lubricant.

GATE CONTROL

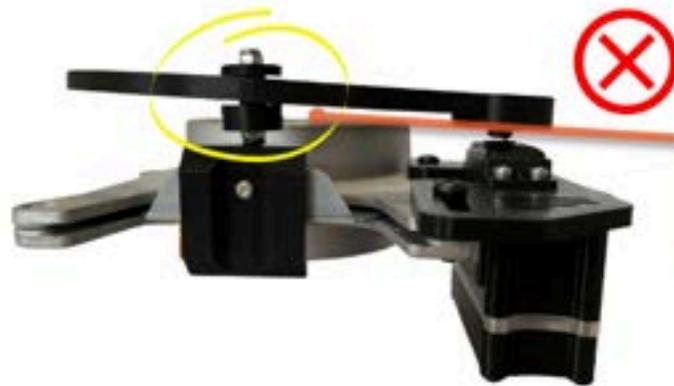
Finetune the Arm Position

To make sure your Gate Control Arm slides smoothly, take care in placing the correct configuration of Hat and Flat washers on the Slide Bracket post so that the Arm is level and secure. The best configuration will vary from gate-to-gate, so use these images as a guide.

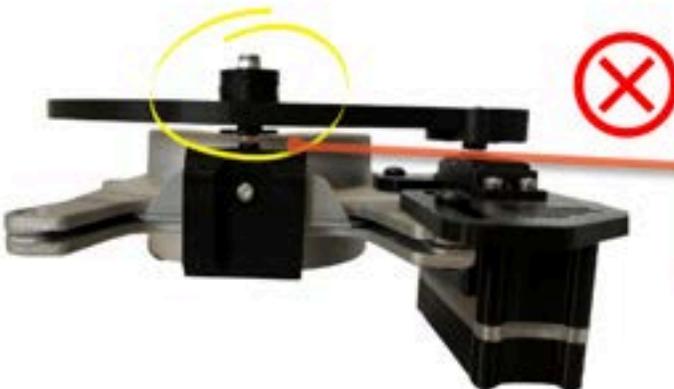


This Arm is fairly level and supported with no additional tension being placed at its connection point with the servo.

For reference, this configuration has a 3mm and 1mm washer placed below the Arm with a hat washer, 3mm, and 1mm washer placed above.



This Arm is pitched up at an angle due to too many flat washers being placed below the Arm.



While this Arm is fairly level, it is not adequately supported with flat washers underneath the Arm.

Gate Control
Installation

GATE CONTROL

Attach the Arm

The Arm of the Gate Control device arrives separate from the actuator so that proper placement can be achieved. Follow the steps in the installation video for attaching the Gate Arm.

The image displays two screenshots from the GRIT mobile application. The top screenshot shows the 'Gate Configuration' screen for a gate named 'Bundara'. It features a 'Calibrate' button at the bottom, which is being pointed to by a hand icon. A callout box on the right explains the first step: 'Step 1: Select the detail configuration screen of the gate you need to reattach. Then, press 'Calibrate'.' The bottom screenshot shows the 'Gate Calibration' screen, which includes a vertical scale on the left and several control buttons on the right: 'Open', 'Close', 'Done', 'More Open', 'Less Open', 'Less Closed', 'More Closed', 'Move To Center', and 'Reset Calibration'. A hand icon is pointing to the 'Reset Calibration' button, and a callout box on the right explains the second step: 'Step 2: Once in the Calibration screen, press 'Reset Calibration'. Then, press 'Move to Center' to move the servo into its center position.'

Step 1:
Select the detail configuration screen of the gate you need to reattach.
Then, press 'Calibrate'.

Step 2:
Once in the Calibration screen, press 'Reset Calibration'.
Then, press 'Move to Center' to move the servo into its center position.

GATE CONTROL



Step 3:
Manually slide the gate's tab so that the gate is approximately half open.



Step 4:
While keeping the gate's tab half open, push the Arm down onto the servo.
Secure with the M3 screw.
Finish calibrating the open and closed positions per the 'Calibration' instructions.

