WDMI-32 Wi-Fi/DCC Locomotive Interface Module for Large Scales

Operating Manual

This document is online at http://www.wifitrax.com/manuals/WDMI-32/WDMI-32-Manual.pdf.

Please see our website for information on our limited warranty.

WifiTrax Model Science

www.wifitrax.com

Version 1.0 September 23, 2022

WDMI-32 Wi-Fi/DCC Interface Module Operating Manual

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

Version History

Version	Changes
1.0	Initial Release

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WDMI-32 Wi-Fi/DCC Interface Module Operating Manual

Scope of this Document

This document describes detailed use of the WDMI-32 Wi-Fi/DCC Interface Module. For a simple starting guide, please see the leaflet at http://www.wifitrax.com/appNotes/quickStart/WDMI-32-Quick-Start.pdf.

This manual applies to firmware version 1, i.e., version numbers 1.X.X. Some features described may not be present in early versions.

What does WDMI-32 Wi-Fi/DCC Locomotive Interface Module do?

The WDMI-32 may be mounted in a large-scale locomotive. It provides an ability to control a NMRA-compatible DCC decoder over a Wi-Fi network. The DCC Out connector provides NMRA compatible DCC power/track signals exactly as you would find on track supplied by an NMRA standard booster driven from a DCC Command Controller.

- You can drive trains using a smart phone or tablet as a hand-held controller provided it has Wi-Fi capability and you have installed one of the recommended apps in Table 1
- WDMI-32 provides a Wi-Fi Access Point (Wi-Fi network). Four throttles at a time can join but these would only drive the same loco.
- You can also use the UWT-100 Universal Wi-Fi Throttle manufactured by TCS. You can use a Windows or Apple computer, such as a laptop or desktop, with a recommended app from Table 1 installed.

You don't need to install JMRI to use the WDMI-32

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 WDMI-32. You can still use JMRI if you want to – it just means that the WDMI-32 and the JMRI installation will both appear as WiThrottle servers in your app. Similarly, if you use more than one WDMI-32 , they will each appear as WiThrottle servers available to your app.

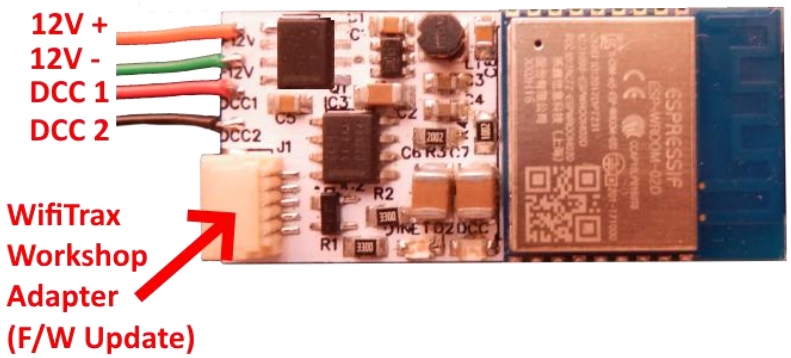


Figure 1 Connections and switches on the WDMI-32

Figure 1 shows the WDMI-32 module with its connectors labelled. There is a pair of Power Input leads at the top left of the module, marked 12V + and 12V-. These can be connected to a battery or other DC power source from 9 to 15 volts. The polarity marked on the module MUST be observed. The unit is protected against damage caused by power reversal but it is best not to rely on this, so DOUBLE CHECK YOUR CONNECTIONS BEFORE TURNING ON POWER.

The leads lower down on the left marked DCC1 and DCC2 are the DCC output that should be connected to your DCC decoder's track connections. The WDMI-32 replaces the track connections.

The small white, 5-pin connector on the lower left is a JST connector that can be used for updating your firmware using a Wifitrax FWA-11 or FWA-21 Workshop Adapter together with the free Wifitrax Workshop software.

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 de-facto standard and is used by other products. You can find technical information here:

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 here:

https://www.jmri.org/

Let's get Started!

Installing your new WDMI-32 in a Locomotive

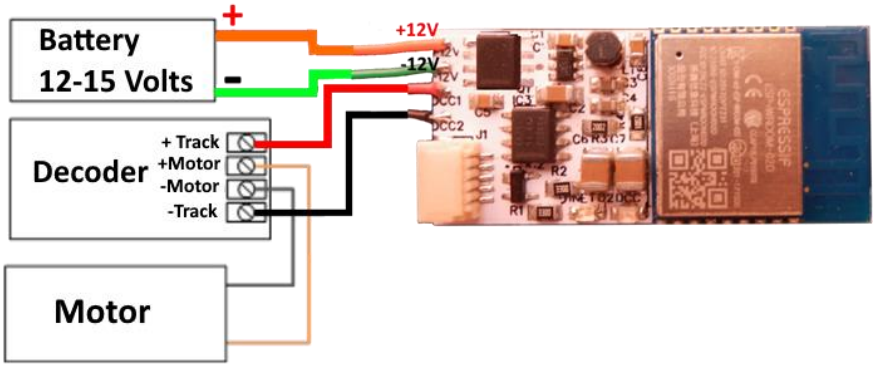


Figure 2 Connecting the WDMI-32 to your decoder and battery

Installation Instructions

Figure 2 shows how to connect the WDMI-32 to your locomotive and battery

(1) The module is intended to receive power from a 12-15 Volt battery when mounted in a locomotive. It is not fitted with a rectifier so its Input Power leads must not be connected to the track since if the loco is turned around, power would be reversed!

(2) Mount the unit suitably in your locomotive. Be sure that no part of the unit is touching any metal part of the locomotive.

(3) Connect the DCC-Out leads to the +Track and – Track (Track Right, Track Left) inputs to your decoder as shown in Figure 2. These are the decoder connections that would normally be connected to the track. Now, the WDMI-32 acts in place of the pickups from the track.

(4) Connect the +Motor and -Motor outputs from your decoder to the connections on the locomotive motor in the usual way.

(5) Connect the function outputs and speaker if applicable according to the instructions supplied with your decoder. The WDMI-32 is not concerned with these.

(6) Connect the WDMI-32 power input + and – leads (orange +, Green -) to the + and – terminals of your 12-15 V battery using a suitable switch if required. Take great care to connect these correctly. The orange wire must be connected to the positive battery terminal and the green wire must be connected to the negative terminal. A series FET device prevents damage if they are connected the wrong way around but it's better not to rely on it!

Driving your First Trains

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. The WDMI-32 does not support routes, layout power or JMRI panels. You can also drive trains using a web browser such as Edge, Safari or Chrome.

You can also configure the WDMI-32 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

App Name	Author	Get From:	Windows 10	Android	Apple IOS	Notes	Advanced Features
WiThrottle	Beth Hoffman	Apple App Store	NO	NO	YES		Via Web Pages
WiThrottle Lite	Beth Hoffman	Apple App Store	NO	NO	YES	No Accessories, No web page	Via Web Pages using Safari
Engine Driver	Steve Todd	Google Play Store	NO	YES	NO		Via Web Pages

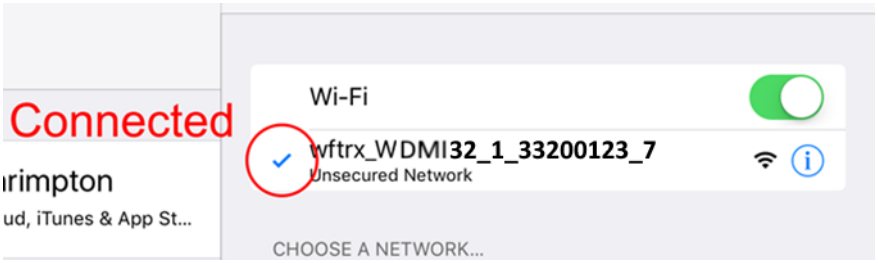
Table 1 Recommended Apps that work with the WDMI-32

Getting Started with a Web Browser

(1) First make sure you have completed installation as described in the WDMI-32 Getting Started Guide. Power up the locomotive and make sure it has a known DCC address.
(2) Connect your computer, tablet or phone to the Wi-Fi network provided by the WDMI-32 module. Here, Apple is used as an example. Windows or Android will be a little different.
(3) Tap the Settings icon on your iPhone or iPad, etc.

