TR12

PC Programmable
Universal Trigger Interface

Introduction & Features

The TR12 is a universal trigger output module that can be easily configured by a PC. There are numerous possibilities due to 4 separate inputs (8 wires total, 1 positive and 1 negative for each input) and 4 separate outputs. The inputs can be set to trigger from a certain number of pulses (positive or negative), a selectable trigger voltage (from .20 volts to 14 volts in .20 volt increments) or from a latched and pulsed input. The four outputs can be programmed for pulsed, latched or timed 12v or ground and have a current rating of 3A each.

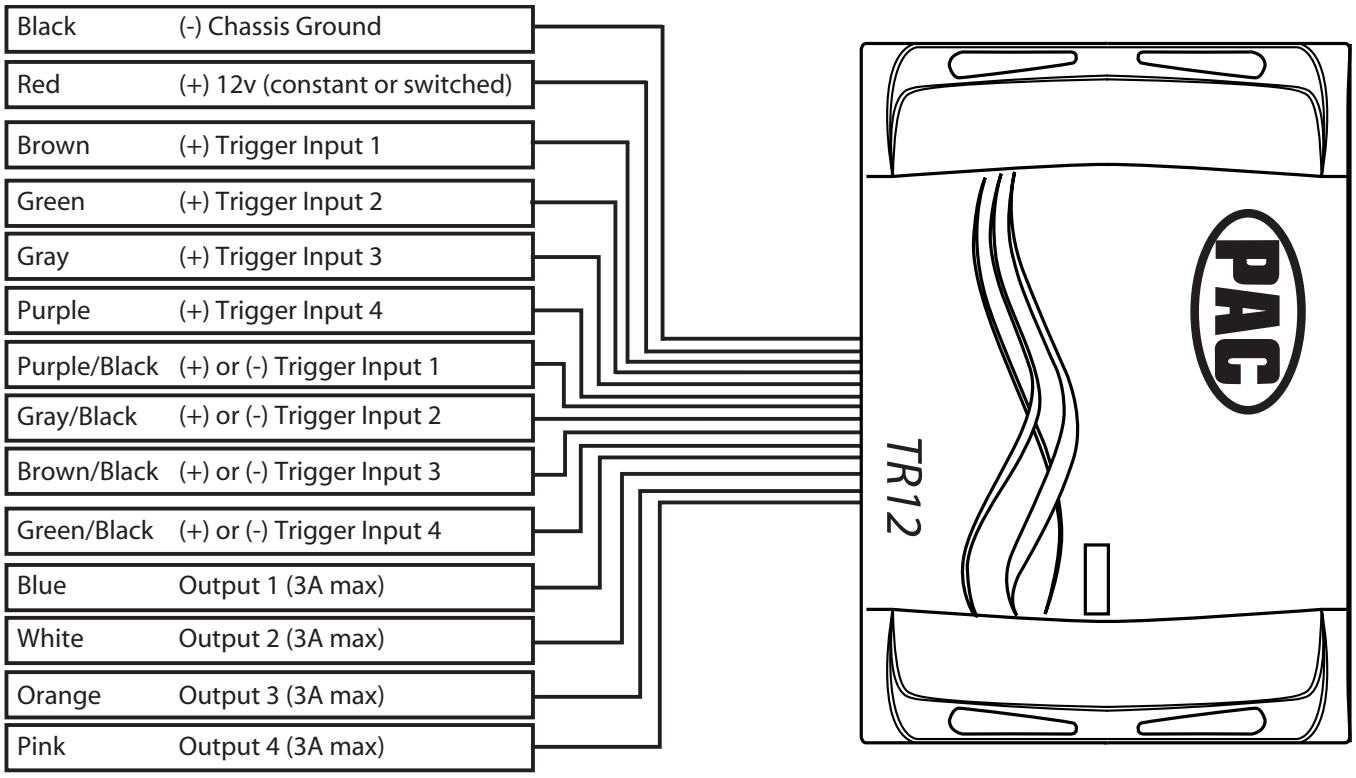
- Pre-Programmed presets for Pioneer, Clarion and Alpine head units
- PC Programmable
- Universal applications including: Low-Voltage Trigger down to 200mV, VIM Bypass, Actuator Controller with Limit Switch Capability (additional relays required and are not included), Delay Turn On/Off, Latched/Unlatched Output, Pulse Extender, Channel Expander, 4 in 1 Timer Output, Horn Honk Output. The possibilities are endless!

WARNING! It is dangerous (and illegal in most states) for the driver to watch the TV/Video monitor while driving the vehicle. The driver may be distracted from looking ahead and an accident could occur. Install the TR12 only in RV and Marine applications where there is no parking/hand brake to interface to. Do not install the TR12 where the driver may be able to view the monitor when driving.