GATE CONTROL

Gate Control Device Configuration

The screenshot shows the GRIT Gate configuration interface. At the top, the logo "GRIT Gate" is displayed. Below it, the "Gate Name" field is set to "Bandsaw" with an "Open Gate" button. To the right, the "Associated Triggers" section lists several tools: Bandsaw (checked), Drum Sander, Floor Sweep, Jointer, Planer, and Tablesaw (all unchecked). Below the gate name, the "Delay Gate Close" is set to "0 Seconds" and a "Calibration" button is visible. At the bottom, a navigation bar includes "Home", "Assets", "Devices", "Reports", and "Admin".

Callout 1 (Gate Name): Rename the device, generally, with the name of the tool it is associated with.

Callout 2 (Associated Triggers): Configure the trigger or triggers that will cause the gate to open.

Callout 3 (Calibration): Set the Open and Closed positioning for the gate.

Callout 4 (Delay Gate Close): Configure the number of seconds to wait before closing the gate. This setting allows the dust to be cleared after all tools associated with this gate turn off.

GATE CONTROL

Calibration

The screenshot shows the 'Gate Calibration' interface. At the top, a 'Servo Force' graph displays a power curve. Below the graph are four main control panels: 'Open' (green), 'Close' (red), 'Move To Center' (blue), and 'Reset Calibration' (yellow). Each panel has associated adjustment buttons: 'More Open' and 'Less Open' for the Open panel; 'Less Closed' and 'More Closed' for the Close panel. Callout boxes provide instructions for each element.

Servo Force
Servo Force power graph shows the amount of stress against the gate actuator.

Open
Press 'Open' to swing the Arm into the open position. Press More Open/ Less Open to adjust.

Close
Press 'Close' to swing the Arm into the closed position. Press More Closed/ Less Closed to adjust.

Move To Center
Press 'Move to Center' to place Arm in its center swing position.

Reset Calibration
Press 'Reset Calibration' to clear previous settings made. The Open/Closed positions will return to the values it had when it was first bound.

Done
Press 'Done' to close calibration screen and return to Gate Control detail page.