(4) Tap Wi-Fi on the left-hand menu. Under CHOOSE A NETWORK on the right, the list should include one like wftrx_WDMI32_1_XXXXXXXX_7, where XXXXXXXX is the serial number of your unit that appears on its label. Tap that Wi-Fi Network. **You must always connect to this Network otherwise you will not see the WDMI-32.**

(5) No password is required and after a few moments you should see that it has connected.



(6) Now open a web browser such as Safari on Apple, Chrome on Google or Edge on Windows. Type the following in the address bar: 192.168.7.1 followed by enter. You should see the main menu for the WDMI-32 as in the next image.

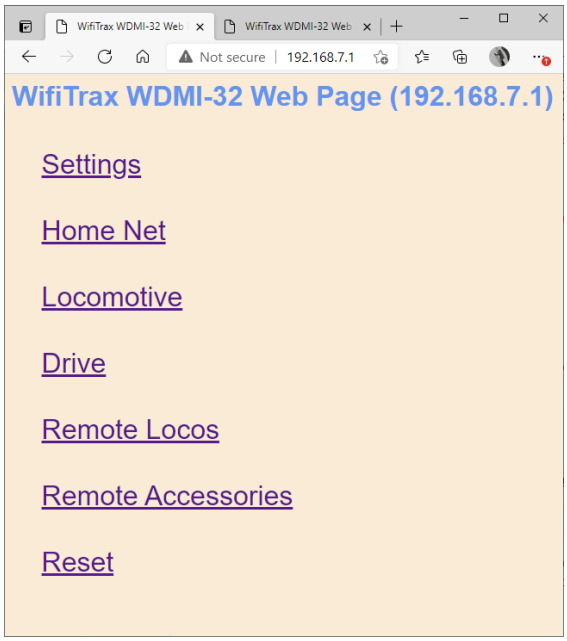


Figure 3 The WDI-32 Main Menu

(7) Now tap on Locomotive, type the known DCC Address of the decoder, in the locomotive you are using, in the DCC Address field and tap Save. Remember a new decoder or one just reset will have the default address of 3. **Note: this does not set the DCC address in the decoder, it just records it in the WDMI-32 module**.

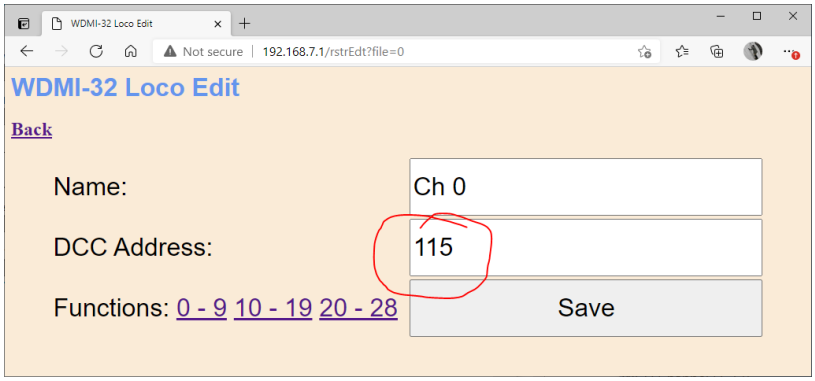


Figure 4 Setting the DCC Address of your Locomotive

(8) Tap Back again, if necessary, to return to the main menu, then tap Drive. You will now see the Drive page as in the next image.

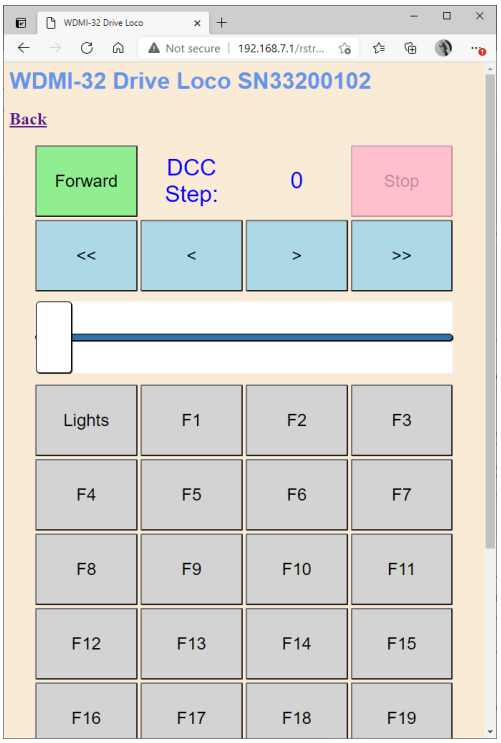


Figure 5 The Web Browser Drive Page

(9) The drive page can be used to control your locomotive's speed direction and DCC functions.

Tap Forward to toggle the direction.

Use the slider to control the speed. Alternatively tap >> to increase the speed by ten DCC steps or > to increase by just one step. Tap << to reduce the speed by ten DCC steps or < to reduce the speed by one DCC step.

Tap any of the function buttons to change their value.

Actually, you will probably get a better experience using the WiThrottle app, Engine Driver app or the TCS UWT-100, so please do explore those options.

However, you can always come back to these web pages on any device with a browser. Remember to connect to the module's network first.

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.

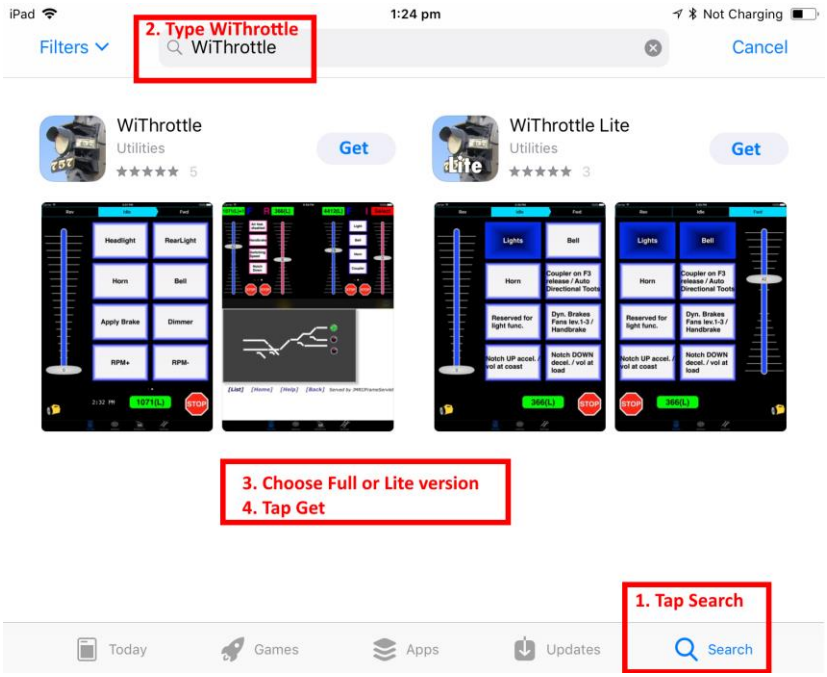


Figure 6 The Apple App Store page for WiThrottle

(3) Before opening the app, make sure your WDMI-32 is installed in a loco with a DCC decoder with a known DCC address and is powered up.