Important Notes

1. All output wires are rated at 3A. If more current is needed a relay must be used.
2. The inputs can be tied together for multiple triggers off of one wire, however the outputs cannot be tied together.
3. The TR12 is equipped with 4 LEDs on the side that can be used as visual confirmation that the outputs are configured properly. A red LED indicates a positive output and a green LED indicates a negative output.

Wiring Connection Chart



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Installation Steps

1.

To download the TR12 PC application follow these steps:

1. Go to www.pac-audio.com
2. Search the term "TR12" in the searchbox found in the top right corner of the website
3. Click the product picture to go to the product page
4. Once on the product page click the "Technical Docs" tab
5. Click the link under the "Technical Docs" tab to download the PC Application
6. Follow the instructions included in the download to install the program. Once you have installed the TR12 application on your PC you can use it to load presets, pre-configured user setting files or manually program the inputs and outputs of the interface to fit your installation needs. Follow the example on page 4 for preset programming.

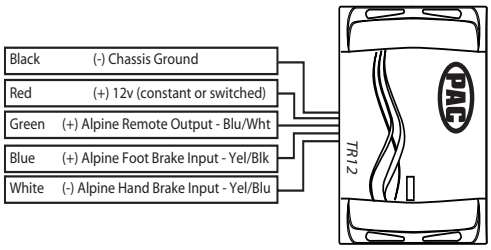
Once you have downloaded and installed the TR12 application

7. Connect the TR12 to your PC using the supplied micro USB cable
8. Program the interface. Please see next page for usage modes and examples. You can also select a factory programmed preset from the Preset tab.
9. Connect the wires on the TR12 according to the input and output settings on the PC App.The connections made to the TR12 will vary greatly depending on your situation. When programming with the PC App you will set up what wires are connected to what. Please see below for pre-programmed preset wiring.
10. Once all connections have been made, connect the harness to the TR12 and check for proper operation.

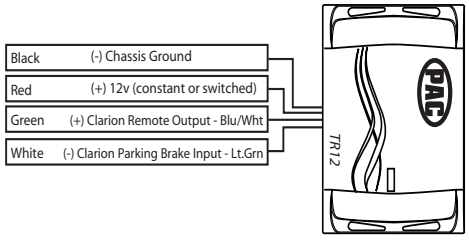
Wiring for Preset Configurations

Please Note: The preset timing can be adjusted to be more suited to the user's needs.

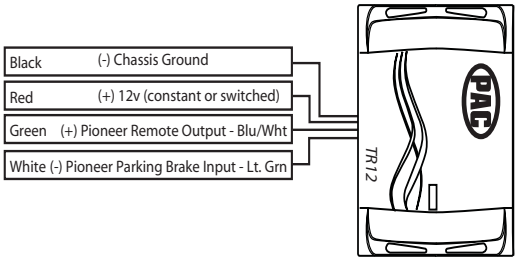
Alpine Preset Wiring



Clarion Preset Wiring



Pioneer Preset Wiring



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Modes and Use Examples

When programming the TR12 with the PC app, you will see the following selections under the wires on the "Output Configuration" tab:

- **Disabled:** The output wire will be disabled and not used
- **Pulse:** Pulses the designated amount of times on designated trigger input. EX: VIM Bypass
- **Latch:** Latch the output forever on designated trigger input. Must cycle power to the module to unlatch.
- **Unlatch:** Starts with output of selected polarity then latches the output forever on designated trigger input. Must cycle power to the module to unlatch again.
- **Toggle:** Allows you to toggle selected outputs on/off on designated trigger input. EX: Turn lights on/off
- **Delay:** Turns on/off with designated time. Behaves like Toggle and will turn off and on with the designated trigger. EX: Amp delay turn on/off
- **Actuator:** Configures outputs for use with linear actuators. **Requires additional relays and are not included.**

Although the possible uses of the TR12 are nearly limitless, here are some examples for the most common uses:

1. **Low Voltage Trigger -** Supplies a 12 volt remote output for an aftermarket amplifier when used with a stock head unit that does not have a remote output. Use the TR12 to generate a 12 volt output from a speaker output or 5 volt remote source.
2. **Toggled On/Off Outputs -** Turn on neon lights or other accessories from an alarm with a momentary output or from a momentary switch
3. **Amp Turn On Delay -** Upon a constant trigger, the TR12 will delay the turn on for the user programmed amount of time.
4. **Double Pulse Unlock -** Pulses outputs twice when triggered from a constant or pulsed signal. Use for alarm applications where the unlock wire needs two pulses to unlock all doors.
5. **Reverse Camera Delay:** Allows the reverse camera image to be displayed on the radio for a pre-determined amount of time after the gear has been shifted out of reverse.
6. **Horn Honk Generator -** Using the 12v siren output from an aftermarket alarm, set the timing for the horn honk to where it sounds the best.
7. **Linear Actuator Controller -** Open/close amplifier racks from a sigle or multiple trigger. This setting also has limit switch triggers in cases where the actuator motor does not. **Requires additional relays and are not included.**
8. **Doorlock Pulse Generator -** Good for automatically locking and unlocking door locks when ignition is turned on and off.
9. **Channel splitter -** Split 1 channel from an alarm to two outputs. Both outputs are user programmable for pulse, latched or timed output.
10. **Four Timers in One -** Upon a trigger, all four outputs are user programmable to delay before turning on outputs or turning on instantly then delay before turning off outputs. Good for situations where you need more than one timer but on a different timer period, without having multiple modules.