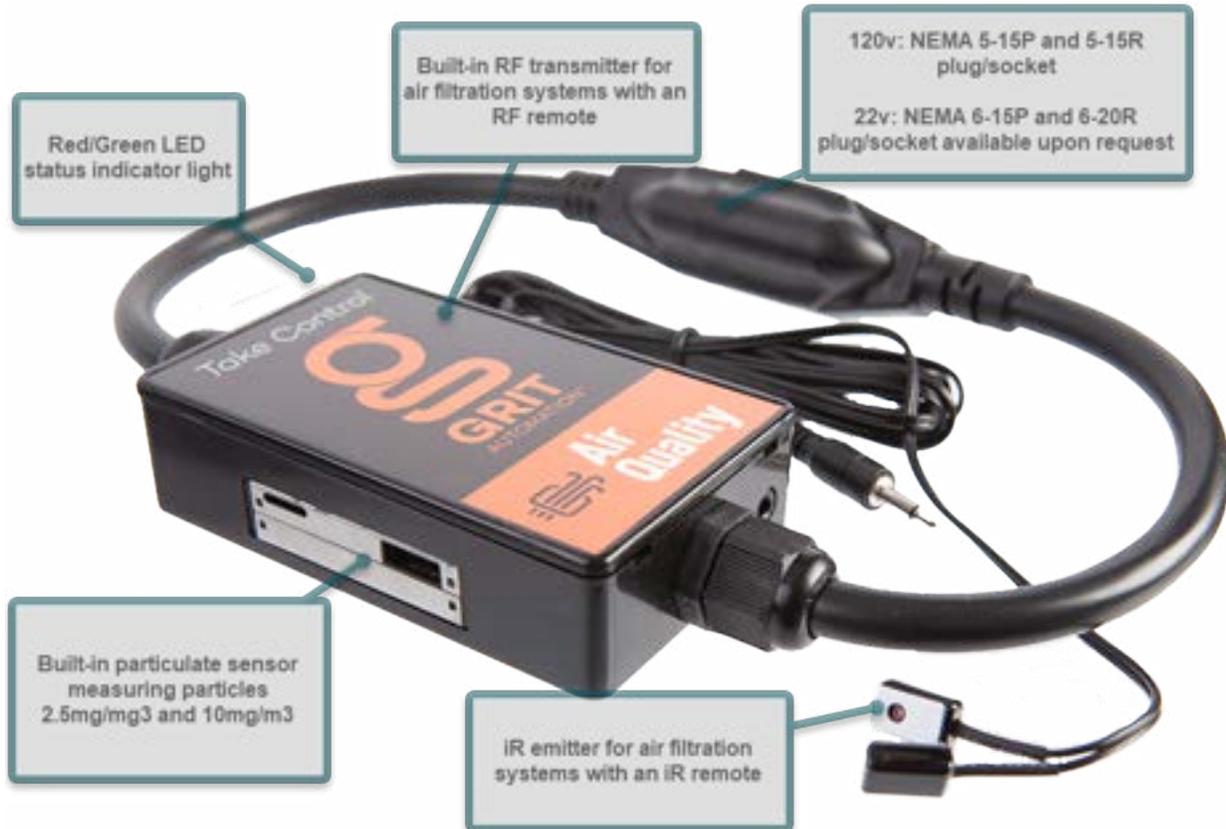
Gate Control
Configuration

*Tips/Tricks: The LEDs on the Gate will flash each time you adjust its Open/Close position. Decrease the amount of the Open/Close if the stress on the servo becomes high. Indications that the position is too far in one direction is servo shuttering, the gate opening/closing spontaneously, or the LEDs turning off and the gate resetting.

AIR QUALITY

Air Quality

The GRIT Air Quality device automatically controls air filtration units. It continuously monitors air quality levels and activates the air filter system based on the configured settings.



AIR QUALITY

Installation



Step 1:
Plug your air filter into the GRIT Air Quality device.



Step 2:
Plug the GRIT Air Quality device into the outlet.

Steps 3 and 4 are only used for air filtration systems with an iR remote. Basic on/off systems or systems with an RF remote will not use the included iR emitter.



Step 3:
Plug the jack of the iR emitter into the port on the bottom of the GRIT Air Quality device.



Step 4:
Remove the white sticker from the back of the iR emitter and place on top of the eye on the air filtration system.

Dusty environments might need more tape.

Note: If your shop has multiple Air Quality devices, you may need to cut off the second emitter to avoid sending signals to other devices.

AIR QUALITY

Air Quality Device Configuration

GRIT Air Quality ^{API 4}

Air Quality Device Name
GRIT Shop

Air Quality Levels
1.0 PM2.5 $\mu\text{g}/\text{m}^3$ 1.0 PM10.0 $\mu\text{g}/\text{m}^3$ 85 Dylas #/01ft³ 15

Activation Level
15 PM2.5 $\mu\text{g}/\text{m}^3$ OR PM10.0 $\mu\text{g}/\text{m}^3$ Dylas #/01ft³

Override On Timer
30 Minutes **Turn On**

Automatic Mode
On Off

Minimum Run Timer
10.0 Minutes

Control Type
Inline **iR Remote** RF Remote

Activation Speed
Low Medium **High**

IR Command Setup
-- Select Command Setup --

Associated Triggers
No switch-8392
No Belt/Disc Sander
No Drill Press
No Drum Sander
No Edge Sander
No Floor Sweep
No Jointer
No Spindle Sander
No Tablesaw

Air Quality Indicator
A visual indicator that represents the current air quality relative to the set activation levels.

