Powering Business Worldwide™

Power Systems Generic Installation / Configuration Manual

TD1140 Transmitter
R260 Receiver

DM-R260-0022A
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Revision 1

OMNEX TRUSTED WIRELESS™

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CRITICAL: These instructions are intended only for installing and operating the remote control equipment described here.

This is not a complete Operator's Manual.

For complete operating instructions, please read the Operator's Manual supplied by your equipment manufacturer.

Safety Precautions

READ ALL INSTRUCTIONS

CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Failure to follow the SAFETY PRECAUTIONS may result in radio equipment failure and serious personal injury.

Installation

PROVIDE A SAFETY CUTOFF SWITCH. If maintenance is required, the radio must be disconnected from power

USE PROPER WIRING. Loose or frayed wires can cause system failure, intermittent operation, machine damage, etc.

DO NOT INSTALL IN HOT AREAS. This apparatus can be damaged by heat in excess of 158° F (70° C)

Personal Safety

MAKE SURE MACHINERY AND SURROUNDING AREA IS CLEAR BEFORE OPERATING. Do not activate the remote system unless it is safe to do so.

TURN OFF THE RECEIVER POWER BEFORE WORKING ON MACHINERY. Always disconnect the remote system before doing any maintenance to prevent accidental operation of the machine

Care

KEEP DRY. Do not clean the transmitter / receiver under high pressure. If water or other liquids get inside the transmitter battery or receiver compartment, immediately dry the unit. Remove the case and let the unit air dry

CLEAN THE UNIT AFTER OPERATION. Remove any mud, dirt, concrete, etc. from the unit to prevent clogging of buttons, switches, etc. by using a damp cloth.

Maintenance / Welding

DISCONNECT THE RADIO RECEIVER BEFORE WELDING on the machine the receiver is connected to. Failure to disconnect will result in the destruction of the radio receiver.

System Overview

The **OMNEX Trusted Wireless™ TD1140 / R260** is a portable, long range, programmable radio remote control system. Designed as a compact and easy-to-use product, this **Trusted Wireless™** system puts complete control of your equipment where it's needed most, with the operator. It's robust, easy to install and has complete self-diagnostics. This system can be a simple cable replacement or add intelligence to make it a total control package. It's a radio, a PLC and a valve driver all in one.

The **OMNEX Trusted Wireless™ TD1140 / R260** system uses Frequency Hopping Spread Spectrum (FHSS) technology. FHSS devices concentrate their full power into a very narrow signal that randomly hops from frequency to frequency within a designated band. This transmission pattern, along with sophisticated error-checking techniques, enables our industrially hardened **FHSS** signals to overcome interference that commonly affects licensed radios

The **R260** receiver is designed to be powered from a 12VDC or 24VDC system. It features 19 solid state, high-side driver input / output controls and a reliable E-Stop control.

The **TD1140** comes with 14 buttons to provide the user flexibility to control the functions they need. The transmitter uses a battery pack for regular alkaline AA batteries or a self contained rechargeable pack. When used with the **CCdock2™** or **Pdock2™**, the TD1140 can use and recharge self contained rechargeable pack. Each TD1140 transmitter uses a unique ID code to ensure that no two systems will conflict at a job site.

Features

FCC, IC approved

License free in USA and Canada

1200 foot range @ 900 MHz (900 ft. @ 2.4 GHz)

Hand held / weatherproof / ergonomic

Simple "wire-and-use" installation

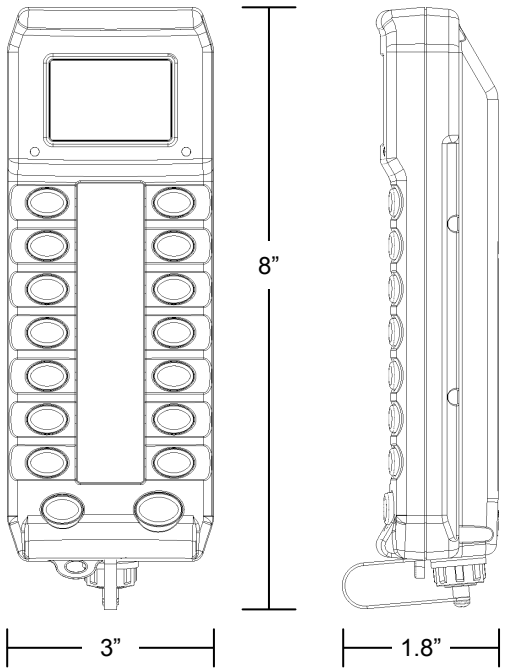
Resilient to impact and shock

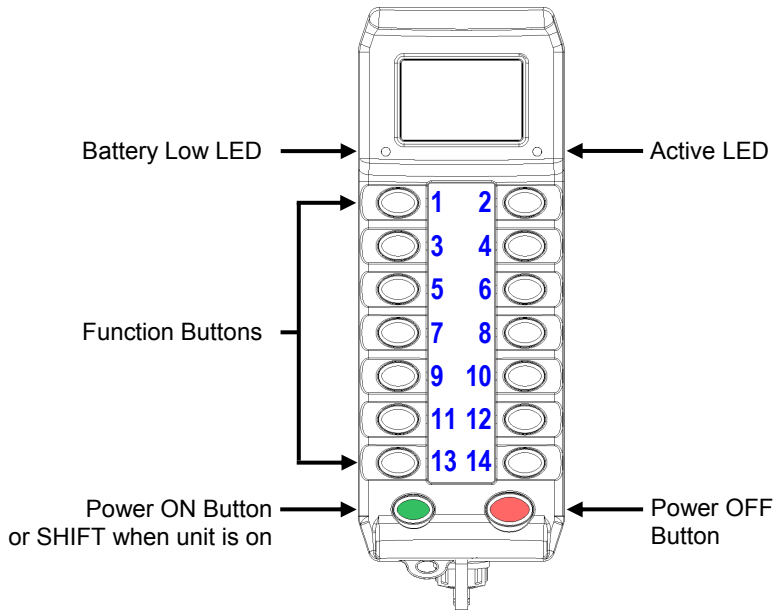
Available in both 900 MHz and 2.4 GHz

Available with optional E-Stop

Factory configurable for all custom applications.

TD1140 Dimensions and Controls





Installing the Receiver

Use the **Wiring Diagram** and the **Connector Diagram** below to connect the receiver pins directly to the appropriate contacts of the machine electronics. R260 Output Cables can be provided with every system to simplify the wiring process. The Wire Color column below only applies to the Eaton Output Cable configuration. Tips on mounting, power connections and filtering are also provided under **Installation Considerations**.

Wiring Diagram

R260 Receiver Internal Wiring

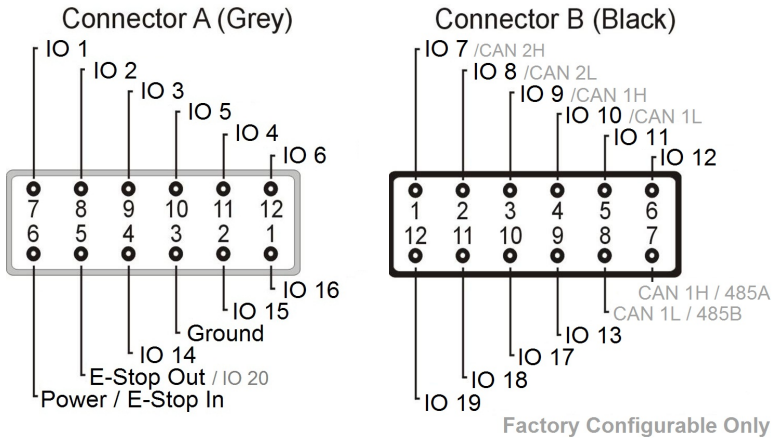
Pin	IO	Wire Colors	Functions	Notes
B7			Factory Configurable Only	
B8			Factory Configurable Only	
A7	1	Orange/Green	Input / Output	
A8	2	Red/Green	Input / Output	
A9	3	White/Red	Input / Output	
A11	4	Blue/Red	Input / Output	
A10	5	Orange/Black	Input / Output	
A12	6	Orange/Red	Input / Output	
B1	7	White/Red/Black	Input / Output	
B2	8	Red/Black/White	Input / Output	
B3	9	Green	Input / Output	
B4	10	Green/Black/White	Input / Output	
B5	11	White	Input / Output	
B6	12	Orange	Input / Output	
B9	13	Red/White	Input / Output	
A4	14	Green/Black	Input / Output	
A2	15	Black/White	Input / Output	
A1	16	Blue/Black	Input / Output	
B10	17	Blue/White	Input / Output	
B11	18	White/Black	Input / Output	
B12	19	Black/Red	Input / Output	
A5	20	Black/White/Red	Switches to Power with Link	
A6		Red	Power Input (+9V to 30VDC)	
A3		Black	Ground	

Outputs: 19 solid state, high-side driver outputs, 3A max. per pin and 3A max per bank, total combined current 10A

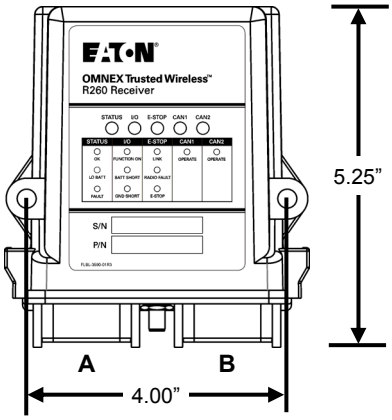
Inputs: All output pins can be factory configured as inputs. Input pins should be connected to a current limiting (fused) source

Connector Pin Assignments

Connectors as seen from under the receiver



R260 Dimensions



Installation Considerations

NOTE: The FCC and IC require that the antenna be restricted to that supplied by the manufacturer and approved for use with this product. An optional 0dB coax wire antenna may be supplied. For other antenna options please contact Eaton Wireless Business Unit.

