

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

WFD-26, WFD-27, WFD-28 Wi-Fi/DCC Trackside Command Station

Operating Manual

This document is online at <http://www.wifitrax.com/manuals/WFD-26-27-28/WFD-26-27-28-Manual.pdf>.

Please see our website for information on our limited warranty.

In this manual the use of WFD-2X means the statements apply to WFD-26, WFD-27 and WFD-28 unless specified otherwise.

WifiTrax Model Science



www.wifitrax.com

Version 1.0 January, 2024

© WifiTrax Model Science 2023 All Rights Reserved

This product is not a toy. Keep away from children. It is not suitable for use by persons under 14 years of age. In operation some parts may become hot to the touch.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Version History

Version	Changes
1.0	Initial Release

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Table of Contents

Table of Figures.....	7
Scope of this Document.....	10
What do the WFD-26 and WFD-28 Wi-Fi/DCC Trackside Command Stations do?.....	11
The NCE Cab Bus	11
What does the WFD-27 Wi-Fi/DCC Trackside Command Station/Booster do?.....	12
Four throttles at a time can join the WFD-27 Wi-Fi Access Point, but you can up this limit to six using “Control Loss Timeout”	12
What is WiThrottle protocol?	13
What is JMRI?.....	14
WFD-26 Connections and Indicators	15
WFD-26 LED Indicators.....	16
WFD-27 Connections and Indicators	17
WFD-27 LED Indicators	17
WFD-28 Connections and Indicators	19
WFD-28 LED Indicators.....	19
Let’s get Started!.....	21
Connecting your new WFD-26 Command Station/Booster.....	21
Connecting your new WFD-27 Command Station/Booster.....	21
Connecting your new WFD-28 Command Station/Booster.....	22
Driving your First Trains.....	23
Getting Started with WiThrottle on Apple IOS	23
Making it Easier Next Time	28
Getting Started with Engine Driver on Android.....	29
Making it Easier Next Time	33
Getting Started with TCS UWT-100.....	34
Accessing the Web Pages.....	38
Access WFD-2X Web Pages using Engine Driver.....	38
Access WFD-2X Web Pages using WiThrottle (Full).....	38
Setup Advanced Features using a Browser.....	38
WFD-2X Master Menu	40
Settings Web Page	41
IP Address	41
Region Code	41
Serial Number	41

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Firmware Version.....	42
Heap State (Heap B/C/W)	42
Current Locomotives (Locos)	42
Current Clients (Clients).....	42
Module Name	42
Wi-Fi Channel.....	42
Net Number	42
WiThrottle Port.....	43
Over-current Timeout.....	43
LEDs Disabled	43
Control Loss Timeout.....	43
Fast Clock (FC) Time	44
FC Ratio	44
FC Start Hour.....	44
FC 24 Hr Format	44
FC Pause Button.....	44
FC Reset Button.....	44
DCC Accessory Cmd. Repeats	44
Refresh.....	45
Home Net Web Page.....	46
Joining Home Net using WPS Button	46
Joining Home Net Manually.....	46
Find Modules Tool	47
Locomotive Roster	50
Adding, Deleting and Moving Locos Up or Down	50
Clearing the Entire Locomotive Roster	51
Editing Rostered Locos.....	51
Function Labelling Web Page.....	52
Driving Rostered Locomotives using Wifitrax Web Throttle	53
Driving multiple locomotives with Web Throttle.	54
Operational Mode Programming (Programming on the Main).....	55
Downloading Locomotives to a File	57
Accessing the Roster Download File on Windows 10	59
Accessing the Roster Download File on Apple IOS	61
Accessing the Roster Download File on Android	61

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Uploading a Previously Downloaded Locos File	62
Accessories.....	64
Adding, Deleting and Moving Accessories Up or Down.....	64
Clearing the Entire Accessory List	65
Editing Listed Accessories	65
Accessory Initialization.....	66
Operating Accessories from the Accessories List Page.....	66
Downloading Accessories to a File.....	67
Accessing the Roster Download File on Windows 10	68
Accessing the Accessory Download File on Apple IOS.....	70
Accessing the Roster Download File on Android	70
Uploading a Previously Downloaded Accessories File	71
Panels.....	72
Editing Panels.....	72
Setting Panel Properties	73
Adding and Positioning Turnouts.....	74
Adding Track	75
Adding Passive Features	76
Operating your Panel.....	77
Using Buttons on a Panel	77
Using Signals on a Panel.....	79
Saving and Restoring Panels	80
Uploading a Previously Downloaded Panels File	82
Routes	83
Adding, Deleting and Moving Routes Up or Down	83
Clearing the Entire Route List	84
Editing Listed Routes.....	84
Activating a Route.....	86
Downloading Routes to a File	86
Accessing the Route Download File on Windows 10.....	88
Accessing the Route Download File on Apple IOS	90
Accessing the Route Download File on Android.....	90
Uploading a Previously Downloaded Routes File	91
Advanced Consists	92
Adding and Deleting Consists	93

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Editing a Consist to Define its Locomotives and their Directions	93
Run Locos Independently of Consist.....	94
Adding a Locomotive to an Advanced Consist.....	94
Adding a non-rostered loco	95
Removing a Locomotive from an Advanced Consist.....	95
Replacing a Lead or Rear loco in an NCE Advanced Consist	95
Service Mode Programming	96
Operational Mode Programming (Programming on the Main).....	97
Factory Reset	98
Mounting Suggestions	99
Tips to Manage your Home Network.....	100
Connection to your Home Router.....	100
Home Net IP Address Assignment	100
Reserving a Fixed IP Address.....	102
More Information	104
FCC Information	105
EU Declaration of Conformity for WFD-26	106
EU Declaration of Conformity for WFD-27	107
EU Declaration of Conformity for WFD-28	108

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Table of Figures

Figure 1 Connections on the WFD-26.....	15
Figure 2 Connections on the WFD-27.....	17
Figure 3 Connections on the WFD-28.....	19
Figure 4 Connecting the WFD-27 Module to your Boosters, NCE Pro Cab, Track and Power.....	21
Figure 5 Connecting the WFD-27 Module to your Boosters, Track and Power.....	21
Figure 6 Connecting the WFD-28 Module to your Boosters, Track and Power.....	22
Figure 7 The Apple App Store page for WiThrottle.....	24
Figure 8 Connecting to the WFD-28 Wi-Fi Access Point.....	24
Figure 9 The iPad has connected to the WFD-28 Wi-Fi Access Point.....	25
Figure 10 The WiThrottle app Server screen.....	25
Figure 11 Connect manually if needed.....	26
Figure 12 The Address tab of WiThrottle. Select a loco to drive.....	27
Figure 13 The loco is successfully selected.....	27
Figure 14 The WiThrottle "Throttle" screen.....	28
Figure 15 Searching for the Engine Driver app in Google Play Store.....	29
Figure 16 The Engine Driver Throttle detail page in the play store.....	29
Figure 17 The Wi-Fi Connection page in the Android Settings app.....	30
Figure 18 WFD-28 Wi-Fi Access Point is visible.....	30
Figure 19 Connected to the WFD-28 Wi-Fi Access Point.....	30
Figure 20 The WFD-28 WiThrottle Server is discovered by the Engine Driver app on Android.....	31
Figure 21 Connecting manually to the WFD-28 WiThrottle Server.....	32
Figure 22 Selecting a locomotive by typing its DCC Address.....	32
Figure 23 The Throttle screen of Engine Driver with a locomotive selected to drive.....	33
Figure 24 Selecting the Network Options menu on the UWT-100.....	34
Figure 25 Select the Add Network option.....	35
Figure 26 Select Scan for Wi-Fi.....	35
Figure 27 Select the Wi-Fi Network of the WFD-28.....	36
Figure 28 The WFD-28 WiThrottle server has been found. Now save it!.....	36
Figure 29 Select a locomotive with a known DCC address.....	37
Figure 30 The WFD-2X Web Master Menu, Note: only the WFD-26 has the NCE Cabs Option.....	40
Figure 31 The WFD-2X General Settings Web Page, Note that only the WFD-27 has the Over Current Timeout.....	41
Figure 32 The Home Net Web Page (not all versions of the firmware have the WPS button).....	46
Figure 33 Downloading the FindModules.html Tool in Widows 10 Edge Browser.....	47
Figure 34 Open the Find Modules Tool once your Module is on your Home Net.....	48
Figure 35 FindModules Tool Display.....	48
Figure 36 The FindModules Tool has Found your WFD-2X module. Click on the URL to open the Main Menu.....	49
Figure 37 The WFD-2X Main Menu Opened from the Find Modules Tool.....	49
Figure 38 The Locomotive Roster Page.....	50
Figure 39 Deleting a loco from the roster.....	51
Figure 40 The Locomotive Roster Entry Edit Page. You can also access the Function labels from here.	51
Figure 41 The function labels displayed for a given locomotive.....	52
Figure 42 Editing a function key for a given locomotive.....	52

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Figure 43 The Drive Hyperlink in the Locomotive Roster Page. Click this to drive the loco.....	53
Figure 44 The Web Throttle Page for a Locomotive whose Function Names have all been Configured	54
Figure 45 Opening a new Web Throttle Tab or Window	55
Figure 46 The Hyperlink to enter Programming on the Main or Operational CV Programming for a Locomotive.....	56
Figure 47 The Operational CV Programming Page	56
Figure 48 Programming the Master Volume on a SoundTraxx Tsunami 2 Decoder	57
Figure 49 The Roster Download Page	58
Figure 50 A Download in Progress	59
Figure 51 Download Complete on Windows using Edge Browser.....	59
Figure 52 The Downloaded Roster File in Windows Explorer.....	60
Figure 53 A loco entry in a JSON Roster File	61
Figure 54 Opening a Previously Saved Locomotives File	62
Figure 55 The Chosen File to be Uploaded is Displayed	62
Figure 56 The Accessory List Page	64
Figure 57 Deleting an accessory from the list.....	65
Figure 58 The Accessory Edit Page.....	66
Figure 59 The Accessories Download Page.....	67
Figure 60 Accessory Download in Progress	68
Figure 61 Accessory Download Complete on Windows using Edge Browser.....	68
Figure 62 The Downloaded Roster File in Windows Explorer.....	69
Figure 63 Accessory Entry in a JSON Accessory List File	70
Figure 64 Opening a Previously Saved Accessories File	71
Figure 65 The Chosen File to be Uploaded is Displayed	71
Figure 66 The Panel List Screen	72
Figure 67 A New Panel Displayed in the Panel Editor.....	73
Figure 68 The Panel Properties Information.....	73
Figure 69 Adding Turnouts to a Panel.....	74
Figure 70 Positioning two turnouts.	75
Figure 71 Track Sections added to the Panel.....	76
Figure 72 Adding a Label to a Panel.....	76
Figure 73 The completed Panel for Valley Fork Station.....	77
Figure 74 Operating a Panel in Open Mode rather than Edit Mode	77
Figure 75 Selecting the Physical Channel for a Button.	78
Figure 76 Selecting the Type of Button.....	79
Figure 77 Using buttons to control a turnout.	79
Figure 78 Setting the Properties of a Signal in a Panel.	80
Figure 79 Setting the Physical Channels for a Two Aspect Signal.....	80
Figure 80 The Panels Download Page	81
Figure 81 Opening a Previously Saved Panels File	82
Figure 82 The Chosen File to be Uploaded is Displayed	82
Figure 83 The WFD-2X Route List	83
Figure 84 Deleting a route from the list.....	84
Figure 85 The Edit Page for a Newly Created Route.....	85
Figure 86 Choosing an Accessory to be Included in a Route	85
Figure 87 A Route with the First Step Added.....	86

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Figure 88 The Routes Download Page	87
Figure 89 Route Download in Progress.....	88
Figure 90 Route Download Complete on Windows using Edge Browser	88
Figure 91 The Downloaded Routes File in Windows Explorer	89
Figure 92 Route Entry in a JSON Route List File	90
Figure 93 Opening a Previously Saved Routes File	91
Figure 94 The Chosen File to be Uploaded is Displayed	91
Figure 95 Two locomotives in the Roster which will form an NCE Advanced Consist.....	92
Figure 96 The Advanced Consists Page.....	92
Figure 97 Editing a New Advanced Consist.....	93
Figure 98 Selecting a Loco to Include in an NCE Advanced Consist.....	94
Figure 99 The Service Mode Programming (Programming Track) page	96
Figure 100 Factory reset confirmation page.....	98
Figure 101 Mounting the WFD-2X on a board.....	99
Figure 102 Using ipconfig to find your computer's IP address and default gateway	101
Figure 103 Access your router by using the IP Address of your default gateway in a browser	101
Figure 104 A typical router admin page.....	101
Figure 105 Typical "Attached Devices" page of a router	102
Figure 106 Use the IP Address to open the main menu web page.....	102
Figure 107 An IP Address reservation table in a router	103
Figure 108 Adding an address reservation	103
Figure 109 Identifying Illustration for WifiTrax Model WFD-26 EU Declaration of Conformity.....	106
<i>Figure 109 Identifying Illustration for WifiTrax Model WFD-27 EU Declaration of Conformity</i>	<i>107</i>
Figure 109 Identifying Illustration for WifiTrax Model WFD-28 EU Declaration of Conformity.....	108

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Scope of this Document

This document describes detailed use of the following Wifitrax products:

WFD-26 Wi-Fi/DCC Trackside Command Station Module with NCE Cab Bus Support. For a simple starting guide, please see the leaflet at <http://www.wifitrax.com/appNotes/quickStart/WFD-26-Quick-Start.pdf>

WFD-27 Wi-Fi/DCC Trackside Command Station/Booster Module. For a simple starting guide, please see the leaflet at <http://www.wifitrax.com/appNotes/quickStart/WFD-27-Quick-Start.pdf>

WFD-28 Wi-Fi/DCC Trackside Command Station Module. For a simple starting guide, please see the leaflet at <http://www.wifitrax.com/appNotes/quickStart/WFD-28-Quick-Start.pdf>

This manual applies to firmware versions listed below, (i.e., version numbers 1.X.X). Some features described may not be present in earlier versions.

Product	Description	Firmware Version
WFD-26	Wi-Fi DCC Command Station with NCE Cab Bus Support	1.0.0 and Later
WFD-27	Wi-Fi DCC 5 Amp Command Station/Booster	2.0.0 and Later
WFD-28	Wi-Fi DCC Command Station	1.0.0 and Later

Please note that sections in this manual may apply only to a subset, one or more, or all of these products. This is identified in each section.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

What do the WFD-26 and WFD-28 Wi-Fi/DCC Trackside Command Stations do?

This section applies to WFD-26 and WFD-28 only

The WFD-26 and WFD-28 (hereinafter referred to as WFD-26/28) are Wi-Fi DCC Command Stations. When connected to one or more suitable DCC boosters, they allow you to drive your DCC trains and control accessories from hand-held untethered controllers. They provides a DCC Command Bus output to one or mode DCC Boosters that, connect to track and control locomotives and accessories fitted with DCC decoders. They provide a DCC Program Track output so that DCC Configuration Variable (CV) values can be written and read back in DCC controllers.

- You can drive trains and control accessories using a smart phone or tablet as a hand-held throttle provided it has Wi-Fi capability and you have installed one of our recommended apps in Table 1 that use the Hoffman WiThrottle Protocol (e.g., Engine Driver or WiThrottle).
- You can drive trains and control accessories using a smart phone, tablet or computer as a hand-held throttle provided it has Wi-Fi capability with any Web Browser using the Web Based Throttle page built into the WFD-26/28.
- You can use a special-purpose hand-held throttle designed to control trains and accessories using the Hoffman WiThrottle protocol such as the UWT-100 from Train Control Systems (TCS).
- You can configure the WFD-26/28 and program CVs using its in-built web pages from one of the apps from any web browser on a phone, tablet or PC.
- You can configure Routes and/or panels to control Switches and Signals using a web browser on a computer or tablet.

Four throttles at a time can join the WFD-28 Wi-Fi Access Point, but you can increase this limit to six using Home Net mode as described later in this manual.

You don't need to install JMRI to use the WFD-26/28

If you have been using an app on your phone to drive trains, via a computer running JMRI, you can now bypass JMRI and connect your phone directly to the WFD-26/28.

The NCE Cab Bus

This section applies only to the WFD-26.

The WFD-26 provides a capability to act as a Bus Master for an NCE Cab Bus. It allows you to connect most NCE equipment that is designed to work with the NCE Cab Bus. Examples are the NCE Pro Cab, the NCE Power Cab (which will work in Pro Cab mode) the NCE Cab06, the NCE USB Interface Module. The WFD-26 Cab Bus also supports Wifitrax Cab Bus products such as WFD-30 and WFD-31.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

What does the WFD-27 Wi-Fi/DCC Trackside Command Station/Booster do?

This section applies to WFD-27 only

The WFD-27 allows you to drive your DCC trains and control accessories from hand-held untethered controllers. It provides a DCC track output to power and control locomotives and accessories fitted with DCC decoders. It is therefore both a DCC Command Station *and* a DCC Booster in one module. It also provides a program track output to program configuration variable (CV) values in DCC controllers.

- You can drive trains and control accessories using a smart phone or tablet as a hand-held throttle provided it has Wi-Fi capability and you have installed one of our recommended apps in Table 1.
- You can use a special-purpose hand-held throttle designed to control trains and accessories using the Hoffman WiThrottle protocol such as the UWT-100 from Train Control Systems (TCS).
- You can use a Windows or Apple computer, such as a laptop or desktop, with a recommended installed app from Table 1 to control trains and accessories.
- You can configure the WFD-27 and program CVs using its in-built web pages from one of the apps in Table 1 or from any web browser on a phone, Tablet or PC.

Four throttles at a time can join the WFD-27 Wi-Fi Access Point, but you can up this limit to six using “Control Loss Timeout

This value determines the amount of time in seconds that a locomotive will continue running if the throttle loses contact with it.

Some apps, WiThrottle on IOS in particular, deliberately stop any locos if the user leaves the Throttle screen for more than this period of time. The logic of this is clear in that you really should have your locomotive under continuous control. However, sometimes when dual throttles are used on WiThrottle, you may want to select and start another loco (or consist) on the second throttle. By default, the timeout is 15 seconds, so you should have enough time. However, if that is not enough, you can increase this value up to 60 seconds.

Engine Driver on Android actually does not do this – just a different philosophy.

The timeout also is effective if your throttle app loses contact because you are out of range.

Note however, that if you release a loco that is running, either from WiThrottle, Engine Driver or UWT-100, the loco will continue running until you reselect it and bring it to a stop. You may or may not like this, so you may adopt the rule that all locos should be stopped before deselecting them. However, it can be useful where you want to alternate between controlling two or more locos on the TCS UWT-100 or other single loco device. It’s your call.

Fast Clock (FC) Time

This displays the current time recorded by the Fast Clock within the module. It is always displayed in 24hr format on this page. The fast clock is distributed to cabs connected to the WFD-2X module, whether by Wi-Fi, as Engine Driver or WiThrottle apps, the Wifitrax Web Throttle screen or, in the case of WFD-26 any connected NCE Cab such as a Pro Cab. So all will show the time of day displayed here.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

FC Ratio

This is the multiplier applied to normal time to give the calculated FC time. It may be set to any integer between 1 and 15. For example, if it is set to 1, the FC will display real time. If it is set to 2, the FC will be twice as fast, so an hour will only last 30 minutes. Similarly 3, 4 etc. up to 15. If the FC ratio is set to 15, one hour will only last 4 minutes!

FC Start Hour

This field specifies the hour of the day at which the FC will start on power on. It will also revert to this value if the FC Reset button is clicked. Only whole numbers between 0 and 23 are permitted. The zero value is 12:00 AM and 23 is 11:00 PM.

FC 24 Hr Format

If this box is checked, the FC will display in 24 Hour format, i.e. 19:00, on Wifitrax Web Throttle pages, otherwise it will display in AM/PM format, e.g. 07:00 PM. This will also affect the display format on NCE Cabs connected to the WFD-26 such as a Pro Cab. The display format on apps such as WiThrottle and Engine Driver is set within the app itself.

FC Pause Button

Clicking this button will pause the FC if running and start it again, if it is paused. Clicking this button does not require the Save button to also be clicked.

FC Reset Button

Clicking this button will reset the FC to the value displayed in the Fast Clock (FC) Time textbox. Clicking this button does not require the Save button to also be clicked. Note that a feature is provided that resets the FC to any desired hour of the day by entering the required hour in the FC Start Hour textbox and clicking this FC Reset button. The permanent stored start hour is only modified if you click the Save button.

DCC Accessory Cmd. Repeats

This entry may be set from 1 to 4 to specify the number of times a command to an accessory will be repeated.

Refresh

Clicking this hyperlink will refresh the Settings screen from the stored values including the displayed fast clock.

- Home Net Web Page" mode as described later in this manual.

You don't need to install JMRI to use the WFD-27

If you have been using an app on your phone to drive trains, via a computer running JMRI, you can now bypass JMRI and connect your phone directly to the WFD-27.

What is WiThrottle protocol?

WiThrottle protocol is a set of commands and data formats, authored by B. Hoffman and used by JMRI, that allows devices such as iPhone, Android phones and tablets to control trains and turnouts through a WiThrottle server. It has become something of a standard and is used by other products. You can find technical information here:

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

<https://www.jmri.org/help/en/package/jmri/jmrit/withrottle/Protocol.shtml>

What is JMRI?

JMRI (Java Model Railroad Interface) is a system of computer programs and support software that can be installed on a computer to do many things with your model railroad including running trains, controlling turnouts and programming DCC decoders. JMRI provides a wiThrottle server to allow you to run trains from phones etc. You can learn about JMRI at <https://www.jmri.org/>

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

WFD-26 Connections and Indicators

This section applies only to WFD-26

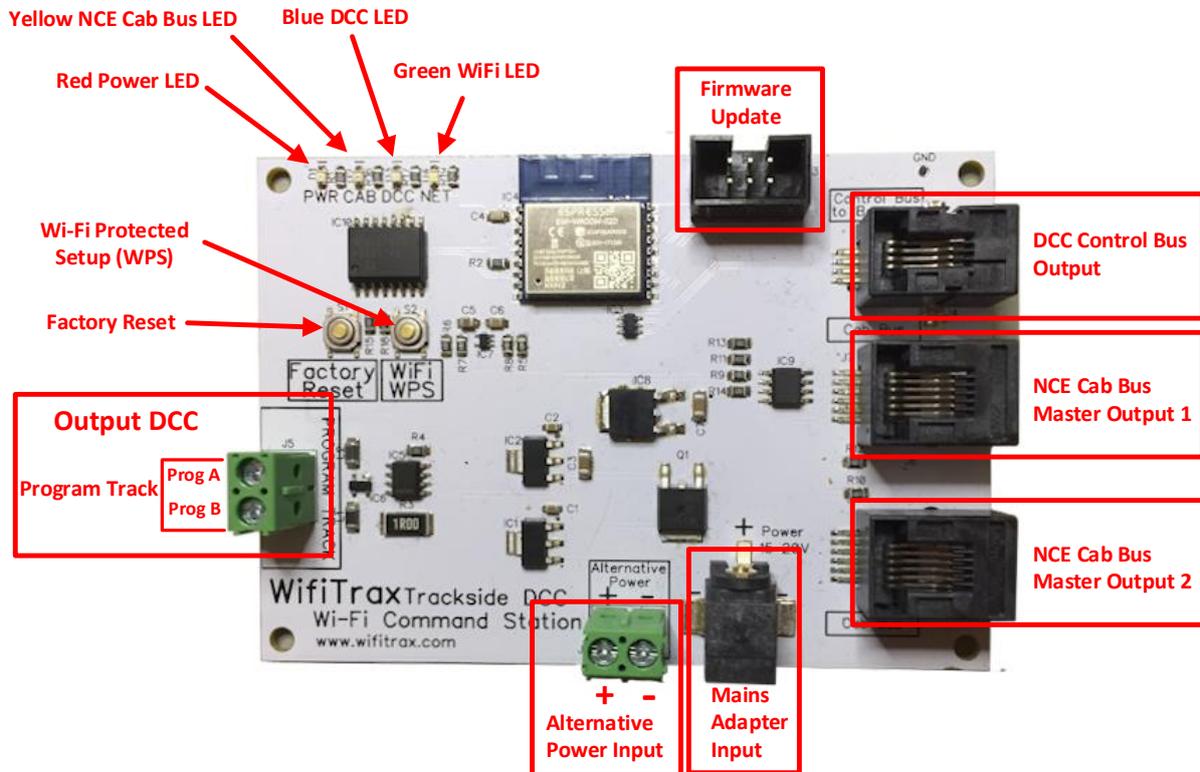


Figure 1 Connections on the WFD-26.

Figure 2 shows the WFD-26 module with its connectors labelled. There is one pair of screw terminals on the left of the module. These supply a programming track. The connections to the track may be made either way around, since DCC is reversible.

On the right of the diagram, the upper 6-pin ribbon connector is for firmware upgrade. You can connect an FWA-20 Workshop Adapter here and use the Wifitrax Workshop software to upgrade firmware in the WFD-26 from the Wifitrax Support web site using a Windows computer.

Below this is the DCC Control Bus Output Connector that supplies balanced DCC to connected Boosters.

Below the Control Bus output in the diagram, are two NCE Cab Bus connectors. You can connect almost any piece of NCE equipment designed to work with an NCE Cab Bus to either of these connectors. Examples are a Pro Cab, a Power Cab which will enter Pro Cab mode, and an NCE USB Adapter. You can connect both connectors to a Cab Bus extending through several NCE Universal Throttle Panels with cab devices connected. You can also connect one or more Wifitrax WFD-30 or WFD-31 Cab Bus/Wi-Fi adapter modules.

At the lower right, the Power Adapter connector is used to connect a suitable mains adapter to power the module. Use a 12-18 V DC mains adapter rated at up to 6 Amp. The connector must be 2.5mm dia. pin, 5.5mm outer diameter, center positive. The power supply can be rated at 2 Amp or more.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

The screw terminals also on the lower right can be used to supply power as an alternative to the power adapter. Again, the voltage and current requirements are as above. The power **MUST** be connected the correct way around. The module is protected against reverse connection, but will not operate in such conditions. If you use the Power Adapter to supply power, you can use these terminals as an output to supply other modules but be careful not to overload your power adapter. If you use these terminals to supply one booster, the capacity must be at least 6 Amps. If you use more than one booster, each should have its own power supply.

WFD-26 LED Indicators

Red LED: The LED is illuminated when power is supplied to the module.

Yellow LED: The LED lights when one or more Cabs are present on the Cab Bus and are recognised by the WFD-26 Cab Bus Controller.

Green LED: When WFD-28 is in direct mode, the LED flashes when Wi-Fi traffic occurs. When WFD-28 is in home-net mode, the LED is illuminated constantly to indicate successful connection to your router. It will flash off briefly when Wi-Fi traffic occurs.

Blue LED: The LED lights continuously when the WFD-28 is supplying DCC on its Control Bus output to connected boosters.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

WFD-27 Connections and Indicators

This section applies only to the WFD-27

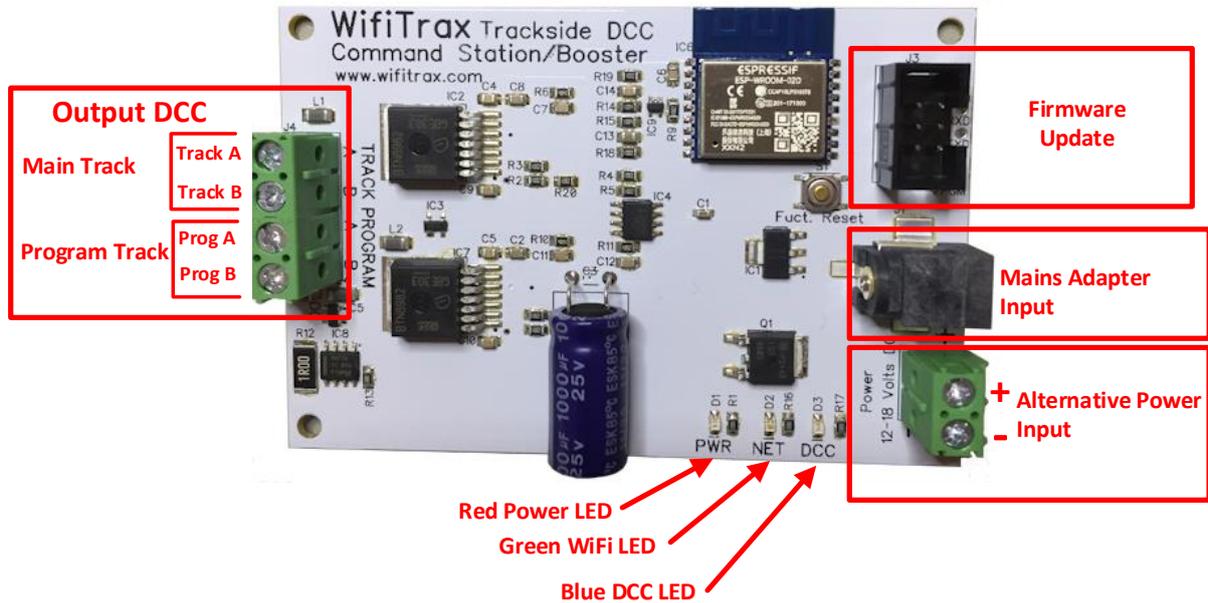


Figure 2 Connections on the WFD-27.

Figure 2 shows the WFD-27 module with its connectors labelled. There are two pairs of screw terminals on the left of the module. The upper pair in the diagram provide DCC to your main track. The lower pair supply a programming track. The connections to the track may be made either way around, since DCC is reversible.

On the right of the diagram, the upper 6-pin connector is for firmware upgrade. You can connect an FWA-20 Workshop Adapter here and use the Wifitrax Workshop software to upgrade firmware in the WFD-27 from the Wifitrax Support web site using a Windows computer.

The Power Adapter connector is used to connect a suitable mains adapter to power the module. Use a 12-18 V DC mains adapter rated at up to 6 Amp. The connector must be 2.5mm dia. pin, 5.5mm outer diameter, center positive. If you use a power supply rated at less than 6 Amp, it should have overload protection since the WFD-27 is designed to cut power to the track at 6 Amp and in such a case, the adapter will detect overload at lower currents than this. You can use a power supply rated at greater than 6 Amp in which case the WFD-27 will protect the track against short circuits on the track.

The screw terminals on the lower right can be used to supply power as an alternative to the power adapter. Again, the voltage and current requirements are as above. The power MUST be connected the correct way around. The module is protected against reverse connection, but will not operate in such conditions. If you use the Power Adapter to supply power, you can use these terminals as an output to supply other modules but be careful not to overload your power adapter.

WFD-27 LED Indicators

Red LED: The LED is illuminated when power is supplied to the module.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Green LED: When WFD-27 is in direct mode, the LED flashes when Wi-Fi traffic occurs. When WFD-27 is in home-net mode, the LED is illuminated constantly to indicate successful connection to your router. It will flash off briefly when Wi-Fi traffic occurs.

Blue LED: The LED lights continuously when the WFD-27 is supplying DCC to your track. It flashes if the WFD-27 goes into overload protection in the event of a short.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

WFD-28 Connections and Indicators

This section applies only to WFD-28

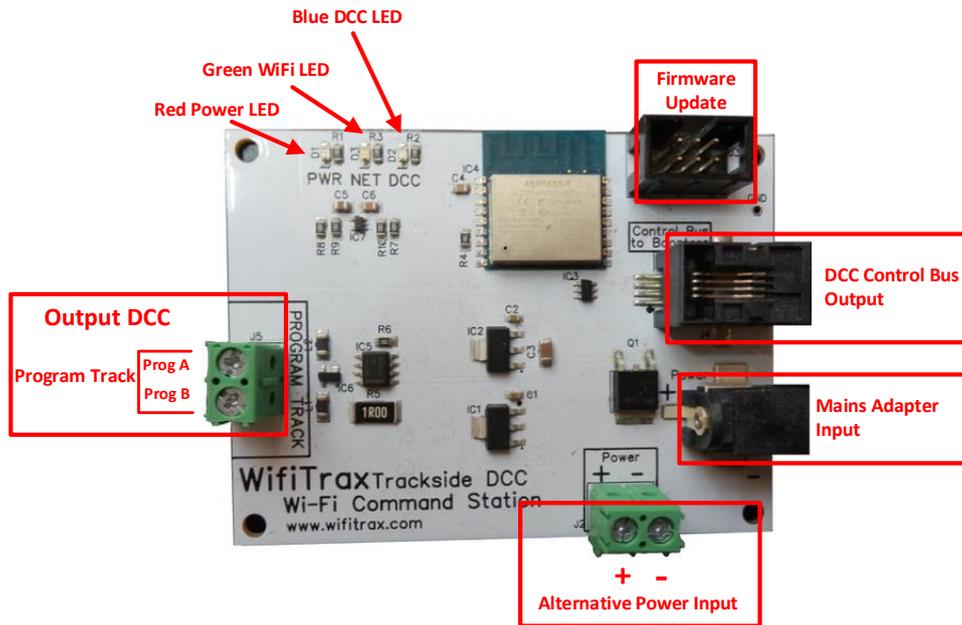


Figure 3 Connections on the WFD-28.

Figure 2 shows the WFD-28 module with its connectors labelled. There is one pair of screw terminals on the left of the module. These supply a programming track. The connections to the track may be made either way around, since DCC is reversible.

On the right of the diagram, the upper 6-pin connector is for firmware upgrade. You can connect an FWA-20 Workshop Adapter here and use the Wifitrax Workshop software to upgrade firmware in the WFD-28 from the Wifitrax Support web site using a Windows computer.

Below this is the DCC Control Bus Output Connector that supplies balanced DCC to connected Boosters.

At the lower right, the Power Adapter connector is used to connect a suitable mains adapter to power the module. Use a 12-18 V DC mains adapter rated at up to 6 Amp. The connector must be 2.5mm dia. pin, 5.5mm outer diameter, center positive. The power supply can be rated at 2 Amp or more.

The screw terminals on the lower right can be used to supply power as an alternative to the power adapter. Again, the voltage and current requirements are as above. The power **MUST** be connected the correct way around. The module is protected against reverse connection, but will not operate in such conditions. If you use the Power Adapter to supply power, you can use these terminals as an output to supply other modules but be careful not to overload your power adapter. If you use these terminals to supply one booster, the capacity must be at least 6 Amps. If you use more than one booster, each should have its own power supply.

WFD-28 LED Indicators

Red LED: The LED is illuminated when power is supplied to the module.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Green LED: When WFD-28 is in direct mode, the LED flashes when Wi-Fi traffic occurs. When WFD-28 is in home-net mode, the LED is illuminated constantly to indicate successful connection to your router. It will flash off briefly when Wi-Fi traffic occurs.