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Programming with the PC App

Loading a preset

1. Connect the TR12 to your PC using the supplied cable.
2. Double click the TR12 icon on your PC to start the program.
3. **Fig.1 -** Select the Preset tab at the top of the application.
4. **Fig.2 -** Select a preset configuration from the drop down menu.
5. **Fig.3** - If necessary, you can adjust the timing as needed for the pulse on delay and pulse duration. The Pre-Delay (A) sets up the time the TR12 will wait before outputting the pulse. The On Time Duration (B) sets up the amount of time the pulse stays on before turning off.
6. **Fig.4 -** Select Send Configuration Data at the bottom left of the application

Fig.1

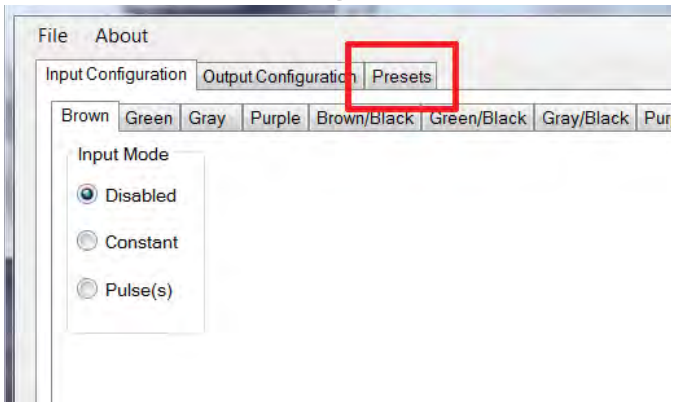


Fig. 2

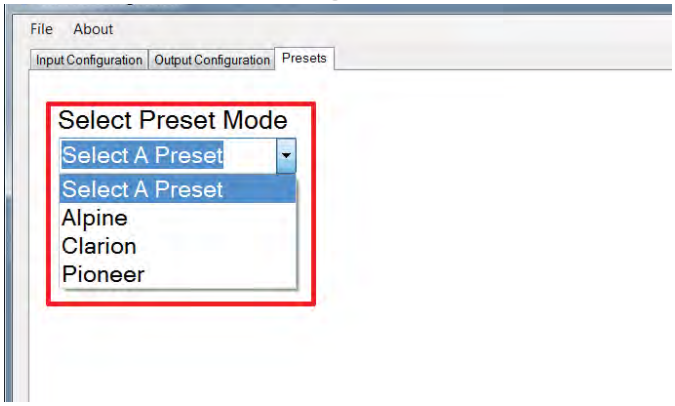


Fig. 3

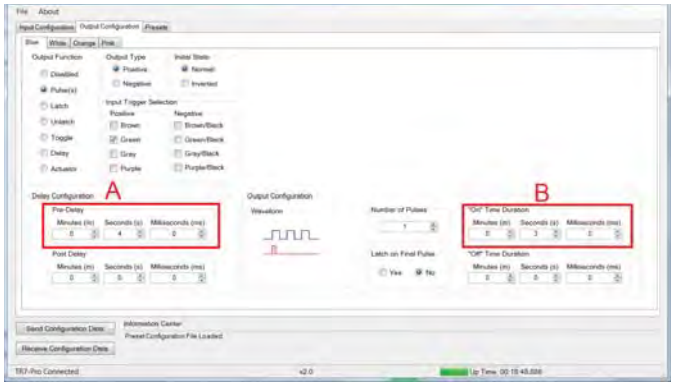
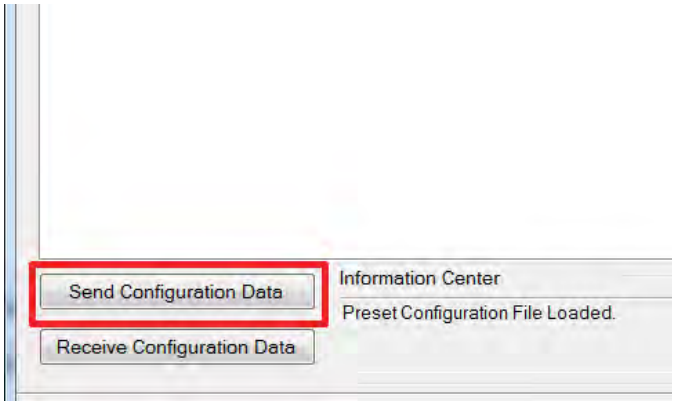


Fig.4



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Programming with the PC App (Cont.)