The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other transmitter.

Mounting and Installation

The receiver can be mounted by fastening two ¼" bolts through the two mounting holes in the unit's enclosure. When mounting, ensure that the receiver is oriented so that the text is upright and the connector is pointing "down".

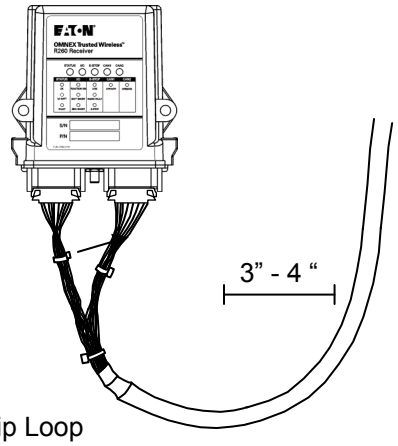
When selecting a mounting point for the receiver, it is recommended that the location

- Use a minimal length of wiring to connect it to the control panel
- Be in a visible area where it has good exposure to the operator
- Be mounted on a surface protected from the weather
- Sustains minimal vibration
- Has best possible line of sight with the transmitter for maximum operational range.

When installing the receiver, it is recommended that a "Drip Loop" is formed with the output cables. By creating a Drip Loop, water from condensation, rain or wet environments, will drip off of the cable instead of running along the wire and into the receiver connections or running along the cables into the machine's electronic controls.

Using approximately 1 foot (30 cm) of cable creates a loop with an approximate radius of 3-4 inches (8-10 cm). Ensure the loop bottom is lower than the receiver connectors.

If connecting an external antenna, a Drip Loop radius of approximately 2-3 inches (5-8 cm) can be formed from approximately 8 inches (20 cm) of cable.



Drip Loop

Power Connections and Wiring

Whenever a power connection is made to an electronic device, it is a good practice to make both the Power (+) and Ground (-) connections route directly to the battery and avoid connecting the power from the charging side of existing wiring or making use of existing "ACC" or other peripheral connection points.

When proportional voltage outputs are used to operate critical equipment it is good practice to use a separate enable signal as part of the control circuit. In some cases an application can be designed using an independent enable output for each proportional output (see wiring diagram). An alternative solution is to use the "Switches to Power with Link" line (see wiring diagram) to explicitly enable each of the functions that are using proportional voltage control. This will ensure that under all fault conditions the equipment will be disabled when the link is disabled (e.g. by hitting E-Stop). **As well, following any instance of a fault condition (e.g. output shorted) it is recommended practice to fully cycle the power to the receiver before restarting the transmitter to ensure that the system is restarted from a known state.**

Make sure that wire of sufficient gauge and insulator type is used when connecting the outputs of the receiver to the control panel. Observe any component manufacturer's instructions and recommendations for proper integration of their product. This includes the power ratings and requirements of such components as relays, valves, solenoids, etc.

Be sure to test each of the outputs with a multi-meter prior to connecting the outputs to your end devices. This will ensure that each output has been programmed to operate in the manner required by each end device.

Filtering and Noise Suppression

Whenever a solenoid or electromagnetic switch is controlled by the receiver, it is a good practice to install a diode across its terminals to ensure that surges and spikes do not continue back into the circuit. Appropriate 36V Bi-directional Diodes kits can be ordered under the Eaton part number "AKIT-2492-01".

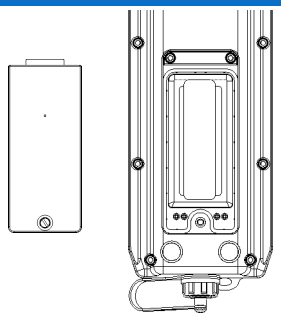
Power the Transmitter

1. Install Battery Pack

Before installing the battery pack purchased with

i. CCdock™ assure the rechargeable pack is fully charged.

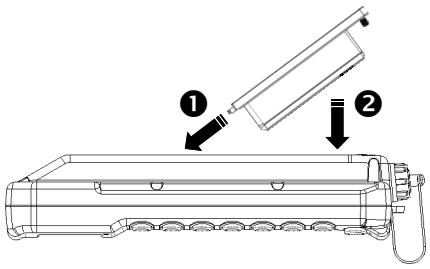
ii. Alkaline “AA” batteries are installed in the correct orientation embossed inside the battery pack. To open the “AA” battery pack slide the cover towards the pack tongue, lift and remove.



Battery Pack & Compartment

WARNING: When using “AA” batteries do not install backwards, charge, put in fire, or mix with other battery types. May explode or leak causing injury. Keep the battery compartment dry to prevent corrosion. **Replace all batteries as a complete set and do not mix and match battery types.**

The battery compartment is located on the back lower half of the TD1140. Insert the battery pack tongue first under the retainer at the top of the compartment ❶ then pivot the pack down in to the compartment ❷. Using a slotted screwdriver secure the battery pack in the compartment.



Inserting Battery Pack

NOTE: For operation at temperatures below –10° C lithium batteries are recommended. Low temperatures reduce battery performance for both alkaline and lithium types. Refer to the battery manufacturer’s specifications for detailed information on low temperature performance.

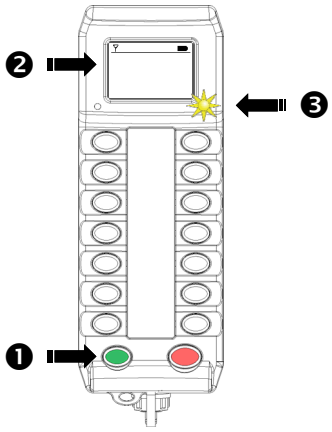
2. Turn on the Transmitter

Press Power [ON] ❶. Refer to the **Light Legend** below for LED states.

At a minimum the display will briefly show a splash screen and display the RF link strength and battery status ❷. Depending on the presence of a powered and paired receiver the display area may have more information and the Communication LED may blink yellow ❸.

3. Turn off the Transmitter

Press the Power [OFF] button.



Turn ON Transmitter

Light Legend	Solid	Slow Flash	Fast Flash	Red Solid	Green Solid	Yellow Solid	Red & Green Alternating

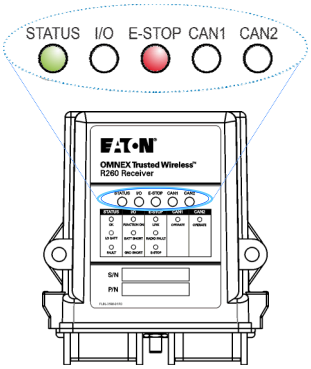
Test the Transmitter / Receiver Link

Follow these steps to ensure that there is a radio link between the transmitter and receiver. Refer to the Light Legend below for LED states.

1. R260

Apply power to the R260 and confirm the light pattern as shown in the diagram on the right.

If the R260 does not power confirm it was wired correctly. Reference the Wiring Diagram in the section *Installing the Receiver*.

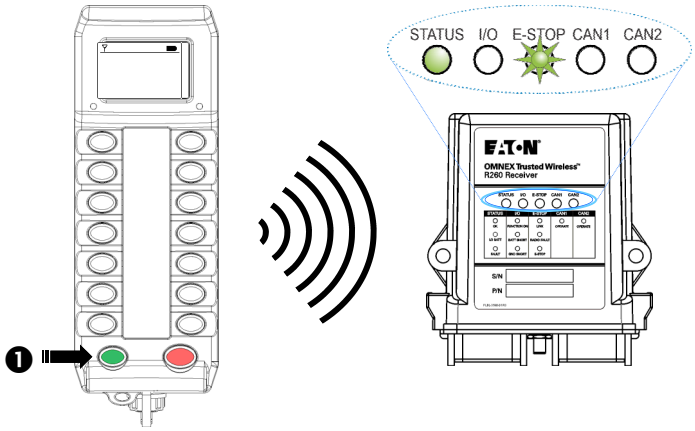


2. Power TD1140

Press and hold the Power ON ❶ button until the display shows the startup logo then release the ON button.

The transmitter can take from 2-7 seconds to link with the R260.

If the transmitter does not power refer to the previous section *Power the Transmitter*.



The System is now ready for use.

If the receiver's (E-STOP) light flashes GREEN the system is ready to use.

Follow *Pair a Transmitter* in the *Service Mode* section if

1. The receiver's (E-STOP) light is solid RED
2. The Display shows "Err 06: Not Paired"

NOTE: As a battery saving feature the transmitter may shut itself off (and the receiver will transition all outputs to a safe state) after the configured transmitter timeout inactivity period. The *Transmitter Timeout* feature is configurable within the transmitters *Service Mode* section.

Momentarily operating any button on the transmitter, including the [Power] button will restart the timeout monitoring.

Light Legend	Solid	Slow Flash	Fast Flash	Red Solid	Green Solid	Yellow Solid	Red & Green Alternating

Service Mode

Service Mode is available on all TD1140 configurations and allows the operator to adjust the transmitters characteristics. For example, the LCD backlight can be adjusted to operate under various lighting conditions.

Once the transmitter is put in to service mode a unique display screen is used to view or modify each option. Navigation and option selection/modification is controlled by four buttons as described by the *Enter Service Mode* and *Navigation*.