Blue LED: The LED lights continuously when the WFD-28 is supplying DCC on its Control Bus output to connected boosters.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Let's get Started!

Connecting your new WFD-26 Command Station/Booster

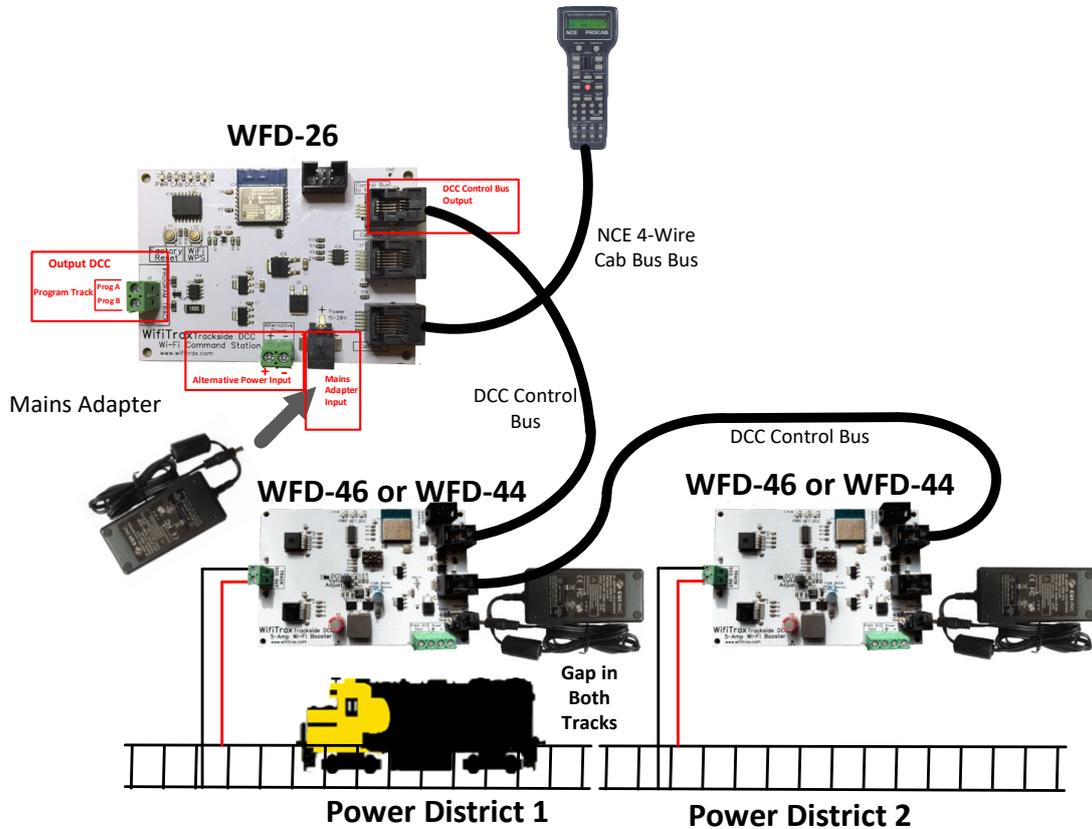


Figure 4 Connecting the WFD-27 Module to your Boosters, NCE Pro Cab, Track and Power

Connecting your new WFD-27 Command Station/Booster

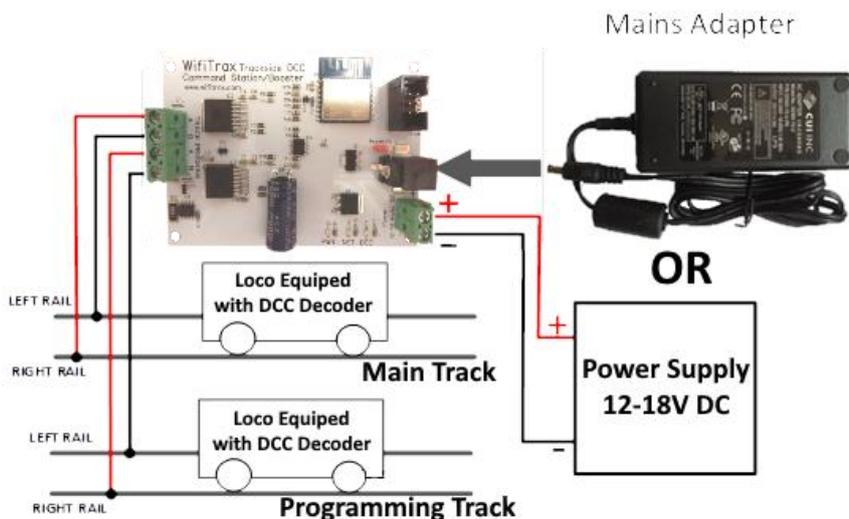


Figure 5 Connecting the WFD-27 Module to your Boosters, Track and Power

- (1) Mounting: Mount your WFD-27 Module in a convenient location where nothing metal will touch it, either in a plastic box or at a convenient location on your baseboard or fascia. Please see the

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

“Mounting Suggestions” section. As a minimum, make sure it will not be dragged around by pulling on a connected cable and touch on some metal object. **Do not let the unit touch powered track or it may be damaged beyond repair!**

- (2) Connect: Connect the Main Track outputs to the track of your layout. If the wires are long use a heavy gauge wire to avoid voltage losses due to the resistance of the wire.

Connecting your new WFD-28 Command Station/Booster

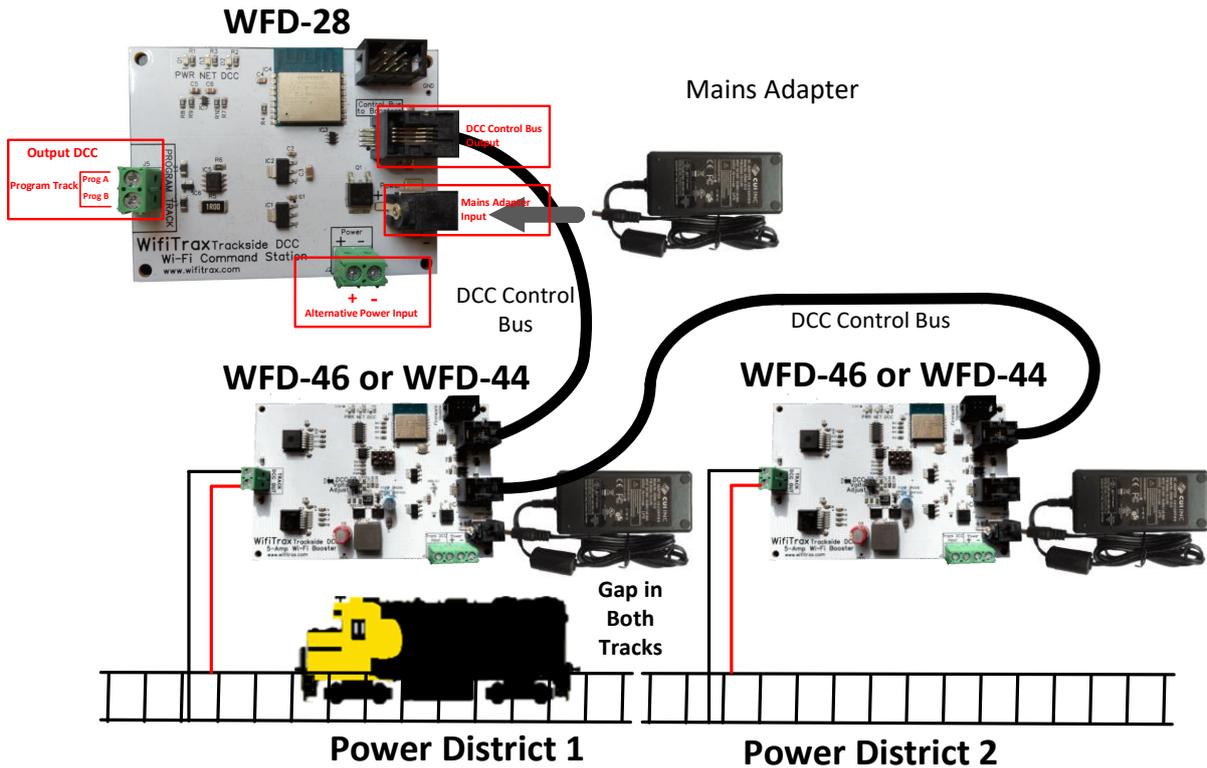


Figure 6 Connecting the WFD-28 Module to your Boosters, Track and Power

- (3) Mounting: Mount your WFD-28 Module in a convenient location where nothing metal will touch it, either in a plastic box or at a convenient location on your baseboard or fascia. Please see the “Mounting Suggestions” section. As a minimum, make sure it will not be dragged around by pulling on a connected cable and touch on some metal object. **Do not let the unit touch powered track or it may be damaged beyond repair!**
- (4) Connect: Connect a suitable Power Adapter to your module or supply power through the Alternative Power Connectors. Connect the Control Bus output of your WFD-28 to a DCC Booster such as Wifitrax WFD-46 as shown in Figure 6.
- (5) You must also supply power to your boosters. The WFD-46 requires 18V DC power at minimum so it is best to use a separate adapter. However, if you have a large, high current rated power supply, you can share the power between boosters using the Alternative Power inputs instead of the Power Adapter inputs.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Driving your First Trains

This Section applies to WFD-26, WFD-27 and WFD-28

You can drive trains using any of the Apps in Table 1. WiThrottle and Engine Driver are apps that use the [WiThrottle protocol](#) and provide driving of trains, and control of accessories and routes. You can also configure the WFD-28 using its [Web Pages](#) which are accessible using WiThrottle (Full Version) or Engine Driver or indeed any web browser via the device's default URL <http://192.168.7.1>. You can also drive trains using just a browser such as Safari on Apple, Chrome on Android or Edge on Windows.

App Name	Author	Get From:	Windows 10	Android	Apple IOS	Notes
WiThrottle	Brett Hoffman	Apple App Store	NO	NO	YES	
WiThrottle Lite	Brett Hoffman	Apple App Store	NO	NO	YES	No Accessories, No web page
Engine Driver	Steve Todd	Google Play Store	NO	YES	NO	
Train Throttle	Drew Hoffman	Microsoft Store	YES	NO	NO	No Web Pages
Safari, Chrome or Edge	Apple, Microsoft, Google	Usually already present	YES	YES	YES	Use WFD-26/27/28 in-built throttle page

Table 1 Recommended Apps that work with the WFD-28

Getting Started with WiThrottle on Apple IOS

- (1) On your iPhone, iPad or iPod device, make sure you are connected to the internet then go to the home screen and run the App Store app:



- (2) Tap Search at the bottom right, type "WiThrottle" in the Search box at the top, tap the Search key, and tap either the Lite or full version, tap "Get" to download and install. This is a great app and the full version is well worth the small fee so we definitely recommend buying it! Don't open the app yet.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

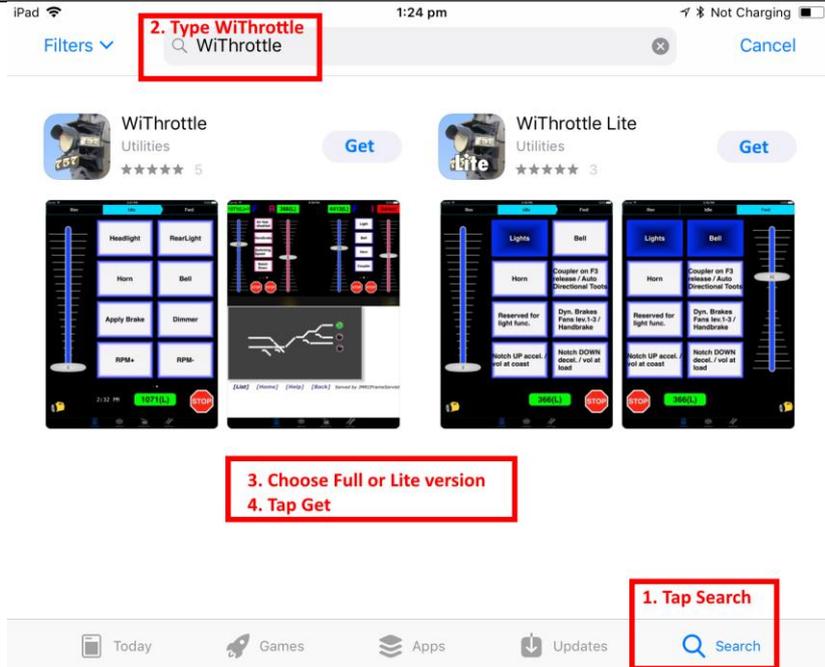


Figure 7 The Apple App Store page for WiThrottle

- (3) Before opening the app, make sure your WFD-28 is connected, powered up and there is a locomotive on the track with a known DCC address. Both the red power LED and the blue DCC indicator LED should be alight.
- (4) Now run the Settings app on your iPhone (or iPad etc.):



- (5) Tap Wi-Fi on the left-hand menu. You should see a collection of available Wi-Fi Access Points on your right. Look for one that is of the form wftrx_WFD2X_1_XXXXXXX_7, where XXXXXXXX is the serial number of your unit that appears on its bag and the unit itself. Tap that Wi-Fi Access Point as Figure 8.

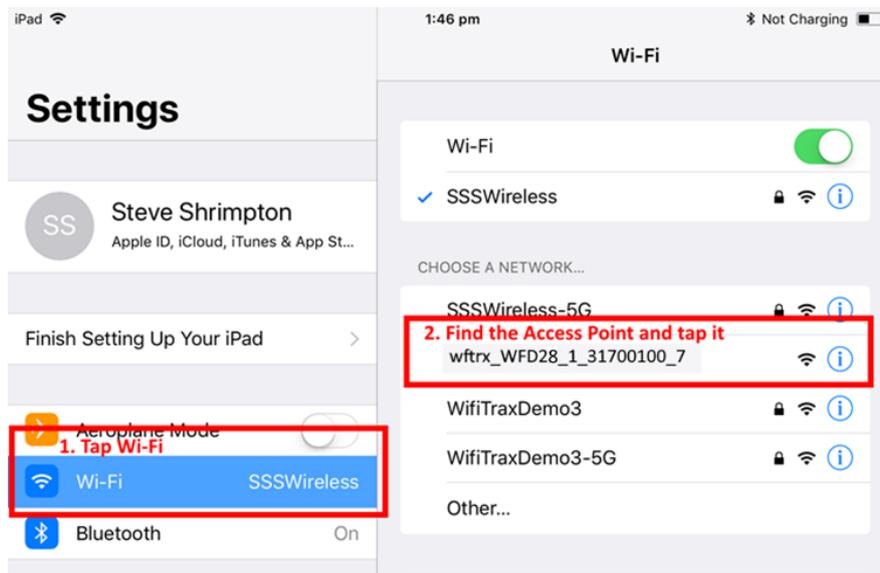


Figure 8 Connecting to the WFD-28 Wi-Fi Access Point

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

- (6) No password is required and after a few moments you should see that it has connected as in Figure 9. The left-hand menu shows Wi-Fi wftrx_WFD2X_1_XXXXXXX_7. You will not be able to access the internet while you are connected to the Wi-Fi access point of the WFD-2X, but consult the manual to find out how to put everything on your home network.

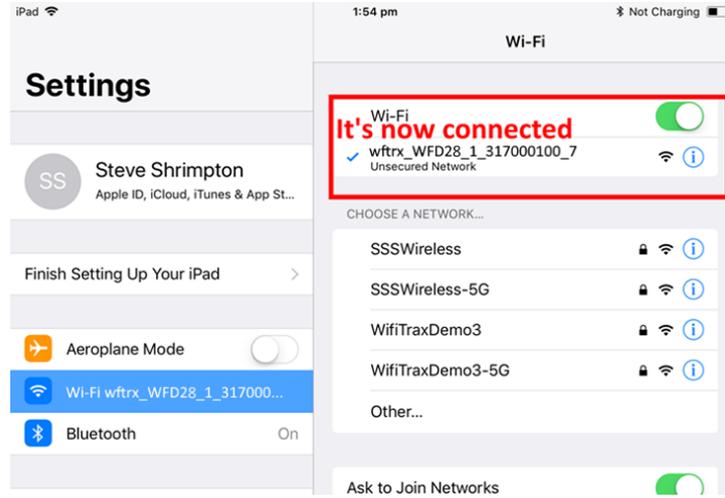


Figure 9 The iPad has connected to the WFD-28 Wi-Fi Access Point

- (7) Go to the Home Screen and find and open the WiThrottle app by tapping its icon:



- (8) You should see the connection screen headed by “wftrx_WFD2X_1_XXXXXXX_7”. The WFD-2X is a WiThrottle Server and it should appear in the “Available WiThrottle Servers” section, identified by its serial number. If it is visible, tap it as Figure 10. You may sometimes need to wait a few moments or go back to the home screen and tap the WiThrottle icon again.

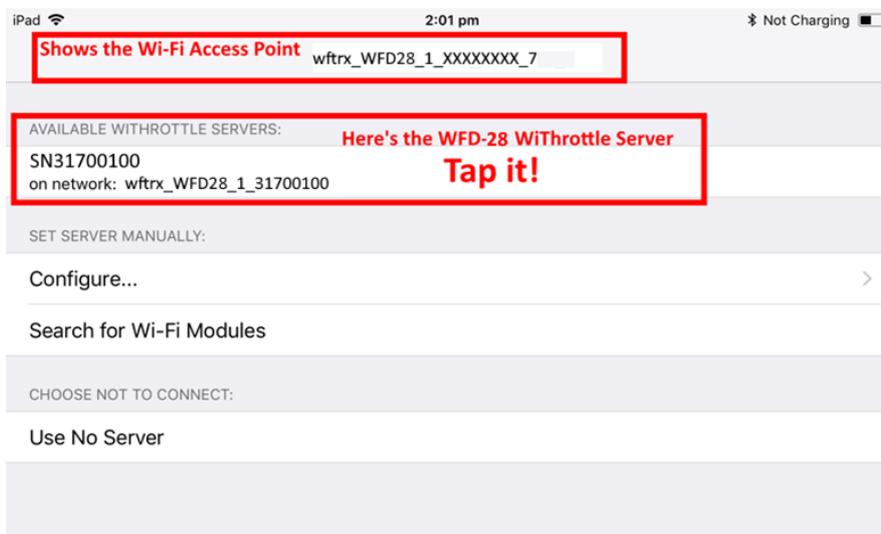


Figure 10 The WiThrottle app Server screen

- (9) If for some reason there is nothing in the “Available WiThrottle Servers” list, tap “Configure” or “Search for Wi-Fi Modules” and follow a. or b below.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

- a. Configure: The WFD-28 always has the IP Address 192.168.7.1 on its own access point, so type this IP Address. Then type 12090 into the Port textbox and tap the Connect button as Figure 11. The green network LED on your WFD-28 should now flash regularly to show that the app is communicating with it.
- b. Search for Wi-Fi Modules. The same as a. but IP Address and port are pre-entered, so just tap “Connect”.

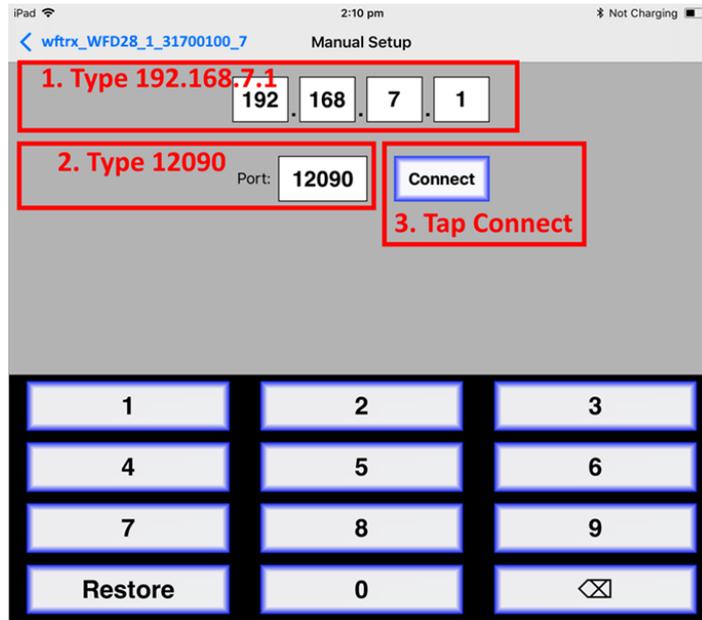


Figure 11 Connect manually if needed

(10) Now tap the “Address” tab at the bottom (it might go there automatically), tap Keypad and key in the DCC address of the locomotive that you wish to drive then tap the Set button as Figure 12.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

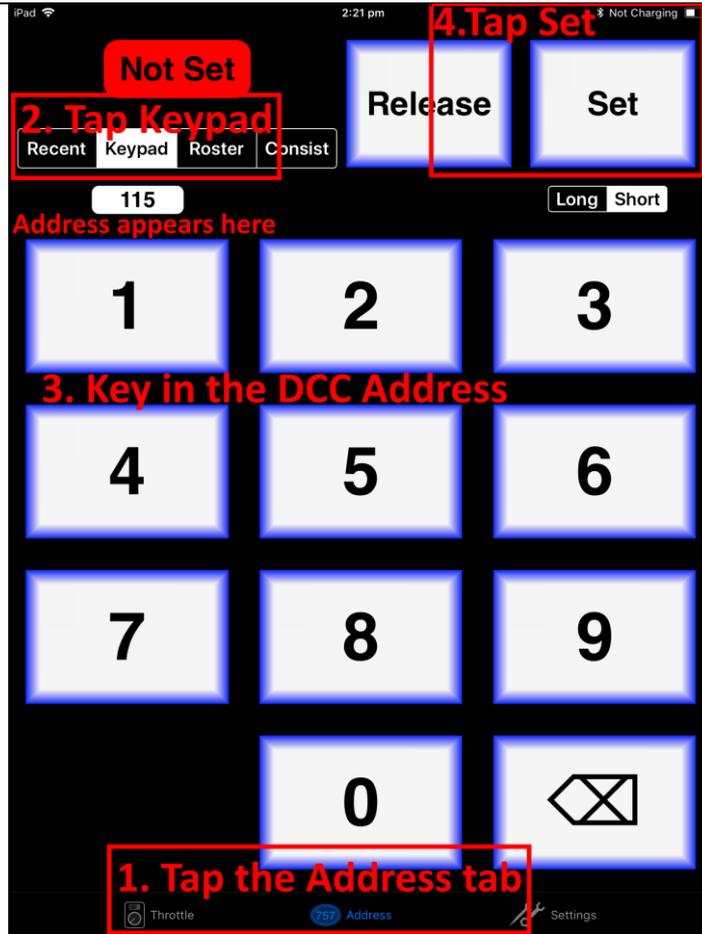


Figure 12 The Address tab of WiThrottle. Select a loco to drive

(11)The red button at the top left should turn green to show the loco is selected as Figure 13.

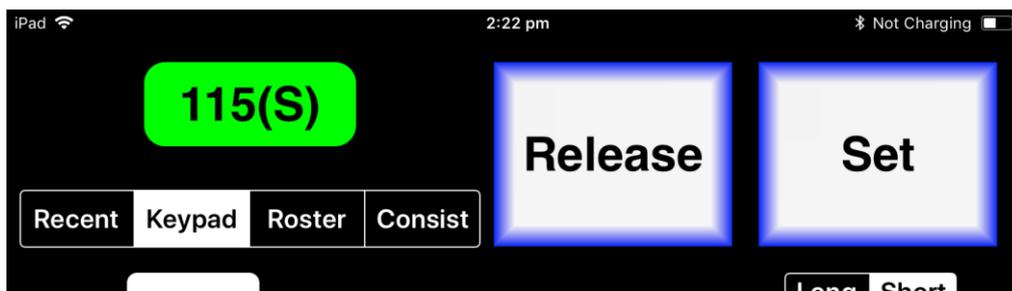


Figure 13 The loco is successfully selected

(12)Tap the Throttle tab at the bottom-left of the screen and you can begin driving as Figure 14. Each time you make a change to the locomotive's state, both the green network LED and the blue Cab Bus LED will flash.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

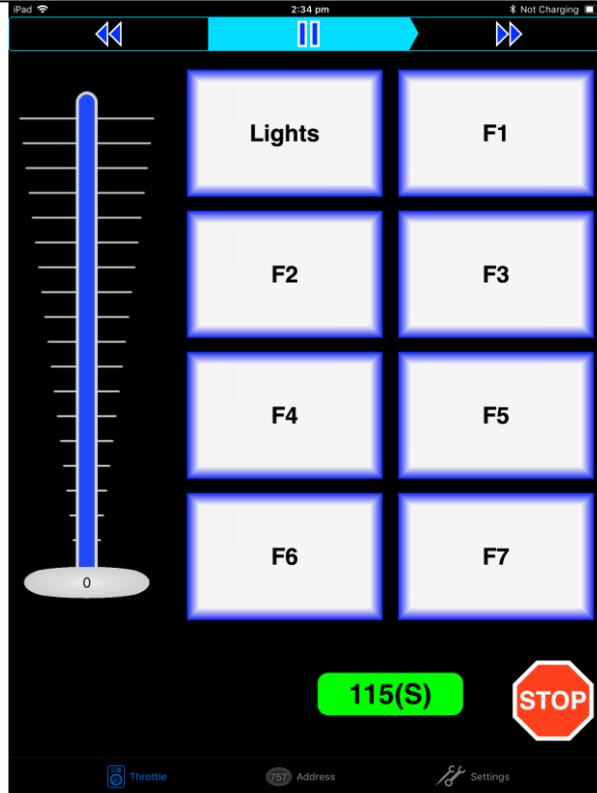


Figure 14 The WiThrottle "Throttle" screen

(13) Please consult the WiThrottle manual for more information. There are lots of screen options and some allow two locos to be driven at the same time. WFD-28 supports this. Go to:

<https://www.withrottle.com/html/manual.html>

Please note that WiThrottle, has many features that may vary according to the version that you install. WifiTrax has no control over the features of WiThrottle, but has tested carefully its operation with our product. If you have trouble working with WiThrottle and our module, please email us your problem rather than using the WiThrottle support. WiThrottle support persons are very helpful with WiThrottle features but may not know details of WifiTrax products, so please do not expect it. Support email: wifitrax@steveshrimpton.com or check our website.

Making it Easier Next Time

You can make connecting to the WFD-28 easier by setting your iPhone to automatically connect to the wftrx_WFD2X_1_XXXXXXX_7 access point whenever your system is powered up. Do this by going to the Settings page on your iPhone, connecting to the wftrx_WFD2X_1_XXXXXXX_7 access point, then tapping it. You will see a list of options. Make sure the Auto-Join option is enabled – the Slide Switch will be green. Then, when you turn on your railroad power, after a few seconds your iPhone will join. To make this reliable, you must disable Auto-Join on any other Wi-Fi Access points such as your home router. You can always enable it again when you have finished your model railroad session.

The WiThrottle app has an option "Use Automatic Network Configuration". Set that to "on" and WiThrottle should connect automatically if your WFD-28 is powered up.

Use the recent option when selecting locos to save typing the DCC address each time, but please read the section "Locomotive Roster" to find out about defining rosters that you can pick from.

It is a good idea to always release locomotives before powering down your WFD-28. If for some reason you can't select a locomotive, just restart the WiThrottle app by tapping its icon on the home screen.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Getting Started with Engine Driver on Android

- (1) On your Android phone or tablet, make sure you are connected to the internet and run the Google Play Store app from the home screen:



- (2) Search for Engine Driver by M. Steve Todd, download and install it. To do this:
 - a. Tap in the “Search” Text Box at the top,
 - b. Type “Engine Driver” into the text box and click the Search button, make sure the correct app “Engine Driver Throttle” displays as in Figure 15,
 - c. Tap on the “Engine Driver Throttle app” (Figure 15). The app detail page displays.
 - d. Tap the Install button (Figure 16). The app downloads and install on your device. Do not open the app until after the next steps.

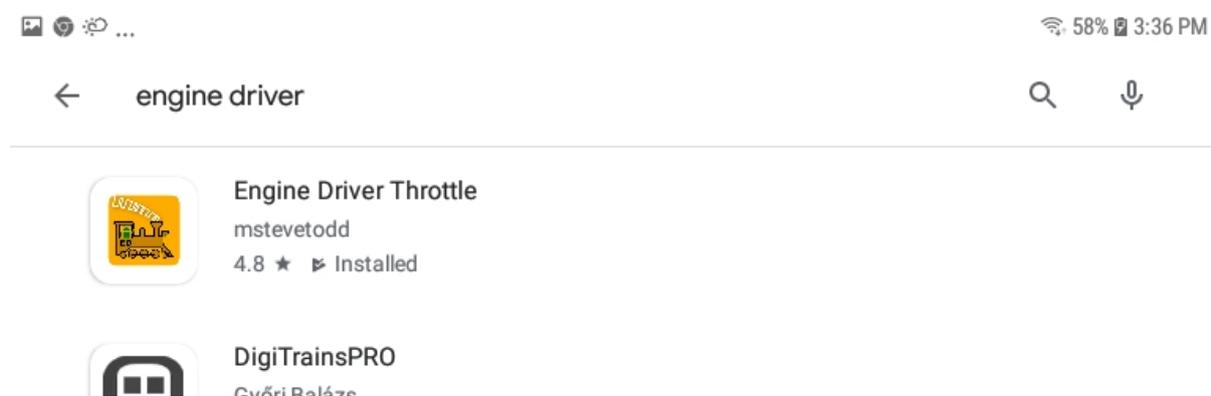


Figure 15 Searching for the Engine Driver app in Google Play Store

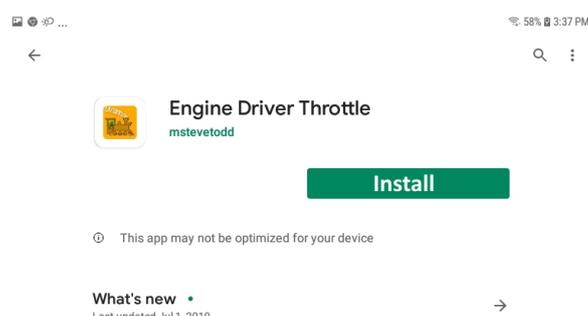


Figure 16 The Engine Driver Throttle detail page in the play store

- (3) Make sure power is on, the WFD-28 is connected to the track and there is a locomotive on the track with a DCC address that you know. Both the red power LED should and the blue DCC indicator LED should be alight constantly.
- (4) Tap the Home button, and run the settings app on your Android phone.



- (5) Tap Connections on the left, then Wi-Fi on the right as Figure 17 (This may vary with different versions of Android).

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

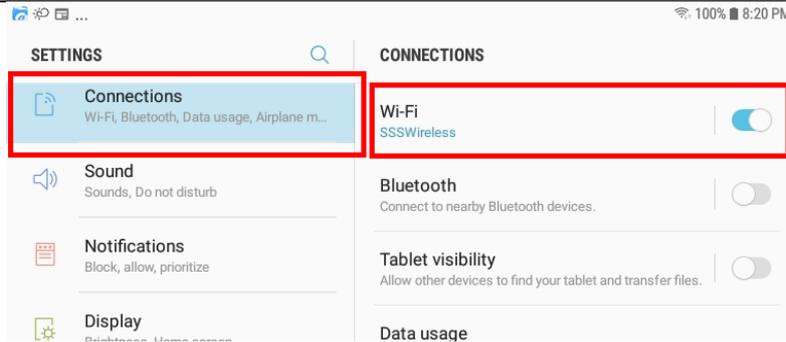


Figure 17 The Wi-Fi Connection page in the Android Settings app

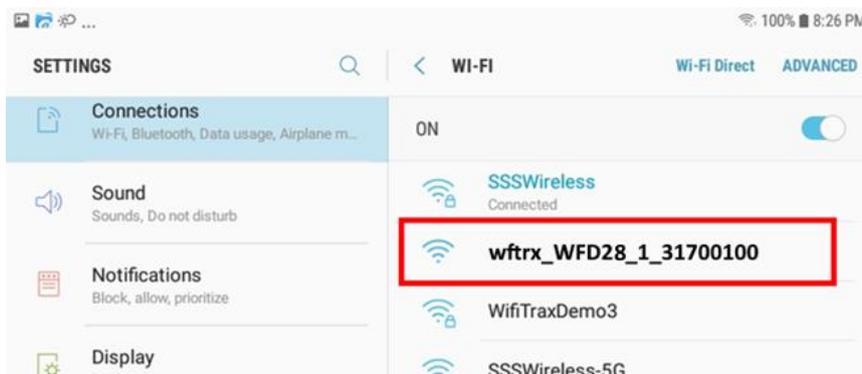


Figure 18 WFD-28 Wi-Fi Access Point is visible

- (6) You now see a collection of available Wi-Fi Access Points. Look for one that is of the form `wftrx_WFD2X_1_XXXXXXXX_7`, where `XXXXXXXX` is the serial number of your unit that appears on its bag and the unit itself, like Figure 18. Tap that Wi-Fi Access Point – no password is required – and wait for it to connect. You will not be able to access the internet while you are connected to the Wi-Fi access point of the WFD-2X but consult the manual later to see how you can put everything on your home network. After a few moments the Access point should show “Connected, no internet” as Figure 19

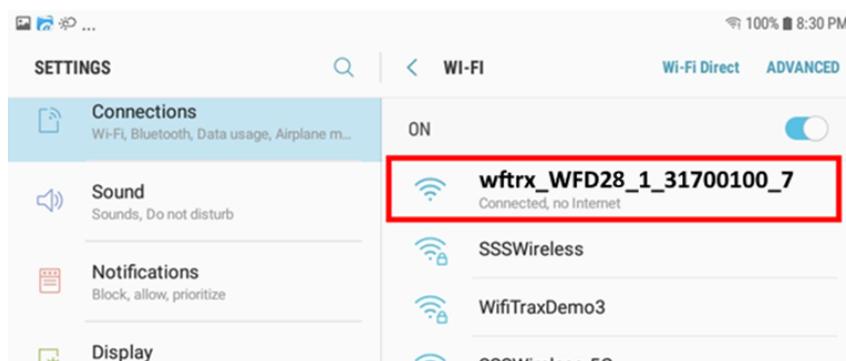


Figure 19 Connected to the WFD-28 Wi-Fi Access Point

- (7) Now you can open the Engine Driver app that you installed. Do that by going to the Home Screen and clicking the Apps icon:



WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

- (8) On the Apps find the Engine Driver app icon – you may have to swipe right - (for convenience you could add a shortcut to your Home Screen), then tap it:



- (9) Go through the setup sequence, accepting all the defaults and allowing the required privileges.
(10) After setup, you should see the “Connect to Server” page with your WFD-28 listed as a “Discovered Server” as Figure 20. Tap on it to connect. The green network LED on your WFD-28 should now flash regularly to show that the UWT-100 is communicating with it.