(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_WDMI32_1_XXXXXXXX_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 7.

Figure 7 Connecting to the WDMI-32 Wi-Fi Access Point

(6) No password is required and after a few moments you should see that it has connected as in Figure 8. The left-hand menu shows Wi-Fi wftrx_WDMI32_1_XXXXXXXX_7. You will not be able to access the internet while you are connected to the Wi-Fi access point of the WDMI-32, but consult the manual to find out how to put everything on your home network.

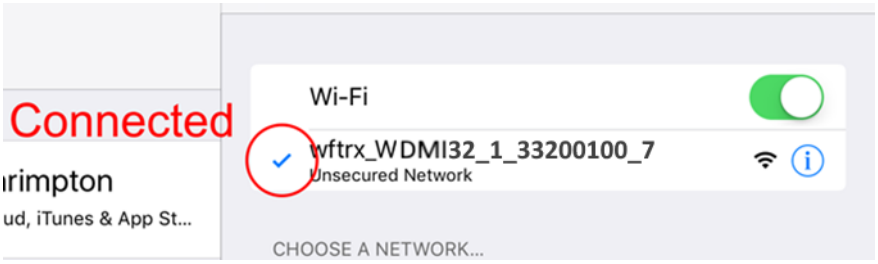
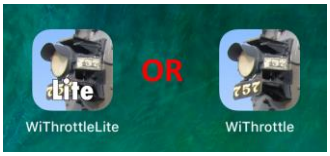


Figure 8 The iPad has connected to the WDMI-32 Wi-Fi Access Point

(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_WDMI32_1_XXXXXXXX_7". The WDMI-32 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 9. You may need to wait a few moments.

Figure 9 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.

a. Configure: The WDMI-32 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 10.
b. Search for Wi-Fi Modules. The same as a. but IP Address and port are pre-entered, so just tap "Connect".

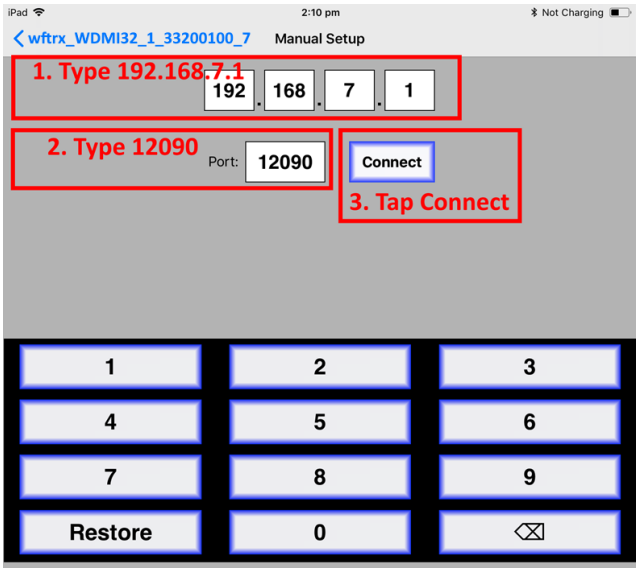


Figure 10 Connect manually if needed

(10)Now tap the "Address" tab at the bottom (it might go there automatically), tap Keypad and key in the DCC address of the decoder installed in the locomotive with the WDMI-32 (if it is a brand-new decoder, it will be 3) then tap the Set button as Figure 11.

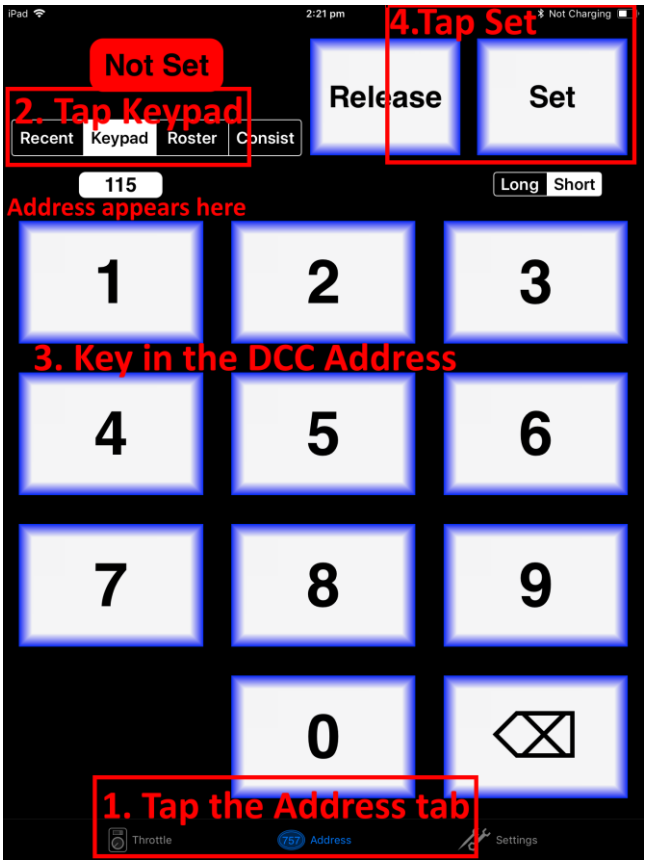


Figure 11 The Address tab of WiThrottle. Select a loco to drive

(11)The red button at the top left should turn green to show the loco is selected as Figure 12.

Figure 12 The loco is successfully selected

(12)Tap the Throttle tab at the bottom-left of the screen and you can begin driving as Figure 13.

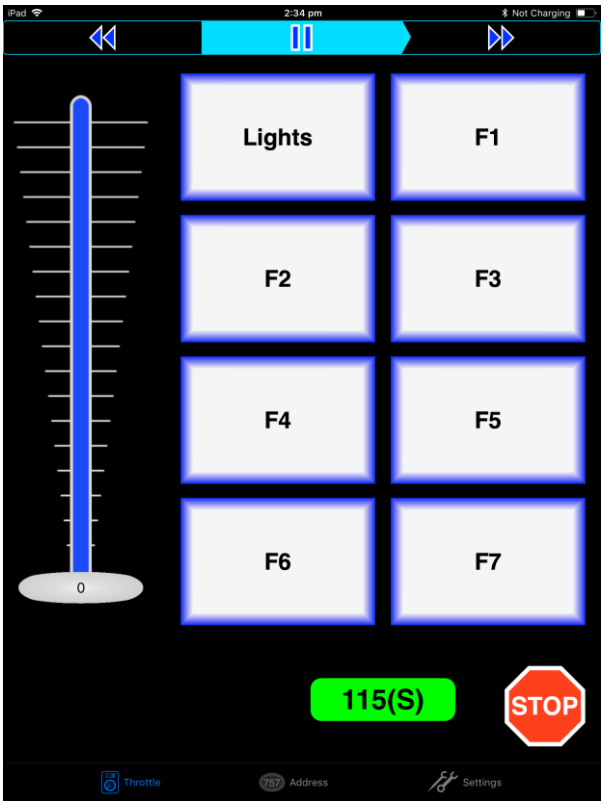


Figure 13 The WiThrottle "Throttle" screen

(13)Please consult the WiThrottle manual for more information:
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 do 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 WDMI-32 easier by setting your iPhone to automatically connect to the wftrx_WDMI32_1_XXXXXXXX_7 access point whenever your system is powered up. Do this by going to the Settings page on your iPhone, connecting to the wftrx_WDMI32_1_XXXXXXXX_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 loco with the WDMI-32 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 Web Page” to find out about defining rosters that you can pick from.