The following sections describe each option in detail and how to execute or modify it.

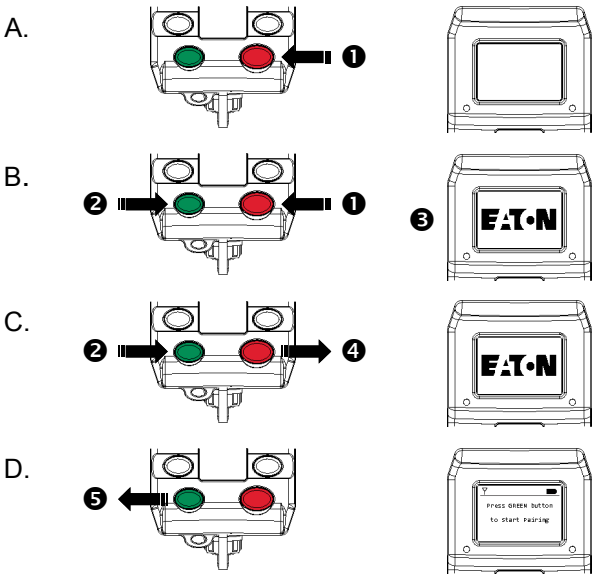
Enter Service Mode

A. Press and Hold Power OFF ❶ [RED]

B. Press and Hold Power ON ❷ [GREEN]
Wait for the display splash screen ❸ and immediately proceed to next step.

C. Release Power OFF ❹ [RED]

D. Release Power ON ❺ [GREEN]

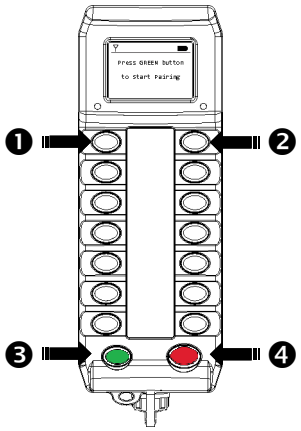


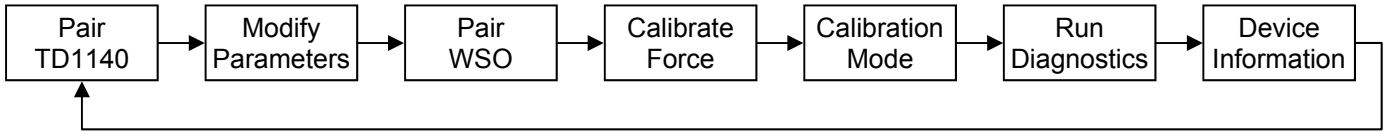
Navigation

Once you have entered service mode you can move through the option menus by using the top left ❶ and right buttons ❷. Where the top left button moves one menu option to the left and top right one menu option to the right. To modify an option follow the screen prompts.

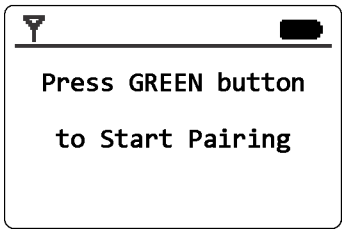
Typically the Power ON ❸ [GREEN] will allow you to execute, view or modify an option, where as Power OFF ❹ [RED] will allow you to move up from an entry or power off the unit.

The first screen displayed in service mode is “Pair TD1140”. See the diagram below for screen navigation.





Pairing



This function allows you to pair the TD1140 with a base station.

Pairing is required to teach a transmitter's unique configuration to a base station. Once complete the base station is capable of establishing a two-way radio link with a unique transmitter.

Pairing is a three step process

1. Prepare the TD1140
2. Prepare the R260 base station
3. Start Pairing

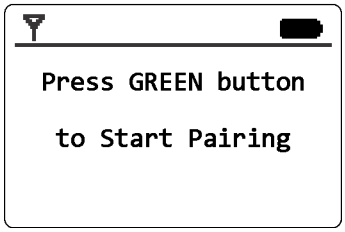
The following sections describes the three step process to pair the TD1140 with an R260 base station. Refer to *Troubleshooting Chart #4* for Tips and Considerations.

NOTE: It is necessary to associate the transmitter to base station when replacing either the transmitter or base station.

1. Prepare the TD1140

On the TD1140 navigate to the screen on the right ❶. **Do not** press the Power ON [GREEN] button.

❶



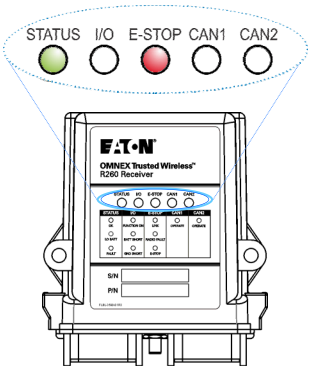
2. Prepare the R260 base station

There are two methods to prepare the R260

A. Using the magnet on the TD1140 or wand (sold separately).

B. Opening the R260 housing and manually initiating the pairing state.

The following section deals with method A. Refer to Appendix A if you need to perform the manual method B then proceed to step *3 Start Pairing*.



2.1. Power R260

Supply power to the base station. The base station is ready when the base station lights

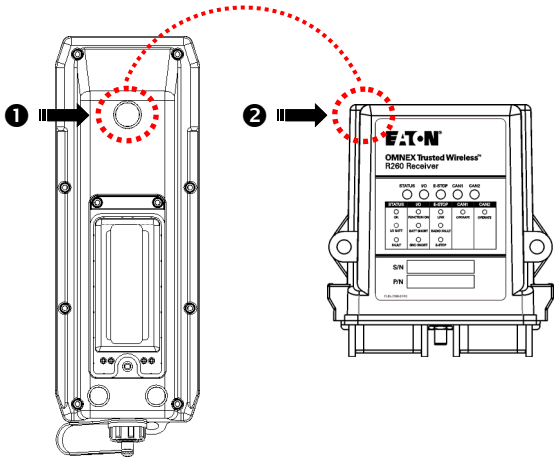
Status: solid green
E-Stop: solid red

Light Legend	Solid	Slow Flash	Fast Flash	Red Solid	Green Solid	Yellow Solid	Red & Green Alternating

2.2. Initiate R260 Setup Mode

A. Maneuver the rear of the TD1140 so that its magnet ❶ is placed over the top left corner ❷ of the R260.

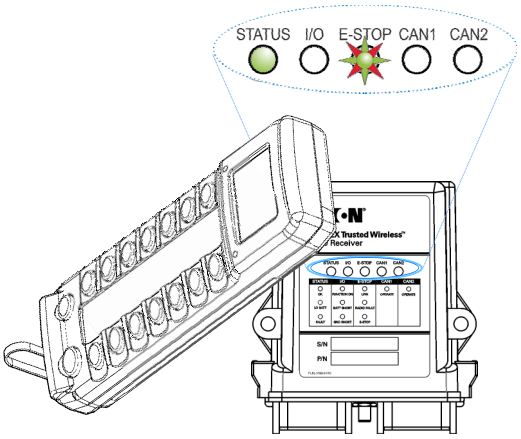
A.



B. Adjust the TD1140 position until the R260 **E-Stop** light slow flashes green.

Status: solid green
E-Stop: slow flashing green

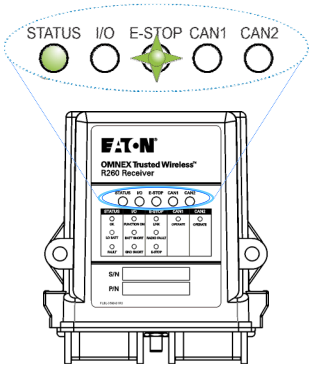
B.



C. Remove the TD1140 when the R260 **E-Stop** light slow flashes green quickly.

E-Stop: slow green

C.



NOTE: If the R260 is left in Setup Mode idle for over 30 seconds, the R260 will time out. The **Status light stays solid green** and **E-Stop** light will flash red slowly and after Setup Mode times out. To return to Setup Mode repeat step 2.2.

Light Legend	Solid	Slow Flash	Fast Flash	Red Solid	Green Solid	Yellow Solid	Red & Green Alternating

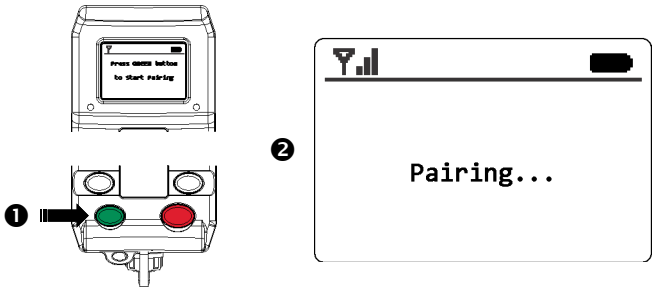
Service Mode: Start Pairing

3. Start Pairing

A. Press the TD1140 Power ON [GREEN] button ❶ to start the pairing process.

The pairing will start and the TD1140 screen will display the pairing progress as shown on the right ❷.

A.



B. Pairing is complete when

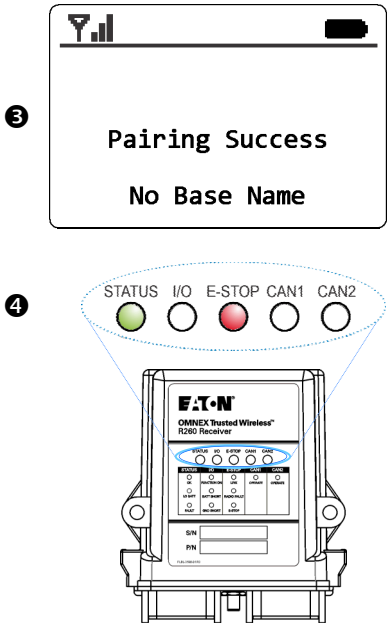
1. TD1140 displays the success screen as shown on right ❸.