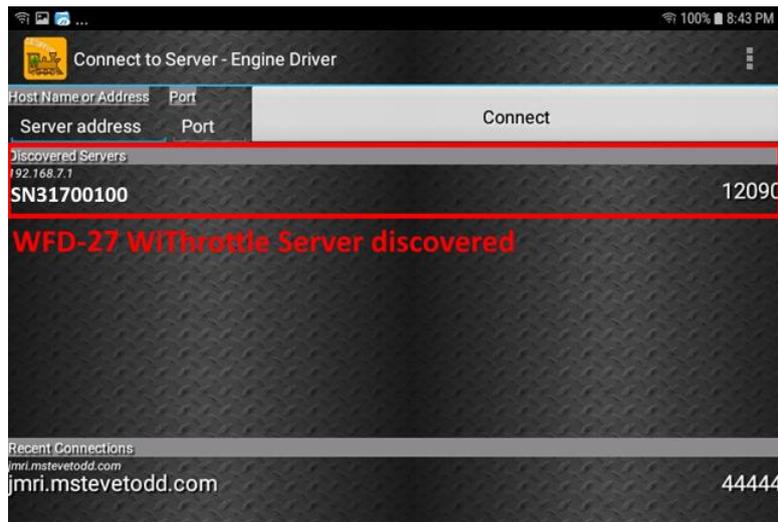


Figure 20 The WFD-28 WiThrottle Server is discovered by the Engine Driver app on Android

- (11) **Only if the WFD-28 is not discovered** for some reason, after waiting a few moments, you must type the IP Address of the WFD-28 unit always 192.168.7.1 in the “Server Address” box at the top-left and the port value of 12090 in the port textbox as Figure 21, then tap the “Connect” button.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

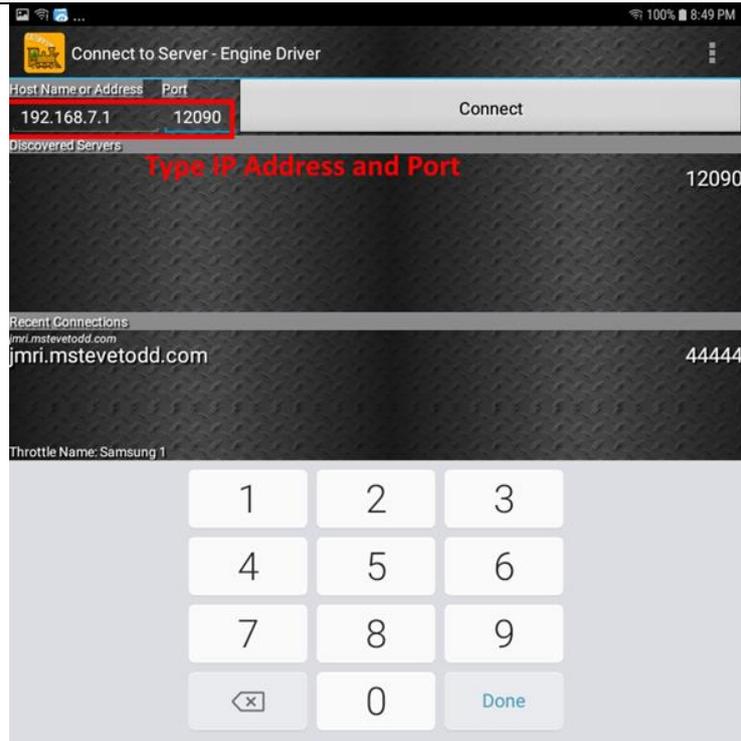


Figure 21 Connecting manually to the WFD-28 WiThrottle Server

(12)The Throttle screen should then appear, ready to select a loco and drive. Tap the Select button, check the “DCC Address” option and type the address of your locomotive either short or long as in Figure 22. Tap Acquire.

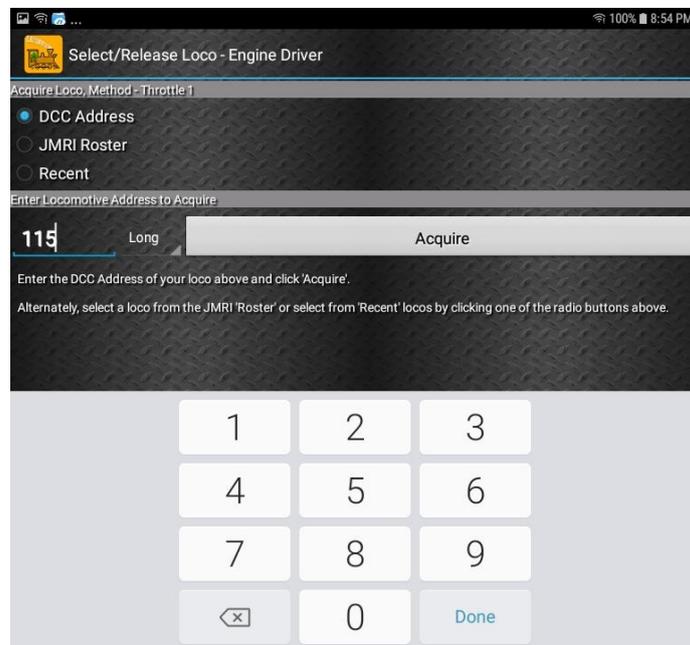


Figure 22 Selecting a locomotive by typing its DCC Address

(13)Now the Throttle screen appears with your DCC address as the selected loco as Figure 23. Try the function buttons and throttle slider to make sure your loco responds. Each time you make a

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

change to the locomotive's state, both the green network LED and the blue Cab Bus LED will flash.



Figure 23 The Throttle screen of Engine Driver with a locomotive selected to drive

(14) Engine Driver has many better screen options than the basic one in Figure 23. Please consult the Engine Driver “About” menu for more information about the app. It is possible to control more than one locomotive at a time and select different display appearances and preferences. Consult the website for more information:

<https://enginedriver.mstevetodd.com/>

Please note that Engine Driver, has many features that may vary according to the version that you install. WifiTrax has no control over the features of Engine Driver, but has tested carefully its operation with our product. If you have trouble working with Engine Driver and our module, please email us your problem rather than using the Engine Driver support. The author of Engine Driver may not know details of WifiTrax products, so please do not expect it. Support email: wifitrax@steveshrimpton.com or check our website.

Making it Easier Next Time

You can make connecting to the WFD-28 easier by setting your Android phone to automatically connect to the wfitrx_WFD2X_1_XXXXXXX_7 access point whenever your system is powered up. This varies according to the Android version. Once this is done, when you turn on your railroad power, after a few seconds your iPhone will join the WFD-2X's access point.

To make this reliable, you must disable Auto-reconnect on any other Wi-Fi Access points such as your home router. You can always enable it again when you have finished your model railroad session.

The WiThrottle app has an option “Auto-Connect to First WiThrottle Server” on the Preferences menu. If you enable that, Engine Driver should connect as soon as you power up your WFD-2X.

Use the recent option when selecting locos to save typing the DCC address each time, but please read the section “Locomotive Roster” to find out about defining rosters that you can pick from.

It is a good idea to always release locomotives before powering down your WFD-2X. If for some reason you can't select a locomotive, just restart the Engine Driver app.

You can also install the WFD-2X onto your Home Net, so you can operate and access the internet, control turnouts etc. at the same time as driving trains.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Getting Started with TCS UWT-100

- (1) Make sure power is on to your WFD-28, the DCC Track output is connected and there is a locomotive on the track with a DCC address that you know. Both the red power LED and the blue DCC indicator LED should be alight constantly.

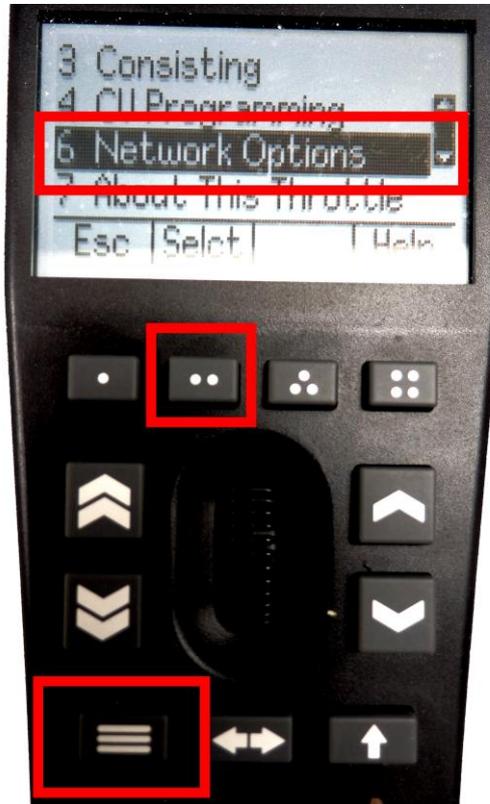


Figure 24 Selecting the Network Options menu on the UWT-100

- (2) Press the Menu button on your UWT, then use the up/down chevron buttons to choose Network Options, then press the Selct button [.] to open the Network menu as in Figure 24.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

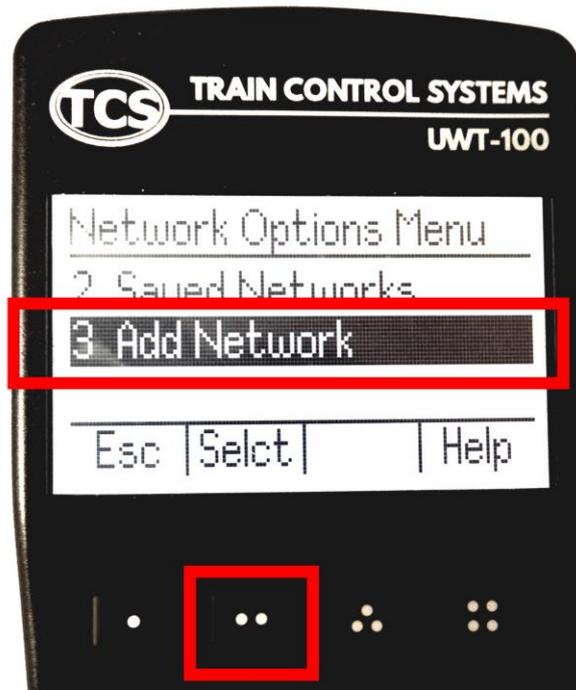


Figure 25 Select the Add Network option

(3) Select option 3, Add Network as Figure 25

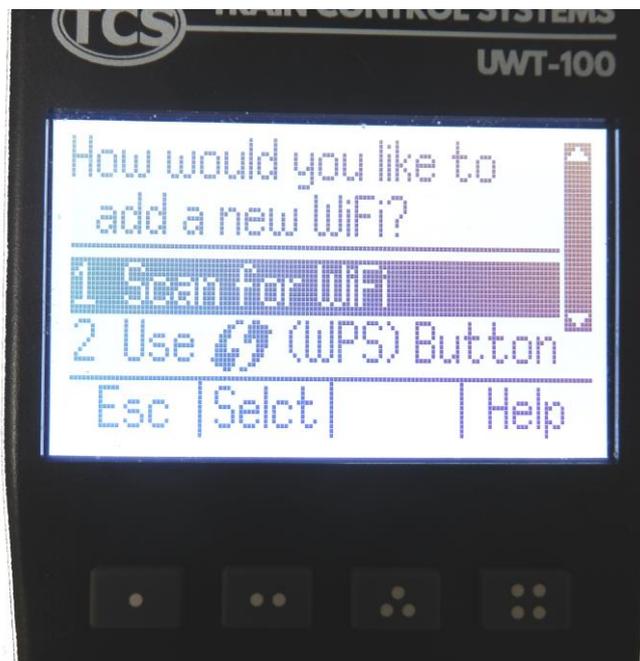


Figure 26 Select Scan for Wi-Fi

(4) Select option 1, Scan for Wi-Fi as Figure 26.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

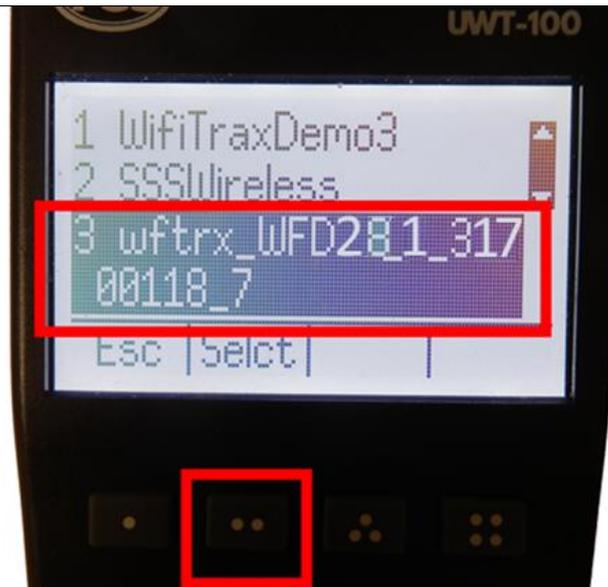


Figure 27 Select the Wi-Fi Network of the WFD-28

- (5) In the Found Networks list, identify the one which has the form wftrx_WFD2X_1_XXXXXXXX_7, where XXXXXXXX is the serial number of your unit as Figure 27. Select that Network, using the Selct [..] key.



Figure 28 The WFD-28 WiThrottle server has been found. Now save it!

- (6) There will be a number of messages appear but eventually you should see the message “Found WiThrottle Server” as Figure 28. Press the Save [..] key.
- (7) Briefly, the message “Connected to wftrx_WFD2X_1_XXXXXXXX_7 should appear. The green network LED on your WFD-2X should now flash regularly to show that the UWT-100 is communicating with it.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual



Figure 29 Select a locomotive with a known DCC address

- (8) Press the Locomotive button on the keypad. Type the DCC address of a locomotive on your layout, followed by the Enter key as Figure 29
- (9) The DCC Address should show in the top left of your screen.
- (10) Test the lights, horn and bell using the HLght, F2 and F1 buttons (if your loco has sound). Verify that the loco moves forward and backwards using the Up/Down chevron buttons and the thumb wheel. Test the Emergency Stop too! Each time you make a change to the locomotive's state, both the green network LED and the blue Cab Bus LED will flash.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Accessing the Web Pages

This section applies to WFD-26, WFD-27 and WFD-28. Where a description applies to all three modules, WFD-2X is used. Any image relating to one of the three should be assumed to be the same or similar on the others, unless stated otherwise.

The WFD-2X units provides setup of their features via a set of web pages that may be accessed via any browser or from the in-built browser in the apps Engine Driver and WiThrottle (full). Note that WiThrottle Lite does NOT provide this feature, but you can use Safari instead on an Apple device. Please understand that this is NOTHING TO DO WITH THE INTERNET OR THE WORLD WIDE WEB! The web pages are served **from the module itself** so you do not need to be connected to the internet. The WFD-2X just uses the same protocol as the internet, i.e. HTTP and HTML.

Access WFD-2X Web Pages using Engine Driver

- (1) Connect to the Wi-Fi Access Point that your WFD-2X is using.
 - a. If you are working in direct mode, that is you have not set up a home net yet, connect to the wftrx_WFD2X_1_XXXXXXX_7 Wi-Fi access point using the Settings App on your Android device.
 - b. If you are working in Home-Net mode, you need to connect to your home Wi-Fi network.
- (2) Run Engine Driver and on the Connect to Server page select the SNXXXXXXX entry in the Discovered Servers list. If you have changed the module name, your new module name will appear in this list instead.
- (3) Tap the “three dots” icon at the top right of the screen and select Web in the menu. You should now see the WFD-2X Main Menu as in Figure 30. You can click or tap on any of the headings in the menu to access that feature. The following sections provide information about all of the menu options.

Access WFD-2X Web Pages using WiThrottle (Full)

- (1) Connect to the Wi-Fi Access Point that your WFD-2X is using.
 - a. If you are working in direct mode, that is you have not set up a home net yet, connect to the wftrx_WFD2X_1_XXXXXXX_7 Wi-Fi access point using the Settings App on your Android device.
 - b. If you are working in Home-Net mode, you need to connect to your home Wi-Fi network.
- (2) Run WiThrottle and the Connect to Server will display. Select the SNXXXXXXX entry in the Available WiThrottle Servers list. If you have changed the module name, your new module name will appear in this list instead.
- (3) You now should see the WiThrottle Address page. At the bottom there should be four tabs Throttle, Address (highlighted in blue), WebServer and Settings. Tap on the WebServer tab and you should now see the Web Setup Main Menu as in Figure 30. You can click or tap on any of the headings in the menu to access that feature.

Note that WiThrottle Lite does not have this WebServer tab so if you are using the Lite version you will have to use Safari as described in the section “Setup Advanced Features using a Browser”

Setup Advanced Features using a Browser

- (1) On your hand-held device or computer open a browser such as in Table 2.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Device	Operating System	Browser Options
iPhone, iPad	IOS	Safari
Android Tablet or Phone	Android	Chrome
Windows Computer	Windows XP, 7, 8, 10	Internet Explorer, Edge, Chrome etc.

Table 2 Web Browsers available on different platforms

- (2) If you are working in Direct Mode, connect your device to the Wi-Fi Access Point of your WFD-2X, that is wftrx_WFD2X_1_XXXXXXXX_7, where XXXXXXXX is the 8-digit serial number. If you are working in Home Net mode you do not need to do this.
- (3) Type the URL of the WFD-2X into the Address Bar of the browser.
 - a. In Direct Mode type 192.168.7.1 and hit the enter key or “Go” button (the http:// may appear automatically. Do NOT use “https” (the WFD-2X does not support secure sockets).
 - b. In Home Net mode, type the IP Address that was assigned by your router and hit the enter key. Please see the section “Tips to Manage your Home Network” to see how to find this out.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

WFD-2X Master Menu

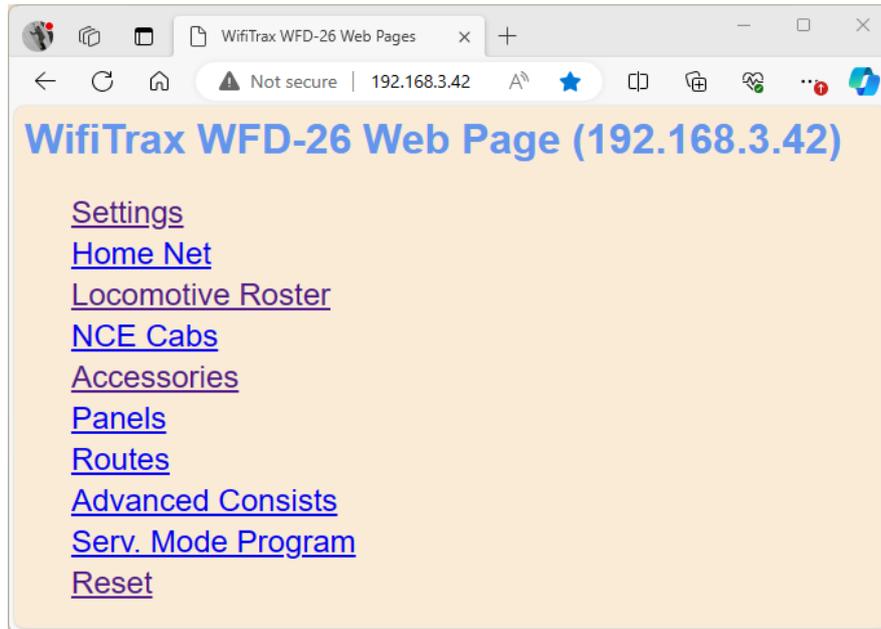


Figure 30 The WFD-2X Web Master Menu, Note: only the WFD-26 has the NCE Cabs Option.

- (4) The WFD-2X Main Menu appears as Figure 30. You can click or tap on any of the headings in the menu to access the setup for that feature, described in the following sections. The NCE Cabs option is only present on the WFD-26, since it is the only one of the three to support an NCE Cab Bus as master.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Settings Web Page

To modify General Settings, tap the Settings heading in Figure 30.

IP, Rg, SN:	192.168.3.43, 0, 31700200
F/W Ver. Heap B/C/W, Locos, Clients:	2.0.17, 26664/26264/25424 0 0
Module Name:	SN31700200
Wi-Fi Channel (1-13):	1
Net Number:	7
WlThrottle Port (1-65535):	12090
Over Current Timeout mS (40 - 500):	100
LEDs Disabled:	<input type="checkbox"/>
Control Loss Timeout(Sec.):	15
Fast Clock (FC) Time:	00:04
FC Ratio (1-15):	1
FC Start Hour (0-23):	00
FC 24 Hr Format:	<input type="checkbox"/>
<input type="button" value="FC Pause"/>	<input type="button" value="FC Reset"/>
DCC Accessory Cmd. Repeats(1 - 4):	1
Refresh	<input type="button" value="Save"/>

Figure 31 The WFD-2X General Settings Web Page, Note that only the WFD-27 has the Over Current Timeout.

The first line shows the IP Address, the Region Code and the Serial Number

IP Address

If you are working in direct mode this will display 192.168.7.1. If you are in Home-Net mode it will display the IP Address assigned by your router. You cannot change this from the Settings page but you may want to take note of it since that is the IP address you need if you want to use a browser to access these pages, but remember that the router may change this unless you set up a reservation (Please see the section “Tips to Manage your Home Network”).

Region Code

This is 1 for the Americas and 0 for the rest of the world. In the Americas, Wi-Fi Channels 12 and 13 are not permitted.

Serial Number

This is assigned at manufacture. You may need this if you contact Wifitrax for assistance or warranty repair.

Line two contains the Firmware Version, heap status, connected locos and connected clients.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Firmware Version

This is the version of the WFD-2X firmware installed at the factory. You cannot change this but if you request WifiTrax support, you may be asked for it. If you upgrade the firmware, this will show the version you installed.

Heap State (Heap B/C/W)

The three numbers separated by slashes show Best, Current and Worst free heap available during the last minute. Normally you can ignore this technical information as Wifitrax has thoroughly tested that these remain high. However, if they do become low, you may want to restart your module. If it happens frequently you may want to look at a firmware upgrade and/or report the issue to Wifitrax.

Current Locomotives (Locos)

The locomotives that you record in the roster as described later, are stored in Flash memory. When a loco is being driven a page is allocated for it in RAM memory. The number of such pages is shown here.

Current Clients (Clients)

This shows the number of throttle clients currently connected to the module via its WiThrottle Server, e.g., devices running WiThrottle or Engine Driver, or TCS UWT-100. You should not try to run more than four throttles in direct mode or six in Home Net mode.

Module Name

This defaults to the value SNXXXXXXXX where the X's are the 8-digit serial number. You can change this to a name up to 10 characters long which cannot include spaces. Type the name you want in the text box (such as "Wi-Fi_DCC") and tap Save. After cycling power, this name will appear to all apps using WiThrottle protocol such as Engine Driver and WiThrottle as the name of the discovered WiThrottle Server.

Wi-Fi Channel

This is the Wi-Fi channel in the 2.4GHz Wi-Fi band that the WFD-2X will use when operating in Direct Mode. It will have no effect in Home Net mode as the channel will be determined by your router. You can set the channel to a value from 1 to 13 (1 – 11 North America) and the default value is 1 after a factory reset. You do not normally need to change this but it may be helpful if other interfering Wi-Fi devices are being used nearby and thus limiting bandwidth. You need to cycle power before the channel change will have an effect. Once you have cycled power, the WFD-2X Wi-Fi access point will be of the form wftrx_WFD2X_N_XXXXXXXX_7 where N is your selected channel.

Note: Only channels 1 to 11 may be used in North and South America, 1 to 13 may be used in Europe and Asia/Pacific. It is your responsibility to avoid breaking the law by adhering to these conditions.

Net Number

This defines the subnet that the WFD-2X will use to set its own IP Address and to allocate IP Addresses to hand-held devices that connect in Direct Mode.

It has no effect in Home Net mode.

If you change this value, by typing an integer from 1 to 14 and tapping Save, the WFD-2X will use this after cycling power. The subnet will be 192.168.N.0 where N is the net number. The unit's IP Address

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

will then be 192.168.N.1 and it will assign IP Addresses: 192.168.N.2 to 192.168.N.5 to connecting devices.

The WFD-2X Wi-Fi access point will be of the form wftrx_WFD2X_1_XXXXXXXX_N where N is your selected net number.

WiThrottle Port

This is the port number that will define how your WiThrottle Protocol app such as Engine Driver, WiThrottle or TCS UWT-100 connects to your module. Normally you should leave this at its default value of 12090. Even if you use multiple WFD-2X, or JMRI as well as WFD-2X, you should have no need to change this since the servers will be distinguished by their IP addresses. Nevertheless, there are some subtle cases where model railroaders do need to change this.

Over-current Timeout

This section only applies to the WFD-27 since that is the only one of the three to supply current to the track

This sets the period of time in milli-seconds (1 milli-second or mS = 1/1000 of a second) that the module will allow a current exceeding 6 amps before shutting down the DCC output. If a short occurs on the track, the module will shut down its DCC output and the blue LED will flash. After a short period of time the module will try again and, if the short persists, will shut down again. This sequence continues until the short is removed.

The default timeout is 50mS but you may increase this up to 500mS (= 1/2 second). This may be necessary when using a reverser that is intended to detect a short as a locomotive crosses a gap and reverse the DCC supply to a section of track. Examples are return loops, wyes and turntables. If the WFD-27 timeout is set too short, it may cut off DCC power before the reverser has a chance to reverse the supply and thus remove the short. Take care not to make this timeout setting any longer than that necessary for the reverser to operate. A long timeout may cause overheating and damage when a genuine short occurs. **Take care to maintain vigilance and avoid any possibility of a fire! Do not leave your system running unattended.**

Another point to be aware of, is that if the over-current timeout is made long, the power adapter supplying the unit may shut down or the voltage may drop before the WFD-27 shuts down so that the WFD-27 firmware crashes. In this case you need a complete power down to restart.

LEDs Disabled

When this checkbox is checked, the LEDs on the module are disabled, except the red Power LED. Some users may be annoyed by flashing LEDs and use this to reduce distraction.

Control Loss Timeout

This value determines the amount of time in seconds that a locomotive will continue running if the throttle loses contact with it.

Some apps, WiThrottle on IOS in particular, deliberately stop any locos if the user leaves the Throttle screen for more than this period of time. The logic of this is clear in that you really should have your locomotive under continuous control. However. Sometimes when dual throttles are used on WiThrottle, you may want to select and start another loco (or consist) on the second throttle. By default, the timeout is 15 seconds, so you should have enough time. However, if that is not enough, you can increase this value up to 60 seconds.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Engine Driver on Android actually does not do this – just a different philosophy.

The timeout also is effective if your throttle app loses contact because you are out of range.

Note however, that if you release a loco that is running, either from WiThrottle, Engine Driver or UWT-100, the loco will continue running until you reselect it and bring it to a stop. You may or may not like this, so you may adopt the rule that all locos should be stopped before deselecting them. However, it can be useful where you want to alternate between controlling two or more locos on the TCS UWT-100 or other single loco device. It's your call.

Fast Clock (FC) Time

This displays the current time recorded by the Fast Clock within the module. It is always displayed in 24hr format on this page. The fast clock is distributed to cabs connected to the WFD-2X module, whether by Wi-Fi, as Engine Driver or WiThrottle apps, the Wifitrax Web Throttle screen or, in the case of WFD-26 any connected NCE Cab such as a Pro Cab. So all will show the time of day displayed here.

FC Ratio

This is the multiplier applied to normal time to give the calculated FC time. It may be set to any integer between 1 and 15. For example, if it is set to 1, the FC will display real time. If it is set to 2, the FC will be twice as fast, so an hour will only last 30 minutes. Similarly 3, 4 etc. up to 15. If the FC ratio is set to 15, one hour will only last 4 minutes!

FC Start Hour

This field specifies the hour of the day at which the FC will start on power on. It will also revert to this value if the FC Reset button is clicked. Only whole numbers between 0 and 23 are permitted. The zero value is 12:00 AM and 23 is 11:00 PM.

FC 24 Hr Format

If this box is checked, the FC will display in 24 Hour format, i.e. 19:00, on Wifitrax Web Throttle pages, otherwise it will display in AM/PM format, e.g. 07:00 PM. This will also affect the display format on NCE Cabs connected to the WFD-26 such as a Pro Cab. The display format on apps such as WiThrottle and Engine Driver is set within the app itself.

FC Pause Button

Clicking this button will pause the FC if running and start it again, if it is paused. Clicking this button does not require the Save button to also be clicked.

FC Reset Button

Clicking this button will reset the FC to the value displayed in the Fast Clock (FC) Time textbox. Clicking this button does not require the Save button to also be clicked. Note that a feature is provided that resets the FC to any desired hour of the day by entering the required hour in the FC Start Hour textbox and clicking this FC Reset button. The permanent stored start hour is only modified if you click the Save button.

DCC Accessory Cmd. Repeats

This entry may be set from 1 to 4 to specify the number of times a command to an accessory will be repeated.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

[Refresh](#)

Clicking this hyperlink will refresh the Settings screen from the stored values including the displayed fast clock.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Home Net Web Page

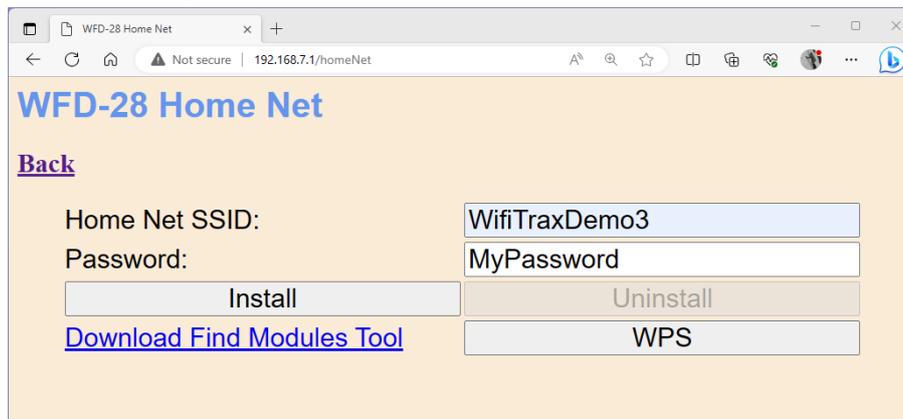


Figure 32 The Home Net Web Page (not all versions of the firmware have the WPS button)

This page allows you to change your WFD-2X from Direct Mode to Home Net Mode and back again. Once you have changed to Home-Net mode, you will not be able to work in Direct Mode, but if for some reason the WFD-2X cannot join your Home Net (maybe you typed it wrong, put in the wrong password or the router was turned off), the WFD-2X will attempt to connect for about 30 seconds then revert to Direct mode. You will then see the wftrx_WFD2X_1_XXXXXXXX_7 access point which you can connect to and correct the problem. It's always worth restarting your home router if you've checked everything and connection does not succeed, as these do seem to get locked up somehow!

You can join your WFD-2X either manually or using Wi-Fi Protected Setup (WPS)

Joining Home Net using WPS Button

This section applies only to those versions of the firmware that display the WPS button on the Home Net page

This is the simplest method and can be used if your home router has a WPS button.

- (1) First access the Home Net page on your WFD-2X by connecting your computer, phone or tablet to its access point wftrx_WFD2X_1_XXXXXXXX_7 and selecting Home Net from the main menu. You will see the WPS button but don't click it yet.
- (2) Locate the WPS button on your router and press it. Depending on the router, there will probably be an LED that starts to flash indicating that WPS mode has been activated.
- (3) Immediately click the WPS button on the Home Net page of your WFD-2X module.
- (4) The module will reset then join your home net. This will be indicated by the green NET LED lighting continuously.

Joining Home Net Manually

If for some reason, WPS was not available, you can join your module to your home net manually. First display the Home Net page, then type the SSID of your home Wi-Fi router in the Home Net SSID textbox. Type the password (shared key) for you home Wi-Fi Access Point into the Password textbox. Be careful as passwords and SSIDs are case sensitive. Check the section "Tips to Manage your Home Network" to find some tips on finding out your SSID and password. This will often be provided by your internet service provider on a card, but you may have changed it.

You may at this point want to download the Find Modules tool by clicking on the "Download Find Modules Tool" hyperlink. This will download an HTML/JavaScript file called FindModules.html as in

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Figure 33. This tool will help you find the IP Address assigned to your module by the router. Do not open it yet. See the Section “Find Modules Tool” to find out how to use this.

When you are satisfied the SSID and Password are correct, tap “Install”. The unit will restart and connect to the Home Wi-Fi Network you have specified. To continue, you must reconnect your phone, tablet or computer to your home network and use the WFD-2X’s IP Address on that network.

To obtain the roster and drive trains when operating in Home Net mode, make sure your device is connected to your home net, then run Engine Driver or WiThrottle. The app should see the WFD-2X as a Discovered Server.

Select the WFD-2X WiThrottle server from the Discovered Servers list, or manually configure using the IP Address assigned to the WFD-2X module. Please see the section “Tips to Manage your Home Network” and “Find Modules Tool” to find out the IP Address and to set your router so it always assigns the same address. Once you have connected to the server, the operation of Engine Driver and WiThrottle is the same as in Direct mode.

To access the web pages, you need to use the IP address that has been allocated to the WFD-2X by your router instead of the fixed 192.168.7.1 address in direct mode. Engine driver provides a menu item to access the web page and WiThrottle (Full Version) shows a tab at the bottom. Once you have the Web Pages visible, you can note down the IP Address at the top of the Main Menu so you can connect just using your browser if required.

If you have not downloaded an app and have been using Wifitrax Web Throttle in Direct mode, see the next section or the section “Tips to Manage your Home Network”.

Find Modules Tool

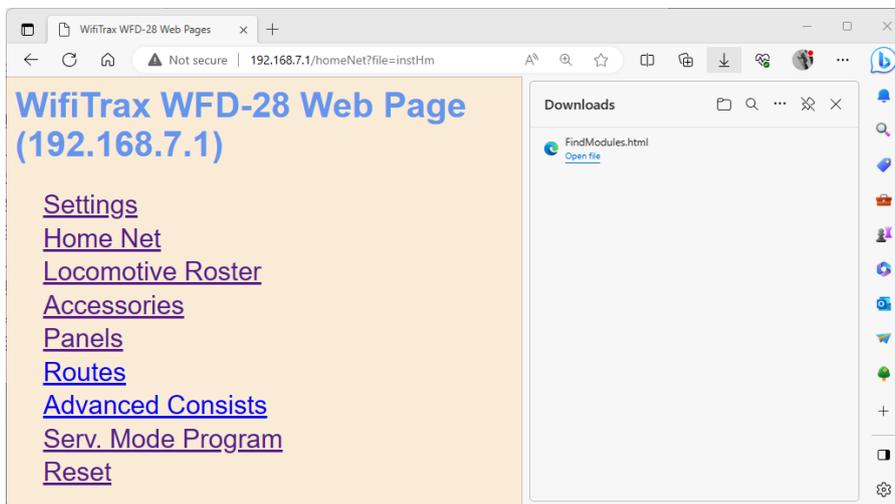


Figure 33 Downloading the FindModules.html Tool in Widows 10 Edge Browser

If you have downloaded the FindModules tool while in Direct mode, you can use it to find the IP Address of your module once it is on your home network.

