Getting more out of your WFS-84E

See the full manual for information about features available:

- Use the Home Net option. That way you can leave you phone or tablet connected to your home network. When you power up your WFS-84E, your phone or tablet will connect much more quickly.
- Explore the WFS-84E web pages to see the features available.
- Use the WFD-60 Gateway to control switches using WiThrottle, or Engine Driver apps on phones, while driving trains.
- Build Schematic Control Panels on your WFD-60 to control turnouts and other layout features..
- Access the WFS-84E Manual at http://www.wifitrax.com/manuals/WFS-42-43/WFS-42-43-Manual.pdf
- Access the WFD-60 Manual at http://www.wifitrax.com/manuals/WFD-60/WFD-60-Manual.pdf

This product is not a toy. Keep away from children. It is not suitable for use by persons under 14 years of age.
Warning: This product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

WifiTrax products are made in Australia using globally-sourced components and services. Check our website for warranty information.

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WFS-84E Getting Started Guide

This document is online at http://www.wifitrax.com/appNotes/quickStart/WFS-84E-Quick-Start.pdf. Please consult the full WFS-84E manual for much more detail at http://www.wifitrax.com/manuals/WFS-42-43/WFS-42-43-Manual.pdf

Package Contents: WFS-84E Module in Static Shielding Bag

WFS-84E 8-Way Wi-Fi/DCC Controller for Switch Machines with SPDT Switch Inputs

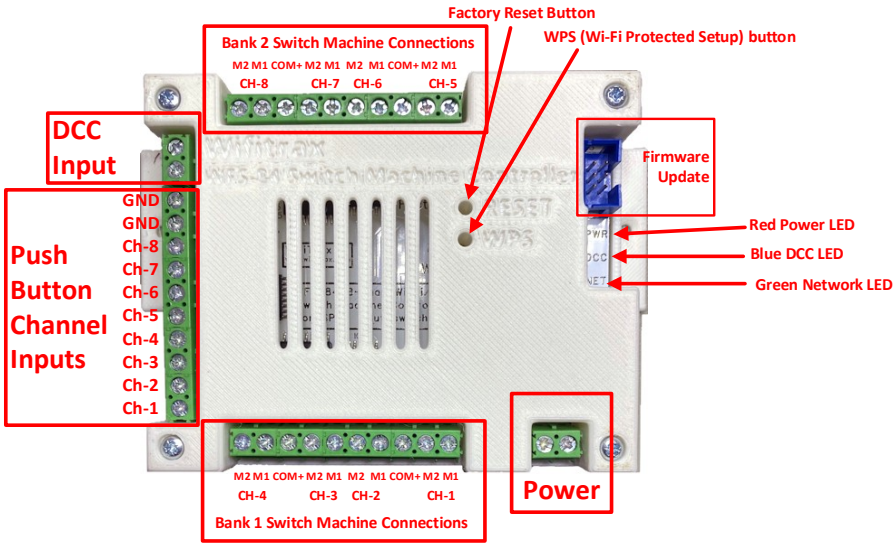

Figure 1 WFS-84E Connections

The WFS-84E provides control for up to 8 switch machines, of end-switch type requiring Single Pole Double Throw control inputs. Examples are the MT-4 and MT-1 manufactured by MTB. Turnouts can be operated through the module's DCC Input or by its web browser interface.

Wiring for MTB Switch Machines

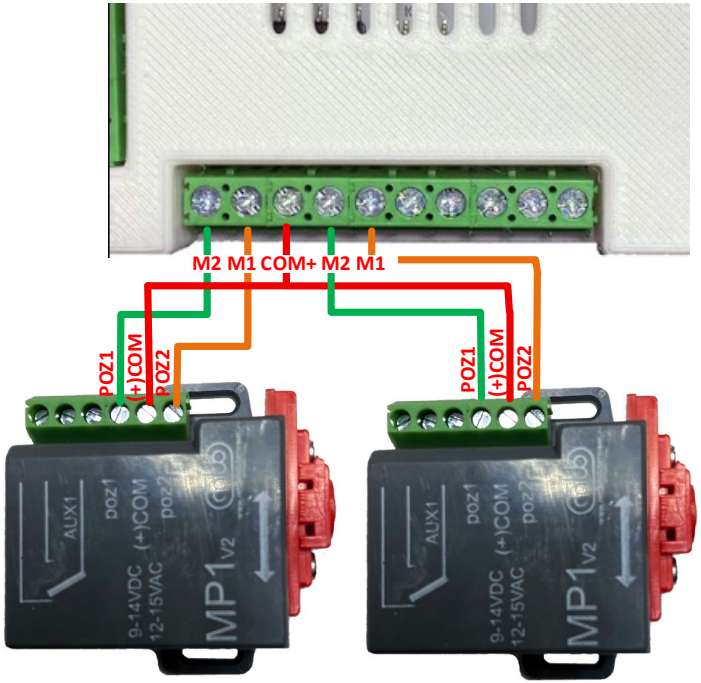

Figure 2. Connection Diagram for MTB MP1 Switch Machines. See also Table 1.