   If a base name was assigned to the R260 then the name will appear in the bottom line of the TD1140 display instead of “No Base Name”.

2. R260 E-Stop light will change from green to red ❹.

   E-Stop: solid red

B.



NOTE: If the pairing fails the TD1140 will display an error screen with the reason for failure. Correct the error, power cycle the transmitter and base station, and then repeat the pairing process.

If repeated attempts at pairing fails, contact your service representative for assistance as there may be a setup or hardware failure.

Light Legend	Solid	Slow Flash	Fast Flash	Red Solid	Green Solid	Yellow Solid	Red & Green Alternating

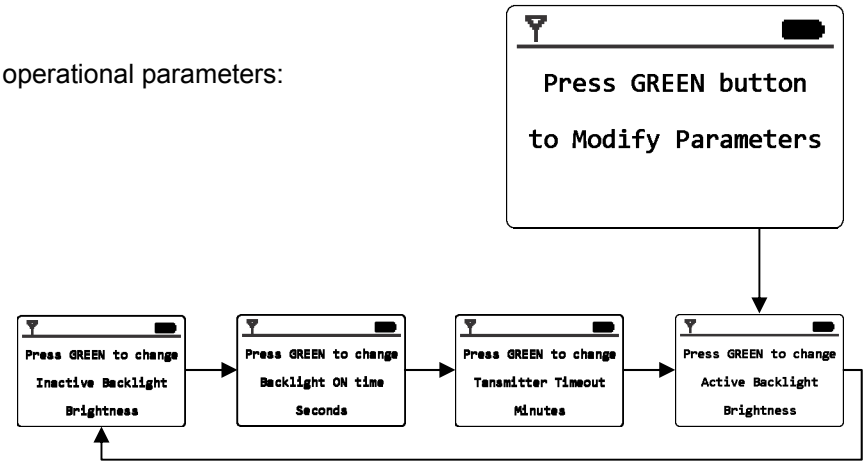
Service Mode: Modify Parameters

Modify Parameters

This function allows you to modify the TD1140 operational parameters:

- Active Backlight Brightness
- Inactive Backlight Brightness
- Backlight On Time
- Transmitter Timeout

Press the Power ON [GREEN] to adjust these parameters. Press the top left or top right navigation button to move to the next service option. The available service option, in order of navigation, are displayed to the right.



The following sections describe each *Modify Parameters* adjustment in detail.

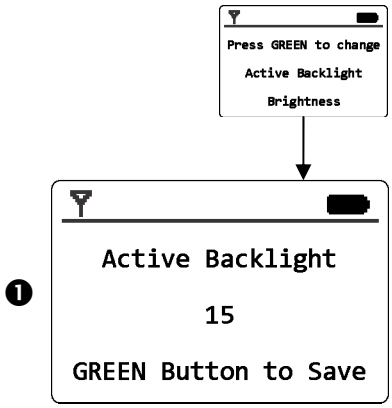
Active Backlight Brightness

When a button is pressed the backlight will switch to an active state and light the display at a configured brightness.

The active backlight brightness is configurable from 0 to 100% in increments of 10%. The backlight is off at 0% and maximum brightness at 100%. The default value is 15%.

To adjust the backlight brightness navigate to the screen on the right ❶. Press the top left button to decrease the brightness by 10%. Press the top right button to increase the brightness by 10%.

Press and release Power ON [GREEN] to save your changes. Press and release Power OFF [RED] to abort any changes and return to the previous menu.

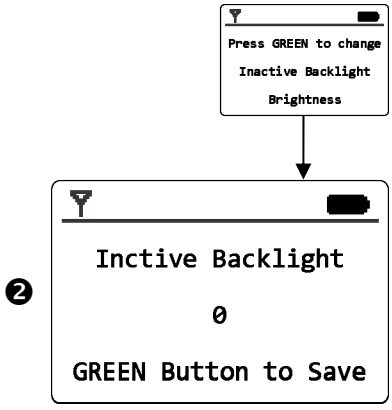


Inactive Backlight Brightness

The backlight inactive state occurs when no button has been pressed after the backlight on time has passed. The inactive backlight brightness is configurable from 0 to 100% in increments of 10%. The default value is 0% or backlight OFF.

To adjust the backlight brightness navigate to the screen on the right ❷. Press the top left button to decrease the brightness by 10%. Press the top right button to increase the brightness by 10%.

Press and release Power ON [GREEN] to save your changes. Press and release Power OFF [RED] to abort any changes and return to the previous menu.



Service Mode: Modify Parameters

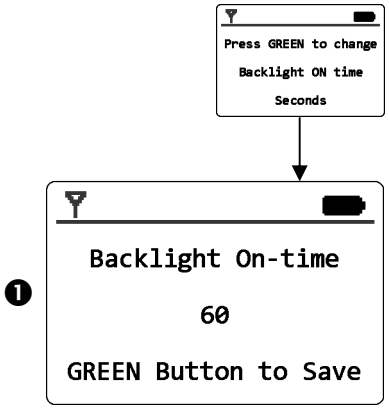
Backlight On Time

When a button is pressed the backlight will switch to an active state for a period defined by backlight on-time. Once the period has expired the backlight will switch to its Inactive state.

The active backlight on-time is configurable from 0 to 100 seconds in increments of 10 seconds. The backlight on-time is disabled when set to 0 seconds and the display backlight is only active while a button is pressed. The default value is 15 seconds.

To adjust the backlight on-time navigate to the screen on the right ❶. Press the top left button to decrease the on-time by 10 seconds. Press the top right button to increase the on-time by 10 seconds.

Press and release Power ON [GREEN] to save your changes. Press and release Power OFF [RED] to abort any changes and return to the previous menu.



❶

NOTE: The display backlight affects power consumption! The higher the backlight brightness or longer the backlight is active affects the remaining battery power.

To reduce power consumption always configure the backlight brightness and on time to a minimum.

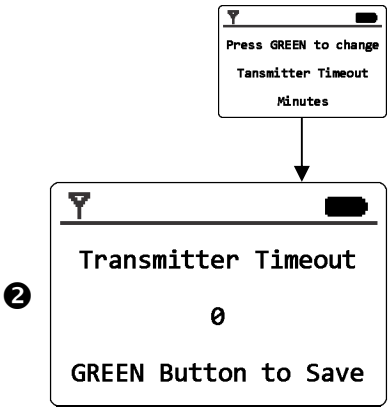
Transmitter Timeout

As a battery saving feature the transmitter has the ability to turn it self off after a defined period of inactivity.

The transmitter timeout is configurable from 0 to 480 minutes in increments of 5 minutes. The default value is 0 or timeout feature disabled.

To adjust the transmitter timeout navigate to the screen on the right ❷. Press the top left button to decrease the timeout by 5 minutes. Press the top right button to increase the timeout by 5 minutes.

Press and release Power ON [GREEN] to save your changes. Press and release Power OFF [RED] to abort any changes and return to the previous menu.



❷

CAUTION: When a transmitter turns off due to inactivity it will cause the receiver it is communicating with to go in to its safe state. The receiver safe state by default is all functions off unless specified differently by your equipment supplier.

You must be aware of any behavior that may change due to adjusting the timeout and consider all safety aspects of operation. Consult with the supplier of your equipment if your are unsure of affected safety operation.

Failure to follow SAFETY PRECAUTIONS may result in equipment failure and serious personal injury.

Service Mode: Calibrate Force Buttons

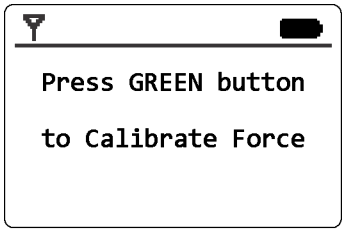
Calibrate Force Buttons

This function allows you to calibrate any force buttons installed on your TD1140. If no force buttons are installed then ignore this section.

The TD1140 first 8 buttons (1-8) can be factory installed as force buttons (if ordered). At the factory these are preconfigured with default calibration values; However, over time the calibration may need adjustment due to button wear or natural aging.

Use the following procedures to calibrate a *single* button's minimum and maximum force position.

❶



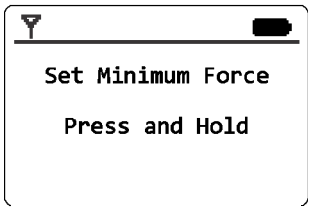
1. Start Force Calibration

On the TD1140 navigate to the screen on the right ❶ and press the Power ON [GREEN] button.

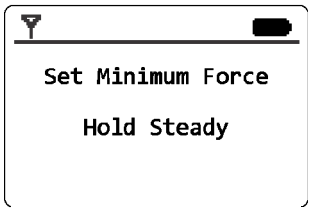
2. Adjust Calibration

1. Press and hold a force button ❷ to calibrate its minimum depressed position.
2. Hold the button steady ❸ at the minimum desired position.
3. After approximately 2 seconds the buttons minimum force value will be saved when the release button screen is shown ❹.
4. Release the button to adjust the buttons maximum force position.
5. Press the same force button ❺ to calibrate its maximum depressed position.
6. Hold the button steady ❻ at the maximum desired position.
7. After approximately 2 seconds the buttons maximum force value will be saved when the Successful Release Button screen is shown ❼.
8. To adjust another force button repeat steps 1 to 7. To exit force calibration press the Power OFF [RED] button.