Callout Boxes:
- Rename the device, usually, with the name of the air filtration unit it is associate with.
- Current air quality readings from the sensor.
- Set the level of dust in the air that triggers the air filter to turn on.
- Set the length of time the air filter should run regardless of automatic activation levels.
- Set whether the air quality device should automatically turn on the air filter according to activation settings.
- Set the number of minutes the air filter should run after it would normally turn off (i.e., air levels are below set activation levels.)
- Select the type of on/off control for your air filter.
- Select the speed of the air filter when it is initially turned on by GRIT.
- Select a predefined model or 'Custom' to train the GRIT system for your specific device.
- Select the trigger or triggers that, when running, will cause the air filter to turn on.

Navigation: Home Devices Reports Admin

AIR QUALITY

Air Quality Device Configuration with an iR or RF Remote

To program the GRIT Air Quality device to your air filtration system, first determine if the remote is iR or RF. If you are unsure, you can determine this by looking for a clear LED bulb on the remote or a tinted plastic window on the top of your remote. If none is present, it is RF.



**For Step-by-Step
Instructions,
Watch our
Video**



SCAN ME

Air Quality
Configuration

GRIT REPORTS

Three types of reports available:

1. Activity Reports: view a log of GRIT device activity for the specified time range.
2. Maintenance Reports: view of tool maintenance for the specified time range.
3. Tool Reports: view tool activity for the specified time range.

Activity Reports



GRIT REPORTS

Step 1:
Select the type of report

Step 2:
Select the Date Range for the report.

Step 3:
Select whether you would like seconds data displayed in the timestamps.

Step 4:
Select whether you would like online/offline data about the system (used mainly for troubleshooting).

Step 5:
Select the type of activity for the report.

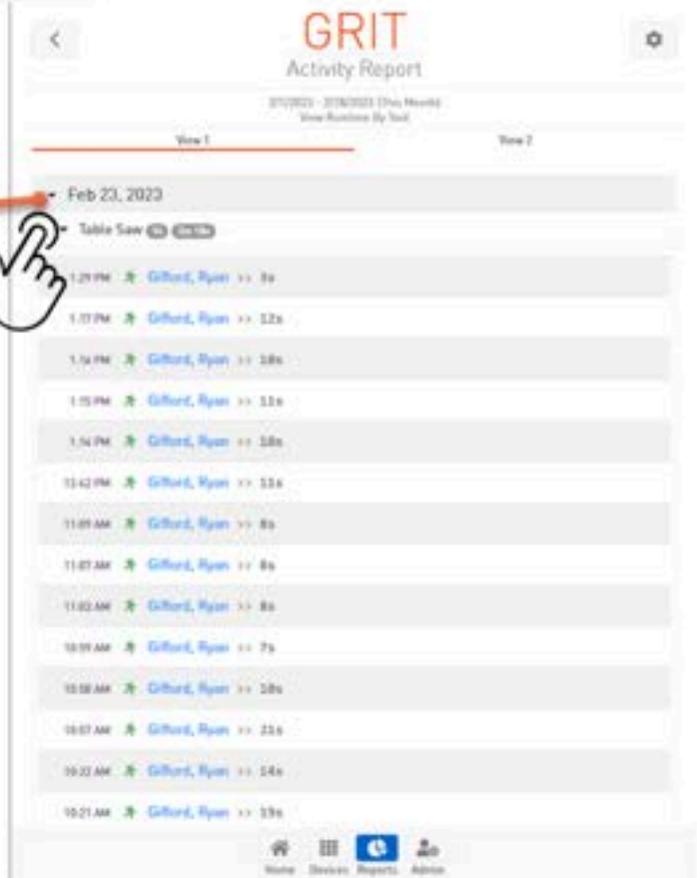
Step 6:
Press 'Refresh Report'

GRIT REPORTS



View 1: Tools
A list of activity for each date in the selected date range.

Press the dropdown menu for a detailed view of activity for each tool on a given date.



GRIT REPORTS

Reports
Activity Reports



Press the dropdown menu for a detailed view of activity for each collector on a given date.