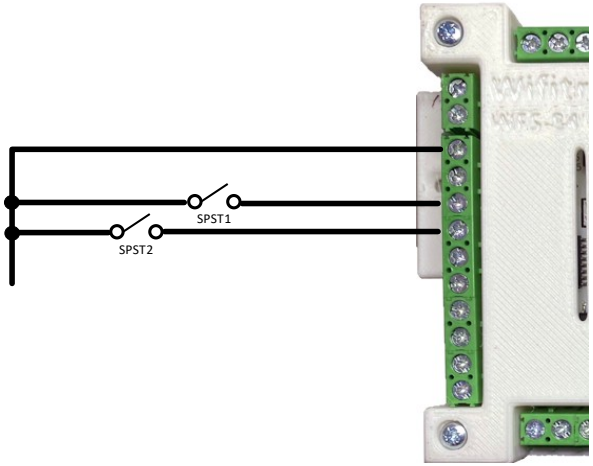

Figure 3. Wiring for Manual Push-buttons

Connecting the WFS-84E to your Home Network

Before your WFD-60 can find the new WFS-84E module, you will need to set the WFS-84E as a station on your home net. There are two ways of doing this. Wi-Fi Protected Setup (WPS) and manually.

You can use the WPS button only if your router has that capability. First press the WPS button on your router, then once it indicates WPS mode, usually by flashing an LED, press the WPS button on the WFS-84E. After flashing a few times, the WFS-84E will connect to the router and the green LED will stay on continuously. You can now let your WFD-60 find the channels of your WFS-84E module.

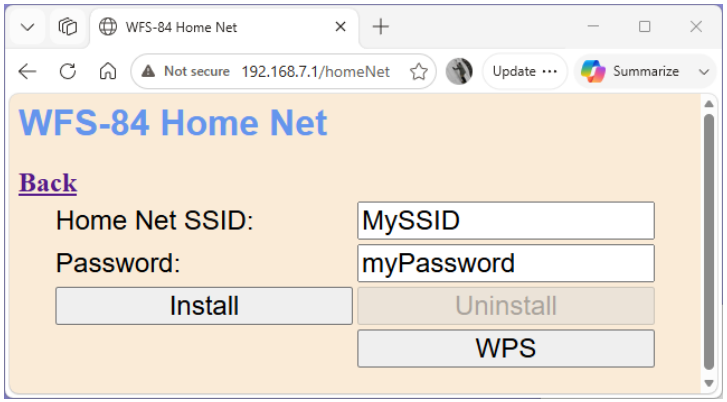

Figure 4 The WFS-84E Home Network Screen

If for some reason the WPS method does not work, use the Home Net screen in Figure 4, accessed from the main menu, to enter the SSID and Password.

Direct-to-Module DCC Operation

The WFS-84E supports DCC being connected directly to the module. To control turnouts with DCC via the WFS-84E, connect your DCC track power to the DCC Input shown in Figure 1.

You can use more than one WFS-84E on your layout and connect each one to the same DCC signal. However, each channel on your collection of WFS-84E Switch Machine Controllers must have a unique DCC Address. You can set this by accessing the WFS-84E Switch Machine Channels screen as in Figure 9 and clicking on the Name hyperlink to show the Switch Channel Edit screen as Figure 5.

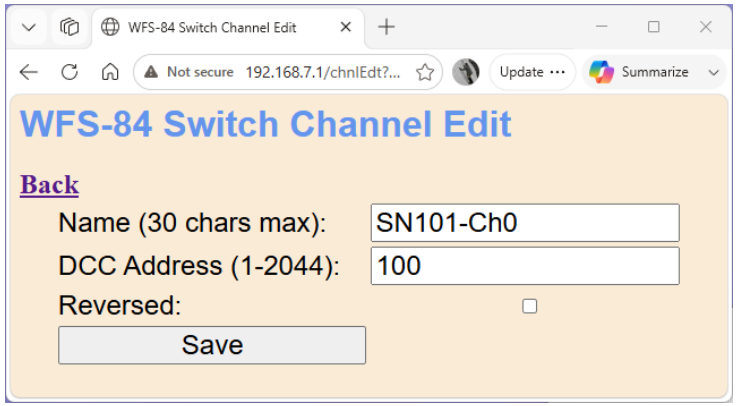

Figure 5 The Switch Machine Channel Edit Screen

On this screen you can change the Name and DCC Address as well as the Reversed flag. This causes the Closed/Thrown output voltage polarity to be reversed. The Name can have up to 30 characters but only the first 10 are recorded by the WFD-60, so it's best to name the channels 10-Digit unique names.