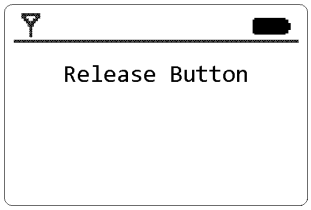
❷



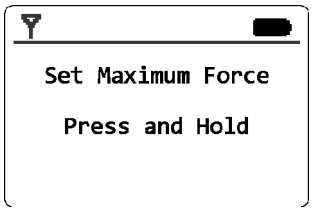
❸



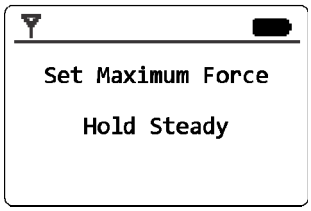
❹



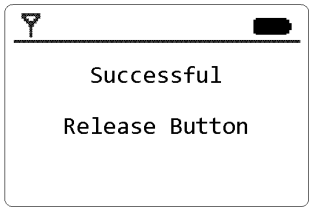
❺



❻



❼



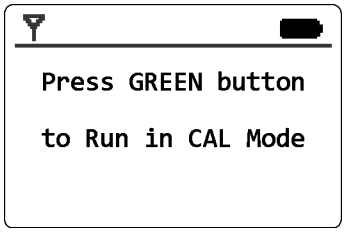
Light Legend	Solid	Slow Flash	Fast Flash	Red Solid	Green Solid	Yellow Solid	Red & Green Alternating

Calibration Mode

This function allows you to run your application specific TD1140 calibration.

If your application was not specified with specific calibration parameters then executing the mode will do nothing.

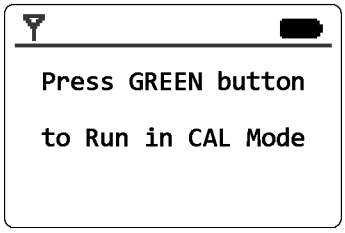
Use the following procedures to enter calibration mode and execute any specific application calibration required.



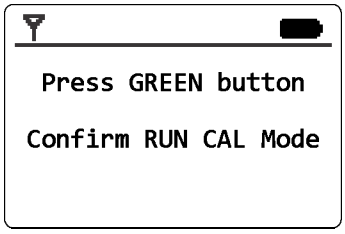
Run Calibration Mode

1. On the TD1140 navigate to the screen on the right ❶ and press the Power ON [GREEN] button.
2. To confirm running calibration mode ❷ press the Power ON [GREEN] button.
3. If this device supports calibration mode the TD1140 will power cycle and enter calibration mode. If calibration mode is not defined the TD1140 will loop back to step 1.

❶



❷



Light Legend	Solid	Slow Flash	Fast Flash	Red Solid	Green Solid	Yellow Solid	Red & Green Alternating

Service Mode: Run Diagnostics

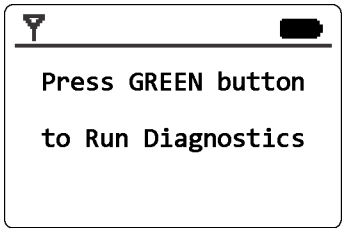
Run Diagnostics

This function allows you to run TD1140 diagnostics.

Diagnostics allow you test the functionality of buttons, force buttons and E-Stop (if installed).

To run diagnostics on the TD1140 navigate to the screen on the right ❶ press the Power ON [GREEN] button and follow the procedures below.

❶



Test Buttons

1. On the TD1140 navigate to the screen on the right ❷ and press the Power ON [GREEN] button.
2. The screen will prompt you to press any button ❸.
3. Press the button to test. If the button is functioning it will place a 0 in the corresponding position.

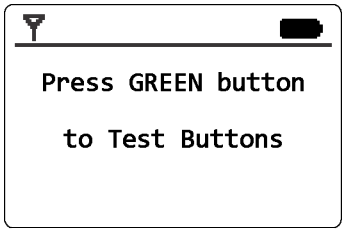
   Refer to **TD1140 Dimensions and Controls** on page 4 for button numbering.

   For example, pressing button 1, 2, 13 and 14 will produce a 0 in positions 1, 2, 13 and 14. See the screen shot ❹ to the right.
4. To exit button testing press Power OFF [RED] button and hold for 2 seconds.

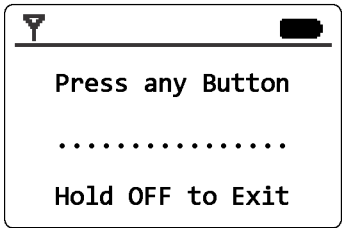
If a button will not function make sure the button is clean of any debris and repeat the test.

If a button will not function then contact you service representative for assistance.

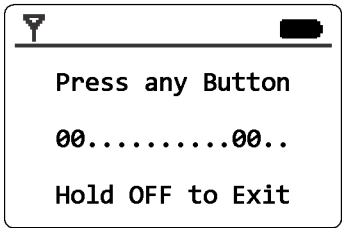
❷



❸



❹



CAUTION: Only clean a button or the TD1140 with a soft cloth lightly dampened with water.

DO NOT clean a button or the TD1140 with any sharp instruments or objects that can cut or damage the button membrane or housing. DO NOT pour any liquids, use a hose, or pressured water directly on the TD1140. Consult with the supplier of your equipment if your are unsure of correct cleaning procedures.

Failure to follow CLEANING PROCEDURES may result in equipment failure and serious personal injury.

Light Legend	Solid	Slow Flash	Fast Flash	Red Solid	Green Solid	Yellow Solid	Red & Green Alternating

Service Mode: Run Diagnostics

Test Force Buttons

1. On the TD1140 navigate to the screen on the right ❶ and press the Power ON [GREEN] button.
2. The screen ❷ will display eight gauges representing the force butons 1 to 8 (left to right top to bottom).
3. Press the force button to test. If the button is functioning the representative gauge will climb from the left, minimum force, to the right, maximum force.

   For example, applying maximum force to button 2 and approximately 25% force to button 3 will produce screen shot ❸ to the right.
4. To exit force button testing press Power OFF [RED] button.

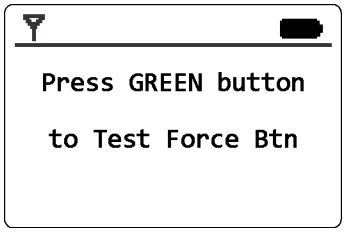
If a force button will not function

1. Clean the force button of any debris
2. Perform the **calibrate force button** in service mode

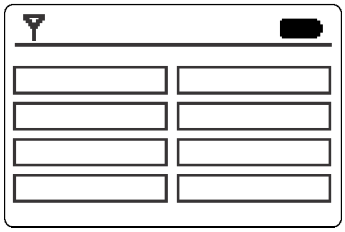
and repeat the test.

If a force button will not function then contact you service representative for assistance.

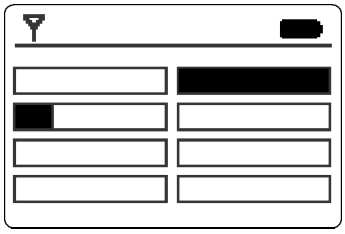
❶



❷



❸



Test E-Stop

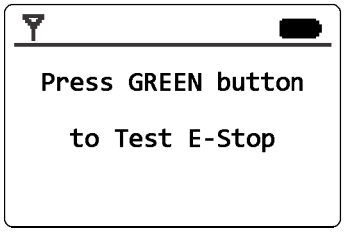
1. On the TD1140 navigate to the screen on the right ❶ and press the Power ON [GREEN] button.
2. The screen ❷ will display the current E-Stop button state.

   Changing the state of the E-Stop by twisting and releasing it (OUT) will display `ESTOP is OUT`. Pushing the E-Stop in will display `ESTOP is IN`.
3. To exit E-Stop testing press Power OFF [RED] button.

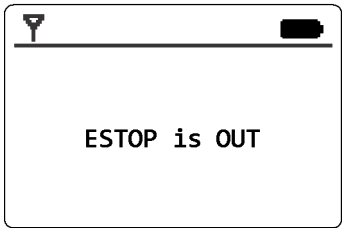
If the E-Stop fails to report its status correctly clean the E-Stop of any debris and repeat the test.

If E-Stop will not function then contact you service representative for assistance.

❶



❷



CAUTION: Only clean a button or the TD1140 with a soft cloth lightly dampened with water.

DO NOT clean a button or the TD1140 with any sharp instruments or objects that can cut or damage the button membrane or housing. DO NOT pour any liquids, use a hose, or pressured water directly on the TD1140. Consult with the supplier of your equipment if your are unsure of correct cleaning procedures.

Failure to follow CLEANING PROCEDURES may result in equipment failure and serious personal injury.

Light Legend	Solid	Slow Flash	Fast Flash	Red Solid	Green Solid	Yellow Solid	Red & Green Alternating

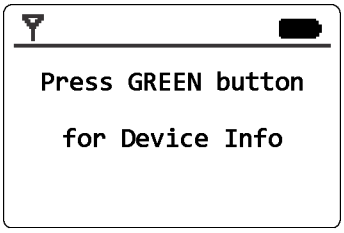
Service Mode: Device Info

Device Information

This function allows you to retrieve the TD1140 device information.

The TD1140 device information is fixed information assigned at the time of the devices manufacturing. The information is very important for assisting your service representative in identifying your unit and its configuration loadout.