In Windows 10, after installing on the home net, your browser will look like Figure 34.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

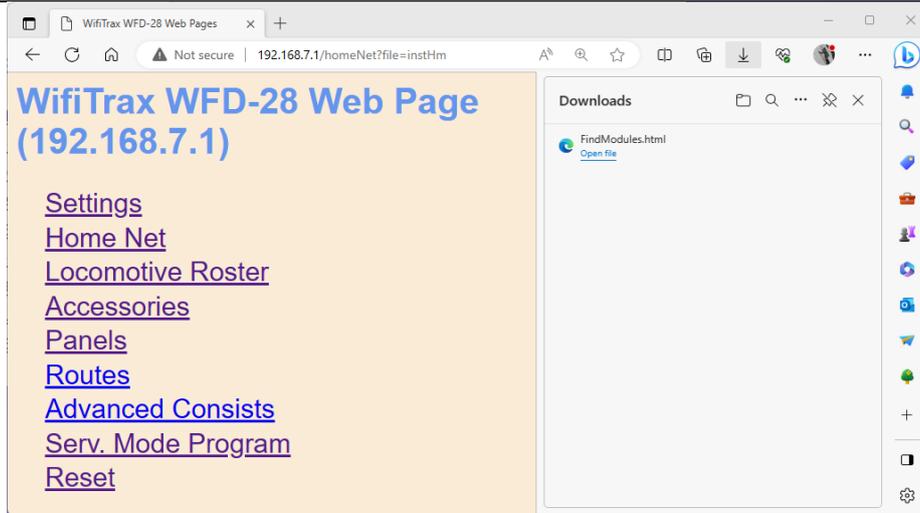


Figure 34 Open the Find Modules Tool once your Module is on your Home Net

However, this is now the wrong IP Address since, if the green LED is lit continuously, your module has now been assigned an IP Address by your router.

So, now connect your computer to your home network, then open the FindModules.html tool by clicking on it in the Downloads pane in Figure 34. The FindModules tool opens to display a page as Figure 35.

To use this, first click on the Find Subnet button. If the subnet shown is correct, this should display green.

Next click the Scan Subnet button. The progress bar will move across the screen and stop when the module is found as in Figure 36.

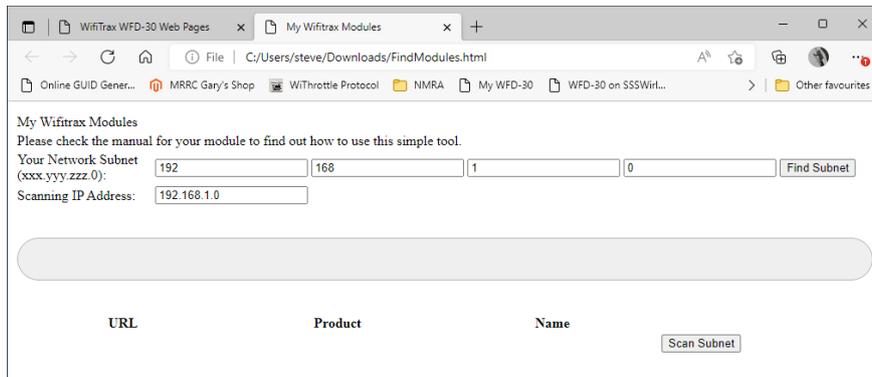


Figure 35 FindModules Tool Display

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

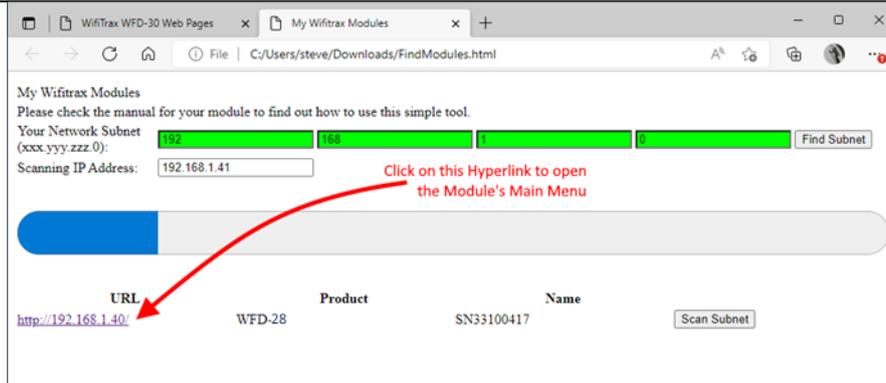


Figure 36 The FindModules Tool has Found your WFD-2X module. Click on the URL to open the Main Menu.

Figure 36 shows that the FindModules tool has found your WFD-2X module and, in this case, the router has assigned it an IP Address of 192.168.1.40. Click on the hyperlink to open the Main Menu of the module as Figure 37. You should now save this as a bookmark in your browser so that you can always access it in future. Note however that the router may assign a different IP address and you would then have to repeat the process. Consult Section “Tips to Manage your Home Network” to learn how to allocate a reserved IP Address.

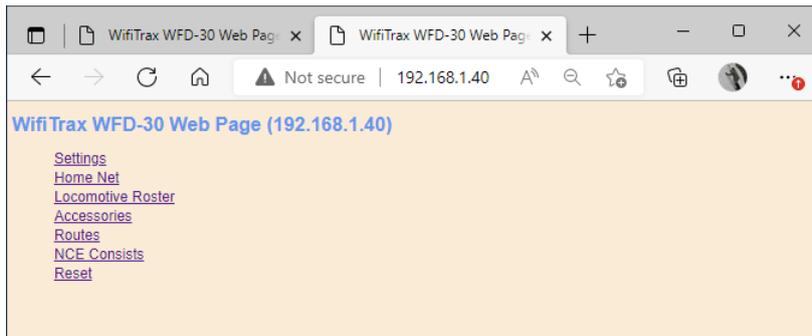


Figure 37 The WFD-2X Main Menu Opened from the Find Modules Tool

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Locomotive Roster

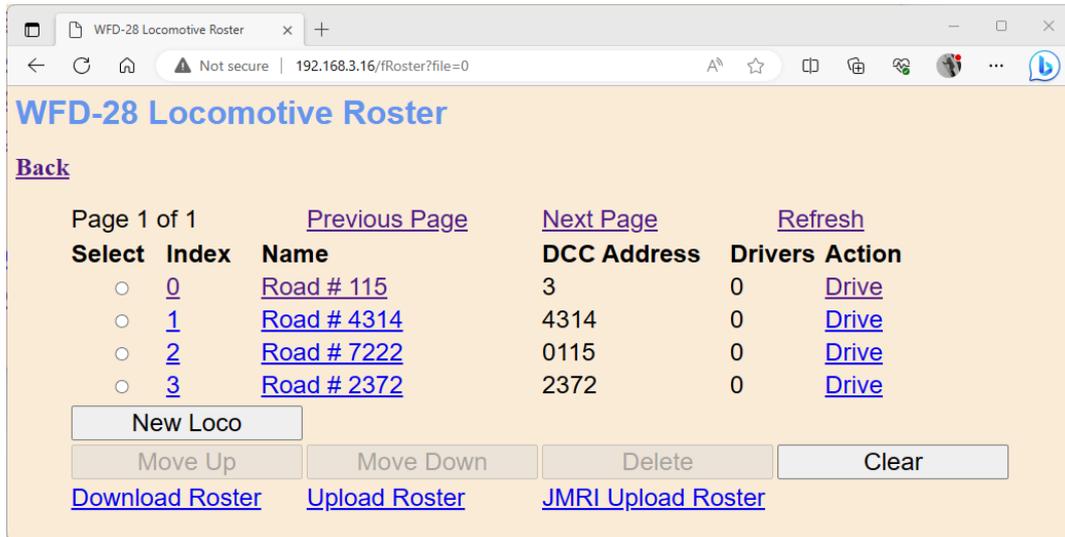


Figure 38 The Locomotive Roster Page

This page allows you to change the entries in the locomotive roster of your WFD-2X. You can give each entry a Name and a DCC Address. You can then select from the roster when using Engine Driver or WiThrottle instead of needing to type the DCC Address. You can also name the function keys to match the usage by your DCC decoder and loco.

This page also allows you to download and save part or all of your roster to be saved and restored later. Driving locos using WifiTrax Web Throttle and CV programming in operational mode (Program on the Main) is also accessible via this page.

View the Locomotive Roster by tapping the Locomotive Roster item in the Main Menu. By default, as shipped and after factory reset only four entries are displayed and given the names “Loco 0” through “Loco 3” with DCC Addresses 3 through 6. Locos can be added, up to maximum of 100.

Adding, Deleting and Moving Locos Up or Down

You can add more locomotives to your roster up to a maximum of 100. Add a loco by tapping the “New Loco” button on the Loco Roster page. A new loco will be added with a default name, DCC address and set of functions. Once you reach 100 locos, tapping the New Loco button will have no effect.

You can delete a loco by selecting it using the radio button in the left-hand column and tapping the Delete button. After a warning (Figure 39), the rostered loco will be deleted. This operation cannot be reversed.

All locos in the roster have an index. This simply indicates the position of the locomotive in the roster. If you delete a locomotive, a gap will occur in the indices. Adding new locos will fill any gaps in the roster index sequence before appending new locos at the bottom.

Display of the locomotive roster is paged, 10 locos to a page so a full roster will have 10 pages. Initially, when you enter the Roster page, the first page will be displayed. Move forward and backwards in the pages by clicking the Next Page and Previous Page links.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

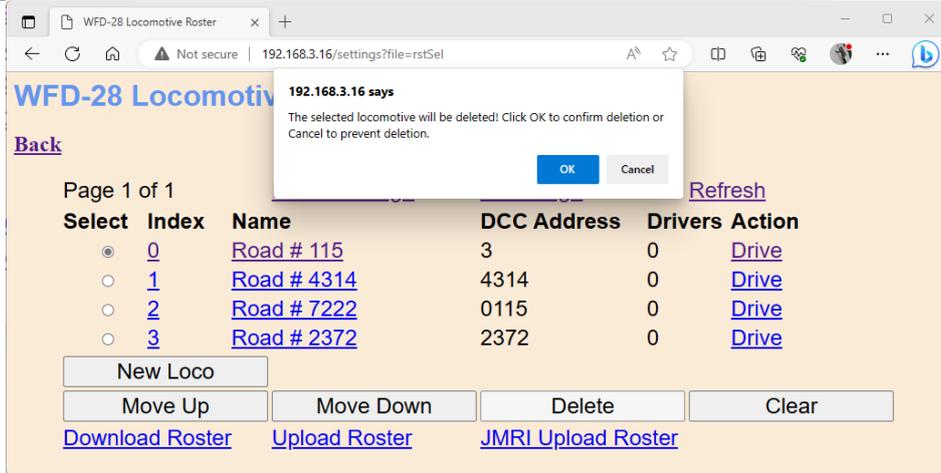


Figure 39 Deleting a loco from the roster

A loco may be moved upwards and downwards in the roster. To move a roster down by one step, select the required loco by clicking the radio button at its left. Then click Move Down. The index of the selected loco will be increased by one so that the loco will move one place downwards in the roster. Similarly, you can move a loco one place up by selecting and clicking the Move Up button. Note that if you have gaps in the index sequence, locos will increase or decrease their index as they move through the gap and only appear to move down or up when an adjacent index is occupied.

Clearing the Entire Locomotive Roster

You can clear the entire roster and begin again by clicking the Clear button. After a warning, all locos will be deleted. This operation cannot be reversed. However, if you have downloaded some or all of your locomotives to a file, you can restore them by uploading the file as described in the Section "Uploading a Previously Downloaded Locos File"

Editing Rostered Locos

To edit one of the entries, tap the name, to show the edit page as Figure 40, and enter what you require in the Name and DCC Address text boxes and tap Save. Names can be up to 15 characters and may contain spaces. DCC addresses must be in the range 1 – 9999.

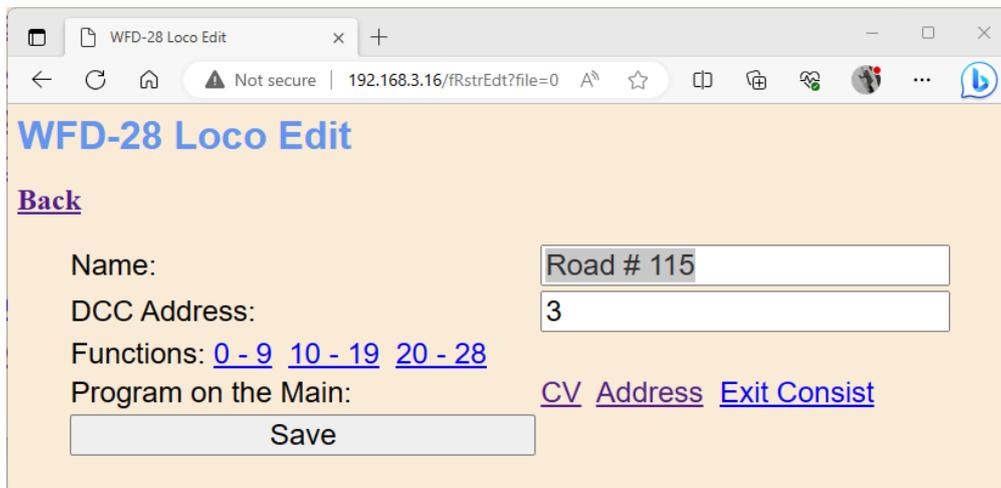
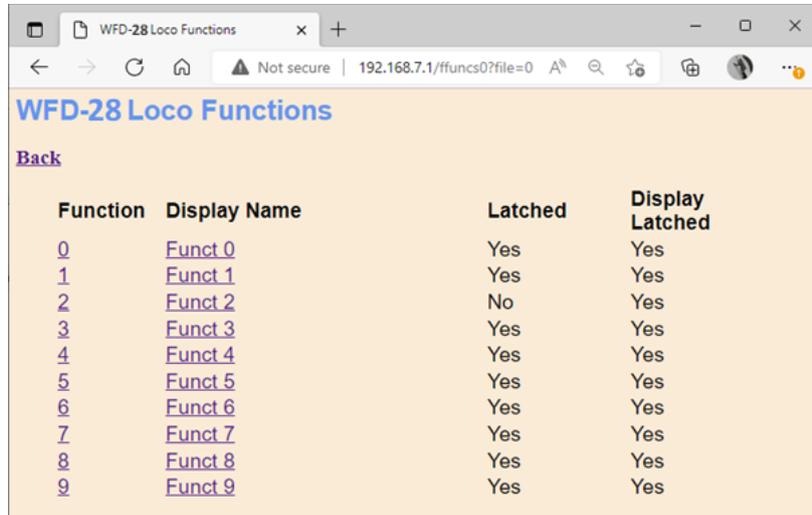


Figure 40 The Locomotive Roster Entry Edit Page. You can also access the Function labels from here.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Function Labelling Web Page

If you want to add function labels, go back into the edit page for the required loco and tap the Functions hyperlink, either “0 – 9”, “10 – 19” or “20 – 28”. The selected range of functions is displayed for that locomotive as in Figure 41.

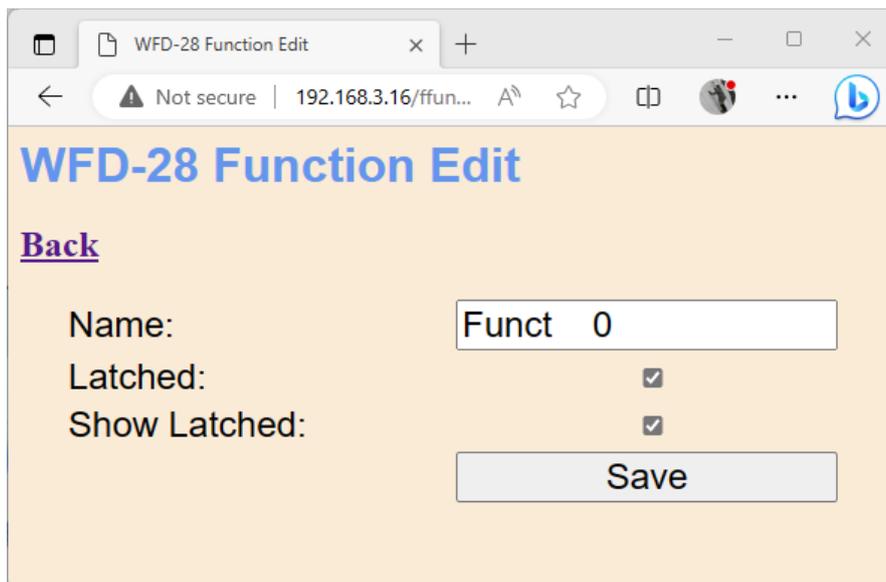


The screenshot shows a web browser window titled "WFD-28 Loco Functions". The address bar shows "192.168.7.1/ffuncs0?file=0". The page content includes a "Back" link and a table with the following data:

Function	Display Name	Latched	Display Latched
0	Funct 0	Yes	Yes
1	Funct 1	Yes	Yes
2	Funct 2	No	Yes
3	Funct 3	Yes	Yes
4	Funct 4	Yes	Yes
5	Funct 5	Yes	Yes
6	Funct 6	Yes	Yes
7	Funct 7	Yes	Yes
8	Funct 8	Yes	Yes
9	Funct 9	Yes	Yes

Figure 41 The function labels displayed for a given locomotive

To edit any function, tap the name of the function and change its name in the textbox. The name can be up to 10 characters long. You can also change whether the function is latched or not using the “Latched” checkbox. When a function is latched, the WFD-2X will send a 1 value when the key is first tapped, then a 0 value when it is tapped a second time. For unlatched functions a 1 is sent when the button is pressed and a zero when released. There is also a “Show Latched” checkbox that is occasionally useful. We have found some DCC decoders seem to perform the function once on each transition, so sometimes it is useful to mark a function as latched but to display is as though it were not latched.



The screenshot shows a web browser window titled "WFD-28 Function Edit". The address bar shows "192.168.3.16/ffun...". The page content includes a "Back" link and a form with the following fields:

Name:

Latched:

Show Latched:

Figure 42 Editing a function key for a given locomotive

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Driving Rostered Locomotives using Wifitrax Web Throttle

WFD-2X provides a means of driving rostered locomotives, called Web Throttle, that does not require an app such as Engine Driver or WiThrottle. It is likely you will get a better experience using either of these apps on your phone or tablet, but if you do not want to install an app or you are working on an operating system such as Windows where apps are not so readily available, you can use Web Throttle. Web Throttle is itself an app written in a language called JavaScript and is downloaded from the WFD-2X when you use it. It is a simple app providing a basic driving experience and control of DCC functions such as Lights, Horn etc. It makes use of the function labelling that can be applied to rostered locos. It will run on most browsers such as Safari, Chrome and Edge on Apple IOS, Google Android and Windows 10.

To drive a rostered loco open the Locomotive Roster page by selecting Locomotive Roster from the main menu. Find the loco that you want to drive, paging down or up as needed and click the Drive hyperlink as in Figure 43. This displays the Web Throttle page as Figure 44.

You cannot, at present, drive a non-rostered loco using the Web Throttle page.

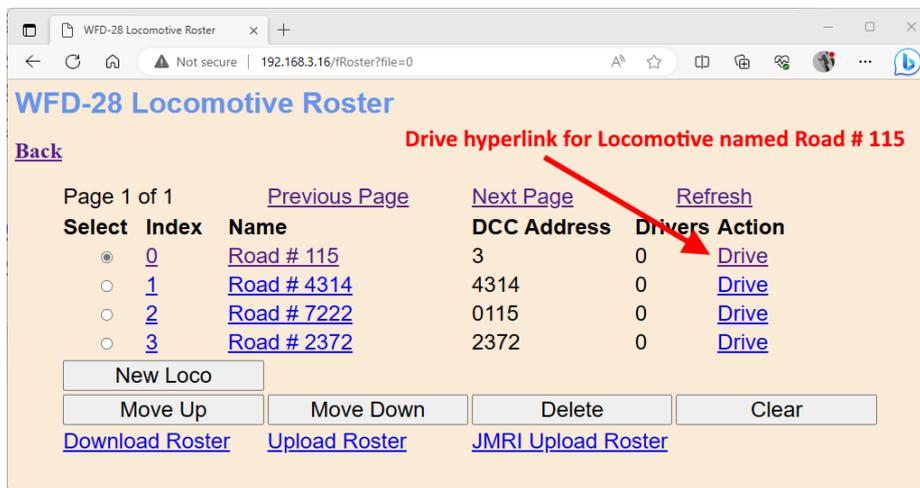


Figure 43 The Drive Hyperlink in the Locomotive Roster Page. Click this to drive the loco.

Figure 44 is fairly self-explanatory.

The button labelled Forward at the top left toggles between forward and reverse when tapped or clicked. It is only operational when the loco is stationary. It shows green when in forward direction and red when in reverse.

The button at the top right labelled Stop is an emergency stop button that will stop the locomotive. It is active only when the loco is running.

The button labelled >> increases the speed by ten DCC steps while the button labelled << reduces the speed by ten DCC steps. Do not confuse these with forward and backwards buttons!

The button labelled > increases the speed by one DCC steps while the button labelled < reduces the speed by one DCC steps. Do not confuse these with forward and backwards buttons!

The Horizontal Slider allows you to increase or decrease the speed. You can drag it right or left with a finger or mouse or you can tap or click at any point on its range to set the speed to that value.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

All the buttons below are function keys that show the names defined in the function key definitions in the Loco Edit pages.

When you have finished driving the locomotive click the Back hyperlink to return to the Locomotive Roster page.

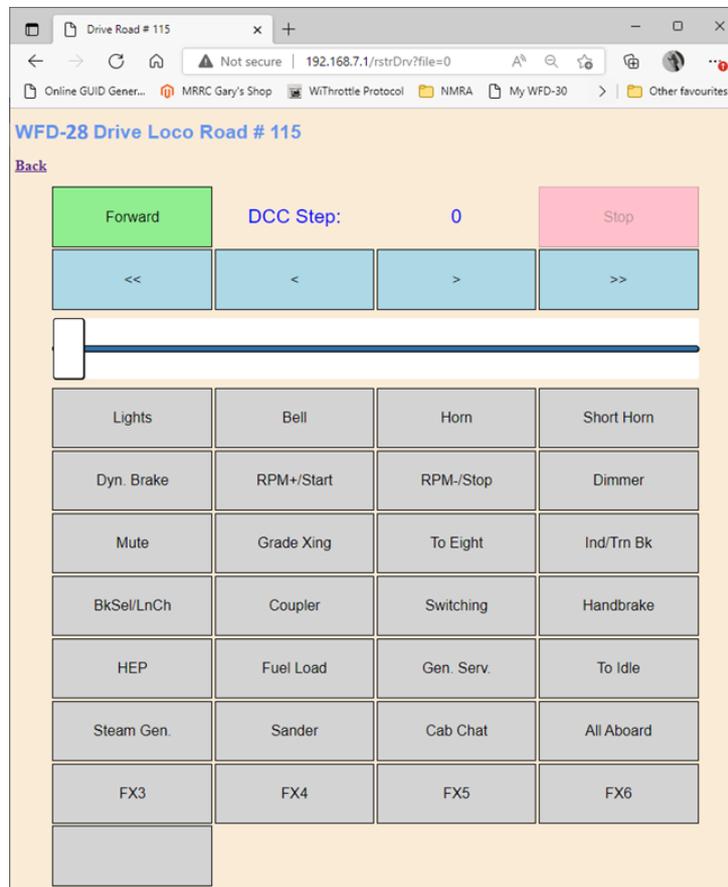


Figure 44 The Web Throttle Page for a Locomotive whose Function Names have all been Configured

Driving multiple locomotives with Web Throttle.

Following the procedure above, you may think that you can only drive one locomotive at a time. However, if you right click on the Drive hyperlink on the Locomotive Roster page in Figure 43, you can open the Web Throttle page in a new tab on your browser or a new window. Figure 45 shows this for the Microsoft Edge browser on Windows.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

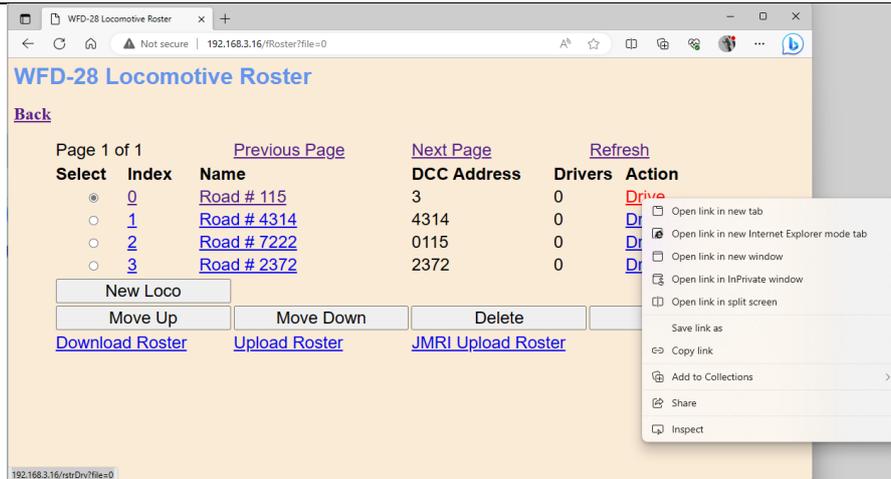


Figure 45 Opening a new Web Throttle Tab or Window

If you open a Web Throttle page in this way do not click the back button when you have finished driving the loco. Instead, close that browser window or tab. This will avoid leaving too many browser windows connected to the WFD-2X.

You can probably drive up to six locomotives in direct mode using Web Throttle pages on one or more devices, but you cannot connect more than four devices. If you have too many windows open, the WFD-2X will not respond and may even crash. You may need to experiment to find the maximum.

In Home Net mode, there is no limit on the number of throttle devices and again, around six locos can be driven at the same time. You may be able to drive up to ten locos if only a few function keys are active.

For the technically inclined: The Wifitrax Web Throttle, unlike throttle apps that use the WiThrottle protocol, does not rely on establishing a socket connection continuously with the WFD-2X module. Therefore, it is not limited by the modules limit of around six continuous socket connections. Instead, it uses the HTTP protocol just like any other web page and updates using JavaScript interaction with the WFD-2X.

Operational Mode Programming (Programming on the Main)

The WFD-2X provides the capability to program any CV in a decoder whose locomotive is placed on the NCE Main Track. This is called Programming on the Main, or Operational Mode CV Programming. WFD-2X uses the Operational Mode Programming capabilities in your NCE Command Station to do this by sending it commands on the Cab Bus.

To program CVs, first open the Locomotive Roster page from the main menu of the WFD-2X. Enter the Loco Edit Page by clicking on the name of the locomotive. Then click on the CV hyperlink (Figure 46) to display the programming page as Figure 47.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

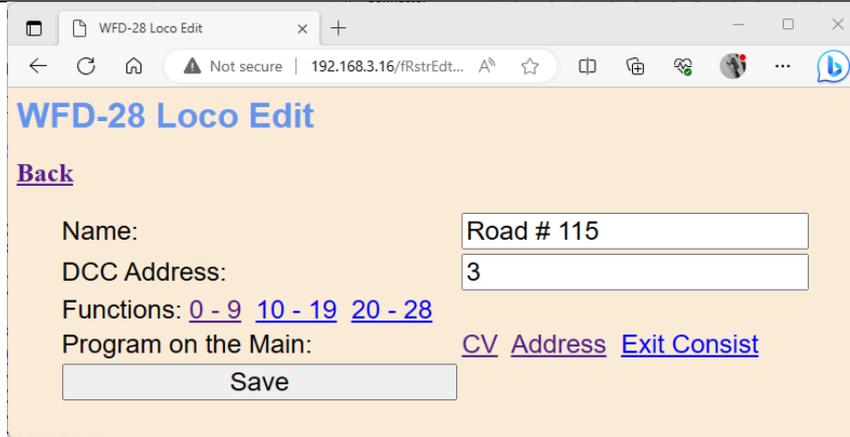


Figure 46 The Hyperlink to enter Programming on the Main or Operational CV Programming for a Locomotive

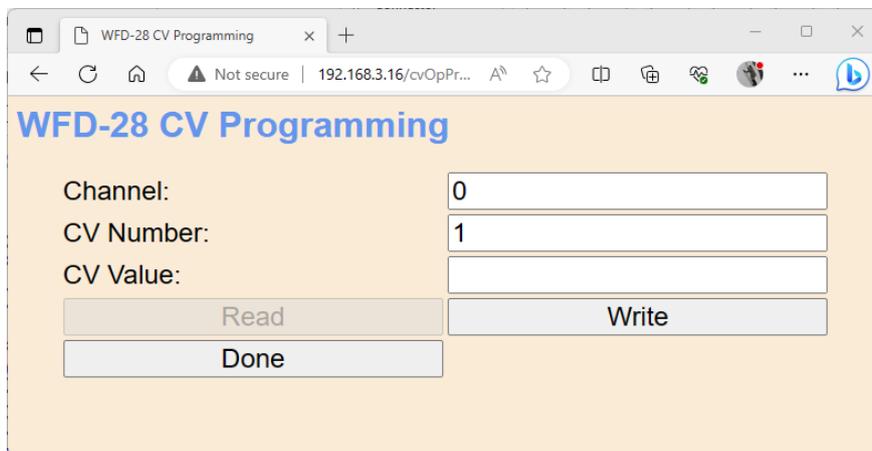


Figure 47 The Operational CV Programming Page

On this page, the channel is actually the same as the locomotive index in the roster and is determined by which loco you selected from the roster.

To program a CV, type the CV number into the textbox labelled CV Number and type the required value into the textbox labelled CV Value, then click the Write button.

For example, on a SoundTraxx Tsunami 2 decoder, the master volume is controlled by CV number 128. This is a good one to test, so for example the settings in Figure 48 will reduce the volume to rather a quiet setting.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

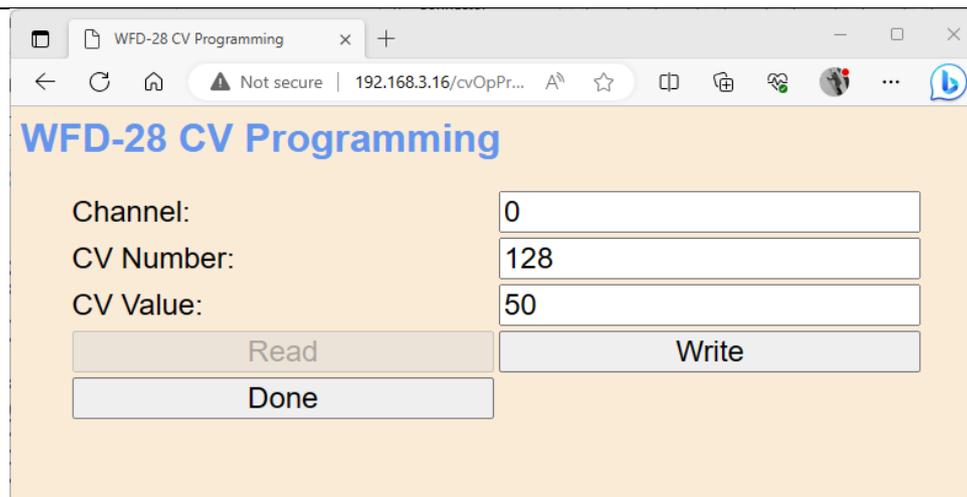


Figure 48 Programming the Master Volume on a SoundTraxx Tsunami 2 Decoder

When you have finished programming CV values, click the Done button, followed by Back to return to the Locomotive Roster.

Important Note: You should be able to program all CVs using this page, however the response and behavior of CV programming is dependent on your decoder. For example, most decoders allow changing the DCC Address using Programming on the Main like this, but the decoder may prevent you from changing the short or long DCC address if the decoder is using that address. To set the address, you may be better to use your NCE Pro-Cab or Power Cab.

Downloading Locomotives to a File

Once you have set up a set of locomotives in your roster, including function names, it is a good idea to download and store it in a file on your PC or other device. For example, if you need to reset the module for some reason, the roster will return to its default and you will have wasted all that work. You also might like to have separate rosters if you use the WFD-2X at a club as well as your own layout.

IMPORTANT: On the Engine Driver and WiThrottle apps, you cannot use the Web display within the app to download or upload a locomotive roster. You must open the setup web pages in a browser such as Safari or Chrome by typing 192.168.7.1 into the browser. If you are in home net mode you use the IP Address assigned by your router. Select the Locomotive Roster page and proceed as described.

To download all or part of a roster, click Download Roster on the WFD-2X Locomotive Roster page. The page that you are currently displaying has no effect. The Roster Download page will appear as in Figure 49.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

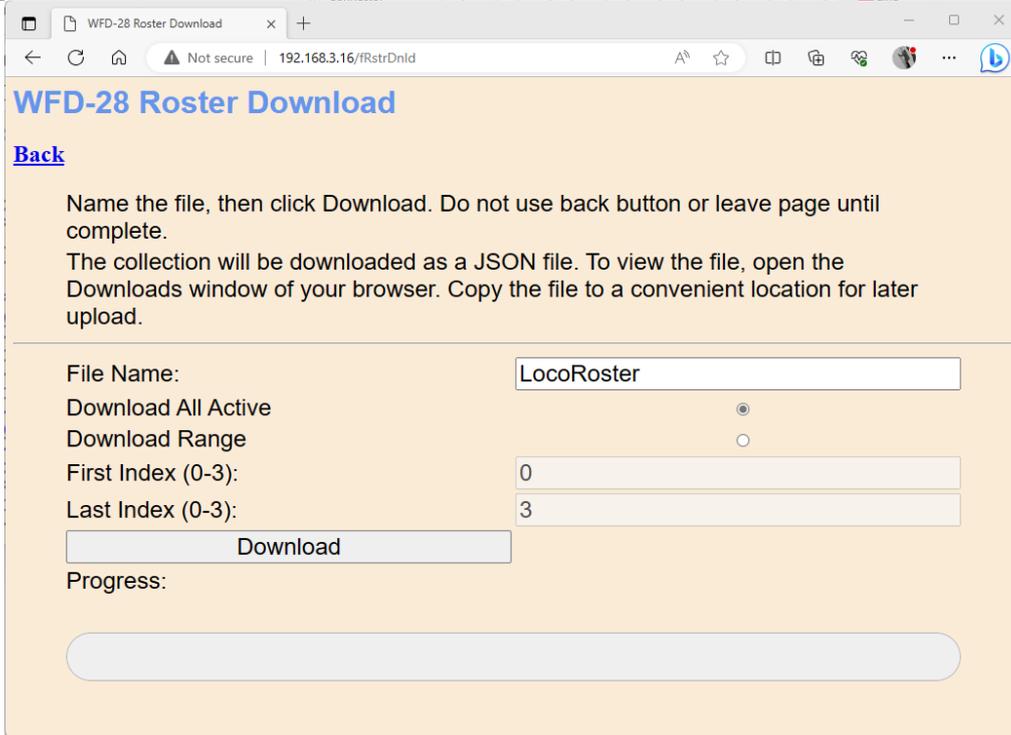


Figure 49 The Roster Download Page

There are 100 indices (loco numbers not DCC Address) in the roster. Usually only some have been filled and are therefore active, so only active roster entries will be downloaded.