The Accessory Address can be 1 to 2044 and, as said earlier, each channel must have a unique DCC Address on your layout.

The other settings are not relevant to the WFS-84E.

With the addition of a Wifitrax WFD-60 Gateway, multiple WFS-84E devices, each with groups of eight switches, can also be operated from phone apps, or using the WFD-60 lists and Schematic Control panels. The WFS-84E does not control twin-coil switch machines or Stall-motor switch machines requiring reversing switch control. The WFS-42 and 43 provide this capability.

Installation Instructions

(1) Consider the various system-level options for turnout control described in this document and decide how your turnouts are ultimately to be controlled. First you will need to connect up and get it working as a single unit as Figure 7.

(2) Figure 1 shows the WFS-84E module with its connections labelled.

(3) The WFS-84E only controls motor driven switch machines with reversing end switches. These machines allow control using a SPDT switch rather than requiring a DPDT reversing switch. Connect up to eight such switch machines. Figure 2 shows two MP1 switch machines used as an example. Table 1 show connections for MTB MP1 and MP4 machines.

WFS-84 Terminal	Description	MTB Switch Machine Connection	
	Completes circuit when:	MP1	MP4
M1	Switch Machine Channel "Closed"	POZ1	M1
M2	Switch Machine Channel "Thrown"	POZ2	M2
COM+	Common Positive Power	(+)COM	+COM

Table 1 Connections for MTB Switch Machines MP! And MP2. The M1 and M2 connections may be reversed at will, to set the closed/thrown state of the switch as needed.

(4) Optionally connect momentary normally-open push buttons between any or all of the inputs Ch1-Ch8 and one of the two Ground connections. These are shown on the left of Figure 1 and an example shown in Figure 3.

(5) Connect your WFS-84E to DC or DCC power, 12 – 15 Volts. About 15 V DC is usually ideal or about 14-15 V Peak-Peak DCC. It does not matter which way around you connect the power. Do not turn on the power until ready for testing. Mount your WFS-84E suitably so that it does not move around.

Basic Testing of your WFS-84E

Once you have installed your WFS-84E, you can test and configure it using its web pages which are accessible from any browser on IOS, Android or Windows. You can do this before connecting it to your home network and integrating with a WFD-60.

Connecting using an Apple IOS Phone or Tablet

(1) Tap the Settings icon on your iPhone or iPad

(2) Tap Wi-Fi on the left-hand menu. Under Other Networks on the right, the list should include one like wftrx_WFS84_1_XXXXXXXX_7, where XXXXXXXX is the serial number of your unit that appears on its label. Tap that Wi-Fi Network. **You must always connect to this Network to access the WFS-84E web pages** until you operate in home-net mode.

Connecting using Android

(1) Press the Home button and tap the Settings icon:

(2) Tap Connections, then Wi-Fi and select the module's network as above.

Connecting using Windows

(3) On your Windows 10 desktop or laptop, click the networks icon in the system tray and select the network described above.

Figure 10 shows another alternative, operating all your turnouts using DCC provided by any Command Station/Booster. An NCE Power Cab is shown as an example with the Flat NCE Cable from the Power Cab connected to the Power Cab Panel (PCP) that comes with the Power Cab. The PCP receives power for the Power Cab using the NCE adapter (not shown) and the Track connections of the PCP are shown as the red and black wires on Figure 10 that are connected to your track to provide DCC power for the locos. However in the diagram, they are also connected to the DCC inputs of the WFD-60. When a DCC Accessory Control is sent from the Power Cab with a specific Accessory Address, the WFD-60 will identify a WFS-84E channel in its list corresponding to that Accessory Address and send a command via Wi-Fi to set the Switch Machine to the state specified by the Power Cab. Thus all of the WFS-84E controllers behave as though each had a DCC input.