GRIT REPORTS

Maintenance Reports

This screenshot shows the top portion of the GRIT Maintenance Reports interface. On the left is a vertical sidebar with three menu items: 'Activity', 'Maintenance' (which is highlighted with a dark background), and 'Tool'. Above the sidebar is a 'Return' button with a left-pointing arrow. To the right of the sidebar is a large green 'Refresh Report' button with a circular refresh icon. A hand cursor icon is positioned over the 'Refresh Report' button, and a large black arrow points downwards from this area towards the detailed report view below.

This screenshot shows the detailed view of a maintenance report in the GRIT application. The title 'GRIT Maintenance Report' is centered at the top, with a date range of '6/1/2022 - 6/17/2022 (This Month)' below it. A table lists the tasks, with one task expanded to show details and activities.

| Tool | Task | Time Remaining |
|----------|--------------------|----------------|
| ▼ Planer | Change Gearbox Oil | 36s |

| Details | | Activities | | |
|--------------|------------------------------------------------|----------------------|----------------|------------------------|
| Frequency: | 36s | Completed On | Performed By | Notes |
| Description: | Change the gearbox oil with the correct fluid. | Jun 16, 2022 5:44 PM | Danowitz, Joel | I completed this task. |

At the bottom of the screen is a navigation bar with four icons: Home, Devices, Reports (which is highlighted), and Admin.

GRIT REPORTS

Tool Reports

Reports
Maintenance Reports

Return **Refresh Report**

Activity
Maintenance
Tool

Date Range
This Month
Select the date range for the tool report.

Tool Selection
All Tools Single Tool

View 1: All Tools Report
A list of total tool runtime for all tools in the shop for the selected date range.

GRIT
Tool Report

2/1/2023 - 2/28/2023 (This Month)
Tools: 9 | Total Runtime: 6h 12m

View 1

| Tool | Duration |
|-----------------|----------|
| Sanders - Hand | 2h 03m |
| Remote Switch | 1h 38m |
| Sanders - Flat | 1h 02m |
| Table Saw | 36m 25s |
| Router Table | 16m 31s |
| Shop Sweep | 16m 12s |
| Bandsaw - Small | 12m 51s |
| Drill Press | 4m 26s |
| Bandsaw - Large | 1m 16s |

View 2

Most Used Tools

| Tool | Duration |
|-----------------|----------|
| Sanders - Hand | 2h 03m |
| Remote Switch | 1h 38m |
| Sanders - Flat | 1h 02m |
| Table Saw | 36m 25s |
| Router Table | 16m 31s |
| Shop Sweep | 16m 12s |
| Bandsaw - Small | 12m 51s |
| Drill Press | 4m 26s |
| Bandsaw - Large | 1m 16s |

GRIT REPORTS

The screenshot shows the GRIT Tool Report interface. At the top, there is a navigation bar with a back arrow on the left, the title 'GRIT Tool Report' in the center, and a settings gear icon on the right. Below the title, the report period is '2/1/2023 - 2/28/2023 (This Month)' and the summary is 'Tools: 9 | Total Runtime: 6h 12m'. The main content area is divided into two views: 'View 1' (left) and 'View 2' (right). View 1 displays a table of tool runtime data for a specific date (Feb 23, 2023). View 2 is currently hidden. A hand icon points to a red line that separates the two views, and a callout box explains that View 2 shows a list of all tool runtime for each date in the selected range. At the bottom, there is a navigation bar with icons for Home, Devices, Reports, and Admin.

| Tool | User | Duration |
|-----------------|---------------|----------|
| Feb 23, 2023 | | |
| Bandsaw - Small | Gifford, Ryan | 2m 02s |
| Remote Switch | Gifford, Ryan | 11m 05s |
| Router Table | Gifford, Ryan | 7m 49s |
| Sanders - Flat | Gifford, Ryan | 1m 39s |
| Shop Sweep | Gifford, Ryan | 1m 29s |
| Table Saw | Gifford, Ryan | 3m 18s |

View 2: All Tools Report
A list of all tool runtime for each date in the selected range.