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

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 14,
   c. Tap on the "Engine Driver Throttle app" (Figure 14). The app detail page displays.
   d. Tap the Install button (Figure 15). The app downloads and install on your device. Do not open the app until after the next steps.

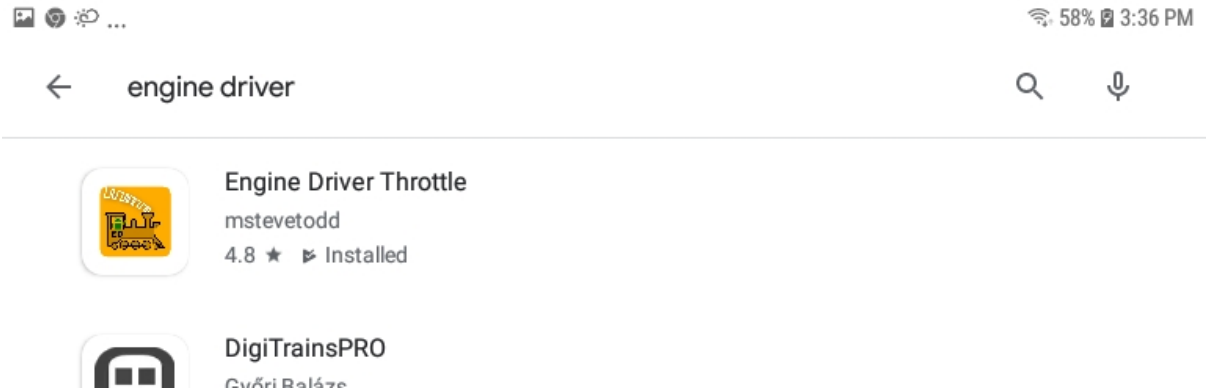


Figure 14 Searching for the Engine Driver app in Google Play Store

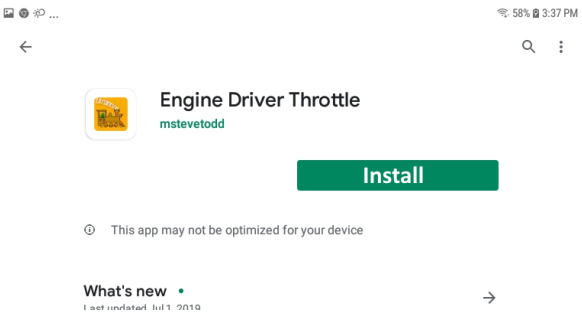


Figure 15 The Engine Driver Throttle detail page in the play store

(3) Make sure your WDMI-32 is properly installed in a locomotive together with a DCC decoder whose DCC Address you know. Power up the locomotive on track with your battery.

(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 16 (This may vary with different versions of Android).

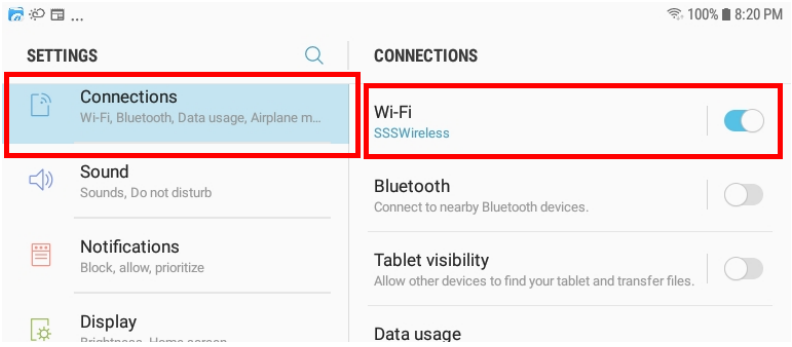


Figure 16 The Wi-Fi Connection page in the Android Settings app

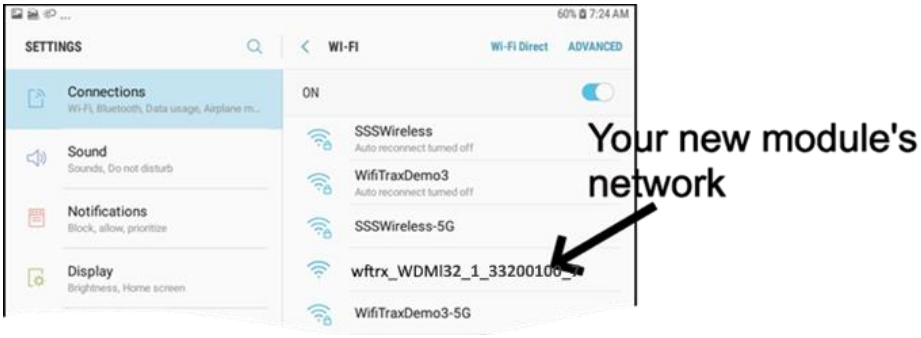


Figure 17 WDMI-32 Wi-Fi Access Point is visible

(6) You now see a collection of available Wi-Fi Access Points. Look for one that is of the form wftrx_WDMI32_1_XXXXXXXX_7, where XXXXXXXX is the serial number of your unit that appears on its bag and the unit itself, like Figure 17. 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 WDMI-32 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 18

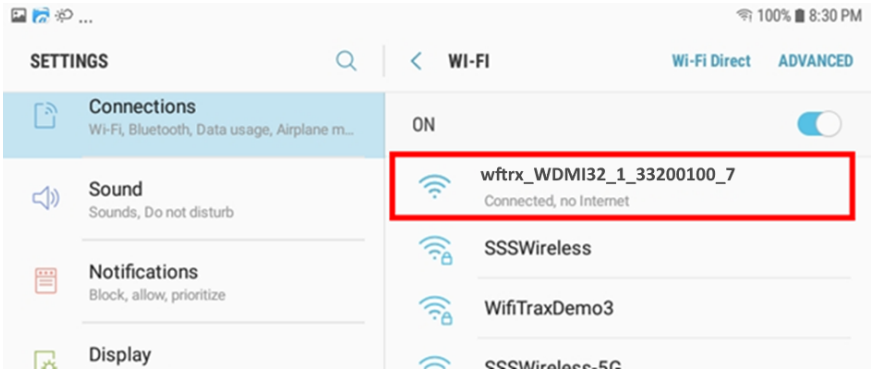


Figure 18 Connected to the WDMI-32 Wi-Fi Access Point

(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:

(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 WDMI-32 listed as a "Discovered Server" as Figure 19. Tap on it to connect.

