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# T150 / R150 User Guide

## STEP 1

**Install Batteries**

Remove the battery cover on the back of the **T150**, and install the four **AA** alkaline batteries as shown in Figure 1.

**Figure 1**

**T150**

## STEP 2

**Power Up T150**

Activation of any switch will cause the **T150** to power up. However as a safety feature, the **[EStop]** switch must be pressed and released, or if already pressed, released within 10 seconds for unit to remain powered up.

## STEP 3

**Using The T150**

The **ACTIVE** LED will flash two times per second indicating that the **T150** is transmitting to the **R150**. When a function switch is used, the **ACTIVE** LED will flash brightly upon activation of the switch and return to flashing at a rate of two times per second when there is no switch activity.

During normal operation the **LOW BATT.** LED will flash to indicate a low battery condition.

The **[EStop]** button is used for both an emergency shutdown as well as a safe way of powering down the **T150** after operation.

Each switch has a device specific label to identify its function.

The Trigger is a Proportional Control switch used in conjunction with a function switch (i.e. **[ROT CW]**). The type of Proportional Control output is dependent on the option of the receiver but will generally be either a Voltage, PWM or Current Control.

**R150**



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## Setting ID Codes

**Required when replacing either the Transmitter or Receiver**

The Transmitter has its **ID Code** factory programmed. Its matching receiver needs to have this same code programmed into it. To do this, the Receiver needs to have its cover removed – refer to Figure 2. Follow the procedure below to program the Receiver **ID Code** to match its corresponding Transmitter.

1. Release the **[EStop]** switch on the **T150**.

2. Turn the **T150** on by toggling the **[SW5]** switch to the **UP** position.

3. While holding the **[SW5]** switch in the **UP** position, press and release the **[EStop]** switch. This enables the "Download Password" mode.

4. Release the **[SW5]** switch. The **ACTIVE** LED will flash once per second.

5. Toggle the switches in sequence: **[SW3]**, **[SW1]**, **[SW4]** and then **[SW2]** to the **UP** position to enter the password code ***(3142)***, followed by toggling the **[SW5]** switch to the **UP** position. Both the **ACTIVE** and **LOW BATT.** LED's will flash twice per second. This confirms the unit is in the "Ready to Download" state.

6. Press and hold the **[SETUP]** button on the **R150** for 5 seconds. The **STATUS** LED on the **R150** will flash once per second while depressed and then begin flashing rapidly indicating that the **R150** is ready to receive "Configuration Data" from the **T150.** Continue holding the **[SETUP]** button after the **STATUS** LED begins flashing rapidly.

7. Momentarily toggle the **[SW5]** switch to the **UP** position; this enables the **T150** to send "Configuration Data" to the **R150**. Release **[SW5]** and release the **[SETUP]** button.

8. Press the **[EStop]** switch to power down the **T150**, and restart the **T150** – refer to **STEP 2.**

## Current Control Module Calibration

**Permits the user to adjust minimum and maximum currents**

1. Release the **[EStop]** on the **T150**.

2. Turn the **T150 ON** by toggling the **[SW5]** switch to the **UP** position.

3. While holding the **[SW5]** switch in the **UP** position, press and release the **[EStop]** switch. This enables the "Download Password" mode.

4. Release the **[SW5]** switch. The **ACTIVE** LED will flash once per second.

5. Toggle the switches in sequence: **[SW3]**, **[SW1]**, **[SW4]** and then **[SW4]** to the **DOWN** position to enter the password code ***(3144)***, followed by toggling the **[SW5]** switch to the **UP** position. The **ACTIVE** and **LOW BATT.** LED's will flash alternately once per second. This confirms the **T150** is sending "Calibration Data" to the **R150**.

6. Select and hold one of the "Proportional Functions" (i.e. **[SW4]** or **[ROT CW]**).

7. With the trigger **OFF** (fully released), the "MIN" level is set. The "MIN" level may be increased by toggling the **[SW5]** switch up or decreased by toggling the **[SW5]** switch down.

8. With the trigger **ON** (fully engaged), the "MAX" level is set. The "MAX" level may be increased by toggling the **[SW5]** switch up or decreased by toggling the **[SW5]** switch down.

9. To reset the "MIN" and "MAX" settings to the factory default, hold the **[SW5]** switch in either the **UP** or **DOWN** position for 5 seconds.

10. To exit, press the **[EStop]** switch.

**Transmitter / Receiver Replacement and Service**

In order to program the **R150** or replace the fuse, you will first need to remove the circuit board from the housing of the **R150**. This is done by releasing the two side tabs on the housing, and sliding the connector block and circuit board out of the housing until the four **STATUS** LED's are visible and the **[SETUP]** SW1 button is accessible. See Figure 2.

Also refer to **Setting ID Codes** for a step by step procedure of setting **ID Codes** to match on both the Transmitter and the Receiver.