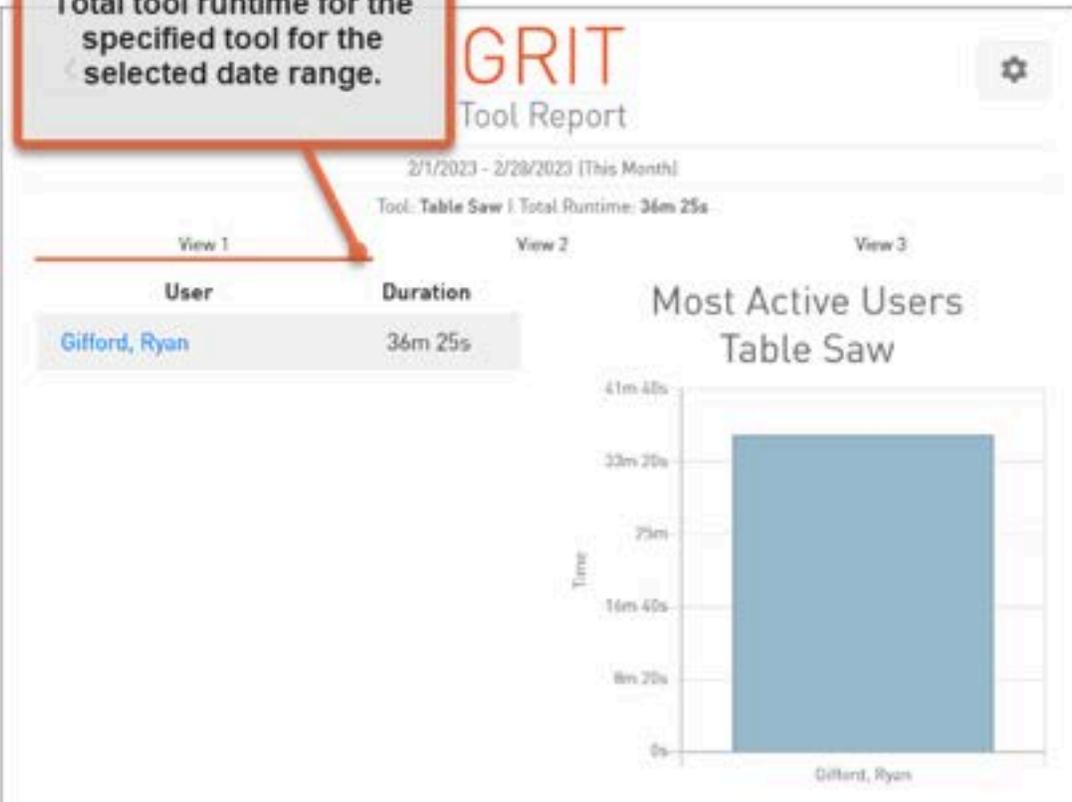
Home Devices Reports Admin

GRIT REPORTS



View 1: Single Tool Report

Total tool runtime for the specified tool for the selected date range.



GRIT REPORTS

GRIT Tool Report

2/1/2023 - 2/28/2023 (This Month)

Tool: Table Saw | Total Runtime: 36m 25s

| User | Duration |
|---------------|----------|
| Feb 23, 2023 | |
| Gifford, Ryan | 3m 18s |
| Feb 20, 2023 | |
| Gifford, Ryan | 17m 16s |
| Feb 11, 2023 | |
| Gifford, Ryan | 10s |
| Feb 9, 2023 | |
| Gifford, Ryan | 22s |
| Feb 8, 2023 | |
| Gifford, Ryan | 13m 48s |
| Feb 4, 2023 | |
| Gifford, Ryan | 1m 31s |

View 2: Single Tool Report
Tool runtime for each date in the selected range.

View 3: Single Tool Report
Each individual instance of tool use in the selected range.