Use the following procedures to display the information.

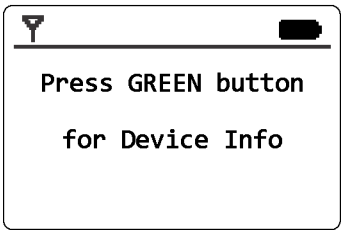


NOTE: The screens shown are for demonstration purpose only. The information to the right of each label is different for each TD1140 manufactured.

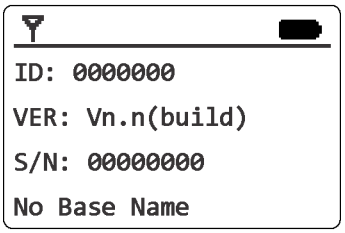
Display Device Information

1. On the TD1140 navigate to the screen on the right ❶ and press the Power ON [GREEN] button.
2. Screen ❷ displays TD1140:
   - ID
   - Version
   - Serial Number
   - Base name pair with this device
3. Navigating to the next screen ❸ displays radio:
   - Wireless band
   - HW version
   - Transmission power
   - Bluetooth version
4. Navigating to the next screen ❹ displays
   - Application name
   - Part number
   - Revision number

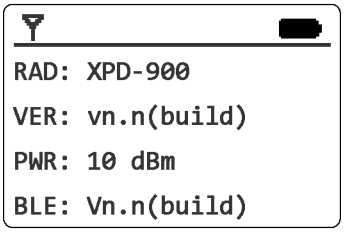
❶



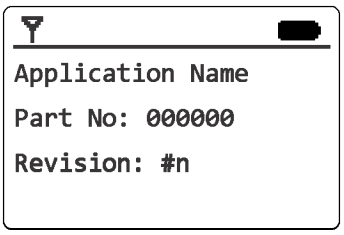
❷



❸



❹



Light Legend	Solid	Slow Flash	Fast Flash	Red Solid	Green Solid	Yellow Solid	Red & Green Alternating

Operations - TD1140 Transmitter

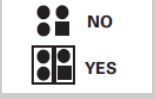
Indicators / Items	Description
	Occurs whenever a function is pressed. Will also remain on momentarily on Power Up.
	Transmitter is in Operating mode. (Data is sent to and received from R260)
	Low Battery. (***Note:*** *Low batteries will last approximately 1 hour once the Low Battery light begins to flash).* Action: Change or Recharge Batteries
	An internal error is preventing the RCU from operating (When available, a specific error message is displayed on the screen.)
Received Signal Strength (Top left corner of the display)	 Strong  Weak  No signal
Out of range vibrate notification	When the RCU moves out of radio range of the R260, the RCU vibrates to alert the operator. Move the RCU closer to the R260 within radio range to re-link.
Other vibration notifications	Other vibration notifications can also be used (defined under application control) to alert the operator when warnings or alarms happen.
Tether operation (Icon displayed when RCU is connected using a tether cable) 	• The tether connection is used to replace radio communication. When the tether is connected, the RCU is guaranteed not to transmit any RF signals. This may be a requirement around some construction zones. • If the RCU is operating and communicating with the R260 when the tether cable is plugged in or removed, the RCU will cease communications and turn itself off. • The tether also provides power to the RCU. When it is plugged in, the RCU will use this power to recharge its batteries (assuming they and the rechargeable type). If the RCU is turned on while charging the status bar will show a small charging icon next to the battery icon. If the RCU is turned off, the display will show a large battery symbol to indicate charging: . When the battery is fully charged and the tether remains plugged in the display will show:  .

Light Legend	Solid	Slow Flash	Fast Flash	Red Solid	Green Solid	Yellow Solid	Red & Green Alternating

Operations - Charge Cradle

Items	Description
Charging	• The cradle will start charging the TD1140 RCU when the vehicle battery voltage is above 12.25V with the RCU inserted. • During charging, if the vehicle battery voltage drops below 12.0V, the charging will be suspended. • If the charging is suspended, it will not resume charging until the battery is above 12.7V (Allowing time for the vehicle's battery to recharge and prevent draining the vehicle battery) • At any time when the battery voltage is above 12.25V, the transmitter is removed and reinserted, the charging will start again.

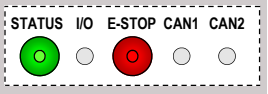
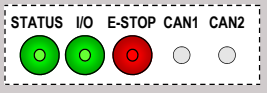
LED Indicator	• OFF: Not charging, fully charged RCU or vehicle voltage too low
	• ON: Charging RCU
	• FLASHING: Error charging RCU. Possible causes:
	  • Alkaline batteries in RCU (not rechargeable)
	  • NiCad od Nickel Metal Hydride batteries in RCU (Cannot be contactlessly charged)
	  • The cradle or the battery pack is too hot (over 35ºC)..

Connector	**Pin** **Name** **Description** 1 Power Vehicle power supply – (9-32VDC) 2 Ground Vehicle power ground 3 CAN-H CAN bus High 4 CAN-L CAN bus Low 5 RLY-NO Transmitter Present Relay – normally open. 0.5A max 6 RLY-NC Transmitter Present Relay – normally closed. 0.5A max 7 RLY-COM Transmitter Present Relay – common 8 PARK IN "Vehicle in Park" input when > 6V Transmitter Present Outputs: • Connections 5-8 can be used to wire to an indicator to alert the vehicle operator if the RCU is not placed in the cradle. • The PARK-IN input is used to indicate when the vehicle is stationary (typically neutral or park indicator). • The "Transmitter Present" relay will be energized (RLY-NO connected to RLY-COM), after a 5 second delay, if the vehicle is NOT in park and the RCU is missing.
CAN operation	The cradle will transmit a status message every 250mSec. The status message has a PGN of 61439. The status message contains the following information: **Position** **Description** 1.1 1 = transmitter present 1.2 1 = charging RCU The default CAN ID of the cradle is 144 (90H). This can be changed by sending the following CAN message with PGN 61328. **Position** **Description** 1 Change CAN ID command 70, 46H 2 Current CAN ID (typically 144 (90H). 3 New CAN ID. CAN priority must be 3 for all packets. CAN data rate is 250 kbps.
CAN Termination	CN5 Jumper settings: 

Light Legend	Solid	Slow Flash	Fast Flash	Red Solid	Green Solid	Yellow Solid	Red & Green Alternating

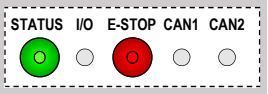
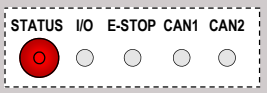
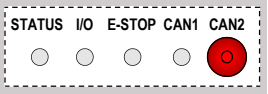
Diagnostics - R260 Receiver

Normal Operation

	**Transmitter is OFF** If the transmitter is off, the receiver is operating properly.
	**Transmitter is ON** When the transmitter is turned on, the Link light (fast flashing) and E-Stop (GREEN) indicates the receiver is operating properly
	**Transmitter is ON in Operation** When a function is activated on the transmitter, the I/O light will turn on GREEN. This indicates the receiver is operating properly
	**Transmitter is OFF** When a latched function is activated then the transmitter is turned off, the IO light will stay on GREEN. If the system was intentionally designed this way, the receiver is operating properly, if not call for service.
	**Transmitter is ON or OFF** Activity on CAN a channel. Light is on when CAN running and will flash when message received or sent. Light is off when CAN is *not* present or disabled.