The File Name is the name given to the file that will be downloaded, so give it a meaningful name that you will recognize.

You can elect to include all of the active loco entries in the file or just a range. Therefore select “Download all Active” or “Download Range” accordingly.

If you select “Download Range” enter the First and Last Index as required. For example, if you just want to download the first 10 locos, use 0 and 9 as the values. Notice that indices begin at 0. You may want to go back to the Locomotive Roster page and jot down the first and last index. A Progress Bar shows the download progress as in Figure 50.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

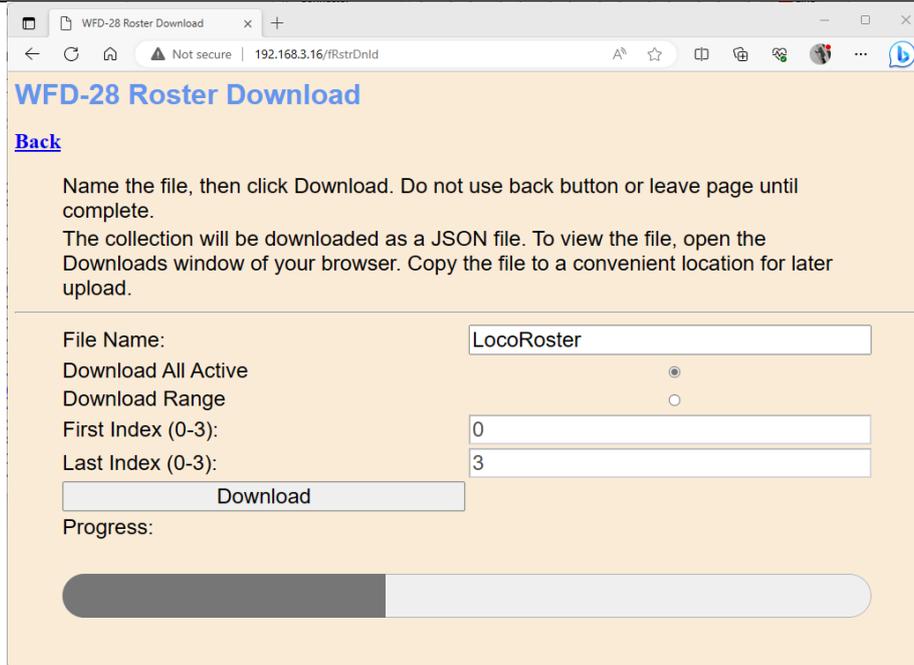


Figure 50 A Download in Progress

When the download is complete, the action depends on the browser and device you are using.

Accessing the Roster Download File on Windows 10

Using Microsoft Edge on Windows 10, the browser automatically opens the Downloads pane as on the right of Figure 51.

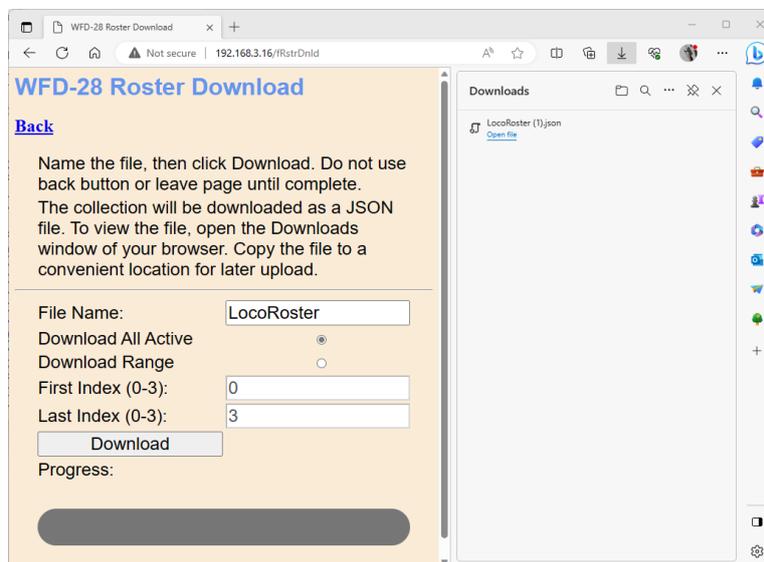


Figure 51 Download Complete on Windows using Edge Browser

This behavior is the same as downloading any file from the internet. The file is placed in the Downloads folder for the account on your machine. How you access this will depend on your device and operating system.

On Windows 10 this will be

C:\Users\\Downloads

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Where <User Name> is the name of the Windows user account on your machine. You can open the Downloads folder in Edge by clicking on the folder icon in the Downloads pane to see the folder in Windows Explorer as in Figure 52.

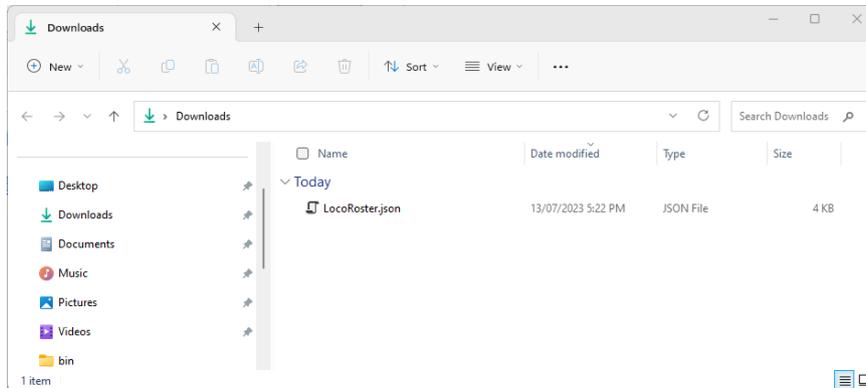


Figure 52 The Downloaded Roster File in Windows Explorer

Now you should copy the file to a suitable location on your computer that you have prepared for rosters. If you leave it in the Download folder it will get lost if you delete the downloads to clear up space on your disk drive.

For the technically inclined, the file is in JSON format and contains locos as JSON objects with 29 function definitions as an array of sub-objects. A section of the file is shown in Figure 53. It is possible to carefully modify this manually, but be careful, as uploading an invalid file may crash the firmware in the WFD-28 and require a factory reset.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

```
Schema: <No Schema Selected>
1  {
2  "roster": [
3  ,
127 ,
251 {
252   "Index": 2,
253   "Name": "Loco 2",
254   "DccAddr": 5,
255   "Flags": 128,
256   "Functions": [
257   {
258     "name": "Funct 8",
259     "Flags": 3
260   },
261   ,
265   ,
269   ,
273   ,
277   ,
281   ,
285   ,
289   ,
293   ,
297   ,
301   ,
305   ,
309   ,
313   ,
317   ,
321   ,
325   ,
329   ,
333   ,
337   ,
341   ,
345   ,
349   ,
353   ,
357   ,
361   ,
365   ,
369   ,
373   ,
374   },
375   ,
499   ,
623   ,
747   ,
871   ,
995   ,
1119  ,
1243  ,
1244  ]
}
```

Figure 53 A loco entry in a JSON Roster File

Accessing the Roster Download File on Apple IOS

On Apple IOS, for example an iPad, Safari puts up a dialog “Do you want to download “My Locos 0-9.json.txt”. When you tap Download, it places the file in the Downloads folder which you can open by tapping the little Downloads Icon at the top (a down arrow with a circle) followed by the Magnifying Glass Icon. Alternately you can open the Files app and tap Downloads.

You can create a Rosters folder either on the iCloud drive or locally and move the downloaded file to that location.

Accessing the Roster Download File on Android

On Android, after the download completes, you are given the option to open the file. You don’t really want to do that, you need to store the file in your desired location, so tap the “three dots” to get the menu on Chrome and tap Downloads to open the Downloads folder. You can use the File

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Manager app to copy the file from Downloads to a new folder called Roster which you create in Main Storage.

Different versions of the Google operating system Android may work differently. Study the features of your device to find the best approach to storing your roster files.

Uploading a Previously Downloaded Locos File

IMPORTANT: On the Engine Driver and WiThrottle apps, you cannot use the Web display within the app to download or upload a locomotive roster. You must open the setup web pages in a browser such as Safari, Chrome or Edge by typing 192.168.7.1 into the browser. If you are in home net mode you use the IP Address assigned by your router. Select the Locomotive Roster page and proceed as described.

To upload a previously save set of locos go to the Locomotive Roster page and click the Upload link. On the Roster Upload page, click the Choose File button and navigate to your saved locos file. Click Open. The chosen file name should show against the Choose File button as in Figure 55. To complete the upload, click the Upload button.

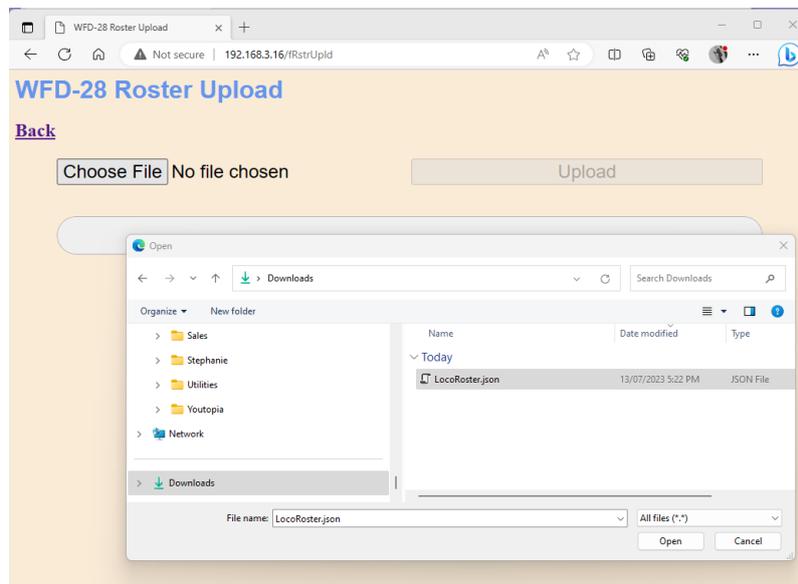


Figure 54 Opening a Previously Saved Locomotives File

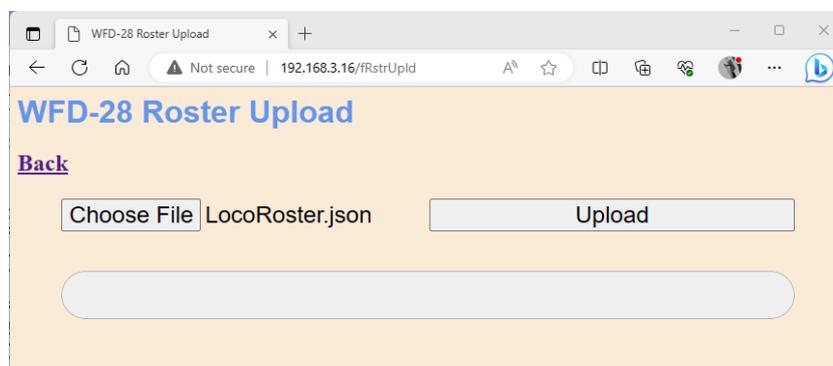


Figure 55 The Chosen File to be Uploaded is Displayed

The progress bar shows upload progress. When complete, the Locomotive Roster page is displayed showing the newly uploaded locomotives.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Note that uploading is controlled by the indices assigned to locomotives (i.e., location numbers in the loc roster), that are stored in the file. If locos already exist at those locations in the list within the WFD-28, they will be overwritten. If they do not exist, they will be created. If you upload several files that have sets of locos with gaps between indices either within a file or between files, locos will appear in the WFD-28 list with those exact same indices. So, there may be gaps in the list. This does not matter but, if you add locos, you will fill the gaps. You can also move the locos up or down and save the whole file again.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Accessories

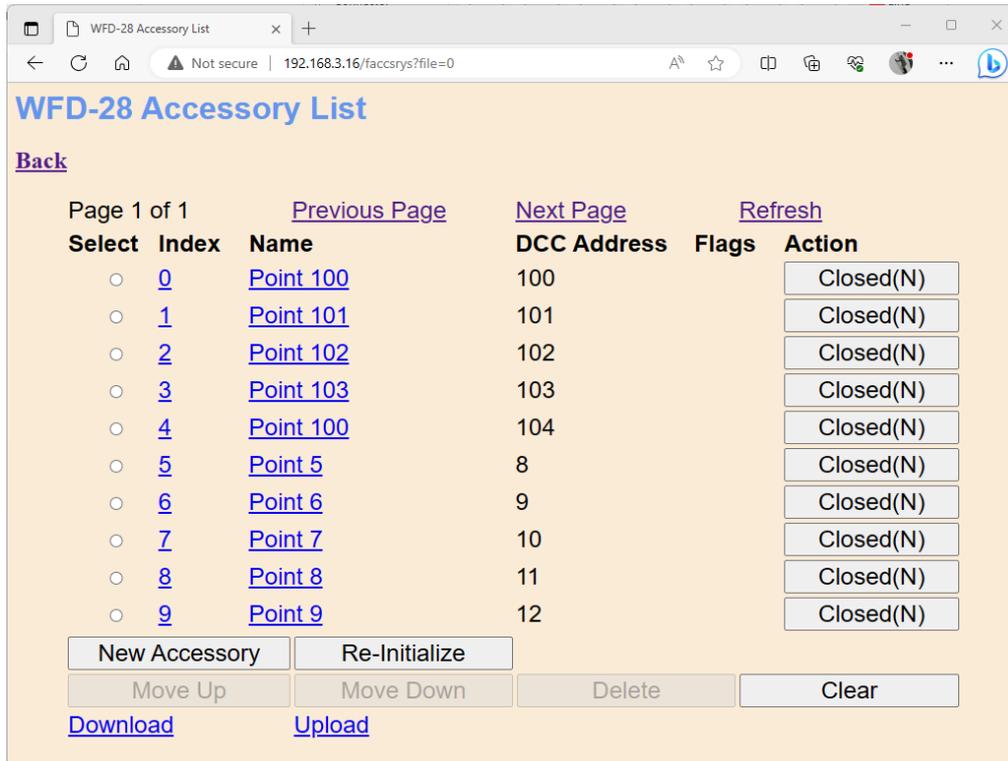


Figure 56 The Accessory List Page

This page allows you to change the entries in the accessory (points) list of your WFD-28. You can give each entry a Name and a DCC Accessory Address. You can then select from the list when using Engine Driver or WiThrottle instead of needing to type the Accessory Address.

This page also allows you to download part or all of your accessory list to be saved and restored later. You can also toggle the accessory between closed and thrown from this page.

View the Accessory List by tapping the Accessories item in the Web Setup Main Menu. By default, as shipped and after factory reset only ten entries are displayed and given the names “Point 0” through “Point 9” with DCC Accessory Addresses 3 through 12. Accessories can be added, up to maximum of 200.

Adding, Deleting and Moving Accessories Up or Down

You can add more accessories to your list up to a maximum of 200. Add an accessory by tapping the “New Accessory” button on the Accessory List page. A new accessory will be added with a default name, DCC address and set of functions. You can edit this to what you require. Once you reach 200 locos, tapping the New Accessory button will have no effect.

You can delete an accessory by selecting it using the radio button in the left-hand column and tapping the Delete button. after a warning, the accessory will be deleted. This operation cannot be reversed.

All accessories in the list have an index. This simply indicates the position of the accessory in the list. If you delete an accessory, a gap will occur in the indices. Adding new accessories will fill any gaps in the accessory index sequence before appending new accessories at the bottom.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Display of the accessory list is paged, 10 accessories to a page so a full list will have 20 pages. Initially, when you enter the Accessory List, the first page will be displayed. Move forward and backwards in the pages by clicking the Next Page and Previous Page links.

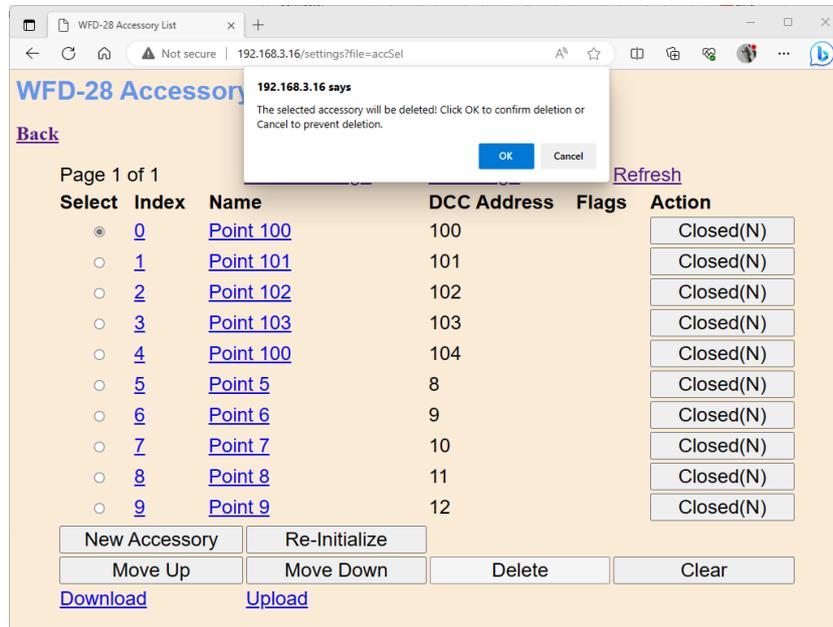


Figure 57 Deleting an accessory from the list

An accessory may be moved upwards and downwards in the list. To move an accessory down by one step, select the required accessory by clicking the radio button at its left. Then click Move Down. The index of the selected accessory will be increased by one so that the accessory will move one place downwards in the list. Similarly, you can move an accessory one place up by selecting and clicking the Move Up button. Note that if you have gaps in the index sequence, accessories will increase or decrease their index as they move through the gap and only appear to move down or up when an adjacent index is occupied.

Clearing the Entire Accessory List

You can clear the entire list and begin again by clicking the Clear button. After a warning, all accessories will be deleted. This operation cannot be reversed. However, if you have downloaded some or all of your accessories you can restore them by uploading the file as described in the Section

Editing Listed Accessories

To edit one of the entries in the Accessory List, tap the name, to show the edit page as Figure 40, and enter what you require in the Name and Accessory Address text boxes and tap Save. Names can be up to 10 characters and may contain spaces. DCC addresses must be in the range 1 – 2000.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

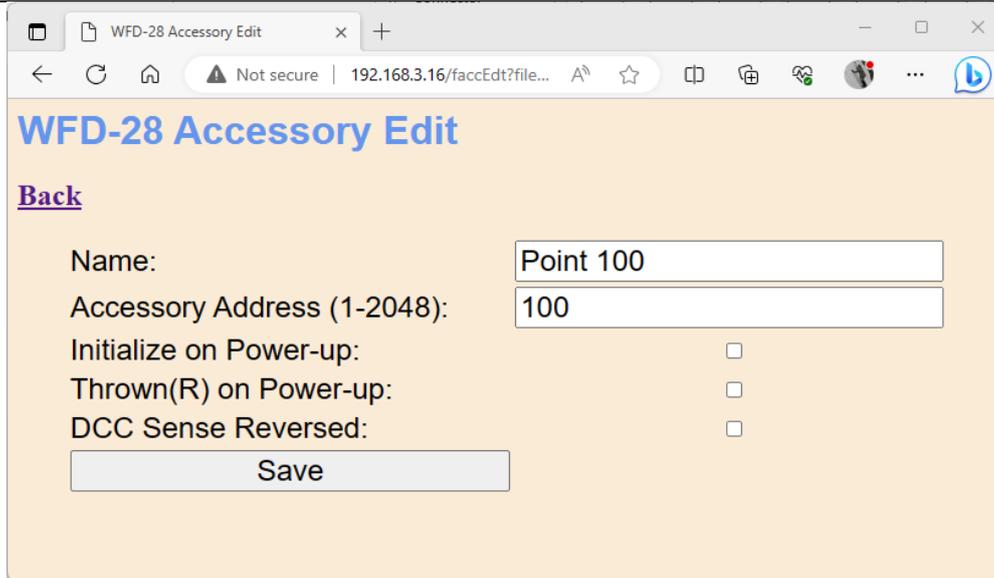


Figure 58 The Accessory Edit Page.

Accessory Initialization

Accessories can be set to initialize to a particular state on power up of the WFD-2X module. For example, you may wish that every time you turn on your system, all the points are set to the closed state, or perhaps all main-line routes are setup as default.

To cause an accessory to set to a defined state on power up, check the Initialize on Power-up checkbox on the Accessory Edit page. To define the state of the point on power-up either check or leave unchecked the Thrown (R) on Power-up checkbox. Note that in NCE Terminology “Thrown” is defined as “Reversed” as would be displayed on your Power Cab or Pro-Cab.

The third checkbox allows for reversal of the commands sent to the NCE Command Station (Power Cab or Power Pro) for the Thrown and Closed settings. Normally Closed = “N” and Thrown = “R”. Checking the NCE N/R Reversed checkbox reverses this sense which might be useful in some rare situations. Normally leave this unchecked.

Once a set of accessories in the list are set to initialize, they will set the states you require each time the WFD-2X is powered up. Back on the Accessory List Page in Figure 56, a button marked Re-initialize will have the same effect when clicked.

Operating Accessories from the Accessories List Page

The buttons on the right in the Accessory List Page in Figure 56 will toggle accessories that are connected on your DCC circuit and which have programmed accessory address matching the definition in the accessory list. The state of the accessory will be shown on the Accessories List Page. The state will also be updated when re-initialization occurs, on power-up and if accessories are changed from a WiThrottle Protocol app or device such as Engine Driver, WiThrottle or TCS UWT-100.

The display will not show the correct state if an accessory is changed using a Power Cab or Pro-Cab, neither will it update if the web page on a WifiTrax WFS series controller is used to change the state. You can, of course, use WFS Series Switch Machine Controllers with your NCE Command Station/Booster, whether Power Cab or Power Pro, but to be consistent you should try to change them from the same place, either the WFD-2X or the WFS web page.

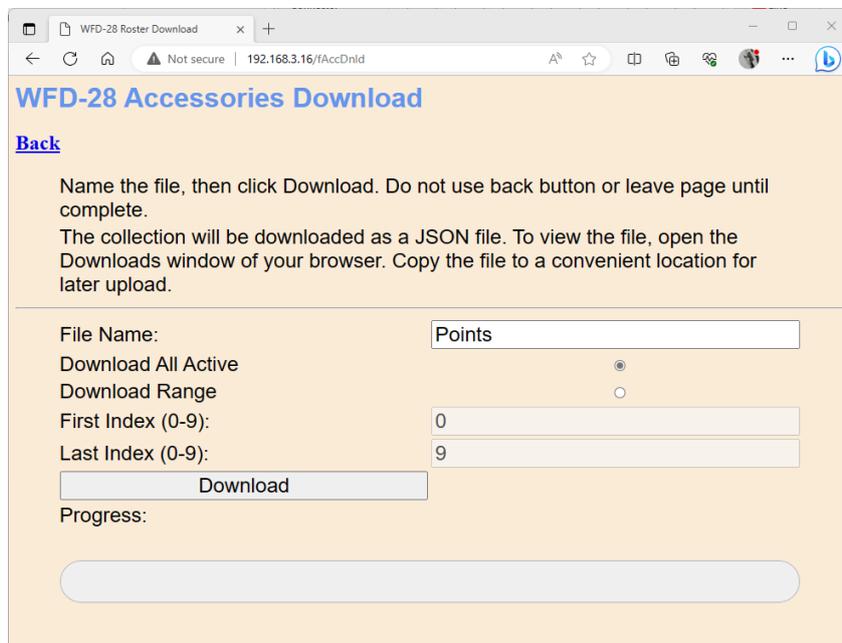
WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Downloading Accessories to a File

Once you have set up a set of accessories in your roster, it is a good idea to download and store it in a file on your PC or other device. For example, if you need to reset the module for some reason, the accessory list will return to its default and you will have wasted all that work. You also might like to have separate accessory lists if you use the WFD-2X at a club as well on your own layout.

IMPORTANT: On the Engine Driver and WiThrottle apps, you cannot use the Web display within the app to download or upload an accessory list. You must open the WFD-2X Web Pages in a browser such as Safari or Chrome by typing 192.168.7.1 into the browser. If you are in home net mode you use the IP Address assigned by your router. Select the Accessories page and proceed as described.

To download all or part of an accessory list, click Download on the WFD-2X Accessory List page. The page within the list that you are currently displaying has no effect. The Accessories Download page will appear as in Figure 49.



WFD-28 Accessories Download

[Back](#)

Name the file, then click Download. Do not use back button or leave page until complete.
The collection will be downloaded as a JSON file. To view the file, open the Downloads window of your browser. Copy the file to a convenient location for later upload.

File Name:

Download All Active

Download Range

First Index (0-9):

Last Index (0-9):

Progress:

Figure 59 The Accessories Download Page

There are 200 indices (accessory numbers not DCC Address) in the list. Usually only some have been filled and are considered active, so only active list entries will be downloaded.

The File Name is the name given to the file that will be downloaded, so give it a meaningful name that you will recognize.

You can elect to include all of the active accessory entries into the file or just a range. Therefore select “Download all Active” or “Download Range” accordingly.

If you select “Download Range” enter the First and Last Index as required. For example, if you just want to download the first 10 accessories, use 0 and 9 as the values. Notice that indices begin at 0. You may want to go back to the Accessory List page and jot down the first and last index.

Click the Download button to start the download. A Progress Bar shows the download progress as in Figure 50.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

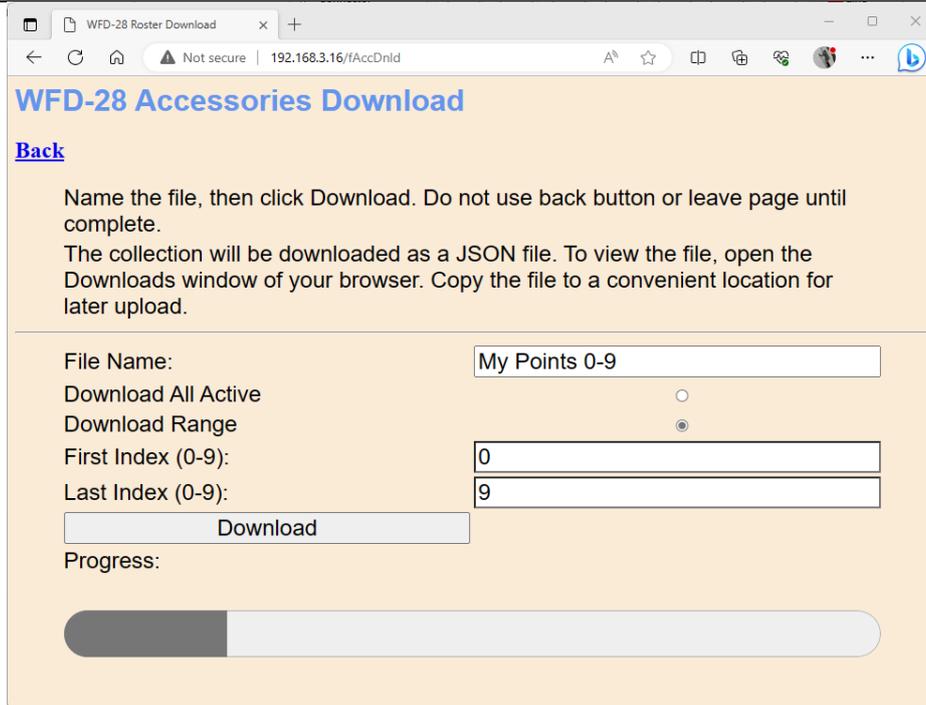


Figure 60 Accessory Download in Progress

When the download is complete, the action depends on the browser and device you are using.

Accessing the Roster Download File on Windows 10

Using Microsoft Edge on Windows 10, the browser automatically opens the Downloads pane as on the right of Figure 51.

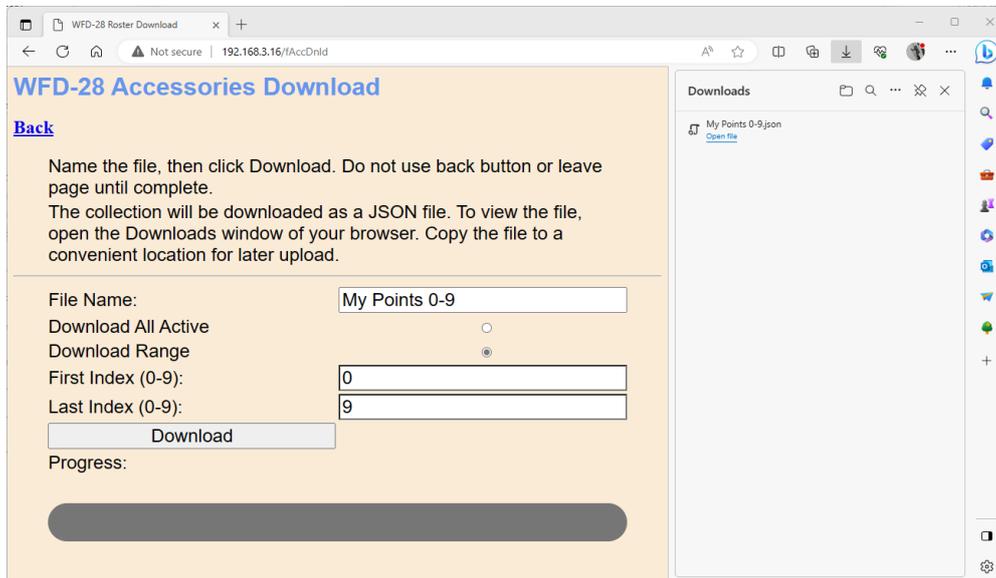


Figure 61 Accessory Download Complete on Windows using Edge Browser

This behavior is the same as downloading any file from the internet. The file is placed in the Downloads folder for the account on your machine. How you access this will depend on your device and operating system.

On Windows 10 this will be

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

C:\Users\\Downloads

Where <User Name> is the name of the Windows user account on your machine. You can open the Downloads folder in Edge by clicking on the folder icon in the Downloads pane to see the folder in Windows Explorer as in Figure 52.

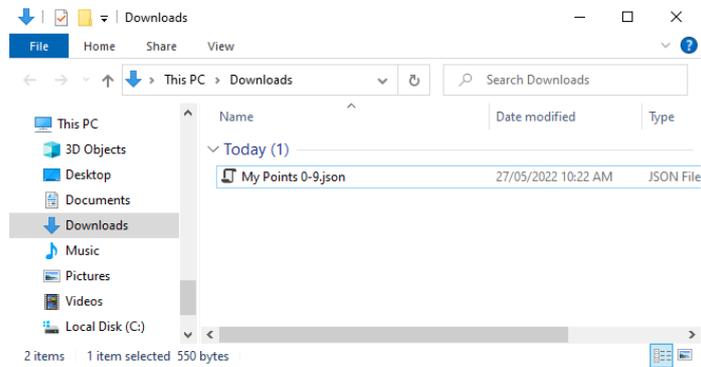


Figure 62 The Downloaded Roster File in Windows Explorer

Now you should copy the file to a suitable location on your computer that you have prepared for rosters. If you leave it in the Download folder it will get lost if you delete the downloads to clear up space on your disk drive.

For the technically inclined, the file is in JSON format and contains locos as JSON objects. A section of the file is shown in Figure 53. It is possible to carefully modify this manually, but be careful, as uploading an invalid file may crash the firmware in the WFD-2X and require a factory reset.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

```
{
  "accessories": [
    {
      "Index": 0,
      "Name": "Point 0",
      "DccAddr": 3,
      "Flags": 128
    },
    ...,
    ...,
    ...,
    ...,
    ...,
    ...,
    ...,
    ...,
    ...,
    ...,
    ...
  ]
}
```

Figure 63 Accessory Entry in a JSON Accessory List File

Accessing the Accessory Download File on Apple IOS

On Apple IOS, for example an iPad, Safari puts up a dialog “Do you want to download “My Points 0-9.json.txt”. When you tap Download, it places the file in the Downloads folder which you can open by tapping the little Downloads Icon at the top (a down arrow with a circle) followed by the Magnifying Glass Icon. Alternately you can open the Files app and tap Downloads.

You can create an Accessories folder either on the iCloud drive or locally and move the downloaded file to that location.

Accessing the Roster Download File on Android

On Android, after the download completes, you are given the option to open the file. You don’t really want to do that, you need to store the file in your desired location, so tap the “three dots” to get the menu on Chrome and tap Downloads to open the Downloads folder. You can use the File Manager app to copy the file from Downloads to a new folder called Accessories which you create in Main Storage.

Different versions of the Google operating system Android may work differently. Study the features of your device to find the best approach to storing your roster files.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Uploading a Previously Downloaded Accessories File

To upload a previously save set of accessories go to the Accessories List page and click the Upload link. On the Accessories Upload page, click the Choose File button and navigate to your saved accessories file. Click Open. The chosen file name should show against the Choose File button as in Figure 65. To complete the upload, click the Upload button.