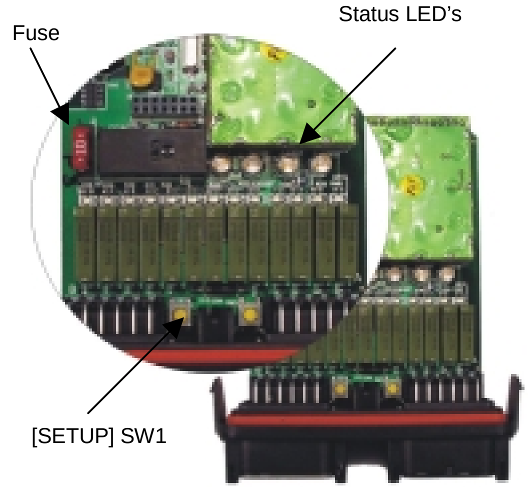
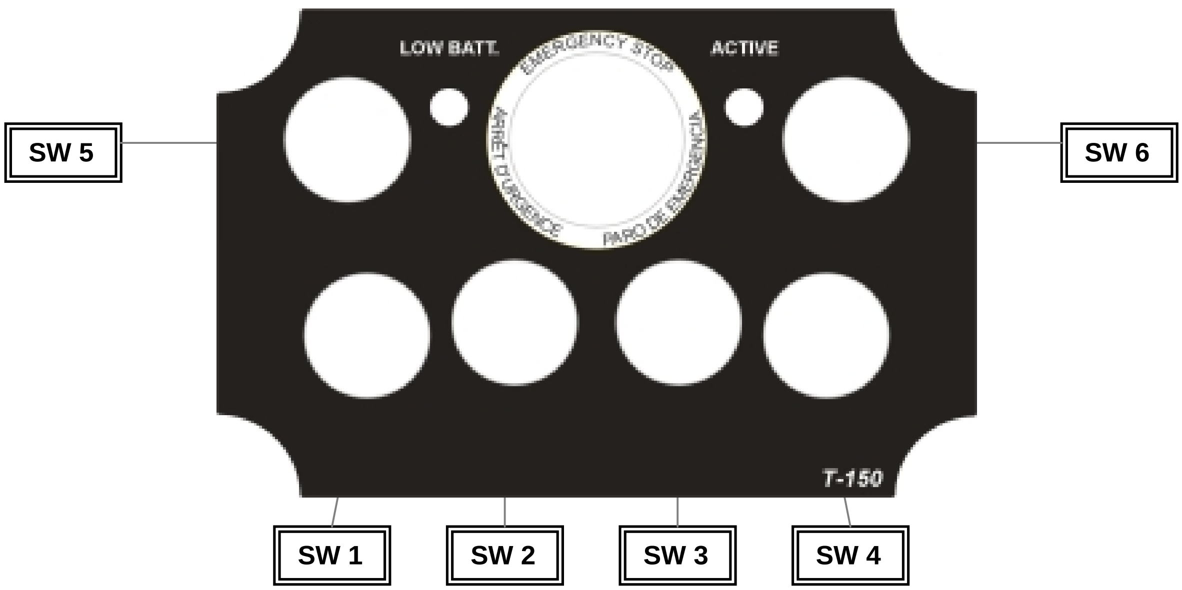



**Figure 2**




| T150 / R150 Switch Function Table | | | | | |
|---|---|---|---|---|---|
| **Switch Number** | **Position** | **Output Control** | **Pin Assignment** | **Color Code** | **Function** |
| **SW1** | UP | Output 9 | B3 | Green | |
| | DOWN | Output 10 | B4 | Green (Black/White) | |
| **SW2** | UP | Output 7 | B1 | White (Red/Black) | |
| | DOWN | Output 8 | B2 | Red (Black/White) | |
| **SW3** | UP | Output 5 | A10 | Orange (Black) | |
| | DOWN | Output 6 | A12 | Orange (Red) | |
| **SW4** | UP | Output 3 | A9 | White (Red) | |
| | DOWN | Output 4 | A11 | Blue (Red) | |
| **SW5** | UP | Output 11 | B5 | White | |
| | DOWN | Output 12 | B6 | Orange | |
| **SW6** | UP | Output 1 | A7 | Orange (Green) | |
| | DOWN | Output 2 | A8 | Red (Green) | |
| **Trigger** | Released | Output 13 | A4 | Green (Black) | Proportional Control |
| | Engaged | | | | |
| **Power** | | | A6 | Red | 9 to 30VDC |
| **Ground** | | | A3 | Black | Ground |
| **EStop** | | EStop Output | A5 | | ]-- Jumpered Externally |
| **Driver Power** | | Driver Power Input | A2 | | |

## Troubleshooting

The **R150** has 4 LED's that are used to indicate device status:

**ESTOP LED**

GREEN – indicates RUN
RED – indicates ESTOP
Flashing RED – indicates fuse blown or relay fault

**FUNCTION/FAULT LED**

GREEN – indicates function ON, no fault
RED – indicates no voltage to relay, short to ground or blown fuse
Flashing RED – indicates short to supply or shorted output relay
Not lit – indicates no function