GRIT Tool Report

2/1/2023 - 2/28/2023 (This Month)

Tool: Table Saw | Total Runtime: 36m 25s

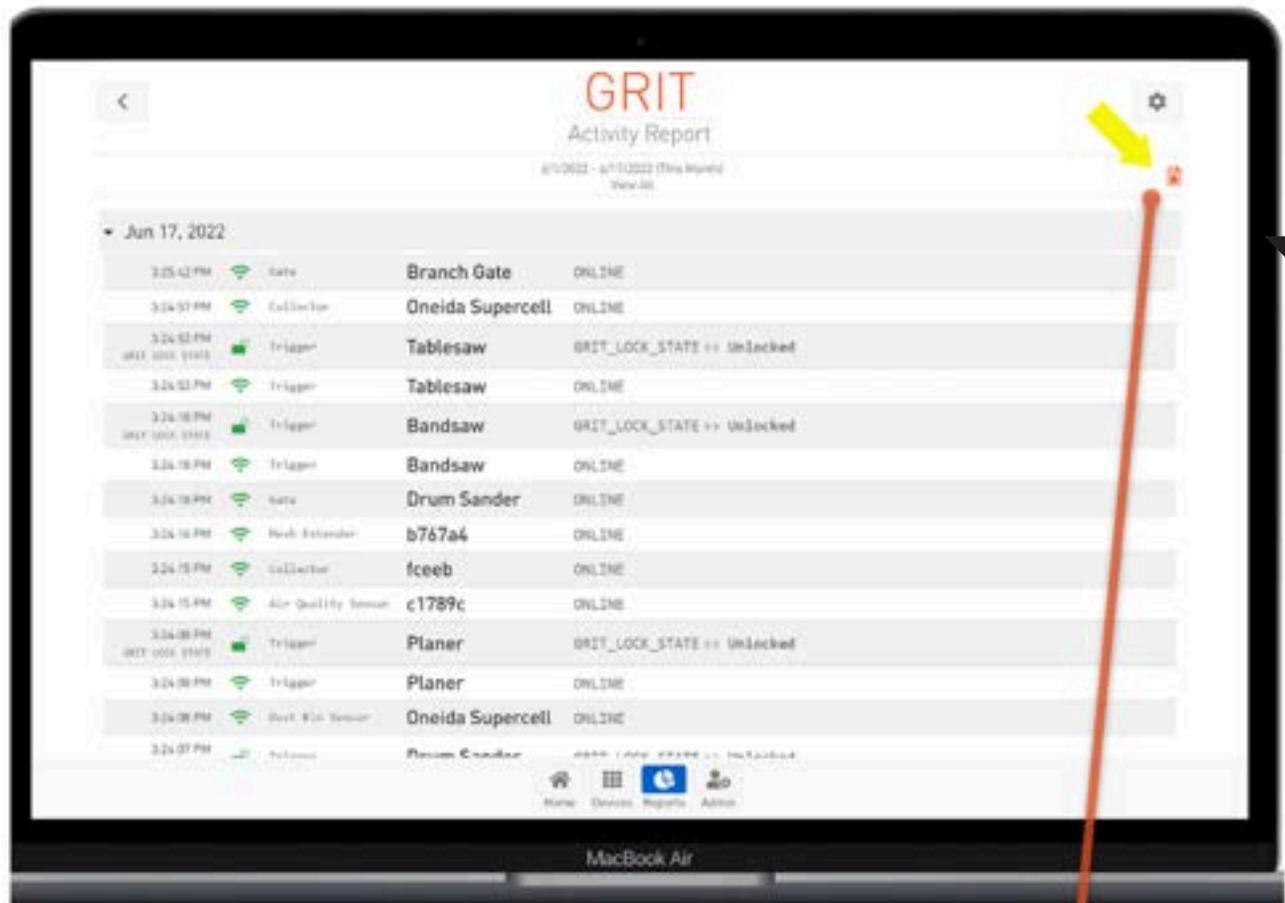
| Time | User | Duration |
|--------------|---------------|----------|
| Feb 23, 2023 | | |
| 10:05 AM | Gifford, Ryan | 12s |
| 10:07 AM | Gifford, Ryan | 34s |
| 10:21 AM | Gifford, Ryan | 19s |
| 10:23 AM | Gifford, Ryan | 14s |
| 10:37 AM | Gifford, Ryan | 21s |
| 10:58 AM | Gifford, Ryan | 10s |
| 10:59 AM | Gifford, Ryan | 7s |
| 11:02 AM | Gifford, Ryan | 8s |
| 11:07 AM | Gifford, Ryan | 8s |
| 11:09 AM | Gifford, Ryan | 8s |
| 12:42 PM | Gifford, Ryan | 11s |
| 1:14 PM | Gifford, Ryan | 10s |
| 1:15 PM | Gifford, Ryan | 11s |
| 1:16 PM | Gifford, Ryan | 10s |
| 1:47 PM | Gifford, Ryan | 12s |
| 1:29 PM | Gifford, Ryan | 3s |
| Feb 20, 2023 | | |
| 11:42 AM | Gifford, Ryan | 1m 10s |