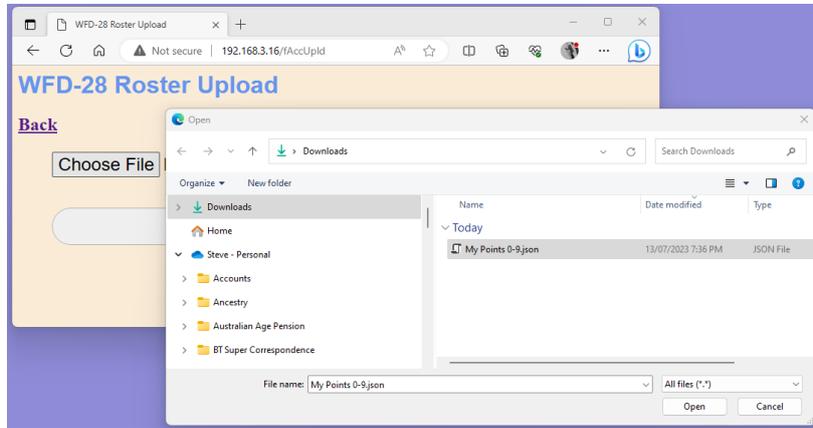


Figure 64 Opening a Previously Saved Accessories File

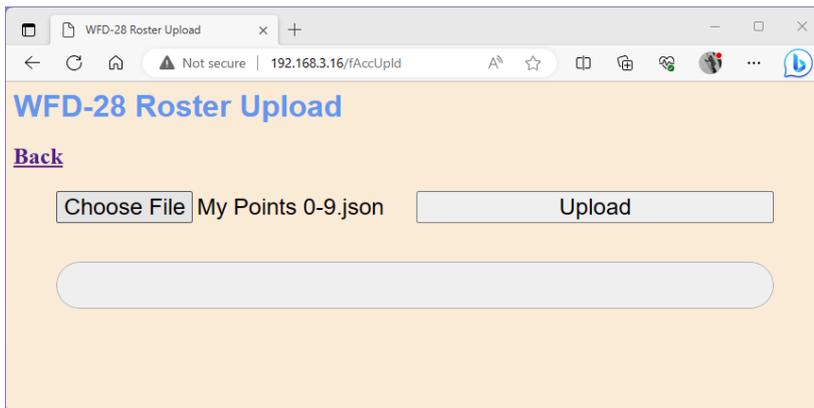


Figure 65 The Chosen File to be Uploaded is Displayed

The progress bar shows upload progress. When complete, the Accessories List page is displayed showing the newly uploaded accessories.

Note that uploading is controlled by the indices assigned to accessories (i.e., location numbers in the accessory list), that are stored in the file. If accessories already exist at those locations in the list within the WFD-2X, they will be overwritten. If they do not exist, they will be created. If you upload several files that have sets of accessories with gaps between indices either within a file or between files, accessories will appear in the WFD-2X list with those exact same indices. So, there may be gaps in the list. This does not matter but, if you add accessories, you will fill the gaps. You can also move the accessories up or down and save the whole file again.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Panels

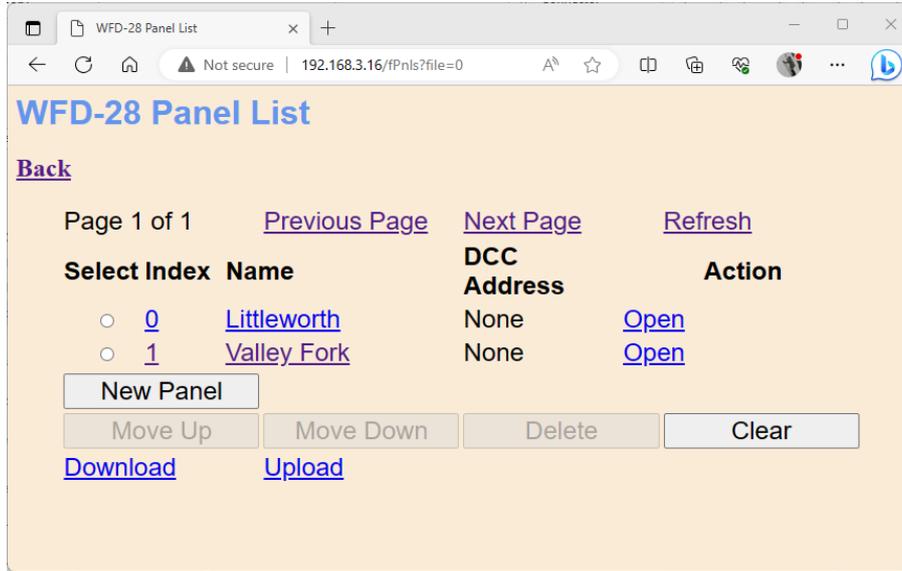


Figure 66 The Panel List Screen

Enter the Panels feature by clicking Panels on the Main Menu. The Panel List is displayed as in Figure 66.

The Panels feature in the WFD-2X allows Schematic panels to be created that can include active features such as turnouts and signals as well as passive features such as track, buildings and labels. Buttons can also be added. The idea is to design a set of diagrams of all or part of your layout, similar to track diagrams in automatic train control centers. You can display these diagrams on any computer, tablet or phone using a web browser. Clicking or tapping on active features such as turnouts or buttons changes the state of those features. Active features map to a physical channel of a device such as a Wifitrax Switch Machine Controller, WFS-47 or WFS-87. These channels (corresponding to physical turnouts on your railway) can be selected for each active feature (turnout or signal) on your diagram.

You can create up to 8 panels in any WFD-2X module. You could have one panel for your entire layout or a set of panels, each covering a section such as a station or yard.

After a reset, one panel is created which you can edit as required by clicking on the hyperlink in the Name column. Once you have completed a panel, you use it by clicking the Open Hyperlink. Remember that you can use your browser features to remember any particular panel in your Favourites collection in your browser. That makes it easier to directly access a panel. You can even select that panel as your browser's home page.

You add more panels by clicking the New Panel button.

Editing Panels

Once you have created a panel, you edit it by clicking its name hyperlink in the Panel List Screen. For a new panel, the screen appears as Figure 67.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

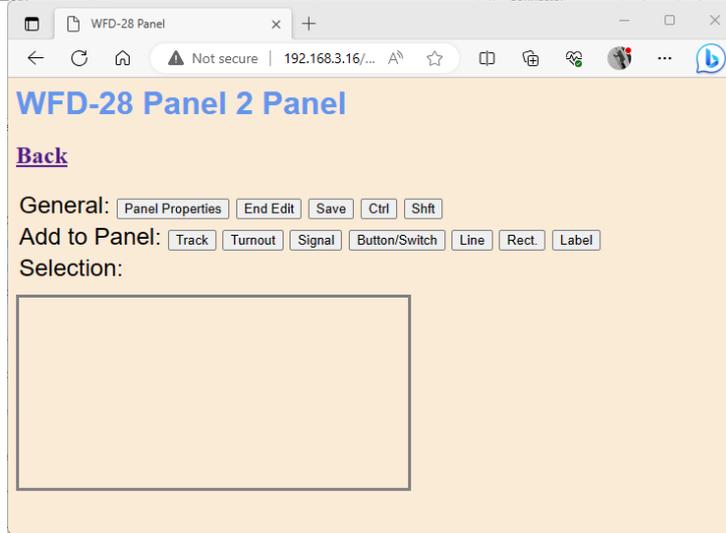


Figure 67 A New Panel Displayed in the Panel Editor

Setting Panel Properties

Perhaps the first thing you will want to do is to give the panel a meaningful name. To do this edit the panel properties by clicking on the Panel Properties button. This shows additional information as Figure 68.

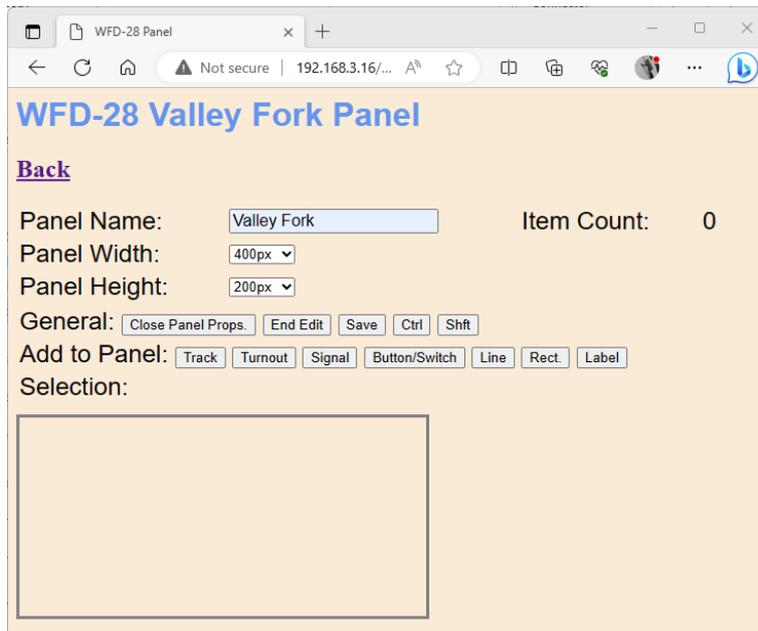


Figure 68 The Panel Properties Information

Type the name you want in the Panel Name textbox such as “Valley Fork” the name of an area on an example railroad. You can also change the size of the panel using the Panel Width and Panel Height dropdowns. Remember to click the Save button. You must always click the Save button before exiting this screen otherwise any changes will be lost.

Once you have set the panel properties, name, width and height you can click the Close Panel Props. button to save some space on your screen.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Adding and Positioning Turnouts

To add an item to your panel, click on one of the buttons in the “Add to Panel” line. The item you add appears in the top-left corner and you can drag it anywhere on the screen. Figure 69 shows two turnouts added. One has been moved to a central position while one remains to be positioned.

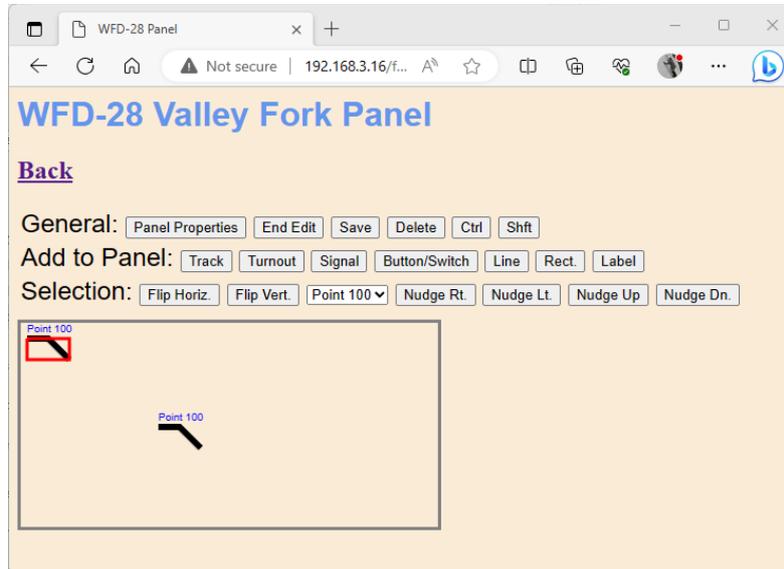


Figure 69 Adding Turnouts to a Panel.

Select a feature by clicking on it. Once you have selected a feature the Selection line appears that contains buttons such as Flip Vert., Flip Horiz., and the Nudge buttons. You can move a feature by dragging and also position it more finely by nudging up, down, left or right. You will find that the three active points on a turnout will snap together and the ends of a track section will snap to one of the three active points on a turnout.

When you select a turnout, you will also see a dropdown that allows you to map it to a channel of an accessory (Switch Machine Control Module) on your layout. These will only appear if either, you have added some accessories manually, or, your WFD-2X has discovered them by scanning your network.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

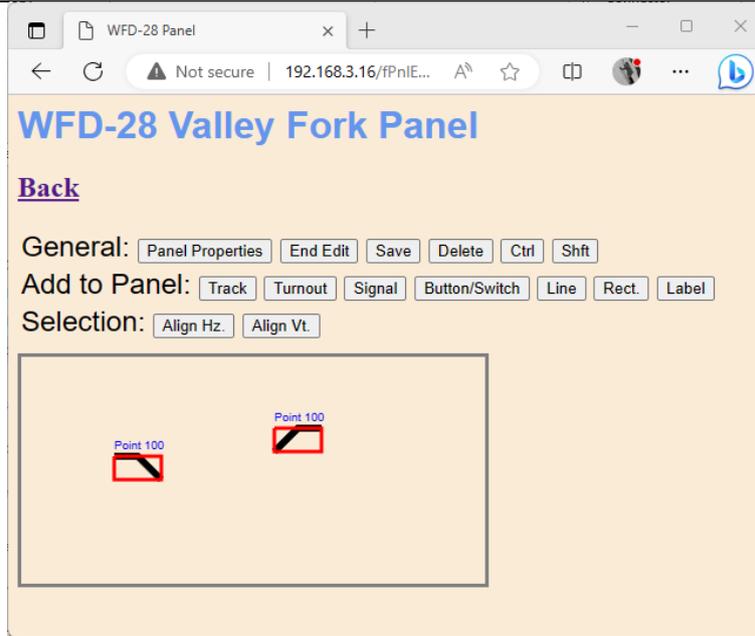


Figure 70 Positioning two turnouts.

Figure 70 shows a situation where we have added and roughly positioned two turnouts. The right hand on has been flipped horizontally and the accessory “Point 101” has been assigned to the symbol. Now we want to better align those turnouts before adding track sections to make a passing siding. You can select both of them by either holding down the control key and clicking one then the other, or, by dragging across both of them with the mouse holding the left button down. On a tablet, you can click the control button which has the same effect as holding down the control key.

When two or more features are selected, the Selection line buttons show only actions applying to multiple features. Figure 73 shows two actions: Align Vert. and Align Horiz. Align Horiz will set the two turnouts neatly aligned horizontally. You can also move them together by dragging one of them.

Adding Track

Once they are nicely positioned, track can be added by clicking on the Track button. Again, the new feature, a length of track this time, appears in the top-left corner. For track, you can drag the whole length by dragging the middle, or just one end by dragging that end. Roughly these sections are one third of the track length each. Practice dragging the part of the track you want to move. The track ends snap to active points on the turnouts. If you hold down the shift key, the dragged item will only move in the horizontal direction.

Remember to click the Save key frequently. Figure 71 shows the completed sections of track and turnouts.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

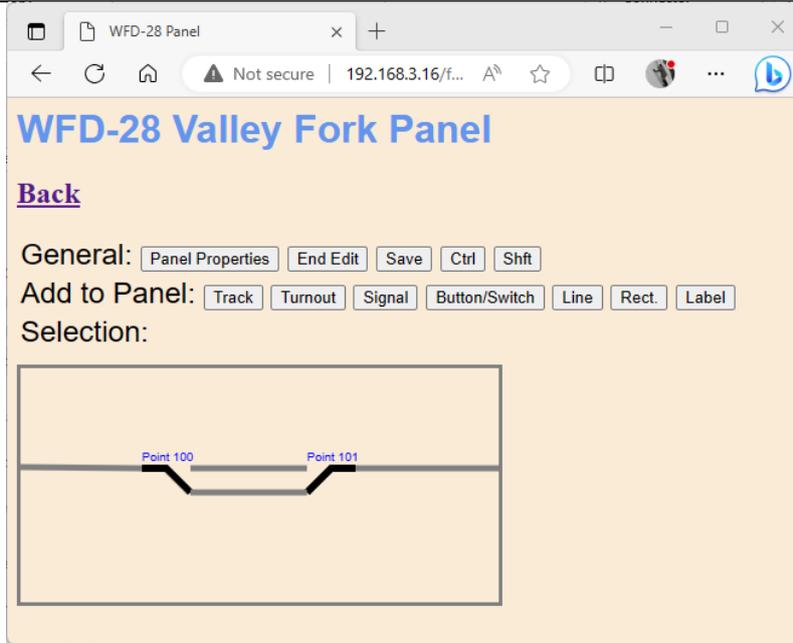


Figure 71 Track Sections added to the Panel

Adding Passive Features

Click on Line or Rectangle to add static geometric features to show a platform or building. Rectangles are sized by dragging the top left or bottom-right corners. They are moved by dragging one of the other corners. Click on Label to add text labelling. You can type the text into the textbox displayed as shown. Select the required font size in the dropdown.

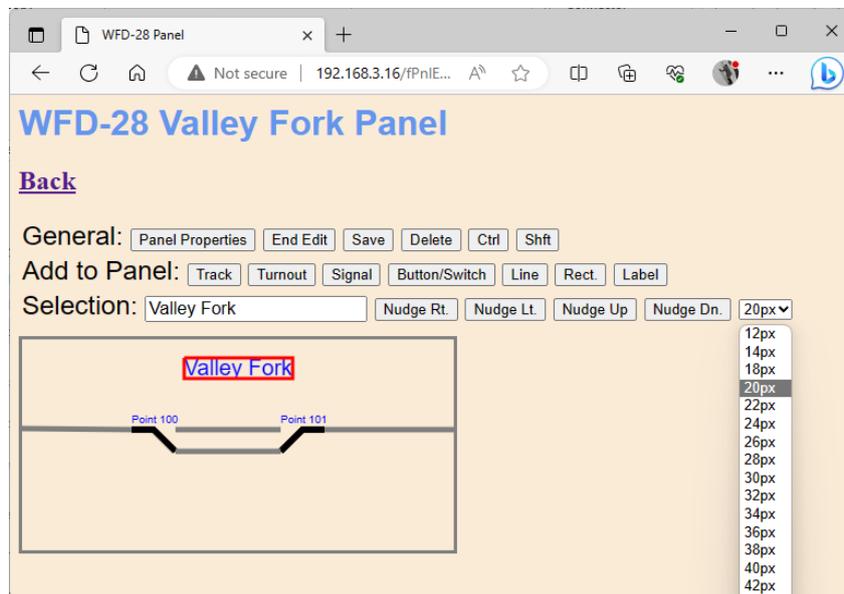


Figure 72 Adding a Label to a Panel

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

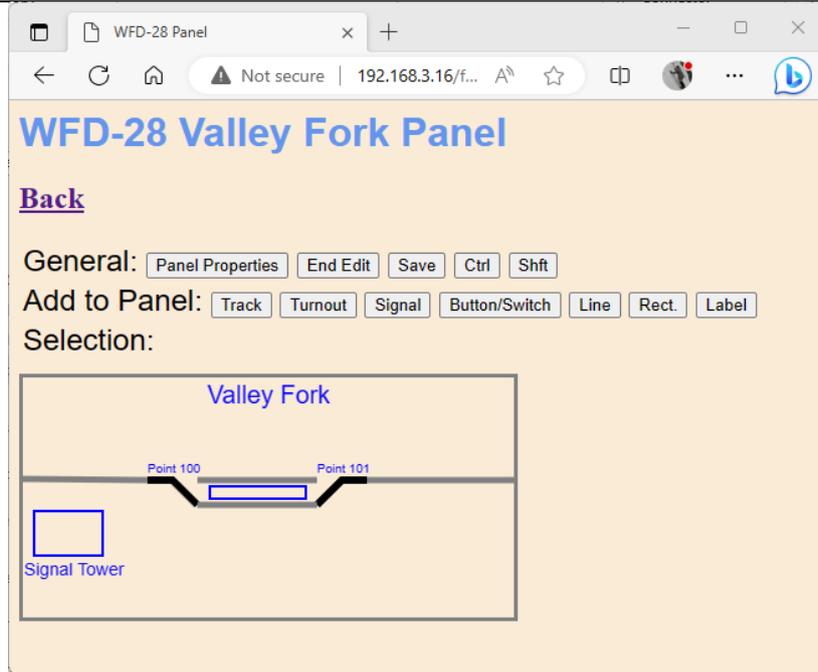


Figure 73 The completed Panel for Valley Fork Station

Operating your Panel

Remember to save your work then click the Back button to return to the Panel List screen. Click the Open hyperlink to operate the panel as in Figure 74. You cannot operate a panel when in edit mode and normally you would not want to since you don't want to accidentally change you panel. You can however be in Edit mode and click End Edit to test Open mode, then you can click Edit to return to Edit mode.

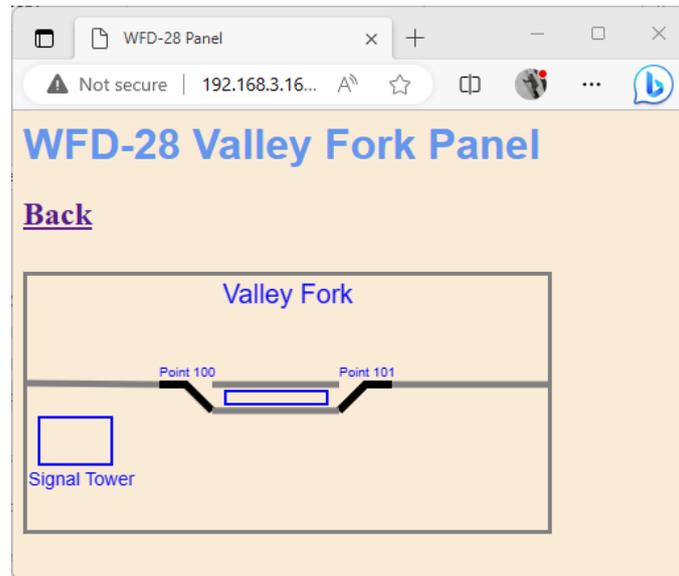


Figure 74 Operating a Panel in Open Mode rather than Edit Mode

Using Buttons on a Panel

Buttons provide an alternative method of operating accessories such as points but are more suited to lights and routes. (Note: Routes are not included on the WFD-2X Version 2.2.X.).

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

To add a button, click on Button/Switch when in edit mode, then drag the button to a suitable location on the panel. When you select a button, a dropdown appears to allow mapping of the button to a physical controller channel as in Figure 75

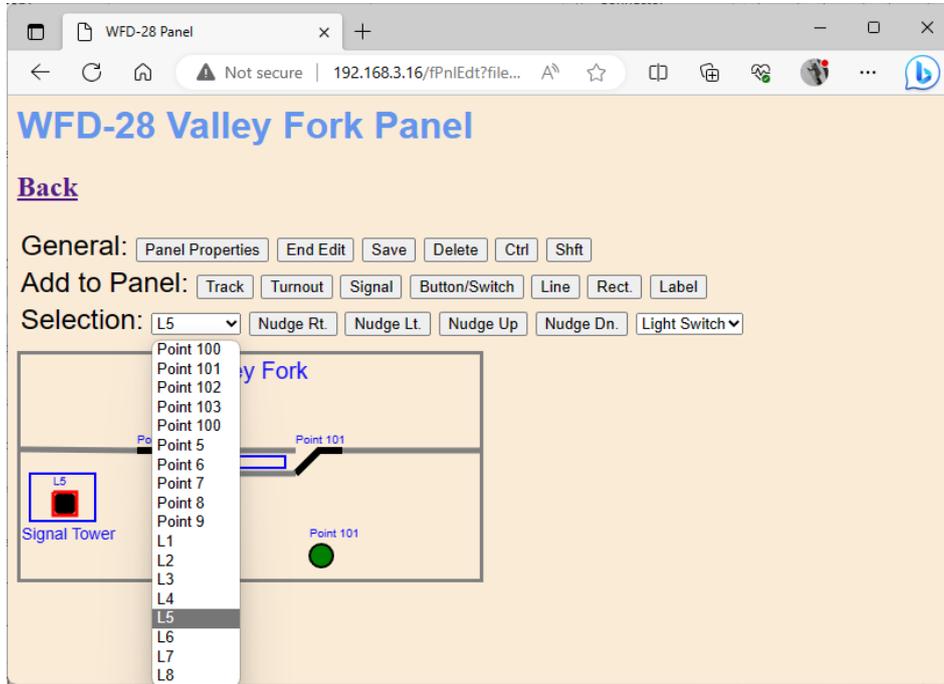


Figure 75 Selecting the Physical Channel for a Button.

Here we have selected a physical channel L5 which is a channel in a WFG-80 Wifitrax Lighting controller. On our layout, this channel is wired to an LED in the Signal Tower. The button will turn the LED on or off. There is also a drop-down to select the type of switch and in this case, in Figure 76, we have selected Light Switch. These buttons can be used for instantaneous actions such as triggering a route or permanently on/off functions such as turning a light on or off and switching a turnout from closed to thrown.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

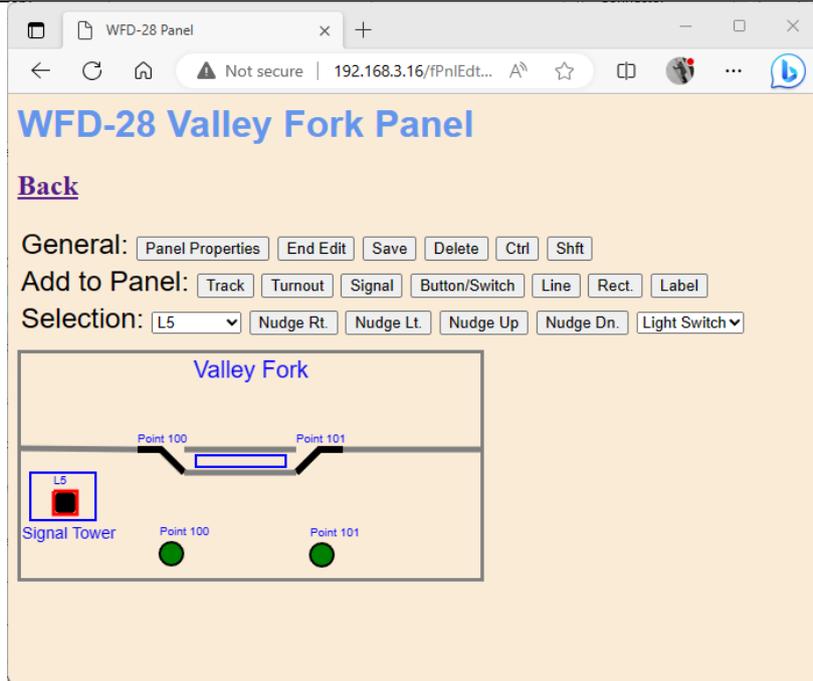


Figure 76 Selecting the Type of Button.

The other two buttons on the panel have been configured as alternative means of controlling the two turnouts as Figure 77.

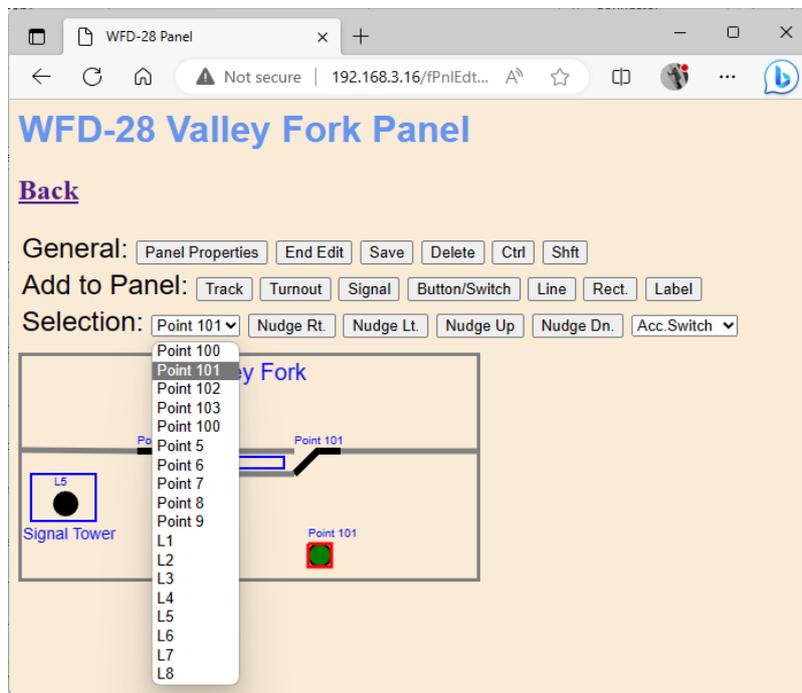


Figure 77 Using buttons to control a turnout.

Using Signals on a Panel

Two kinds of signals are provided in the Panels feature. Two-aspect and three-aspect. The two-aspect signals can be in either Red or Green state. The three-aspect signals can be in red, amber or green.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

To place a signal on the panel, click the signal button and move it to the desired location. When a signal is selected, there are two or three dropdowns to select the physical channels as well as a dropdown to select the signal type, as in Figure 78. Here we have selected a two-aspect (two-colour) type of signal and so two physical channels must be selected, one for the red LED and one for the blue LED. These are chosen in Figure 79. Again we are using the channels of a WFG-80 module having connected channel 1 (L1) to a red LED and Channel 2 (L2) to a green LED in a home made signal.

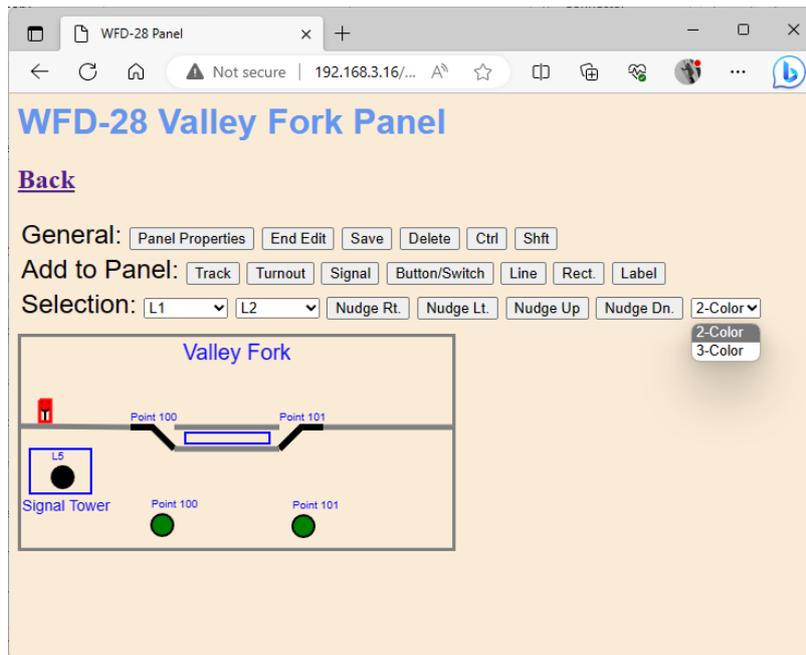


Figure 78 Setting the Properties of a Signal in a Panel.

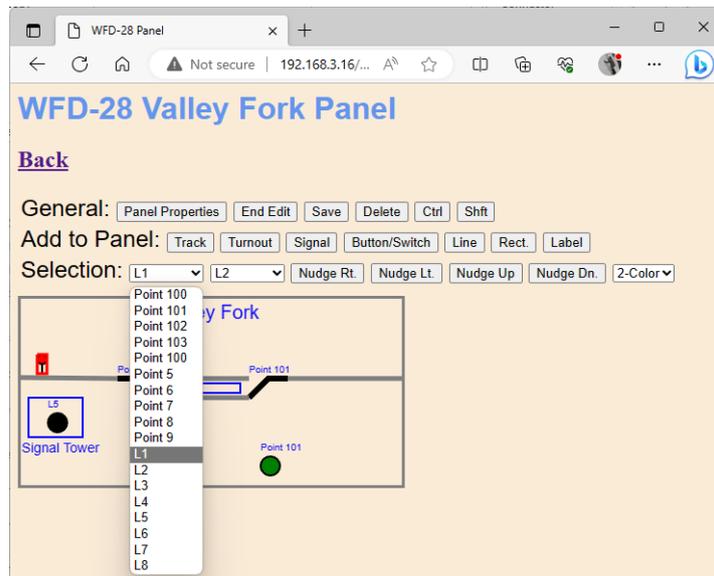


Figure 79 Setting the Physical Channels for a Two Aspect Signal.

Saving and Restoring Panels

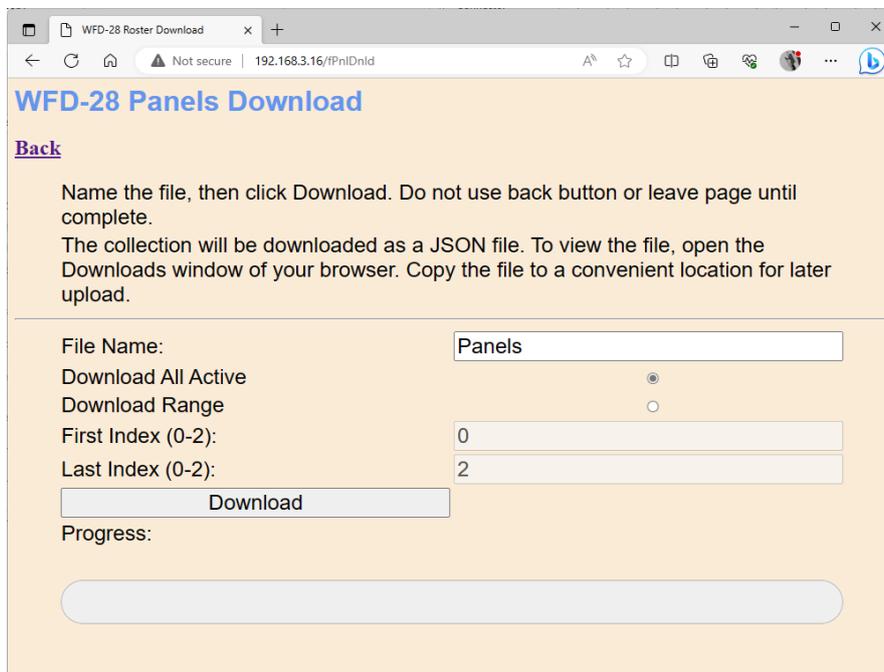
Panels can be saved to your computer as files and restored in a similar manner to Locomotives and Accessories.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Once you have set up a set of Panels, it is a good idea to download and store them in a file on your PC or other device. For example, if you need to reset the module for some reason, the panels list will return to its default and you will have wasted all that work. You also might like to have separate panels if you use the WFD-2X at a club as well on your own layout.

IMPORTANT: On the Engine Driver and WiThrottle apps, you cannot use the Web display within the app to download or upload a panel list. You must open the WFD-2X Web Pages in a browser such as Safari or Chrome by typing its IP Address into the browser. If you are in home net mode you use the IP Address assigned by your router. Select the Panels page and proceed as described.

To download all or part of a panels list, click Download on the WFD-2X Panels List page. The page within the list that you are currently displaying has no effect. The Panels Download page will appear as in Figure 49.



The screenshot shows a web browser window with the address bar displaying '192.168.3.16/fPnlDnld'. The page title is 'WFD-28 Panels Download'. Below the title is a 'Back' link. The main text reads: 'Name the file, then click Download. Do not use back button or leave page until complete. The collection will be downloaded as a JSON file. To view the file, open the Downloads window of your browser. Copy the file to a convenient location for later upload.' Below this is a form with the following fields: 'File Name:' with the value 'Panels'; 'Download All Active' with a selected radio button; 'Download Range' with an unselected radio button; 'First Index (0-2):' with the value '0'; and 'Last Index (0-2):' with the value '2'. At the bottom of the form is a 'Download' button and a 'Progress:' label above a progress bar.