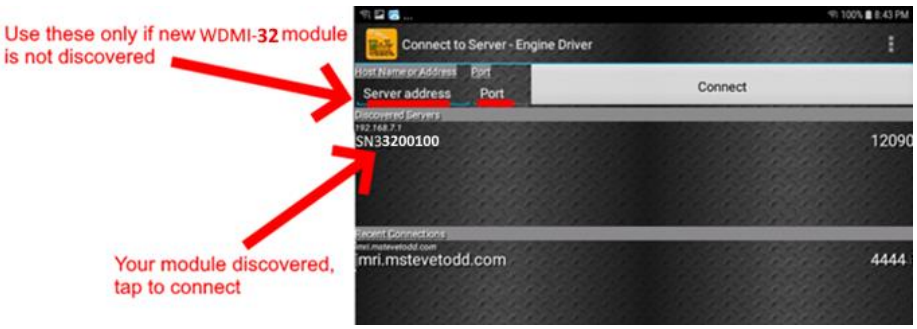


Figure 19 The WDMI-32 WiThrottle Server is discovered by the Engine Driver app on Android

(11) **Only if the WDMI-32 is not discovered** for some reason, after waiting a few moments, you must type the IP Address of the WDMI-32 module 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 20, then tap the "Connect" button.

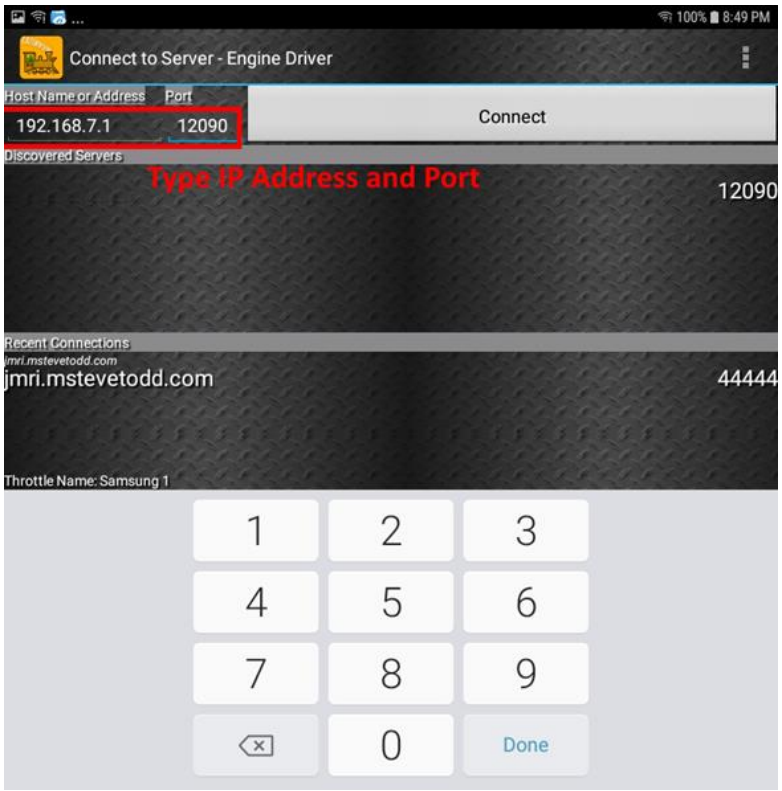


Figure 20 Connecting manually to the WDMI-32 WiThrottle Server

(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 21. Tap Acquire.

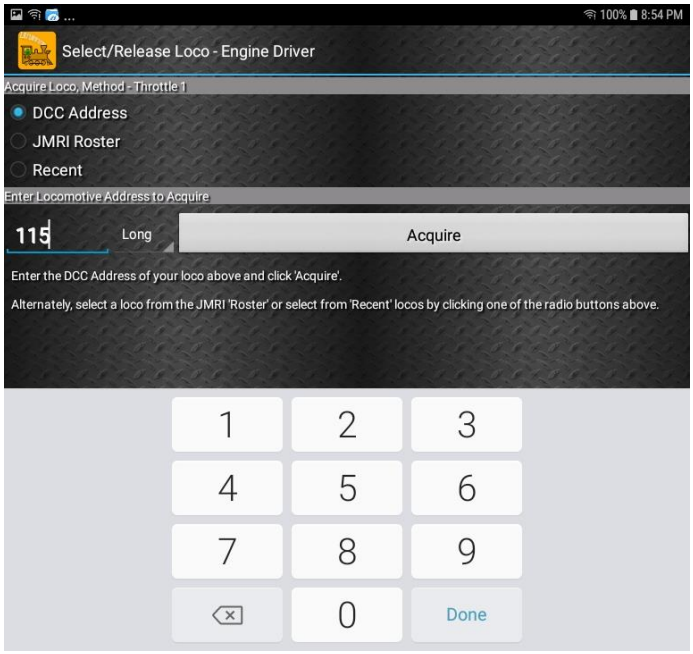


Figure 21 Selecting a locomotive by typing its DCC Address

(13)Now the Throttle screen appears with your DCC address as the selected loco as Figure 22. Try the function buttons and throttle slider to make sure your loco responds.

Figure 22 The Throttle screen of Engine Driver with a locomotive selected to drive

(14)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 will 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 WDMI-32 easier by setting your Android phone to automatically connect to the wftrx_WDMI32_1_XXXXXXXX_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 WDMI-32'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 WDMI-32.

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

It is a good idea to always release locomotives before powering down your WDMI-32. If for some reason you can't select a locomotive, just restart the Engine Driver app.

There are other options to make things easier described in the section "Advanced Features". You can install the WDMI-32 onto your Home Net, so you can operate and access the internet, control turnouts etc. at the same time as driving trains.

Getting Started with TCS UWT-100

(1) Make sure your WDMI-32 is properly installed in a locomotive together with a DCC decoder whose DCC Address you know. Power up the locomotive on track with your battery.

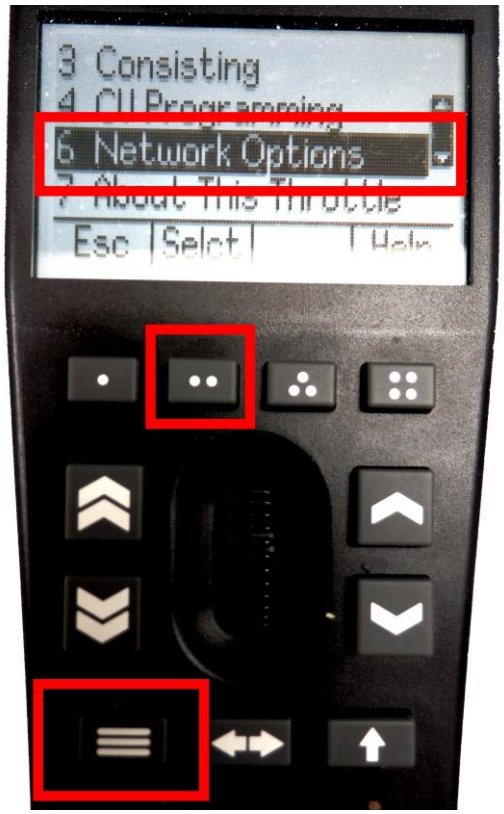


Figure 23 Selecting the Network Options menu on the UWT-100

(2) Press the Menu button on your UWT, use the up/down chevron buttons to choose Network Options, then press the Selct button [..] to open the Network menu as in Figure 23.