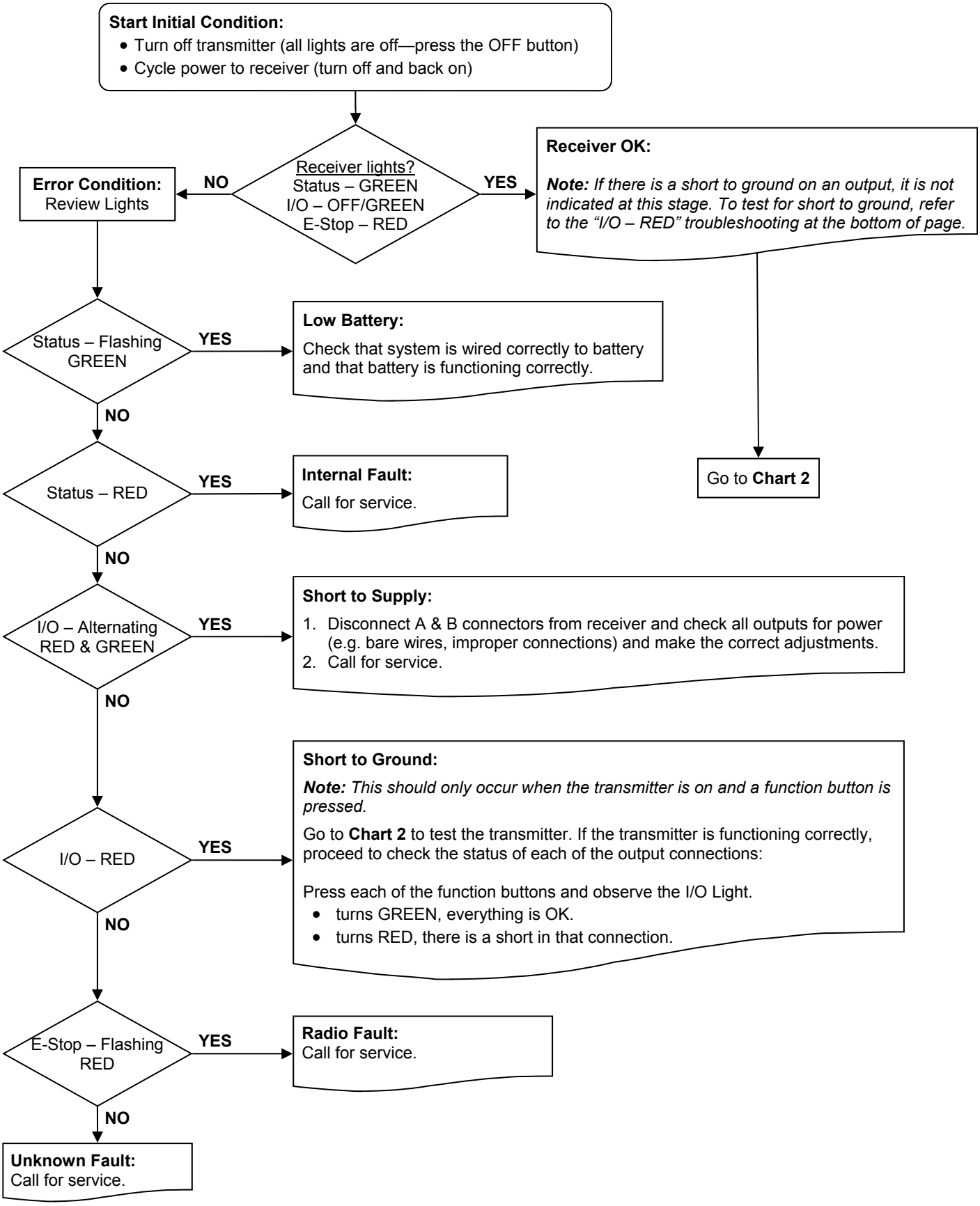
Trouble Indicators

Note: *In some cases, the indicator lights will be different depending on whether the transmitter is on or off. Please note the transmitter status in the "Description" column for each case.*

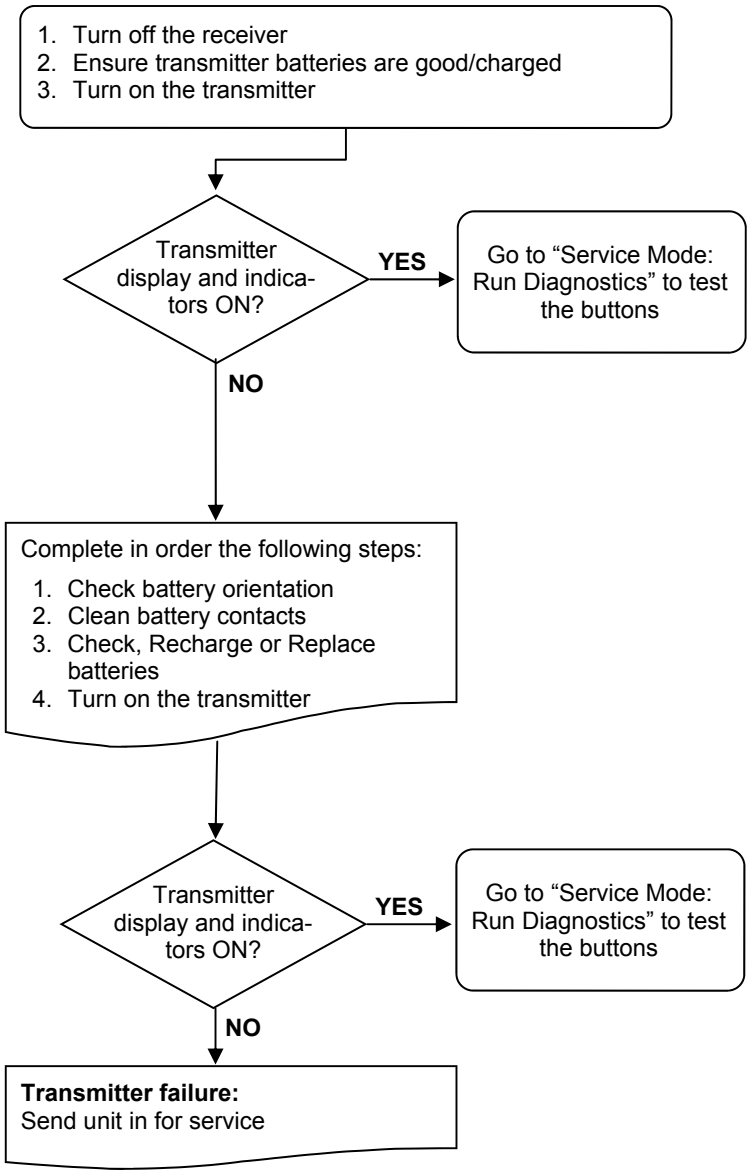
Indicator Lights	Description	Solution
	**Transmitter is ON** The reason is the transmitter is not communicating with the receiver.	Refer to **Troubleshooting Chart #3** for solutions
	**Transmitter is ON or OFF** Internal fault or PLC program is not loaded or stopped.	Recycle the Receiver power. Refer to **Troubleshooting Chart #1** for solutions. If the problem persists than contact Eaton Wireless Business Unit service providing part and serial number.
	**Transmitter is ON** A short to ground or excessive current draw on an output. Likely caused by a wiring fault.	Ensure transmitter is functioning properly, check status of each output connection: Press each function button and observe Fault Light. • If GREEN, everything is OK. • If RED, there is a short in that connection.
	**Transmitter is ON** A setup failure has occurred.	Either hold the Setup button for 5 seconds to return to Setup mode or cycle power to return to the normal operating mode.
	**Transmitter is ON or OFF** CAN channel 1 is in fault.	Verify that the CAN 1 network is wired correctly. Check for; breaks, shorts, and network termination. If problem persists than contact Eaton Wireless Business Unit service providing part & serial number.
	**Transmitter is ON or OFF** CAN channel 2 is in fault.	Verify that the CAN 2 network is wired correctly. Check for; breaks, shorts, and network termination. If problem still persists than contact Eaton Wireless Business Unit service providing part & serial number.

Light Legend	Solid	Slow Flash	Fast Flash	Red Solid	Green Solid	Yellow Solid	Red & Green Alternating

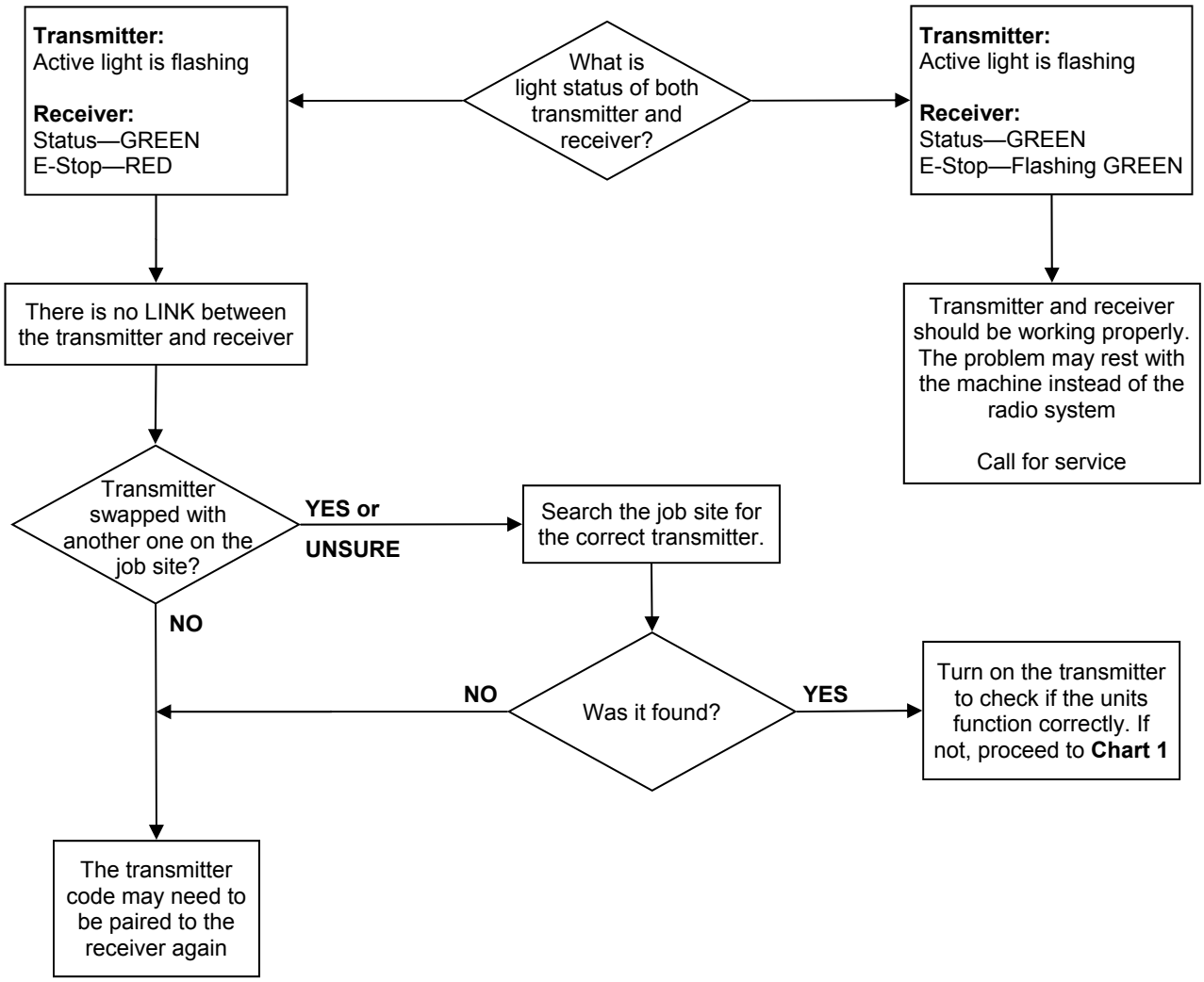
Test the Receiver—R260



Test the Transmitter—TD1140



Testing the Transmitter / Receiver Communication



Considerations when Pairing

Potential downloading issues

If testing of the receiver and transmitter both show the system as working (Chart 1 & 2), then the transmitter and receiver will both go into Pairing/Configuration mode.