**LINK LED**

GREEN – indicates Link
RED – indicates No Link

**STATUS LED**

GREEN – indicates STATUS OK
RED – indicates unrecoverable fault; requires factory authorized service
Flashing RED – indicates low battery

The **T150** has 2 LED's that display the mode and status of the device

**ACTIVE LED**

Momentarily ON or Flashing indicates Power Up procedure or Programming status. LED will flash with each function during normal operation indicating Transmit Status to the R150 is good

**LOW BATT. LED**

Momentarily ON or Flashing indicates Power Up procedure or Programming status
During normal operation, this LED will only flash to indicate battery low

**ACTIVE and LOW BATT. LED's**

Both LED's flashing in sync indicates one of the switches is stuck

## Inputs and Outputs

**Inputs** 4 x 0-5VDC analog inputs (factory configurable only)

**Outputs**

**Option 1** 13 x Form ***A*** relay, monitored, 3A max. each, total combined current 10A

**Option 2** 12 x Form ***A*** relay, monitored, 3A max. each, total combined current 10A max.
1 x ***Proportional Control***

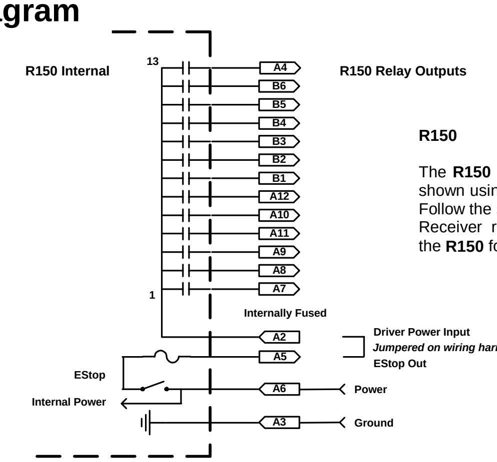
**NOTE:** The Current Control Module may be installed as an option giving the user Proportional Control on output 13 of the **R150 -** refer to **Current Control Module Calibration** for Proportional Calibration procedures.

The Proportional Control option is available from the factory in either Voltage Control, PWM or Current Control.

## Replaceable Parts

| | |
|---|---|
| **Fuse** | MINI® Fuse Type,10A LittelFuse OMNEX (p/n F0047) or equiv. |
| **Mating Plugs** | OMNEX (p/n's J0418 / J0419) |
| **Pins** | OMNEX (p/n J0417) |
| **Sealing Plug** | OMNEX (p/n J0421) |
| **Wedge** | OMNEX (p/n J0420) |
| **Switches** | OMNEX (p/n S0042) |
| **EStop Switch** | OMNEX (p/n S0072) |
| **EStop Contact Block** | OMNEX (p/n S0071) |
| **Batteries** | OMNEX (p/n B0010) 4 x AA |

## I/O Diagram




**R150**

The **R150** is internally fused as shown using a 10A MINI® fuse. Follow the steps in Transmitter / Receiver replacement to open the **R150** for fuse replacement.

## Deutsch Connector Pin Assignments

**Connector A (Grey)**

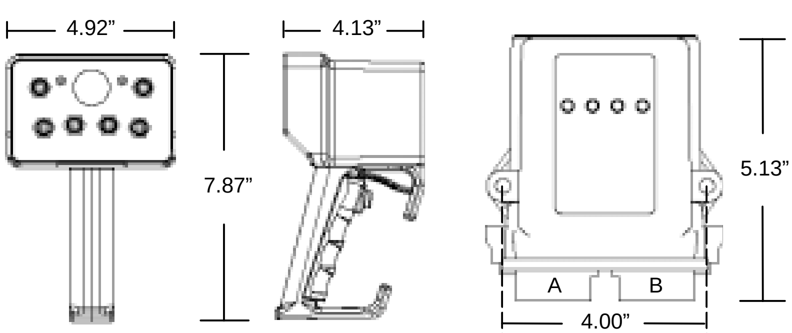
| | | | |
|---|---|---|---|
| Output 6 | 12 | 1 | Input 1 |
| Output 4 | 11 | 2 | Driver Power |
| Output 5 | 10 | 3 | GND |
| Output 3 | 9 | 4 | Output 13 |
| Output 2 | 8 | 5 | EStop Output |
| Output 1 | 7 | 6 | Power |

**Connector B (Black)**

*Factory Configurable Only*

| | | | |
|---|---|---|---|
| Output 12 | 6 | 7 | *RS485 B* |
| Output 11 | 5 | 8 | *RS485 A* |
| Output 10 | 4 | 9 | *RS485 EN* |
| Output 9 | 3 | 10 | Input 4 |
| Output 8 | 2 | 11 | Input 3 |
| Output 7 | 1 | 12 | Input 2 |

## Dimensions

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**Bldg. 74 – 1833 Coast Meridian Road, Port Coquitlam, BC, Canada V3C 6G5**