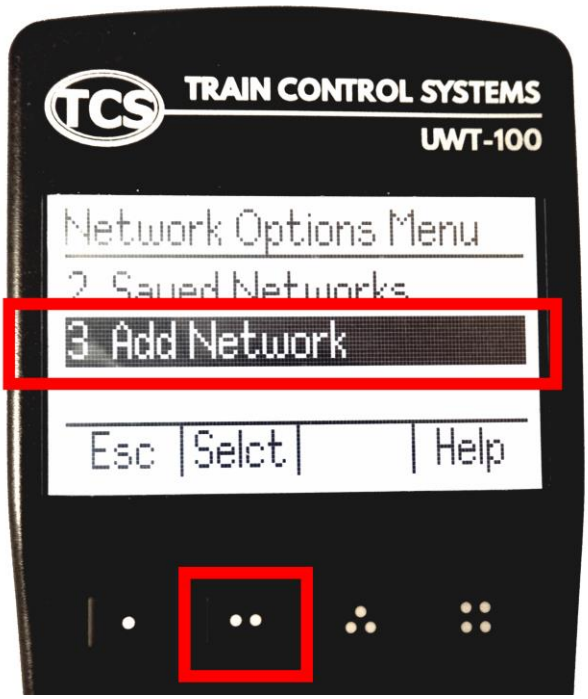


Figure 24 Select the Add Network option

(3) Select option 3, Add Network as Figure 24

Figure 25 Select Scan for Wi-Fi

(4) Select option 1, Scan for Wi-Fi as Figure 25.

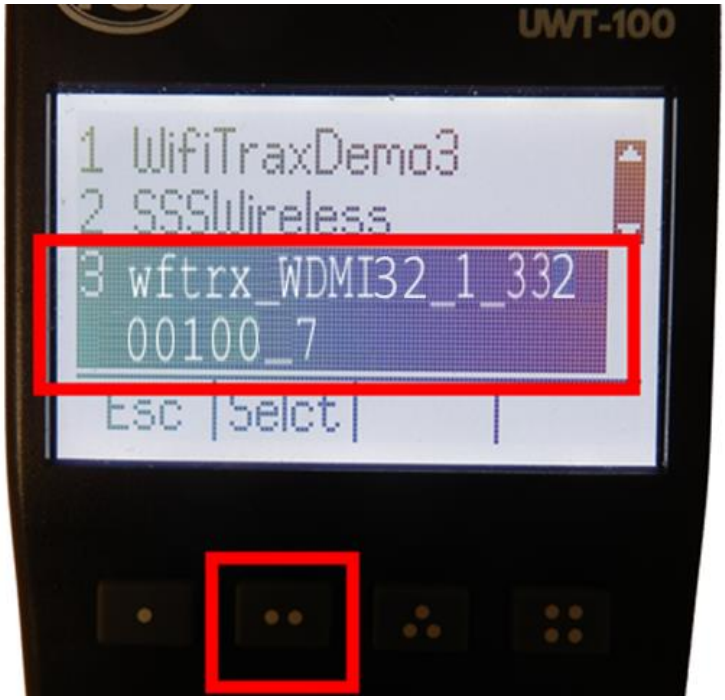


Figure 26 Select the Wi-Fi Network of the WDMI-32

(5) In the Found Networks list, identify the one which has the form wftrx_WDMI32_1_XXXXXXXX_7, where XXXXXXXX is the serial number of your unit as Figure 26. Select that Network, using the Selct [..] key.

Figure 27 The WDMI-32 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 27. Press the Save [..] key.
(7) Briefly, the message "Connected to wftrx_WDMI32_1_XXXXXXXX_7 should appear.

Figure 28 Select a locomotive with a known DCC address

(8) Press the Locomotive button on the keypad. Type the DCC address of the decoder installed with the WDMI-32 in your locomotive, followed by the Enter key as Figure 28

(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!

Advanced Features

The WDMI-32 Setup Web Pages

The WDMI-32 unit provides setup of advanced features via a set of web pages that may be accessed via any browser or from within apps using WiThrottle protocol, Engine Driver and WiThrottle. 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 WDMI-32 itself** so you do not need to be connected to the internet. The WDMI-32 just uses the same protocol as the internet, that is, HTTP and HTML.

Setup Advanced Features using Engine Driver

(1) Connect to the Wi-Fi Access Point that your WDMI-32 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_WDMI32_6_XXXXXXXX_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 SNXXXXXXXX entry in the Discovered Servers list. If you have changed the module name, your new module name will appear in this list instead.

(1) Tap the "three dots" icon at the top right of the screen and select Web in the menu. You should now see the Web Setup Main Menu as in Figure 29. You can click or tap on any of the headings in the menu to access the setup for that feature. The section "Setup Advanced Features using a Web Browser" provides information about all of the menu options.

Setup Advanced Features using WiThrottle

(1) Connect to the Wi-Fi Access Point that your WDMI-32 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_WDMI32_6_XXXXXXXX_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 SNXXXXXXXX entry in the Available WiThrottle Servers list. If you have changed the module name, your new module name will appear in this list instead.

(2) 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 29. You can click or tap on any of the headings in the menu to access the setup for that feature. The section "Setup Advanced Features using a Web Browser" provides information about all of the menu options.

   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 Web Browser"

Setup Advanced Features using a Web Browser

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

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 WDMI-32, that is wftrx_WDMI32_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 WDMI-32 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 WDMI-32 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.

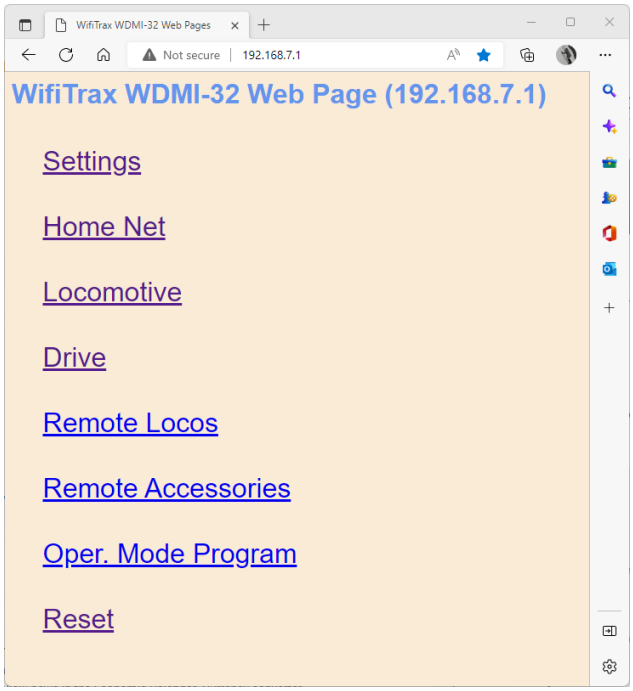


Figure 29 The WDMI-32 Web Setup Main Menu

(4) You should now see the Web Setup Main Menu as in Figure 29. You can click or tap on any of the headings in the menu to access the setup for that feature.

General Settings Web Page

To modify General Settings, tap the "Settings" heading in Figure 29.