Creating a Custom Scenario - For this example we will program the TR12 to turn an amplifier on using a low voltage trigger

1. Connect the TR12 to power.
2. Connect the TR12 to your PC using the supplied cable.
3. Double click the TR12 icon on your PC to start the program.
4. **Fig.1 -** Select the Input Configuration tab at the top of the application.
5. **Fig.2 -** Select Brown (A) as your input wire, since we are using a positive trigger. Select Constant (B) as your input. This means that the TR12 will be triggered by a latching .200mv-14v analog signal. Set the Trigger Level (C) to your desired voltage. This setting will set up the TR12s low voltage threshold. This represents the lowest amount of voltage needed to trigger the TR12. In this case we have set it ti 4v (D). If you have the TR12 wired up and connected to the PC, it will also show you the incoming voltage on the trigger wire. In this case it is 6.77v (E).
6. **Fig.3 -** Select the Output Configuration tab at the top of the application.
7. **Fig.4 -** Select Blue (A) as your output wire. Select Delay (B) as your output function as we want to be able to turn the output on/off with the radio. Set the Output Type to positive (C) as we are using it to turn on an amp. We will leave Normal checked under the Initial State box (D) as we want to toggle a 12v signal on/off. Now select Brown (E) under the Input Trigger Selection because we set the brown wire up as our input trigger wire in Fig. 2. If needed, you can set the Pre pr Post-Delay (F) on the output to delay the turn on or off of the aftermarket amp. Finally, select Send Configuration Data (G) at the bottom left of the app to program the TR12 with this configuration.