View 3: Single Tool Report
Each individual instance of tool use in the selected range.

GRIT REPORTS

Export Reports

Reports
Tool Reports



When running reports on a Desktop, reports can be exported as an Excel file by pressing the red download icon.



GRIT AUTOMATION, INC. 12-MONTH LIMITED WARRANTY

1. GRIT Automation, Inc. ("GRIT", "us", "we", "our") warrants all products sold directly from us to be free from defects in workmanship and materials for a period of twelve (12) months from the original shipment date when installed and used in accordance with the GRIT Automation Owner's Manual. Warranty repairs may require you to install a replacement part provided by GRIT, or require you to return the product to us for warranty service or replacement.

2. Such repair or replacement is subject to verification of the defect or malfunction. If we conclude shipping is necessary we will provide you with a shipping label. You are solely responsible for any damage to the returning product, so please ensure packaging is sufficient to protect all components therein.

3. This warranty does not cover repairs or replacements for:

GRIT products used for a purpose or used in any manner for which the product was not intended.

GRIT products damaged as a result of incorrect or inadequate maintenance or care.

Damages resulting from misuse, abuse, negligence, accidents, or shipping damage.

Damages that are a result of normal wear and tear.

Damages incurred during assembly or maintenance.

Damages that are determined to be from repairs made by third parties.

Without limiting the generality of the foregoing, this warranty will be void for products if you do any of the following:

Install any firmware not specifically issued by GRIT.

Make any change or modification to the electronics or computer components of GRIT.

Use or attempt to use GRIT components to control or move any device or object not specifically issued or authorized by GRIT.

General Disclaimer:

While GRIT Automation, Inc. has made every effort at the time of publication to ensure the accuracy of the information provided herein, product specifications, configurations, system/component/options availability are all subject to change without notice. Product design specifications and colors are subject to change without notice and may vary from those shown. Errors and omissions excepted. Images displayed are for illustration purposes only. The images are intended to help illustrate the product and its functions and are not indicative of actual relative differences.



4. Technical support is done through email only at info@gritautomation.com. To obtain warranty service, first email and include your order number, order date, and contact information along with a brief explanation of the issue you are having. Support will work with you via email to diagnose the issue. This may require you to send pictures and/or videos to help with the diagnostics. Do NOT send any products or components back to GRIT without prior approval from Tech Support.

5. Acceptance of the exclusive repair and replacement remedies described herein is a condition of the contract for the purchase of every GRIT product. In no event shall GRIT be liable for any incidental, special, consequential or punitive damages, or for any costs, attorney fees, expenses, losses or delays alleged to be as a consequence of any damage to, failure of, or defect in any product including, but not limited to, any claims for loss of profits. This warranty is exclusive and in lieu of all other express warranties, written or oral. To the extent permitted by law, GRIT disclaims any implied warranties, including without limitation any implied warranty of merchantability or fitness for a particular use or purpose; to the extent such disclaimer not permitted by law, such implied warranties are limited to the duration of the applicable express warranty as described above.

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