Figure 80 The Panels Download Page

There are 8 indices (panel index numbers) in the list. Usually only some have been filled and are considered active, so only active list entries will be downloaded.

The File Name is the name given to the file that will be downloaded, so give it a meaningful name that you will recognize.

You can elect to include all of the panel entries into the file or just a range. Therefore select "Download all Active" or "Download Range" accordingly.

If you select "Download Range" enter the First and Last Index as required. For example, if you just want to download the first 3 panels, use 0 and 2 as the values. Notice that indices begin at 0. You may want to go back to the Panels List page and jot down the first and last index.

Click the Download button to start the download. A Progress Bar shows the download progress.

When the download is complete, the action depends on the browser and device you are using.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Uploading a Previously Downloaded Panels File

To upload a previously save set of panels go to the Panels List page and click the Upload link. On the Panels Upload page, click the Choose File button and navigate to your saved panels file. Click Open. The chosen file name should show against the Choose File button as in Figure 65. To complete the upload, click the Upload button.

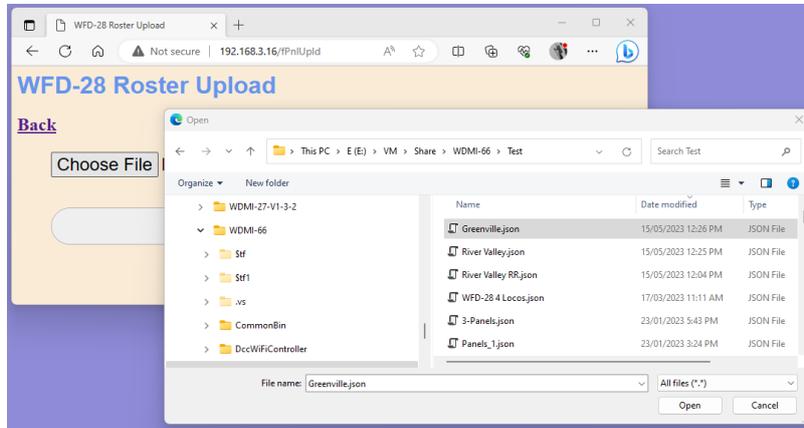


Figure 81 Opening a Previously Saved Panels File

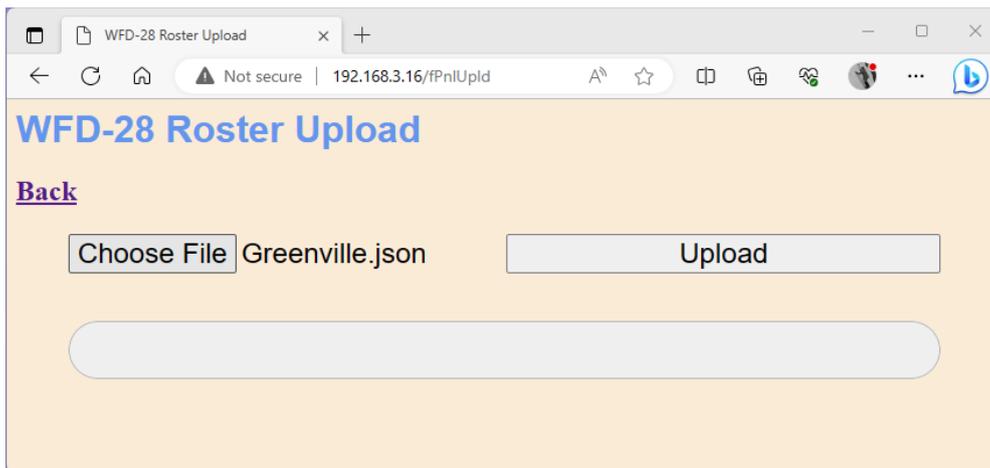


Figure 82 The Chosen File to be Uploaded is Displayed

The progress bar shows upload progress. When complete, the Panels List page is displayed showing the newly uploaded panels.

Note that uploading is controlled by the indices assigned to panels (i.e., location numbers in the panels list), that are stored in the file. If panels already exist at those locations in the list within the WFD-2X, they will be overwritten. If they do not exist, they will be created. If you upload several files that have sets of panels with gaps between indices either within a file or between files, panels will appear in the WFD-2X list with those exact same indices. So, there may be gaps in the list. This does not matter but, if you add panels, you will fill the gaps. You can also move the panels up or down and save the whole file again.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Routes

Many model railroaders like to use routes which are collections of points set in a particular configuration. One simple example is two left hand or two right hand turnouts that form a crossover. You always want to operate the turnouts together – either both closed or both thrown. Any other configuration results in a derailment. Another example is a switching yard with many sidings and multiple points defining which siding will be the destination from the main line.

Wifitrax WFD-2X has a built-in route capability that allows the user to define up to 50 routes that each specify a particular configuration of up to 10 points. Also, you can download your Wifitrax routes to a file to save and re-establish them again by uploading the file.

To start defining Routes, tap the Routes option in the main menu to display the WFD-2X Route List as in Figure 83.

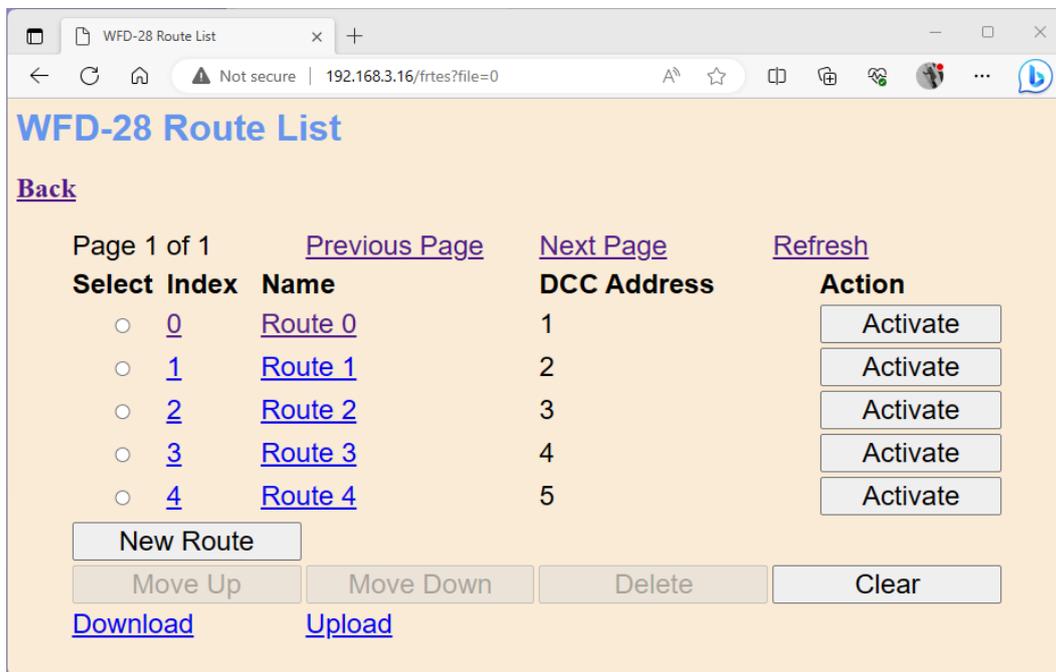


Figure 83 The WFD-2X Route List

When WFD-2X leaves the factory or after a factory reset, 5 routes are automatically created but you can add more by clicking the New Route button.

Adding, Deleting and Moving Routes Up or Down

You can add more routes to your list up to a maximum of 50. Add a route by tapping the “New Route” button on the Route List page. A new route will be added with a default name. You can edit this to the kind of route you require. Once you reach 50 routes, tapping the New Route button will have no effect.

You can delete a route by selecting it using the radio buttons in the left-hand column and tapping the Delete button. After a warning, the route will be deleted. This operation cannot be reversed.

All routes in the list have an index. This simply indicates the position of the route in the list. If you delete a route, a gap will occur in the indices. Adding new routes will fill any gaps in the route index sequence before appending new routes at the bottom.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Display of the route list is paged, 10 routes to a page, so a full list will have 5 pages. Initially, when you enter the Route List, the first page will be displayed. Move forward and backwards in the pages by clicking the Next Page and Previous Page links.

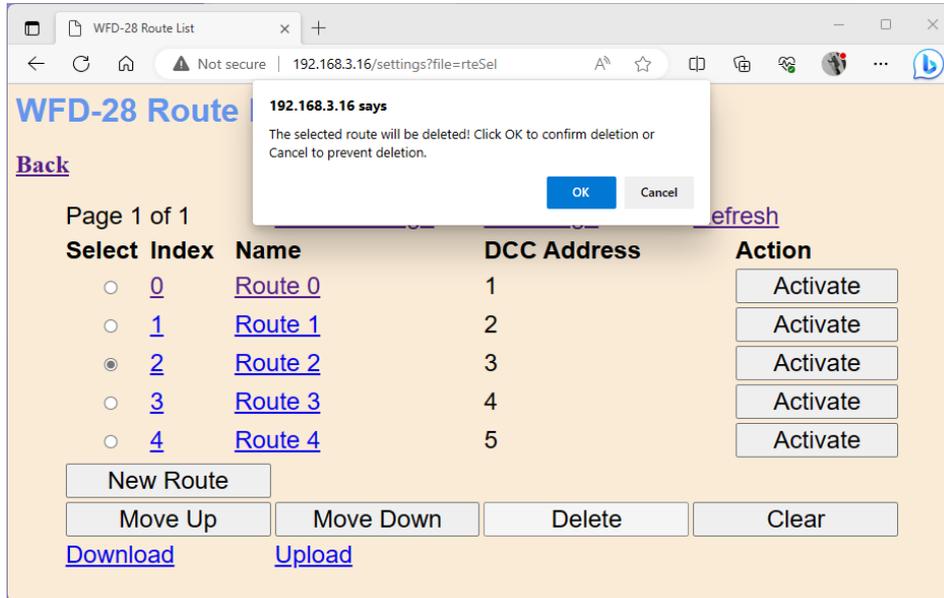


Figure 84 Deleting a route from the list

A route may be moved upwards and downwards in the list. To move a route down by one step, select the required route by clicking the radio button at its left. Then click Move Down. The index of the selected route will be increased by one so that the route will move one place downwards in the list. Similarly, you can move a route one place up by selecting and clicking the Move Up button. Note that if you have gaps in the index sequence, routes will increase or decrease their index as they move through the gap and only appear to move down or up when an adjacent index is occupied.

Clearing the Entire Route List

You can clear the entire list and begin again by clicking the Clear button. After a warning, all routes will be deleted. This operation cannot be reversed. However, if you have downloaded some or all of your routes you can restore them by uploading the file as described in the Section "Uploading a Previously Downloaded Routes File".

Editing Listed Routes

To edit one of the entries in the Route List, tap the name, to show the edit page as Figure 40. This figure shows the default state of a newly created route. It is set to NCE Macro, with Macro Number 0.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

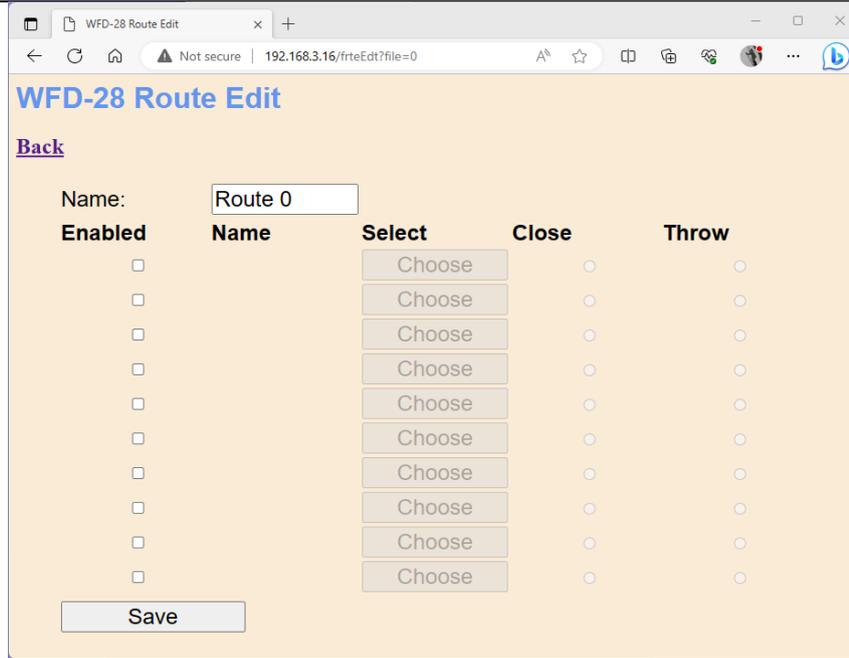


Figure 85 The Edit Page for a Newly Created Route.

The Route Edit page shows a sequence of up to ten steps. This is the maximum number of points that can be included in the route.

To start adding points to the route, check the Enabled box on the first step. This will enable the Choose button for that step. Click the Choose button to display the points in your accessory list that are available to include in your route as in Figure 86. You may need to page up or down to find the accessory that you want. Click the Select button to include the chosen accessory in your route.

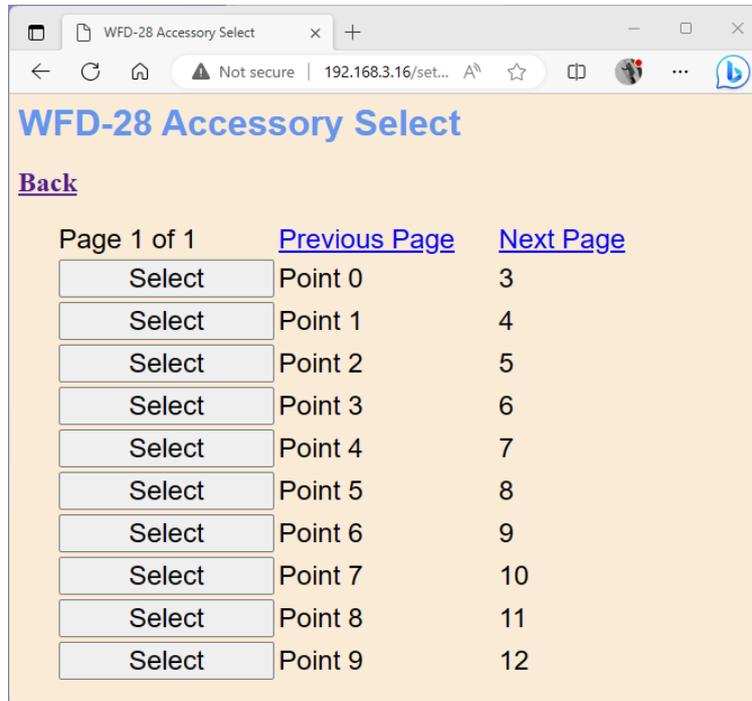


Figure 86 Choosing an Accessory to be Included in a Route

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

This action returns you to the Route Edit page and you now must decide if you want that step in your route to throw or close your selected accessory. Do this by clicking the Close or Throw radio button as in Figure 87.

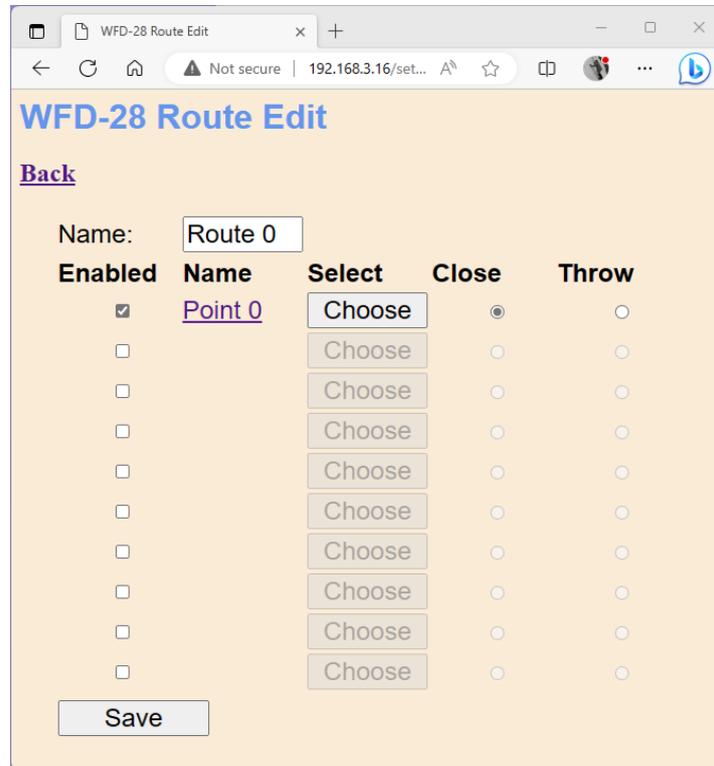


Figure 87 A Route with the First Step Added

You can now either save your route by clicking the Save button or check another step in the sequence and repeat the procedure of selecting the accessory and its required state as described above.

When you have finished the entire route definition remember to click Save.

Activating a Route

You can make a route active, that is set all the accessories in the route to the state defined in the route, by clicking the Activate button to the right of the required route.

When you connect a WiThrottle device to the WFD-2X, it will receive all the Routes as well as the Accessories, so you can activate a route by tapping it in WiThrottle on IOS, Engine Driver on Android or the TCS UWT-100.

Downloading Routes to a File

Once you have set up a set of routes, it is a good idea to download and store it in a file on your PC or other device. For example, if you need to reset the module for some reason, the accessory list will return to its default and you will have wasted all that work. You also might like to have separate accessory lists if you use the WFD-2X at a club as well on your own layout.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

IMPORTANT: On the Engine Driver and WiThrottle apps, you cannot use the Web display within the app to download or upload an accessory list. You must open the WFD-2X Web Pages in a browser such as Safari or Chrome by typing 192.168.7.1 into the browser. If you are in home net mode you use the IP Address assigned by your router. Select the Routes page and proceed as described.

To download all or part of a route list, click Download on the WFD-2X Route List page. The page within the list that you are currently displaying has no effect. The Route Download page will appear as in Figure 49.

The screenshot shows a web browser window with the address bar displaying '192.168.3.16/RteDnld'. The page title is 'WFD-28 Routes Download'. Below the title is a blue 'Back' link. The main content area has a light orange background and contains the following text: 'Name the file, then click Download. Do not use back button or leave page until complete. The collection will be downloaded as a JSON file. To view the file, open the Downloads window of your browser. Copy the file to a convenient location for later upload.' Below this text is a form with the following fields: 'File Name:' with a text input containing 'Routes'; 'Download All Active' with a radio button; 'Download Range' with a radio button; 'First Index (0-4):' with a text input containing '0'; and 'Last Index (0-4):' with a text input containing '4'. At the bottom of the form is a 'Download' button and a 'Progress:' label followed by a horizontal progress bar.

Figure 88 The Routes Download Page

There are 50 indices (accessory numbers not DCC Address) in the list. Usually only some have been filled and are considered active, so only active list entries will be downloaded.

The File Name is the name given to the file that will be downloaded, so give it a meaningful name that you will recognize.

You can elect to include all of the active route entries into the file or just a range. Therefore select "Download all Active" or "Download Range" accordingly.

If you select "Download Range" enter the First and Last Index as required. For example, if you just want to download the first 10 routes, use 0 and 9 as the values. Notice that indices begin at 0. You may want to go back to the Route List page and jot down the first and last index.

Click the Download button to start the download. A Progress Bar shows the download progress as in Figure 50.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

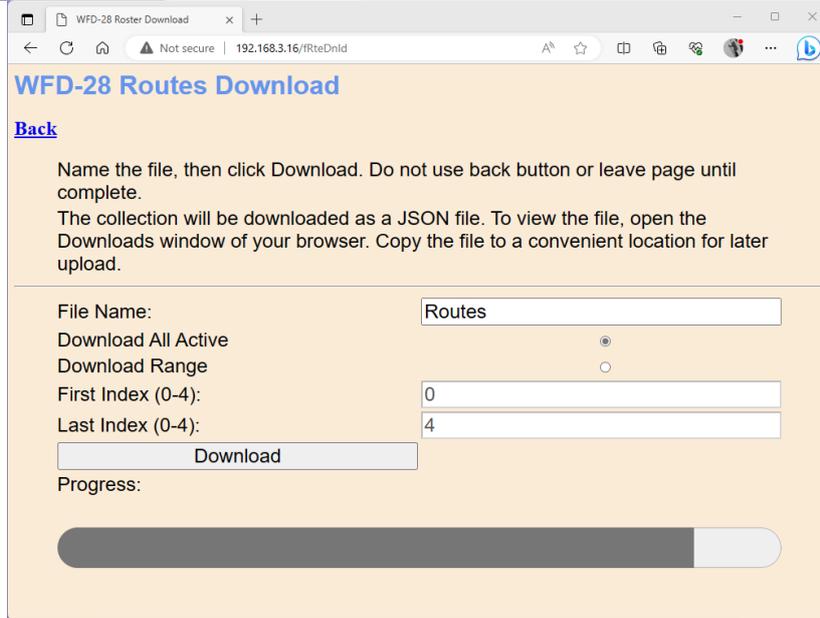


Figure 89 Route Download in Progress

When the download is complete, the action depends on the browser and device you are using.

Accessing the Route Download File on Windows 10

Using Microsoft Edge on Windows 10, the browser automatically opens the Downloads pane as on the right of Figure 51.

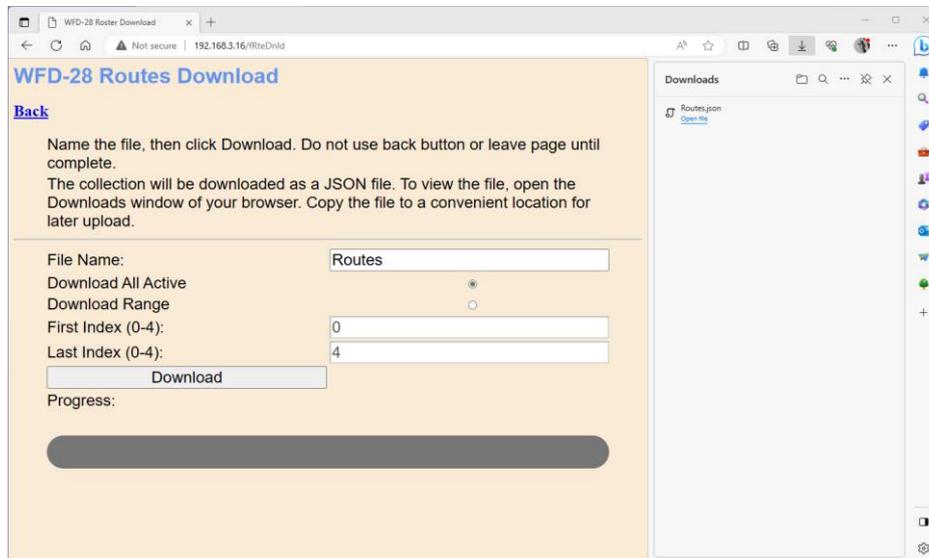


Figure 90 Route Download Complete on Windows using Edge Browser

This behavior is the same as downloading any file from the internet. The file is placed in the Downloads folder for the account on your machine. How you access this will depend on your device and operating system.

On Windows 10 this will be

C:\Users\\Downloads

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Where <User Name> is the name of the Windows user account on your machine. You can open the Downloads folder in Edge by clicking on the folder icon in the Downloads pane to see the folder in Windows Explorer as in Figure 52.

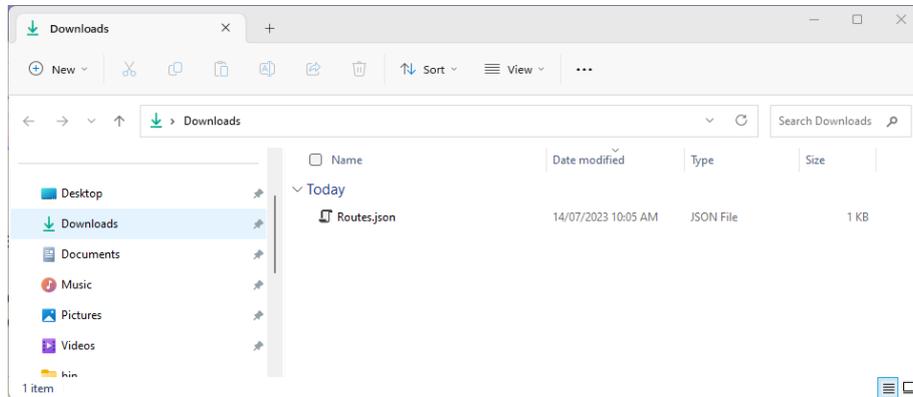


Figure 91 The Downloaded Routes File in Windows Explorer

Now you should copy the file to a suitable location on your computer that you have prepared for rosters. If you leave it in the Download folder it will get lost if you delete the downloads to clear up space on your disk drive.

For the technically inclined, the file is in JSON format and contains locos as JSON objects. A section of the file is shown in Figure 53. It is possible to carefully modify this manually, but be careful, as uploading an invalid file may crash the firmware in the WFD-2X and require a factory reset.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

```
{
  "routes": [
    {
      "Index": "0",
      "Name": "Route 0",
      "DccAddr": "1",
      "Flags": "128",
      "Type": "0",
      "Steps": [
        {
          "Index": 0,
          "Type": 0,
          "Flags": 129,
          "AccsryIndex": 0
        },
        {
          "Index": 1,
          "Type": 0,
          "Flags": 128,
          "AccsryIndex": 1
        }
      ],
      "nceMacro": "0"
    }
  ]
}
```

Figure 92 Route Entry in a JSON Route List File

Accessing the Route Download File on Apple IOS

On Apple IOS, for example an iPad, Safari puts up a dialog “Do you want to download “Routes.json.txt”. When you tap Download, it places the file in the Downloads folder which you can open by tapping the little Downloads Icon at the top (a down arrow with a circle) followed by the Magnifying Glass Icon. Alternately you can open the Files app and tap Downloads.

You can create an Routes folder either on the iCloud drive or locally and move the downloaded file to that location.

Accessing the Route Download File on Android

On Android, after the download completes, you are given the option to open the file. You don’t really want to do that, you need to store the file in your desired location, so tap the “three dots” to get the menu on Chrome and tap Downloads to open the Downloads folder. You can use the File Manager app to copy the file from Downloads to a new folder called Routes which you create in Main Storage.

Different versions of the Google operating system Android may work differently. Study the features of your device to find the best approach to storing your roster files.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Uploading a Previously Downloaded Routes File

To upload a previously save set of routes go to the Routes List page and click the Upload link. On the Routes Upload page, click the Choose File button and navigate to your saved routes file. Click Open. The chosen file name should show against the Choose File button as in Figure 65. To complete the upload, click the Upload button.

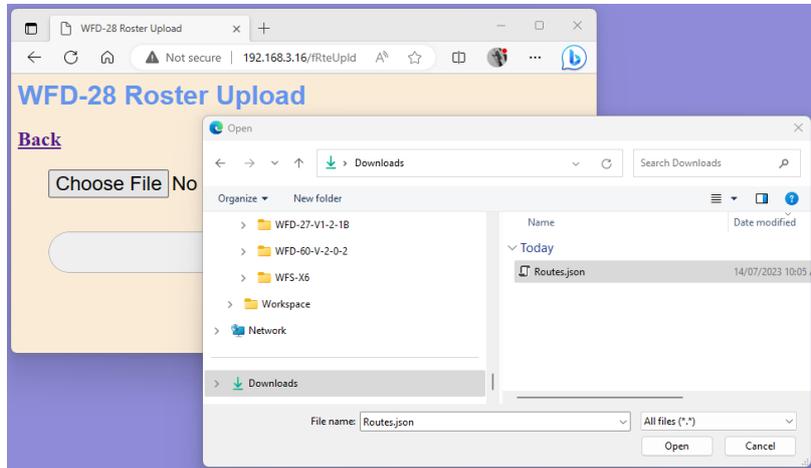


Figure 93 Opening a Previously Saved Routes File

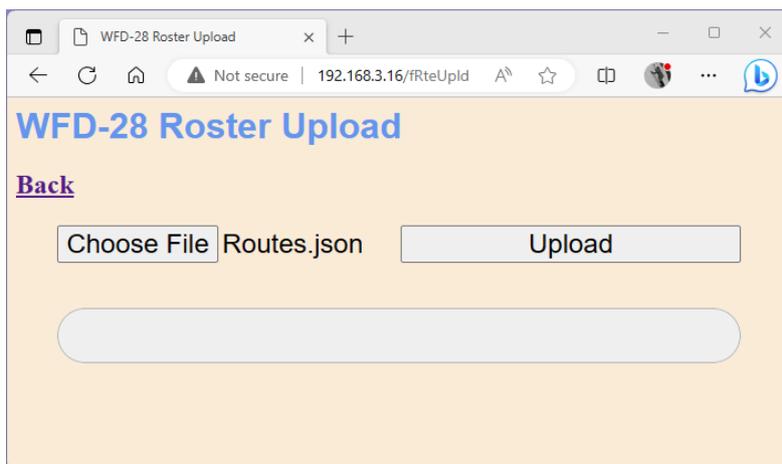


Figure 94 The Chosen File to be Uploaded is Displayed

The progress bar shows upload progress. When complete, the Routes List page is displayed showing the newly uploaded routes.

Note that uploading is controlled by the indices assigned to routes (i.e., location numbers in the route list), that are stored in the file. If routes already exist at those locations in the list within the WFD-2X, they will be overwritten. If they do not exist, they will be created. If you upload several files that have sets of routes with gaps between indices either within a file or between files, routes will appear in the WFD-2X list with those exact same indices. So, there may be gaps in the list. This does not matter but, if you add routes, you will fill the gaps. You can also move the routes up or down and save the whole file again.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Advanced Consists

The NMRA specification documents for DCC define a concept called Advanced Consists in which a set of locomotives are given a Consist Address that is different from their regular short or long DCC address. This is placed in CV19 and is activated using special DCC commands sent from the command station. Once activated the locomotive only responds to DCC movement instructions sent to the consist address. The WFD-2X provides a visual way of setting up these consists using its Advanced Consists web page.

As an example, we have defined two locomotives in the WFD-2X roster, Road #7222 and Road #2372 as in Figure 95. These happen to have long addresses 0115 and 2372 respectively.

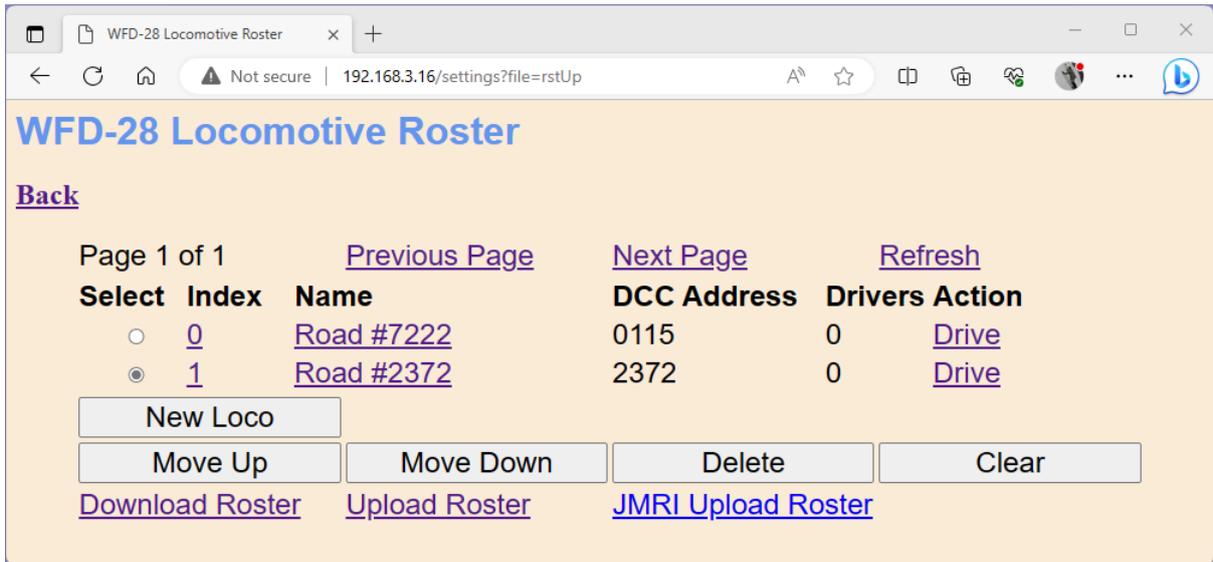


Figure 95 Two locomotives in the Roster which will form an NCE Advanced Consist

To setup an Advanced Consist, tap the Advanced Consists option of the main menu which displays the Advanced Consists page as in Figure 96. By default, after factory reset, one consist is defined with a default name and zero locomotives.