Once the Power Cab (or other Command Station/Booster is connected, you can add to the versatility by connecting a WFD-30 or WFD-31 to its Cab Bus. Now you can control the DCC locos on your layout and the Turnouts from a phone or tablet running Engine Driver or WiThrottle, or indeed the TCS-UWT-100 or UWT-50.

To understand how to set all this up, consult the manual for the WFD-60, but to make the WFS-84E a station on your Home Net, you can use the WPS button or the Network Screen.

This means that rather than each acting as a direct Wi-Fi Access Point, they must all be stations under the router which will assign them unique IP Addresses. Figure 6 shows the WFD-60 communicating via Wi-Fi with a group of WFS-84E. The physical wire connections to the stall-motor controllers are not shown. Once the WFD-60 is aware of all the Switch Machine Channels on your layout, they appear in a list on one of the WFD-60's own web pages and can be operated from buttons on that page.

With the WFD-60 you can also define a set of Panels. Each Panel can be edited to show a schematic diagram of all or part of your layout. Turnouts can be included in the diagram and associated with a switch machine channel on one of the WFS-84E. When you have finished editing and open one of the Panels in Operational Mode, you can toggle the state of any turnout by clicking or tapping on that turnout in the panel's diagram. You can operate these panels from almost any up-to-date browser on a computer, or tablet running Windows 10/11, Android or Apple IOS.

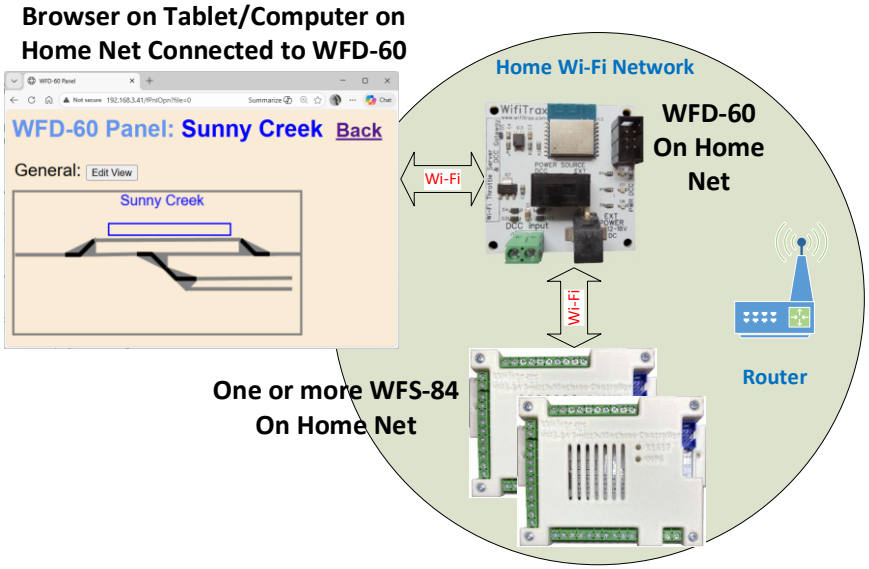

Figure 6. Controlling turnouts using Panels on a WFD-60 with all devices on home net

Testing using the WFS-84E Web Pages

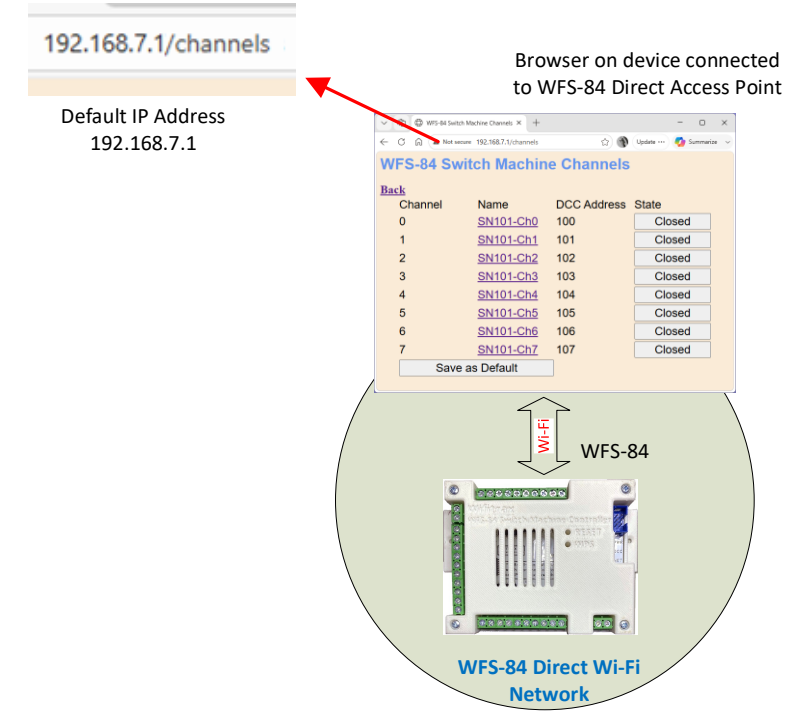

Figure 7 Controlling the WFS-84E Channels via its web interface

Figure 7 shows how the web pages generated in the WFS-84E control its connected switch machines via Wi-Fi.