Fig.1

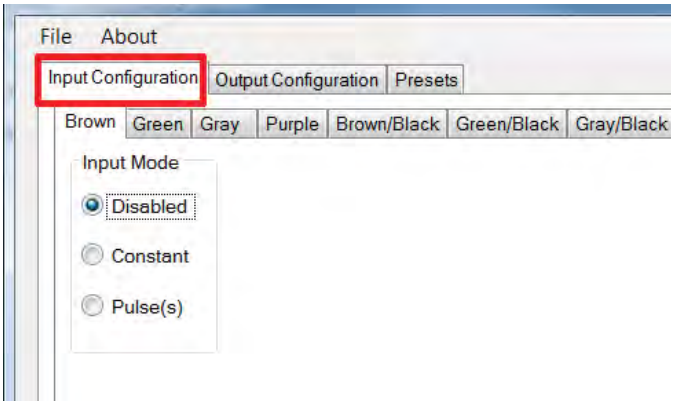


Fig. 2

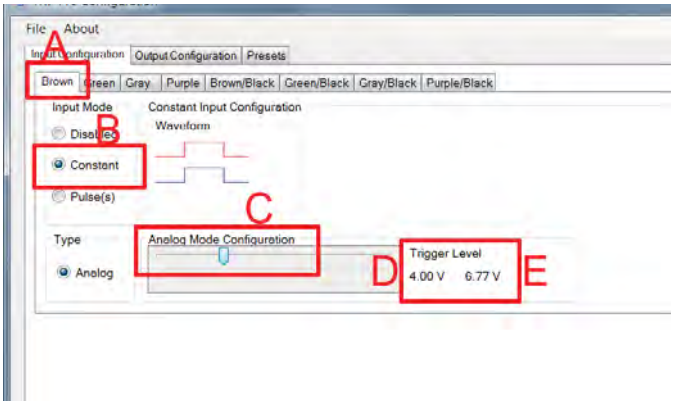


Fig. 3

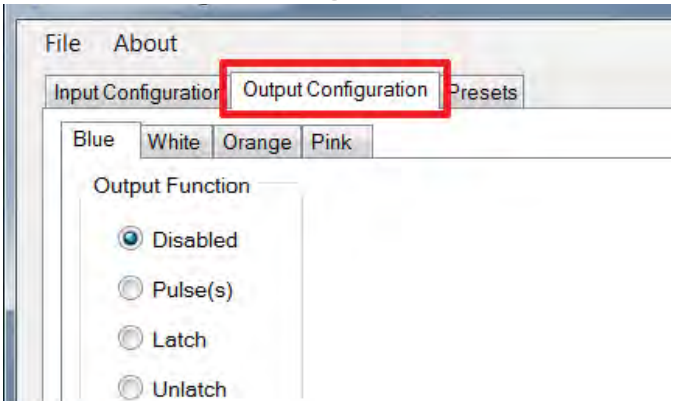
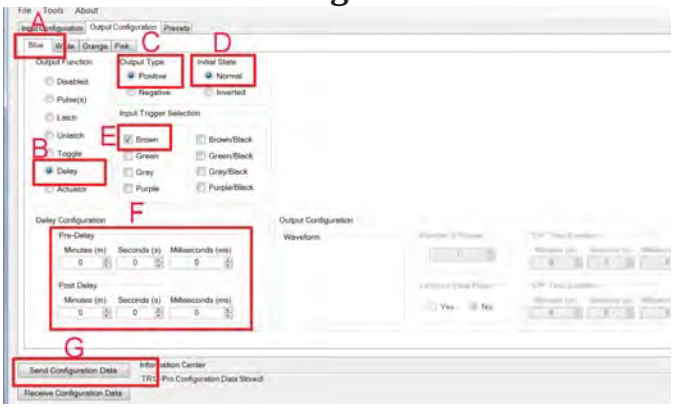


Fig.4



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Programming with the PC App (Cont.)

Creating a Custom Scenario - For this example we will program the TR12 to delay the reverse camera image on an aftermarket radio's screen.

1. Connect the TR12 to power.
2. Connect the TR12 to your PC using the supplied cable.
3. Double click the TR12 icon on your PC to start the program.
4. **Fig.1 -** Select the Input Configuration tab at the top of the application.
5. **Fig.2 -** Select Brown (A) as your input wire, since we are using a positive trigger. Select Constant (B) as your input. This means that the TR12 will be triggered by a latching 12v analog signal. Set the Trigger Level (C) to your desired voltage This setting will set up the TR12s low voltage threshold. This represents the lowest amount of voltage needed to trigger the TR12.
6. **Fig.3 -** Select the "Output Configuration" tab at the top of the application.
7. **Fig.4 -** Select Blue (A) as your output wire. Select Delay (B) as your output function as we want to delay the signal from turning off. Select Positive (C) as your output type as an aftermarket radio looks for a +12v signal on the reverse trigger. Select Brown (D) under the Input Trigger Selection because we set the brown wire up as our input trigger wire in Fig. 2. Set the Post Delay to 10 seconds (E). This will delay the output from turning off for 10 seconds after the factory reverse signal has been removed from the TR12. Finally, select Send Configuration Data (F) at the bottom left of the application to program the TR12 with this configuration.