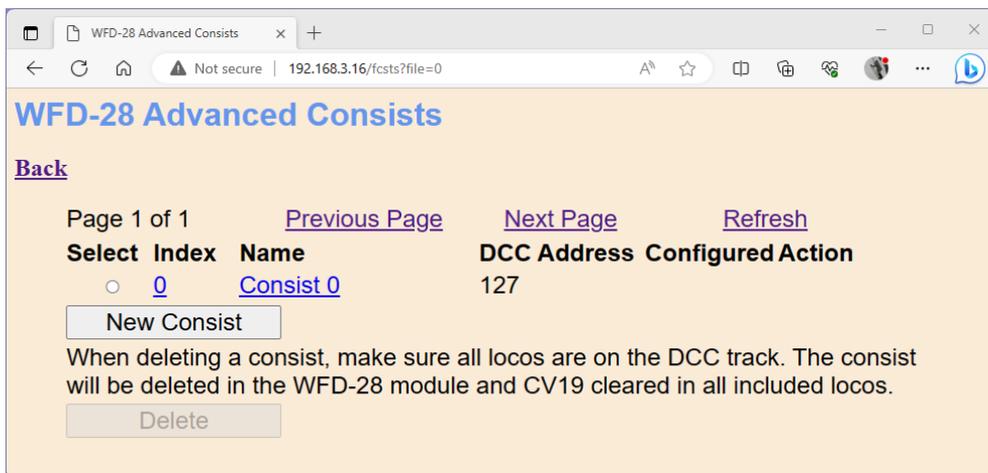


Figure 96 The Advanced Consists Page

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Adding and Deleting Consists

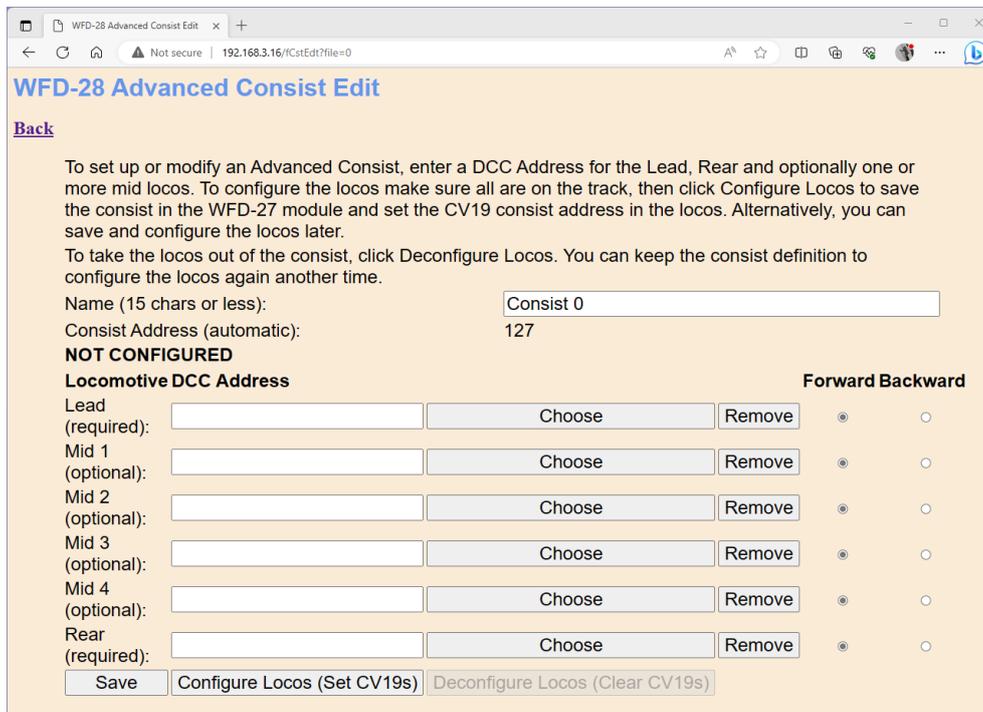
New Advanced Consists can be added by clicking the New Consist button. New consists can be edited by clicking on the name to display the Advanced Consists Edit page to define them as you require. You can define up to 16 consists. Once 16 have been defined, clicking the New Consist button will have no effect.

Display of consists is paged, with 10 consists to a page. You can move from page to page by clicking the Previous Page and Next Page hyperlinks.

To delete a consist select it by clicking the radio button to its left and clicking the Delete button. After a warning, the Consist will be deleted. When you delete a consist, you should make sure all its locomotives are on the DCC powered main track. Deleting will send necessary commands to remove each locomotive from consist mode.

Editing a Consist to Define its Locomotives and their Directions

Once you have created a consist, you need to edit it to set it up the way you want. Do this by clicking the name of the consist to open the edit page as Figure 97.



[Back](#)

To set up or modify an Advanced Consist, enter a DCC Address for the Lead, Rear and optionally one or more mid locos. To configure the locos make sure all are on the track, then click Configure Locos to save the consist in the WFD-27 module and set the CV19 consist address in the locos. Alternatively, you can save and configure the locos later.

To take the locos out of the consist, click Deconfigure Locos. You can keep the consist definition to configure the locos again another time.

Name (15 chars or less):

Consist Address (automatic):

NOT CONFIGURED

Locomotive DCC Address		Forward		Backward	
Lead (required):	<input type="text"/>	<input type="button" value="Choose"/>	<input type="button" value="Remove"/>	<input checked="" type="radio"/>	<input type="radio"/>
Mid 1 (optional):	<input type="text"/>	<input type="button" value="Choose"/>	<input type="button" value="Remove"/>	<input checked="" type="radio"/>	<input type="radio"/>
Mid 2 (optional):	<input type="text"/>	<input type="button" value="Choose"/>	<input type="button" value="Remove"/>	<input checked="" type="radio"/>	<input type="radio"/>
Mid 3 (optional):	<input type="text"/>	<input type="button" value="Choose"/>	<input type="button" value="Remove"/>	<input checked="" type="radio"/>	<input type="radio"/>
Mid 4 (optional):	<input type="text"/>	<input type="button" value="Choose"/>	<input type="button" value="Remove"/>	<input checked="" type="radio"/>	<input type="radio"/>
Rear (required):	<input type="text"/>	<input type="button" value="Choose"/>	<input type="button" value="Remove"/>	<input checked="" type="radio"/>	<input type="radio"/>

Figure 97 Editing a New Advanced Consist

Give the consist a name if you wish. As a minimum you must define a Lead Loco and a Rear Loco. Do this by clicking the Choose button to the right of the Lead Loco entry in the list. This displays the first page of list of the Locomotives in your Roster as Figure 98 where you see the two locomotives we defined in Figure 95.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

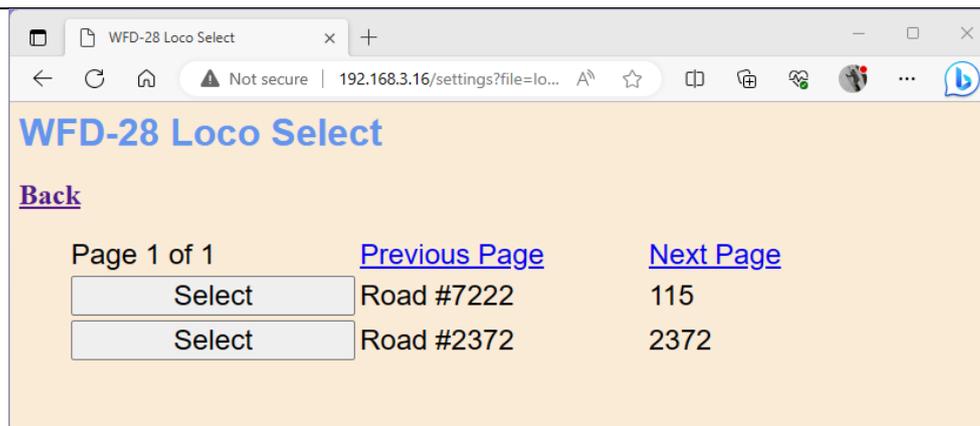


Figure 98 Selecting a Loco to Include in an NCE Advanced Consist

We will choose Road # 7222 for the lead loco, so click the Select button which takes us back to the Consist Edit page with the Lead Loco included. We will leave its direction as forward.

Now click the Choose button for the Rear Loco and this time select Road Number 2372. Back on the Consist Edit page, click the Backward direction radio button.

Finally ensure both locos are on the main track powered from your NCE Command Station and click the button marked “Configure Locos (Set CV19s)”. This will both save the consist in the WFD-2X and also send commands to your locomotives.

Now you can drive the consist using a WiThrottle device such as Engine Driver on Android, WiThrottle on IOS or the TCS UWT-100. Do this by selecting the Lead Loco either from the Server Roster or using its DCC Address. To drive the consist backwards select the rear locomotive.

You can also drive the consist by choosing to drive the lead or rear locomotive from the Locomotive Roster page in the WFD-2X.

Notice that the construction of the consist cannot be changed while it is configured. If you wish to change some aspect of the consist, you must de-configure it by tapping the button labelled “Deconfigure Locos (Clear CV19s)”.

Run Locos Independently of Consist

You can de-configure a consist and yet maintain its structure within the WFD-2X module. For example, you might wish to disconnect a consist from a train, then separate the locomotives, service the locomotives, then re-assemble. To do this, click the “Deconfigure Locos (Clear CV19s)” button, decouple and run the locomotives independently, then re-couple and click the “Configure Locos (Set CV19s)” button.

Adding a Locomotive to an Advanced Consist

To add an intermediate locomotive to a consist, enter the Advanced Consist Edit page and de-configure the consist. Then choose one of the Mid locomotive positions. Click Choose and add another locomotive using the Choose button to select a Loco just as before. You can add up to four Mid Consist locomotives. You must then click the “Configure Locos” button. This will configure the locos as well as that saving it in WFD-2X. If you do not wish to configure the locos at this time, you can just click the Save button.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Adding a non-rostered loco

Instead of using the Choose button to add a locomotive to a consist, you can simply type the DCC address. This enables you to add locos that are not included in your locomotive roster, i.e., non-rostered locos. This technique can also be used for lead and rear locos.

Removing a Locomotive from an Advanced Consist

To remove a mid-consist loco, open the Advanced Consist Edit page for that consist, de-configure it, then click the Remove button for the loco that you wish to remove. Then click the Configure Locos or Save button.

Replacing a Lead or Rear loco in an NCE Advanced Consist

To replace a Lead or Rear loco, open the Advanced Consist Edit page for that consist. Deconfigure the consist, remove the Lead or Rear loco by clicking the Remove button. Then Choose a new Lead or Rear loco either using the Choose button to select from the roster or by typing the DCC address. Click the Configure Locos or Save.

Do not attempt to configure or de-configure a consist that was previously valid where you have removed any of the locos from the track. If you do this, the loco may become undrivable.

If this happens, return all the consist locos to the track and perform a Configure followed by a De-configure.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Service Mode Programming

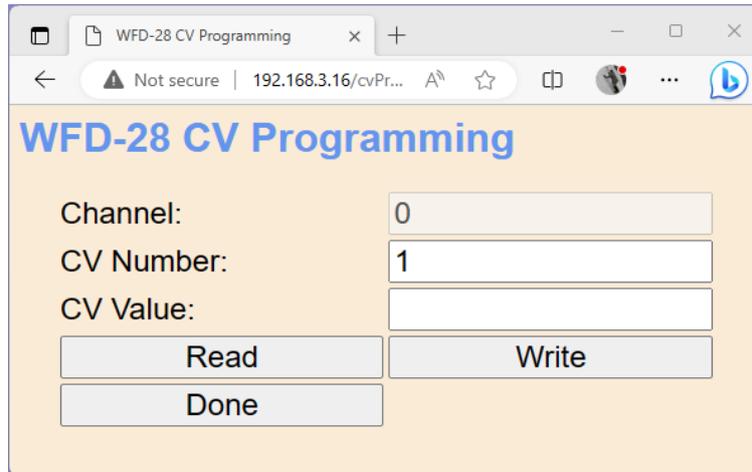


Figure 99 The Service Mode Programming (Programming Track) page

The WFD-2X provides a Program Track DCC output. The program track is used to program the CVs of one locomotive at a time. CVs can also be read from the locomotive on the program track.

Display the Service Mode Programming screen, in Figure 99, by selecting that option from the Main Menu. Locomotives **cannot** be driven when service mode programming is in process (and the Channel textbox is not applicable to Service Mode programming).

To read a CV, type the CV number in the textbox labelled CV Number, then tap the Read button. After a short period of time, the CV Value will appear in the text box to the right of that label. Note that, if more than one loco is present on the programming track, the CV value read will be indeterminate. Also, you should keep the wires to the program track short to avoid noise which might affect the read process.

To change the value of a CV, type the CV number or use the same number just read, then type the new CV value and tap the Write button. After a short period of time the CV will be written and a confirmation value read back.

When you have finished CV programming, tap the Done button to return to the main menu.

Note: It has been reported that the WFD-2X does not read CV values correctly with some decoders, e.g., the Lenz Standard+ V2 and possibly others. In this case the value zero is returned. The write function however, operates correctly in these circumstances.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

[Operational Mode Programming \(Programming on the Main\)](#)

Operational Mode Programming is accessible via the Locomotive Roster pages. Please see the section “Operational Mode Programming (Programming on the Main)” within the Locomotive Roster section..

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Factory Reset

You may factory reset your WFD-2X by selecting the Reset option on the main menu page. You will be asked to confirm the reset and then the unit will immediately revert to its factory configuration. All the settings will take their default values and Home Net settings will be removed. The Locomotive Roster, Accessory List, Panels, Routes and Consists will return to their default values and any entries that you made will be lost.

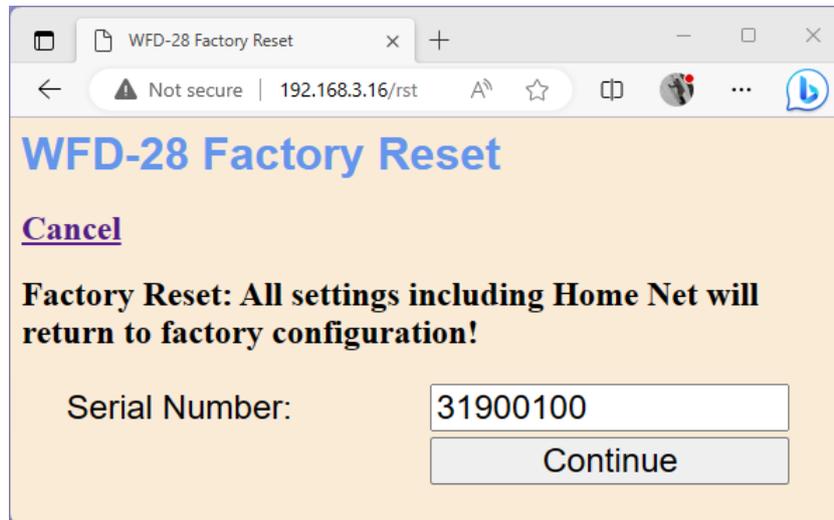


Figure 100 Factory reset confirmation page

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Mounting Suggestions

The WFD-2X is supplied as a bare module and **no part of it must be permitted to touch any metal. If any part is allowed to touch live rails for example, it is likely that the unit will be damaged beyond repair.** For this reason, it should be mounted properly before use. Two options are suggested here.

- (1) Use the mounting kit to attach the module to your baseboard or fascia, as in Figure 101, either on top or underneath in such a way as to avoid anything being placed on it or against it.
- (2) Mount the module inside a suitable plastic box with holes cut to accommodate the wires to track. **Do not use a metal box** as this will cause degradation of the Wi-Fi performance.

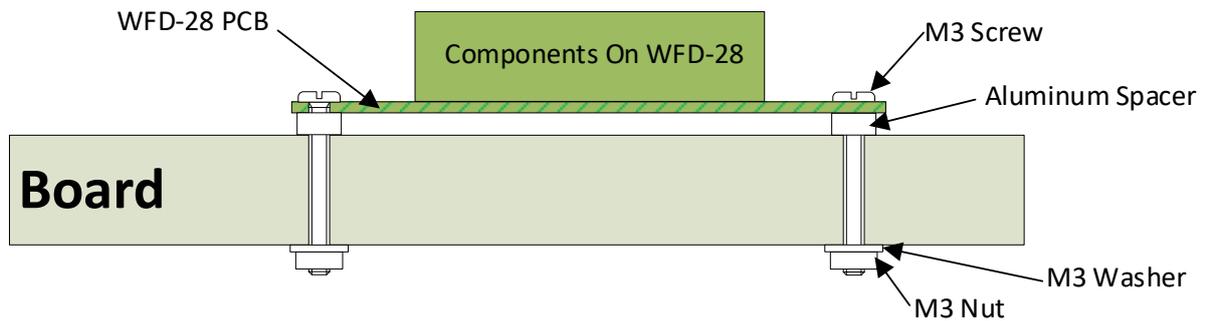


Figure 101 Mounting the WFD-2X on a board

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

Tips to Manage your Home Network

Connection to your Home Router

When you set a WFD-2X module to Home-net mode, it will immediately restart and try to connect to the Wi-Fi Access point that you specified in the SSID, using the password that you supplied. From then on, it will try to connect each time you power on. If the connection is unsuccessful, after about 30 seconds it will keep trying but re-enable Direct mode to allow you to connect and either correct the problem or return it to Direct mode. Usually, failure to connect occurs because the password or SSID is incorrect, so you would need to double check that, but it might be because your home router is too far away or is turned off.

Sometimes routers refuse connections because there are not enough IP addresses, within the router assigned to the network. Sometimes some internal hang-up problem seems to occur so routers need to be restarted from time to time. Also, occasionally there are so many people operating Wi-Fi devices in an area that there is just too much radio traffic. In this case changing the router to a different channel may work. Remember that in Home-net mode, the WFD-2X always uses the Wi-Fi channel of the router to which it is connected.

Home Net IP Address Assignment

Every device connected to a network needs an IP Address and when your WFD-2X successfully connects to your home router, the router will allocate it an IP Address from a list of unused addresses. This process is called DHCP (dynamic host control protocol) and you can Google the term to find all the information you would like. IP Addresses are leased to connected devices and it is possible that the next time you turn on your WFD-2X, the lease will have expired and the router will give it a different IP Address. Also, when a router is restarted, it is likely to give out a different IP Address to each client.

This changing IP Address does not matter if you are using 3rd-party apps using the Hoffman WiThrottle protocol (like Engine Driver and WiThrottle) because they discover one or more WFD-2X modules using a protocol called Multicast DNS. The WFD-2X broadcasts its presence, with its information, to all devices connected to the network, and the Engine Driver and WiThrottle apps display WiThrottle servers found in this way in their list of discovered servers. You then connect to your choice of WiThrottle server when you start the app.

If you want to access your WFD-2X from a browser such as Internet Explorer, Edge, Chrome or Safari, you need to know its IP Address. There are several good ways of finding the IP Address assigned by your router.

- (1) Once you have connected using an app such as WiThrottle or Engine Driver, you can use the "Web Page" menu item or tab to view the Settings page as in section "Settings Web Page". Once you see the IP Address, you can make a note of it and type it into a browser as in section "Setup Advanced Features using a Browser".
- (2) Probably the best way is to visit the Admin page of your router. To do this, type the address of your gateway into a browser. You can find this on Windows by opening a Windows command console and typing the ipconfig command:

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

```
Command Prompt
C:\Users\steve>ipconfig

Windows IP Configuration

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::2d64:f5f1:866c:b25f%14
    IPv4 Address. . . . . : 192.168.3.100
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.3.1

C:\Users\steve>
```

Figure 102 Using ipconfig to find your computer's IP address and default gateway

(3) Figure 102 shows the result. Now take the default gateway IP Address, 192.168.3.1 in this example. and type it into the address bar of your favorite browser, then hit the Enter key.

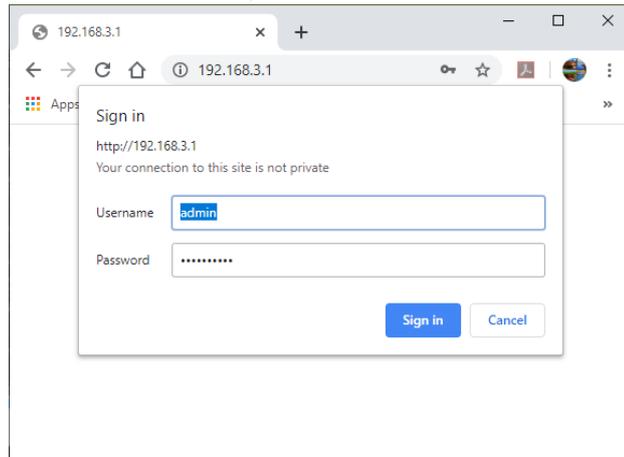


Figure 103 Access your router by using the IP Address of your default gateway in a browser

- (4) The browser will ask for your username and password to access your router's admin page. You can find this in one of these places, unless you have changed it:
- a. A sticker on your router, at the back or underneath. Look for the Admin user name and password (this is not always the same as your Wi-Fi password),
 - b. On a card supplied by your internet service provider or telco,
 - c. In the leaflet that came with your router.

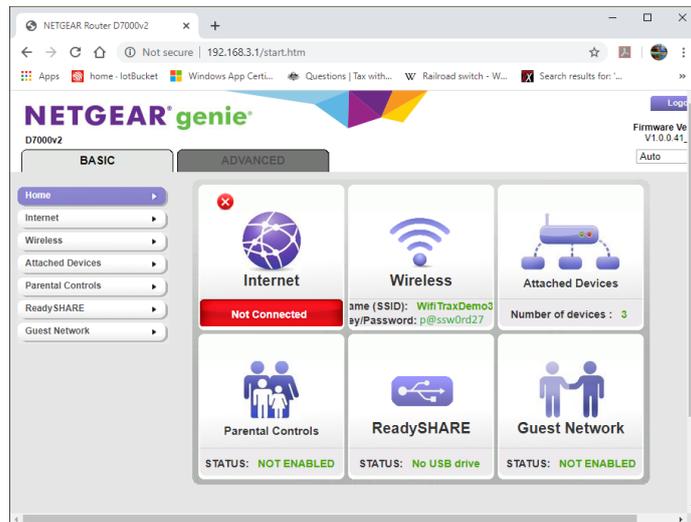


Figure 104 A typical router admin page

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

- (5) Once you have given the credentials, you will see the admin page. A typical one is shown in Figure 104. Find the “Attached Devices” option and click on it.

Attached Devices

Go to [Access Control](#) to allow or block devices.
Access Control: Turned Off [Refresh](#)

Wired Devices

#	IP Address	MAC Address	Device Name
---	------------	-------------	-------------

2.4G Wireless Devices (Wireless intruders also show up here)

SSID	IP Address	MAC Address	Device Name
WifiTrax:Demo3	192.168.3.100	54:27:1E:FA:CE:DB	SSS105
	192.168.3.101	34:8A:7B:04:03:8C	Galaxy-Tab-A
	192.168.3.103	C0:B6:58:B6:A9:C9	iPad-3
--	192.168.3.9	DC:4F:22:39:EA:C0	ESP_39EAC0
--	192.168.3.16	DC:4F:22:39:EB:2A	ESP_39EB2A

5G Wireless Devices (Wireless intruders also show up here)

SSID	IP Address	MAC Address	Device Name
------	------------	-------------	-------------

VPN Client Devices

Device Name	Remote IP Address	Local IP Address	Connection Time
-------------	-------------------	------------------	-----------------

Figure 105 Typical "Attached Devices" page of a router

- (6) You will see a screen something like Figure 105. Find the row where the MAC address matches that printed on the bag label of your WFD-2X device. Here the MAC Address DC:4F:22:39:EA:C0 matches the STA MAC Address on the bag label, so the IP Address is 192.168.3.9
- (7) Now open another tab in your browser and type the IP Address, 192.168.3.9 in this case, into the address bar to get the main menu web page.

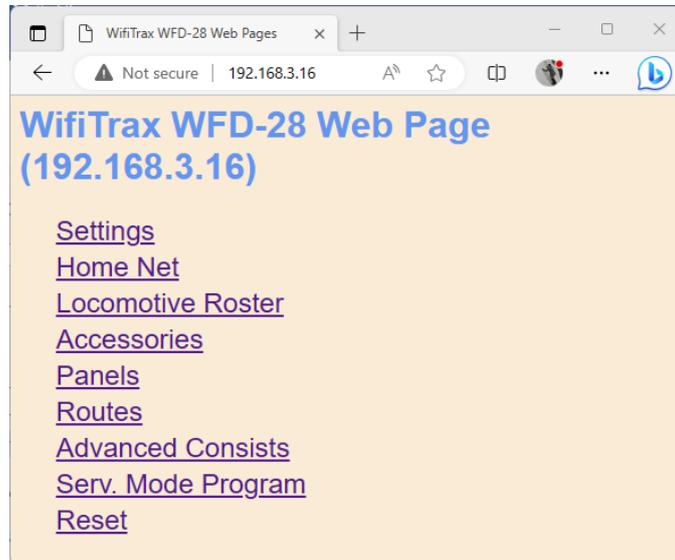


Figure 106 Use the IP Address to open the main menu web page

Reserving a Fixed IP Address

That's all well and good but earlier it was said that routers do not always assign the same IP Address!

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

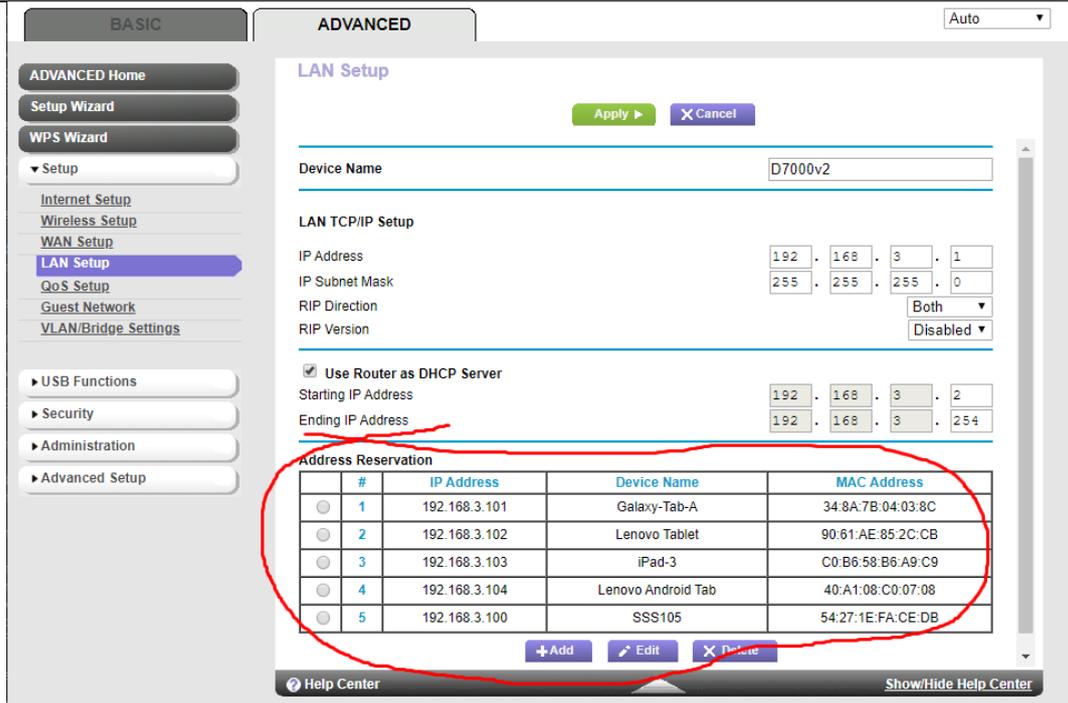


Figure 107 An IP Address reservation table in a router

Well, while you're in the router admin page you can *reserve a fixed IP Address* for your WFD-2X module. In the Netgear D7000v2 that is used here as an example, you need to click the Advanced tab, then the Setup menu and the LAN Setup sub-menu. The table at the bottom of Figure 2 shows the Address Reservation Table. In this router, you can see that there are already 5 reservations and to add a new one, we hit the Add button.

Then type in the information from Figure 105, give the reservation a name "WFD-2X" and hit Add as Figure 108.

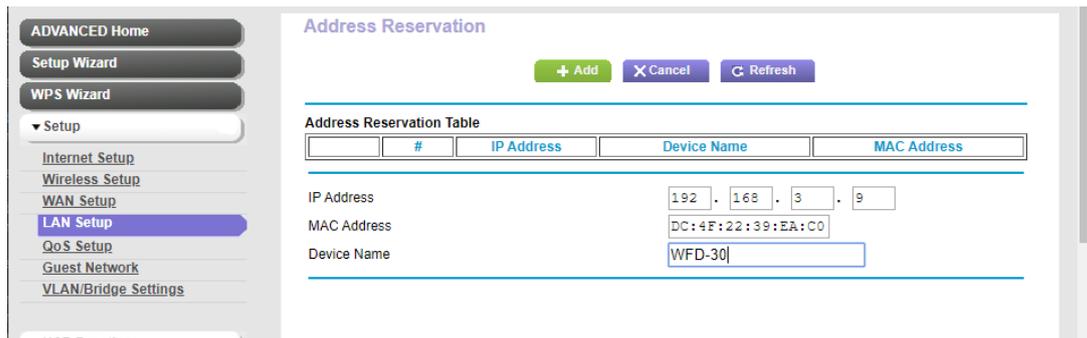


Figure 108 Adding an address reservation

Usually you have to click the Apply button to restart the router, then check the reservation page to make sure the new one is there. Now your module will always have the same IP Address.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

More Information

Article about Wi-Fi/DCC:

<http://www.wifitrax.com/appNotes/WiFi-DCC.pdf>

Access all the articles:

<http://www.wifitrax.com/appNotes/howToArticles.html>

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

FCC Information

Radio or TV Interference (this information is MANDATED by the FCC)

This equipment incorporates Espressif Wi-Fi Transceiver Module ESP-WROOM-02D.

FCC Identifier: 2AC7Z-ESPWROOM02D.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help. **Note that any modifications to the equipment not expressly approved by WifiTrax voids the user's authority to operate under and be in compliance with CFR 47 rules**, as administered by the Federal Communication Commission. WifiTrax believes any conscientiously installed equipment following guidelines in this manual would be unlikely to experience RFI problems.

For Canadian Users: "This digital apparatus does not exceed the Class B limits for Radio noise emission from digital apparatus set out in the Radio Interference Regulation or the Canadian Department of Communications." Le present appareil numerique n emet pas de bruits radio-electriques depassant les limites applicables aux appareils numeriques de la classe B prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

EU Declaration of Conformity for WFD-26

1. Radio equipment: WifiTrax Model WFD-26 Wi-Fi/DCC Trackside Command Station with NCE Cab Bus Support

2. Name and address of the manufacturer or his authorised representative:

WifiTrax Model Science (A business owned by Steve Shrimpton Sciences Pty. Ltd. a company registered with the Australian Securities and Investments Commission ACN: 076 070 258)

116 The Gully Road, Berowra NSW 2081 Australia

3. This declaration of conformity is issued under the sole responsibility of the manufacturer.

4. Object of the declaration:

WifiTrax Model WFD-26 Wi-Fi/DCC Trackside Command Station with NCE Cab Bus Support as pictured in Figure 111 and identified by a label on underside of module bearing the model number WFD-26.

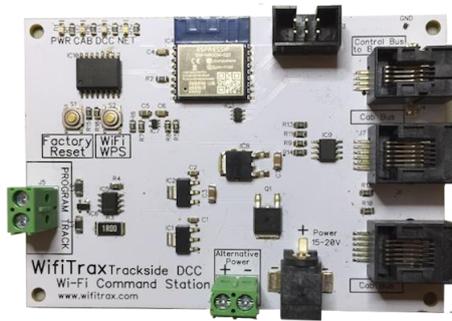


Figure 109 Identifying Illustration for WifiTrax Model WFD-26 EU Declaration of Conformity

5. The object of the declaration described above is in conformity with the relevant Union harmonisation legislation: Directive 2014/53/EU

6. Description of accessories and components, including software, which allow the radio equipment to operate as intended and covered by the EU declaration of conformity:

ESP-WROOM-02D Wi-Fi Internet of Things Module, Espressif Systems (Shanghai) Co., Ltd.

EU-type Examination (Module B) Certificate No. 192140277/AA/00

Issued by Telefication BV the Netherlands, Chamber of Commerce 51565536, www.telefication.com

7. Additional information:

Manufacturer has undertaken engineering analysis and appropriate testing to determine the subject of this declaration performs in its electromagnetic characteristics in the manner specified for the radio module identified in item 6 above.

Module is configured for EU market to allow Wi-Fi Channels 1 through 13 in the 2.4GHz Wi-Fi band.

Signed for and on behalf of: WifiTrax Model Science January 20, 2024, Berowra NSW Australia

Stephen J Shrimpton, Chief Engineer, Director

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

EU Declaration of Conformity for WFD-27

1. Radio equipment: WifiTrax Model WFD-27 Wi-Fi/DCC Trackside Command Station/Booster

2. Name and address of the manufacturer or his authorised representative:

WifiTrax Model Science (A business owned by Steve Shrimpton Sciences Pty. Ltd. a company registered with the Australian Securities and Investments Commission ACN: 076 070 258)

116 The Gully Road, Berowra NSW 2081 Australia

3. This declaration of conformity is issued under the sole responsibility of the manufacturer.

4. Object of the declaration:

WifiTrax Model WFD-27 Wi-Fi/DCC Trackside Command Station/Booster as pictured in Figure 111 and identified by a label on underside of module bearing the model number WFD-27.



Figure 110 Identifying Illustration for WifiTrax Model WFD-27 EU Declaration of Conformity

5. The object of the declaration described above is in conformity with the relevant Union harmonisation legislation: Directive 2014/53/EU

6. Description of accessories and components, including software, which allow the radio equipment to operate as intended and covered by the EU declaration of conformity:

ESP-WROOM-02D Wi-Fi Internet of Things Module, Espressif Systems (Shanghai) Co., Ltd.

EU-type Examination (Module B) Certificate No. 192140277/AA/00

Issued by Telefication BV the Netherlands, Chamber of Commerce 51565536, www.telefication.com

7. Additional information:

Manufacturer has undertaken engineering analysis and appropriate testing to determine the subject of this declaration performs in its electromagnetic characteristics in the manner specified for the radio module identified in item 6 above.

Module is configured for EU market to allow Wi-Fi Channels 1 through 13 in the 2.4GHz Wi-Fi band.

Signed for and on behalf of: WifiTrax Model Science September 23, 2022, Berowra NSW Australia

Stephen J Shrimpton, Chief Engineer, Director

WFD-26/27/28 Wi-Fi/DCC Trackside Command Station Operating Manual

EU Declaration of Conformity for WFD-28

1. Radio equipment: WifiTrax Model WFD-28 Wi-Fi/DCC Trackside Command Station/Booster

2. Name and address of the manufacturer or his authorised representative:

WifiTrax Model Science (A business owned by Steve Shrimpton Sciences Pty. Ltd. a company registered with the Australian Securities and Investments Commission ACN: 076 070 258)

116 The Gully Road, Berowra NSW 2081 Australia

3. This declaration of conformity is issued under the sole responsibility of the manufacturer.

4. Object of the declaration:

WifiTrax Model WFD-28 Wi-Fi/DCC Trackside Command Station/Booster as pictured in Figure 111 and identified by a label on underside of module bearing the model number WFD-28.



Figure 111 Identifying Illustration for WifiTrax Model WFD-28 EU Declaration of Conformity

5. The object of the declaration described above is in conformity with the relevant Union harmonisation legislation: Directive 2014/53/EU

6. Description of accessories and components, including software, which allow the radio equipment to operate as intended and covered by the EU declaration of conformity:

ESP-WROOM-02D Wi-Fi Internet of Things Module, Espressif Systems (Shanghai) Co., Ltd.

EU-type Examination (Module B) Certificate No. 192140277/AA/00

Issued by Telefication BV the Netherlands, Chamber of Commerce 51565536, www.telefication.com

7. Additional information:

Manufacturer has undertaken engineering analysis and appropriate testing to determine the subject of this declaration performs in its electromagnetic characteristics in the manner specified for the radio module identified in item 6 above.

Module is configured for EU market to allow Wi-Fi Channels 1 through 13 in the 2.4GHz Wi-Fi band.

Signed for and on behalf of: WifiTrax Model Science January 20, 2024, Berowra NSW Australia

Stephen J Shrimpton, Chief Engineer, Director