(1) Once you are connected to the module's network, open a browser such as Safari or Chrome and type the following in the URL bar followed by the Enter or Go key: 192.168.7.1
This is the IP Address of the WFS-84E web pages when you are connected to its wftrx_WFS84_1_XXXXXXXX_7 network.

(2) You will see the Main Menu page as in Figure 8

Figure 8. The Main Menu of the WFS-84E

(3) To test the switch machine channels, click or tap the Switch Machine Channels option. You will see the screen below. The names of each channel default to the last three digits of the serial number plus the channel number as shown in Figure 9. The DCC Addresses are important once you connect a DCC input or use a WFD-60 as they are used for identification. DCC Addresses in WFS-series modules should be unique across your layout.

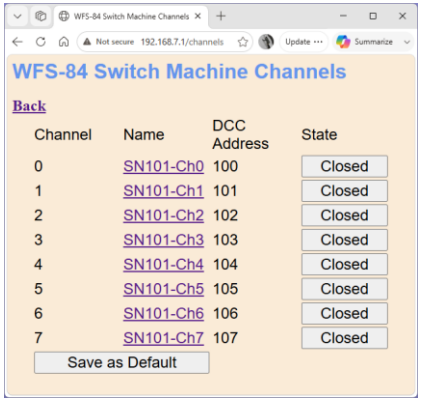

Figure 9. Control of Turnouts using WFS-84E Web Pages before WFS-84E joins home net

Make sure that tapping on the buttons in the State column changes the physical turnout positions from closed to thrown and back.

The Save as Default button will save the current switch settings as the power-on default.

You can also click on each entry in this list to edit the names, DCC addresses and reversed state. DCC addresses are relevant if you connect a DCC Command Station/Booster to the WFD-60 WiThrottle/DCC gateway.

Integrating the WFS-84E into your System

Once you have completed basic testing you are ready to integrate the WFS-84E into your railroad control system.

Options for Turnout Control

If you have more than one WFS-84E, to allow many turnouts on your layout to be controlled, it will be inconvenient to use each one's individual web pages to control all the turnouts like Figure 7. You need a centralized master. The Wifitrax WFD-60 provides this capability.

The diagrams in Figure 6 and Figure 10 show the options for integrating several WFS-84E Switch Machine Controllers with a Wifitrax WFD-60 WiThrottle and DCC Gateway. The WFD-60 can scan your layout to discover Switch Machine and other controllers and control them all from one central location or indeed several locations. You can also turn off scanning and enter or edit them manually.

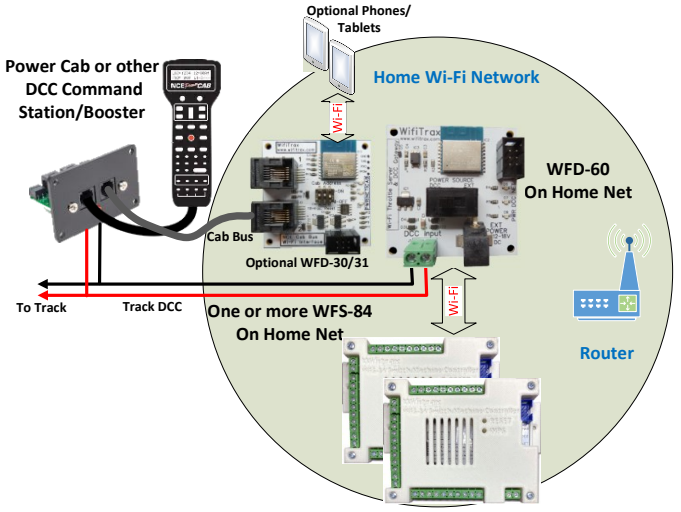

Figure 10. Controlling Points with DCC by Connecting a Command Station to the WFD-60

For this to work, all the WFS-84E (or other WFS controllers) and the WFD-60 need to be placed on your home network so that they can all communicate via a single router.