Fig.1

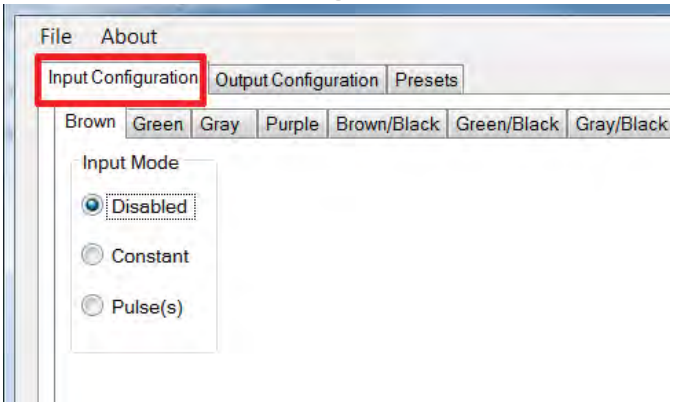


Fig. 2

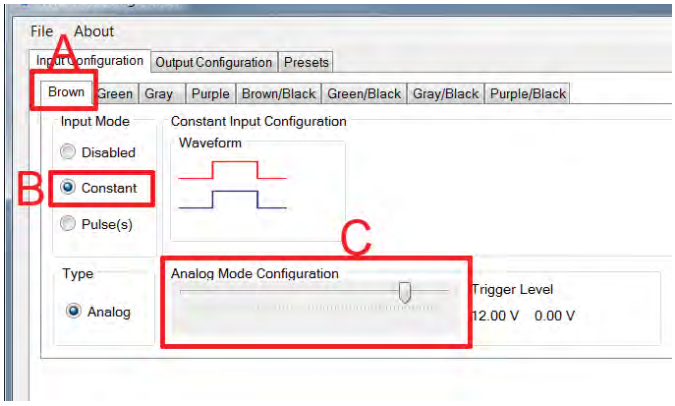


Fig. 3

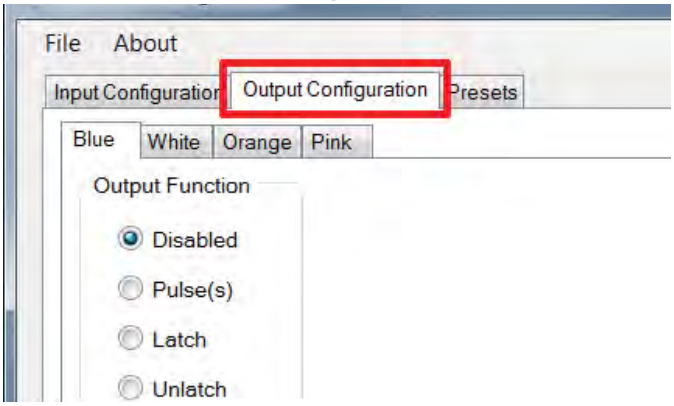
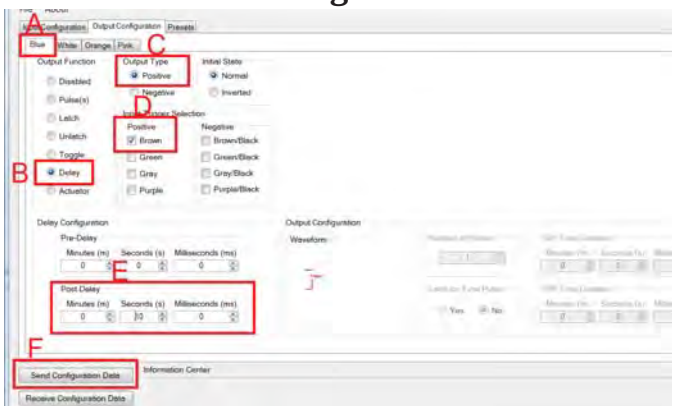


Fig.4



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Programming with the PC App (Cont.)

Creating a Custom Scenario - For this example we will program the TR12 to operate a linear actuator on a single pulse from an alarm's auxiliary channel. Requires the use of SPDT relays (not included). See Appendix A on page 9 for relay wiring.

1. Connect the TR12 to power.
2. Connect the TR12 to your PC using the supplied cable.
3. Double click the TR12 icon on your PC to start the program.
4. **Fig.1 -** Select the "Input Configuration" tab at the top of the application.
5. **Fig.2 -** Select Brown/Black (A) as your input wire, since we are using a negative trigger. Select Pulse (B) as your input. This means that the TR12 will be triggered by a determined number of negative pulses. Set the number of pulses you want to trigger the interface (C). You can also set up a window in which to receive the pulses. If you want to specify a certain length of time for the activation pulse you can do so under Pulse Length Configuration (D). For this example we will not do this.
6. **Fig.3 -** Select the "Output Configuration" tab at the top of the application.
7. **Fig.4 -** Select Blue (A) as your output wire. This will automatically set up the white wire as the reverse actuation wire. Select Actuator (B) as your output function. Select Brown/Black (C) under the Input Trigger Selection because we set the brown/black wire up as our input trigger wire in Fig. 2. There is also a Trigger Mode function (D) which allows you to set whether the forward and reverse actions will need a single trigger to do both or an independent trigger for each action. For this example we will do a single trigger. Set the Forward and Reverse Actuation Time to the desired setting (E), in this case it is 8 seconds. If you are using a linear actuator that does not have a built in limit switch, you can add your own and set those triggers up under the Forward and Reverse Limit Trigger Sections (F). Finally, select Send Configuration Data (G) at the bottom left of the application to program the TR12 with this configuration.