Possible issues could arise during Step 4, the teaching phase of pairing. In this case there are 2 symptoms to look for:

1. The Link light on the receiver will not turn GREEN when the power switch is toggled on the transmitter to download
2. The receiver will "time out" indicating that it didn't receive a signal from the transmitter within the 30 seconds from the time the receiver was put into Setup Mode.

If all indications appear normal during the pairing phase, test the link by turning on the transmitter (note: the transmitter remains in service mode after pairing in Step 4).

1. If the Link light on the receiver doesn't turn GREEN, the receiver didn't receive all of the information that was sent from the transmitter.

Possible Solutions

1. Try the Downloading steps again
2. If this doesn't correct the problem, send both the transmitter and receiver in for service.



NOTE: If possible try to determine whether the fault lies with the transmitter or receiver by completing the Reprogramming procedure with a different transmitter. If this step works, then the fault lies with the original transmitter. If not, the fault may lie with the receiver.

Reprogramming Tips:

1. Be patient and deliberate when pressing the Power and E-Stop buttons in the correct order during power up in Configuration mode
2. Use a pointy instrument to depress the Setup button on the receiver (i.e. a pen) as the button is relatively small
3. Follow each step as laid out in the procedure
4. Never lay the receiver circuit board down on anything metallic (there are contact points on the back which could contact the metal and damage the receiver)

Appendix A:

Manually Initiate R260 Setup Mode

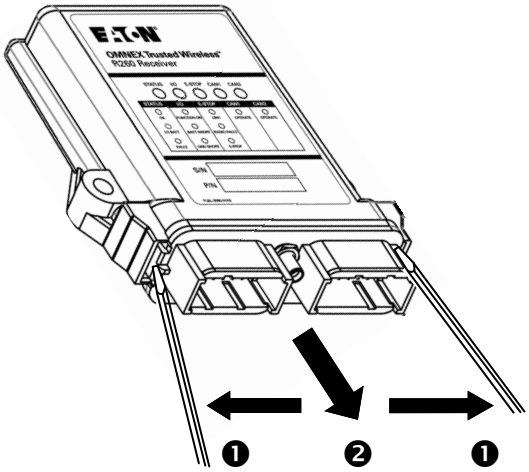
This is only to be used when no magnet is available to place the R260 base station into setup mode for the pairing process.

If you are able to use the transmitter magnet or magnetic wand (sold separately) then the recommend method is to use section *2. Prepare the R260 base station* in Setup Mode: Pairing.

Only proceed if it is not possible to use a magnet to initiate R260 Setup Mode.

1. Opening R260 Case (No Magnet Access)

The case cap is attached to the base by two plastic tabs at opposing sides, which can be unlatched using a screw driver as shown on the right ❶. Once the cap is free slide the base ❷ partially out of the case.

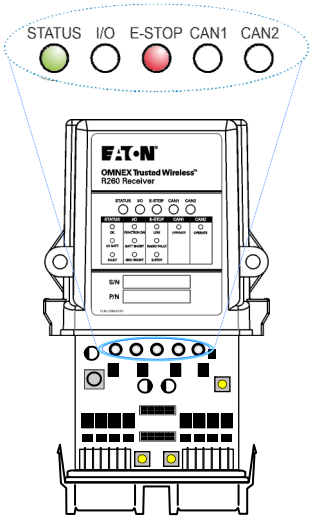


NOTE: Do not slide the base completely from the cap. Once the case is opened the board electronics are exposed and can be damaged Care must be taken to prevent debris, moisture, or external objects from contacting internal components.

2. Power R260

Supply power to the base station. The base station is ready when the base station lights

Status: solid green
E-Stop: solid red



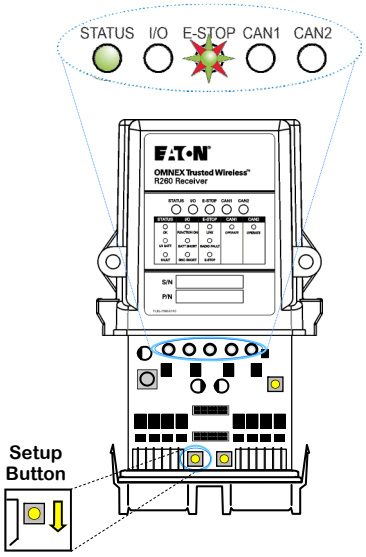
Light Legend	Solid	Slow Flash	Fast Flash	Red Solid	Green Solid	Yellow Solid	Red & Green Alternating

3. Initiate R260 Pairing Mode

A. Press and hold the Setup button until the R260 **E-Stop** light slow flashes green.

Status: solid green
E-Stop: slow green

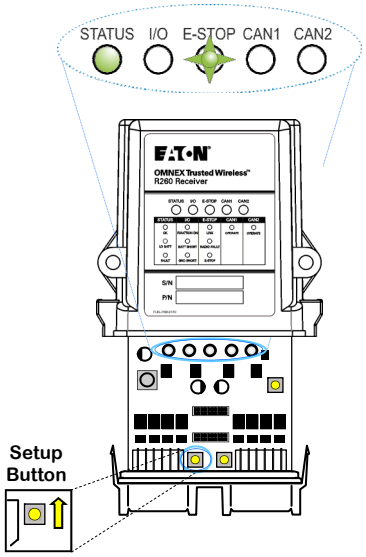
A.



B. Release the Setup button when the **E-Stop** light flashes fast green.

Status: solid green
E-Stop: fast green

B.



NOTE: If the R260 is left in Setup Mode idle for over 30 seconds, the R260 will time out. The **Status** and **E-Stop** light will rapidly flash red after Setup Mode times out. To return to Setup Mode repeat step 2.2.

CAUTION: When replacing the receiver cover, ensure the cover snaps completely into place to create a weather proof seal around the base of the receiver.

Failure to secure the cover may void warranty, result in radio equipment failure and serious personal injury.

Light Legend	Solid	Slow Flash	Fast Flash	Red Solid	Green Solid	Yellow Solid	Red & Green Alternating

Parts & Accessories

Eaton Part Number	Description
ASSY-3834-01	Battery pack, Non-rechargeable
ASSY-3834-02	Battery pack, Rechargeable
FMEC-3840-01	Plastic Holster, Black
AMEC-3914-01	Plastic Holster with Belt Clip, Black
ASSY-3849-01	Battery Charger
ASSY-3850-02	Charge Cradle
ACAB-3681-01	Tether cable, 10 meters
ACAB-3681-02	Tether cable, 30 meters
ACAB-3681-03	Tether cable, 15 meters
ACAB-3679-01	TD Remote, charger,12/24V,auto pwr plug
ACAB-3680-01	TD Remote, charger, 120/240VAC

Specifications

	R260 Receiver	TD1140 Transmitter
Size	5.1” x 4.7” x 1.4” (130mm x 119mm x 36mm)	8.0" x 3.0" x 1.8" (203mm x 76mm x 46mm)
Weight	0.65lbs (0.295kg)	.95 lbs (434g) incl. batteries
Construction	High impact plastic, weatherproof	Industrially robust, hardened plastic, chemical resistant
Input Power	+9V to 30VDC	2AA batteries (alkaline or rechargeable Lithium Ion)
Battery Life	N/A	20 hours (with lithium ion battery)
Operating Temperature Range	-40ºF to 158ºF (-40ºC to 70ºC)	-22ºF to +136ºF (-30ºC to +58ºC)
Outputs	3A (max) each (sourcing), 10A (max) each (combined)	N/A
Antenna	Internal or external	Internal
Approvals	**USA**- FCC part 15.247 **Canada**- IC RSS 210 Issue 6, Sept. 2005	

FCC Rules and Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Part 15.247
ISC RSS 210 Issue 6, Sept. 2005

Warranty

EATON, Controls and Power Conversion Division, Wireless Solutions, warrants to the original purchaser that the Eaton Wireless products are free from defects in materials and workmanship under normal use and service for a period of ONE YEAR, parts (EXCLUDING: SWITCHES, CRYSTALS, OR PARTS SUBJECT TO UNAUTHORIZED REPAIR OR MODIFICATION) and labor from the date of delivery as evidenced by a copy of the receipt. EATON entire liability and your exclusive remedy shall be, at EATON's option, either the (a) repair or (b) replacement of the EATON Wireless product which is returned within the warranty period to EATON Wireless freight collect by the EATON APPROVED carrier with a copy of the purchase receipt and with the return authorization of EATON Wireless. If failure has resulted from accident, abuse or misapplication, EATON shall have no responsibility to repair or replace the product under warranty. In no event shall EATON be responsible for incidental or consequential damage caused by defects in its products, whether such damage occurs or is discovered before or after replacement or repair and whether or not such damage is caused by the negligence of EATON.

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