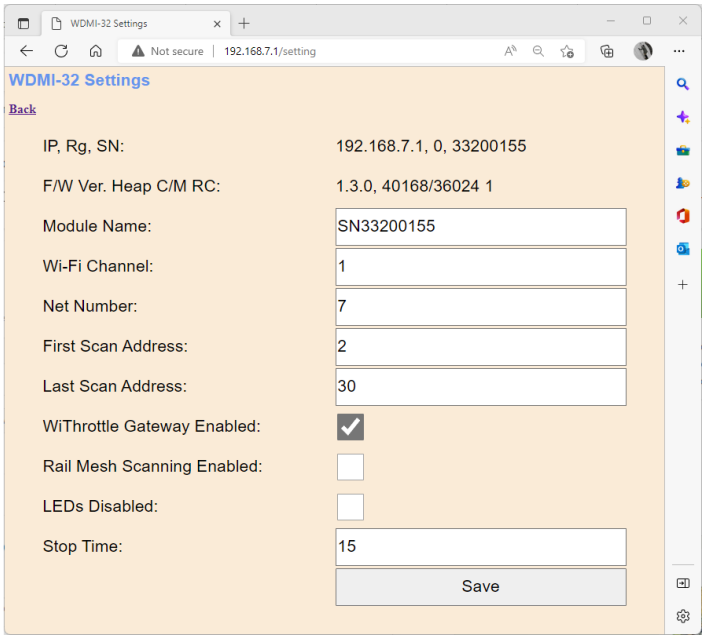


Figure 30 The WDMI-32 General Settings Web Page

The first line contains the IP address (IP), the Region Code (Rg) and the Serial Number (SN)

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.

Region Code

This will be 0 for all regions other than the Americas or 1 for North and South America. In the Americas only Wi-Fi channels 1 – 11 are allowed whereas in the rest of the world 1 – 13 are permitted, both by law and by the firmware.

Serial Number

This is a unique number for your particular module.

The second line shows Firmware Version (F/W Ver.), Heap space Current/Minimum and number of restarts since the last factory reset.

Firmware Version

This is the version of the WDMI-32 firmware installed at the factory. You cannot change this but if you ask for WifiTrax support, you may be asked for it. You can upgrade your firmware using WifiTrax Workshop and the FWA-11 or FWA-21 Workshop Adapter Module.

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 31 characters long which cannot include spaces. Type the name you want in the text box (such as the road number or DCC Address of the loco) 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. This will help you distinguish between several locos.

Wi-Fi Channel

This is the Wi-Fi channel in the 2.4GHz Wi-Fi band that the WDMI-32 will use only 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 to 11 in the Americas) 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 devices are being used nearby. You need to cycle power before the channel change will have an effect. Once you have cycled power, the WDMI-32 Wi-Fi access point will be of the form wftrx_WDMI32_N_XXXXXXXX_7 where N is your selected channel.

Note: Only channels 1 to 11 may be used in North and South America and Taiwan, 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 WDMI-32 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 WDMI-32 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 will then be 192.168.N.1 and it will assign IP Addresses: 192.168.N.2 to 192.168.N.5

The WDMI-32 Wi-Fi access point will be of the form wftrx_WDMI32_1_XXXXXXXX_N where N is your selected net number.

Last Scan Address

When Rail Mesh scanning is enabled (see Section "WifiTrax Rail Mesh") this will be the last IP Address in the scanning range. Scanning will begin at 2 in the subnet and end at this value.

WiThrottle Gateway Enabled

Checking this box enables the module as a WiThrottle Server. If you have multiple locos, you may prefer to drive them all through one gateway module (see Section "Home Net Mode with WifiTrax Rail Mesh enabled"), in which case you need only enable that module as a WiThrottle server. This setting is enabled by default.

Rail Mesh Scanning Enabled

Checking this box enables scanning for other modules that can be controlled from this module as a WiThrottle server (see Section "WifiTrax Rail Mesh"). This is disabled by default. Scanning only occurs when the module is working in Home-Net mode and only takes place when the module is not currently being used to drive any locomotive. Scanning only detects locos that are on the home net as well as only operating when the scanning-enabled module is on the home net.

Home Net Web Page

This page allows you to change your WDMI-32 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 WDMI-32 cannot join your Home Net (maybe you typed it wrong, put in the wrong password or the router was turned off), the WDMI-32 will attempt to connect for about 30 seconds then revert to Direct mode. You will then see the wftrx_WDMI32_6_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 so often seem to get locked up somehow!

To change to Home Net mode, tap the Home Net heading in Figure 29.

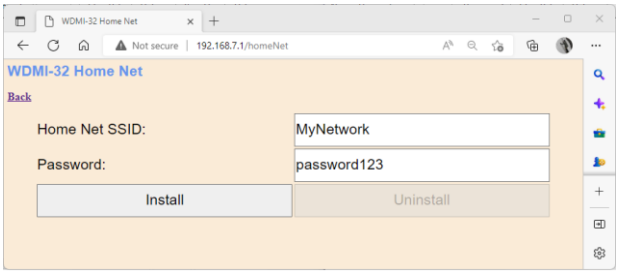


Figure 31 The Home Net Web Page

Figure 31 shows the Home Net web page. 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 the SSID and password for your home network. This will often be provided by your internet service provider on a card, but you may have changed it.

When you are satisfied these are correct, tap "Install". The unit will restart and connect to the Home Wi-Fi Network you have specified. To continue to drive your locomotive, you must reconnect your phone, tablet or computer to your home network and use the WDMI-32'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. Select the WDMI-32 WiThrottle server from the Discovered Servers list, or manually configure using the IP Address assigned to the WDMI-32 module. Please see the section "Tips to Manage your Home Network" 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 WDMI-32 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.

Locomotive Roster Web Page

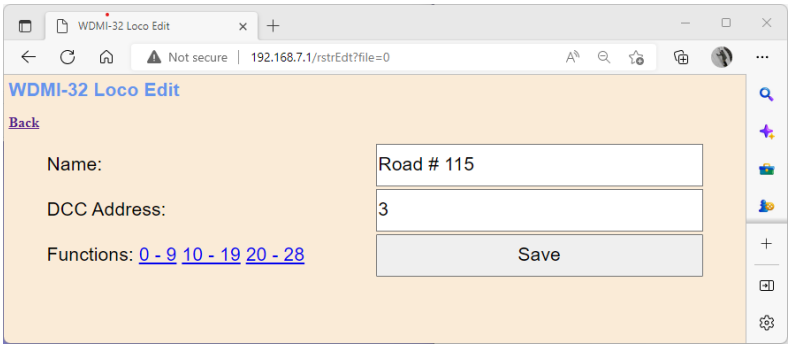


Figure 32 The Locomotive Roster Page

This page allows you to change the entries in the locomotive roster of your WDMI-32. WifiTrax has several products that implement a locomotive roster with multiple entries. WDMI-32 is a special case since it is mounted *in a locomotive* and therefore has a roster of only one loco.

You can give the single entry a Name and a DCC Address. You can then select from the "roster of one" 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 wiring.

View the single locomotive by tapping the "Locomotive" heading in the Web Setup Main Menu. By default, as shipped and after factory reset one entry is displayed and given the name "Ch 0" with DCC Address 3. To edit the entry, tap the name, to show the edit page as Figure 33, 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.

You can specify a DCC address between 1 and 127 as either long or short. Specify it as long by preceding the digits with a leading zero before you save. Figure 33 shows an address of 115 specified as long. This DCC Address must match that programmed into the DCC decoder of your locomotive. **Please Note: This does not change the DCC address programmed into your locomotive. To change this and make them match, you can use Operational Mode Programming or a separate DCC Command Station**.