Fig.1

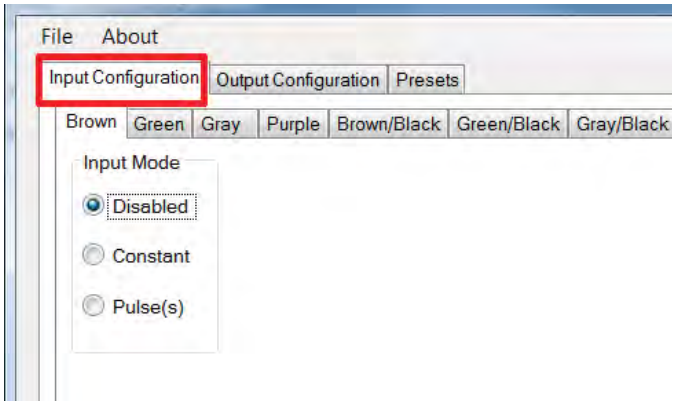


Fig. 2

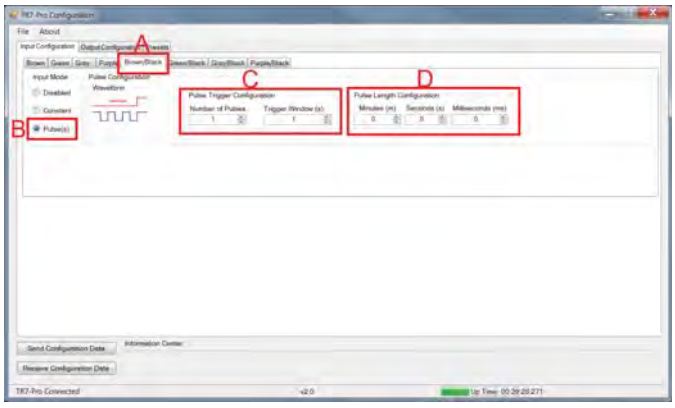


Fig. 3

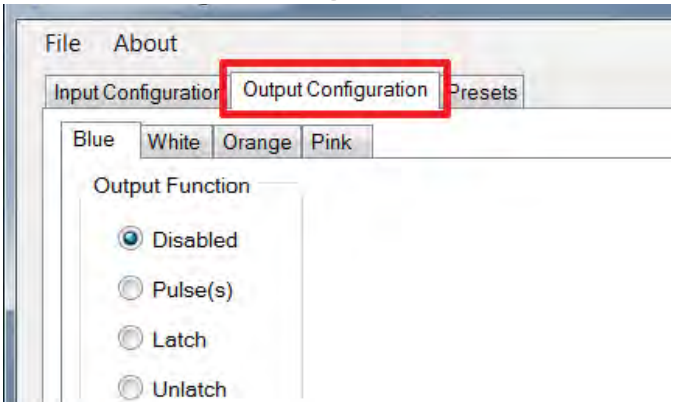
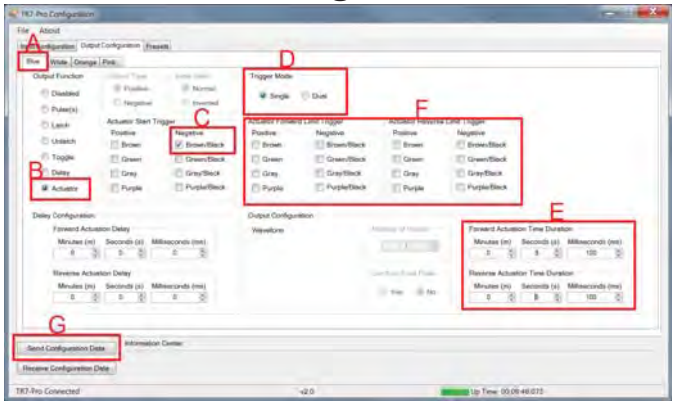


Fig.4



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Programming with the PC App (Cont.)

Saving a configuration for later use

1. Connect the TR12 to power.
2. Connect the TR12 to your PC using the supplied cable.
3. Double click the TR12 icon on your PC to start the program.
4. Create your custom configuration
5. **Fig.1 -** Select File then select Save Configuration
6. **Fig.2 -** Name your configuration file, select a directory to save it in, then select Save.
7. Your configuration is now saved and can be used at any time.

Fig.1

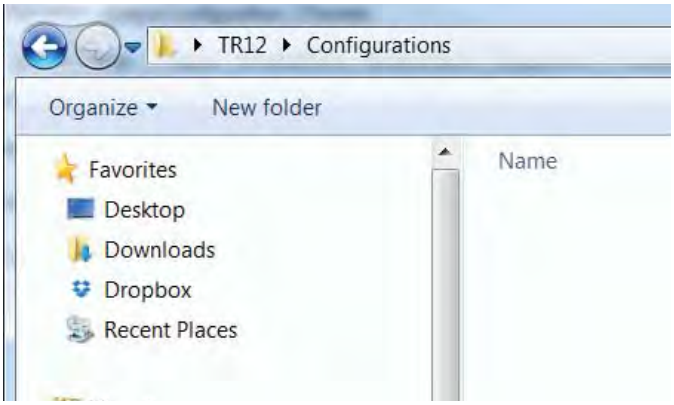
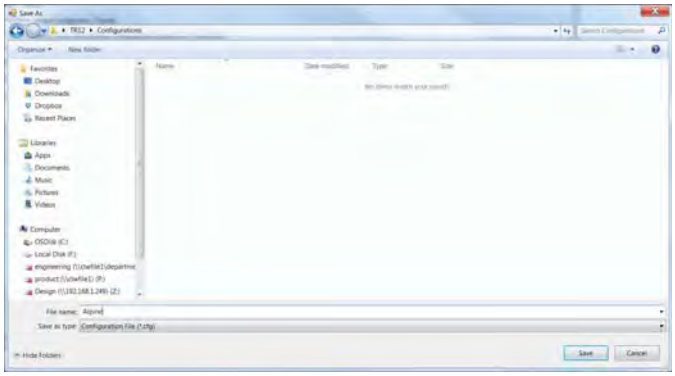


Fig. 2



Loading a saved configuration

1. Connect the TR12 to power.
2. Connect the TR12 to your PC using the supplied cable.
3. Double click the TR12 icon on your PC to start the program.
4. **Fig.1 -** Select File then select Open Configuration
5. **Fig.2 -** Choose the configuration you wish to load from your directory.
6. Your configuration is now loaded and can be adjusted or sent to the TR12 by selecting Send Configuration Data.

Fig.1

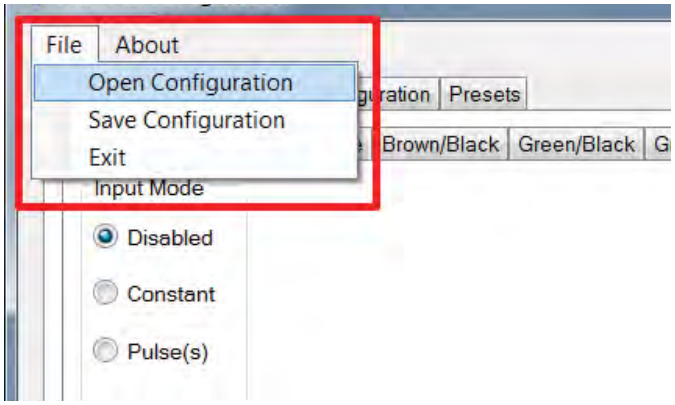
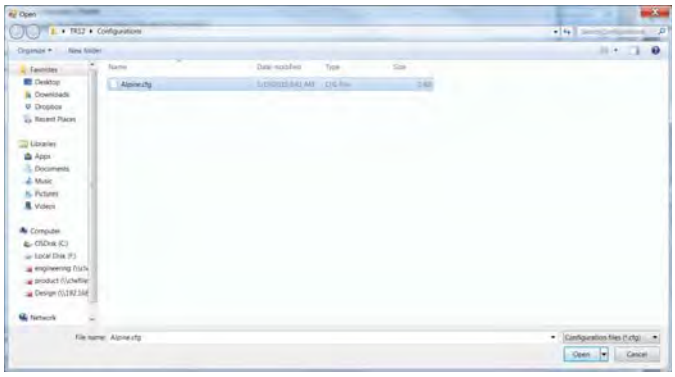


Fig. 2



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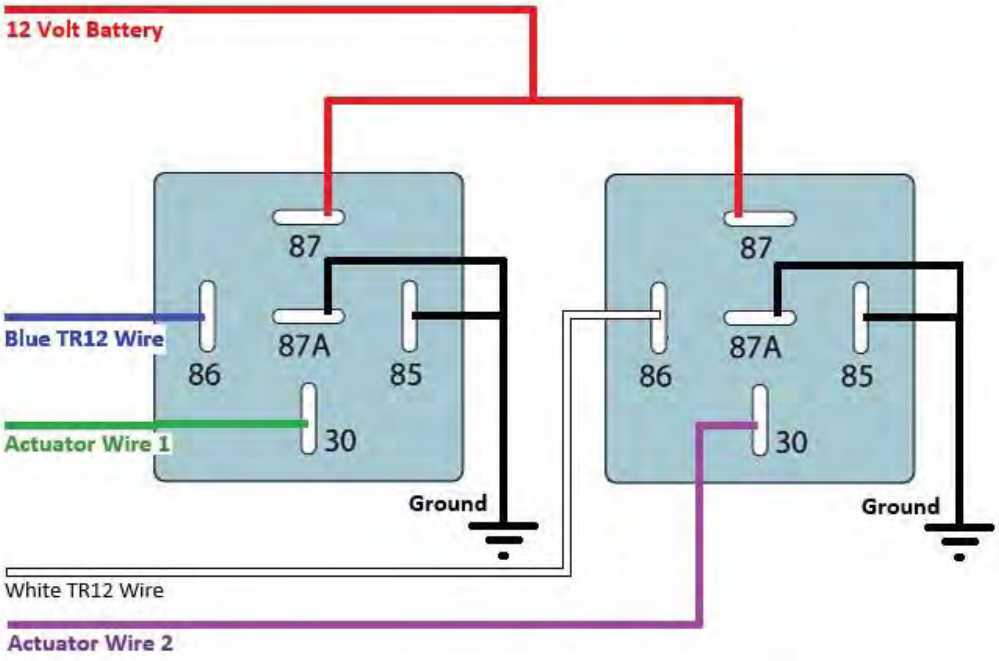
Appendix A

Relay wiring for Linear Actuators



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