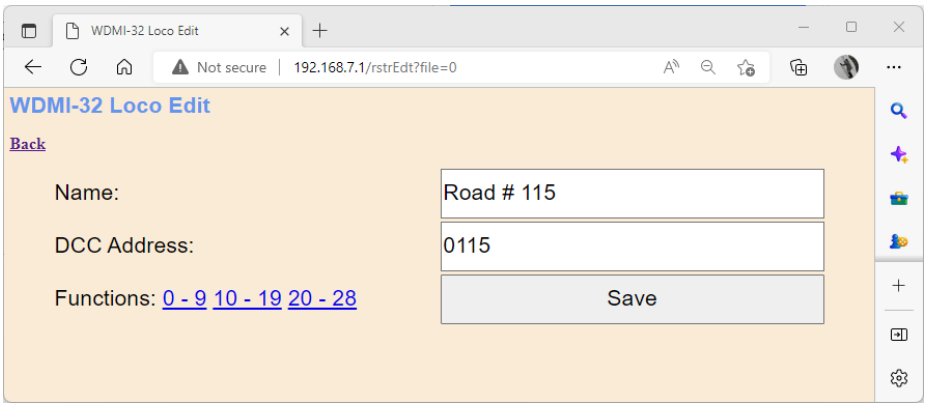


Figure 33 The Locomotive Roster Entry Edit Page showing a long DCC address. You can also access the Function labels from here.

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 34.

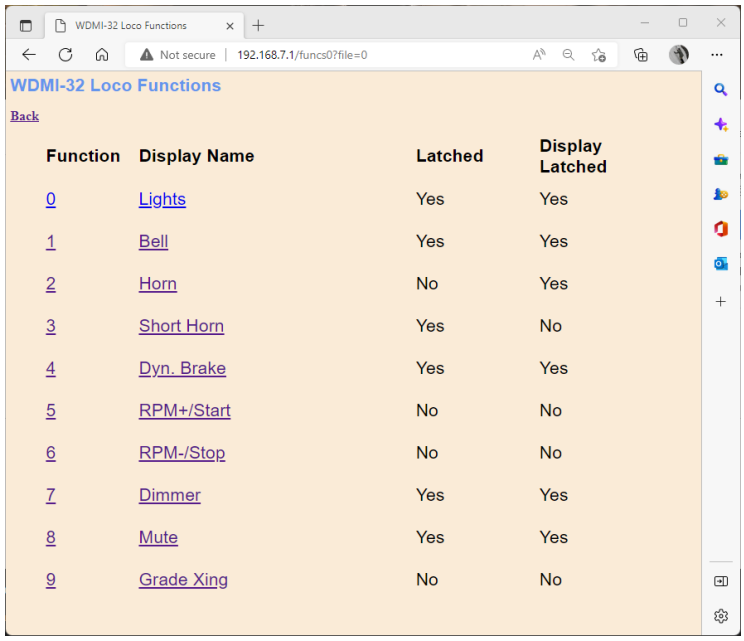


Figure 34 The function labels displayed for a given locomotive

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 WDMI-32 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.

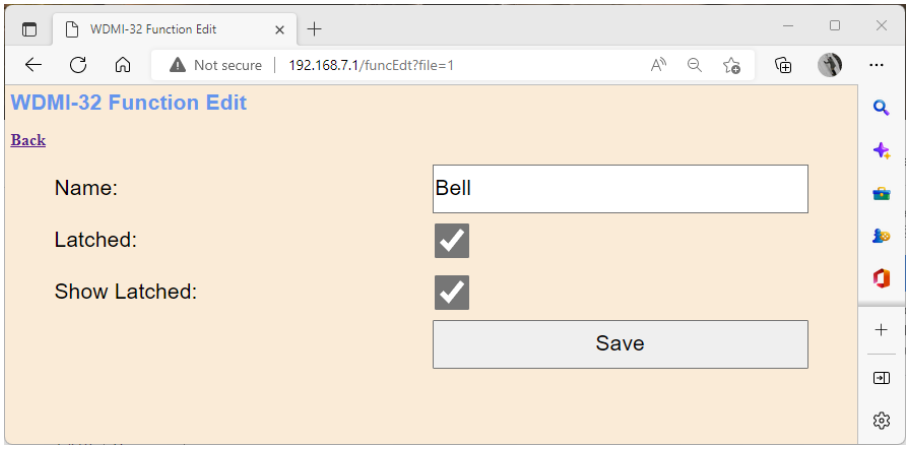


Figure 35 Editing a function key for a given locomotive

In the WDMI-32, you cannot add more locomotives to your roster.

Drive Page

The drive page offers an alternative to allow a loco to be driven from a smart phone, tablet or computer without installing one of the apps in Table 1.

Before you use the drive page, you must record the name and DCC address of your loco in the "Locomotive" page as described in the section "Locomotive Roster Web Page".

To enter the Drive page, tap Drive on the main menu. The drive page is displayed as

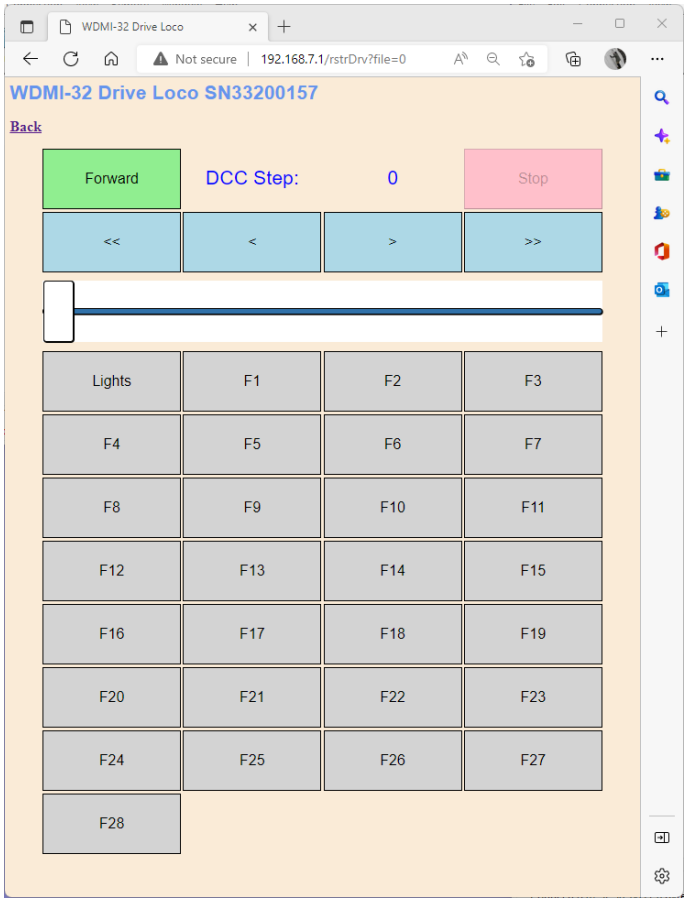


Figure 36 The Drive Page for Web Browser Driving

Tap Forward to toggle the direction.

Use the slider to control the speed. Alternatively tap >> to increase the speed by ten DCC steps or > to increase by just one step. Tap << to reduce the speed by ten DCC steps or < to reduce the speed by one DCC step.

Tap any of the function buttons to change their value.

Actually, you will probably get a better experience using the WiThrottle app, Engine Driver app or the TCS UWT-100, so please do explore those options.

However, you can always come back to these web pages on any device with a browser. Remember to connect to the module's network first.

Service Mode Programming (Not supported)

The WDMI-32 does not support Service Mode Programming. Use Operational Mode Programming to program your locomotive's Configuration Variables (CVs). You will be able to program almost all CVs including probably the address but you cannot read CV values back. **Note: Some decoders restrict programming of the CVs controlling DCC Address. Check your decoder documentation.**

Operational Mode Programming

Operational Mode Programming allows you to change CV values with the locomotive in normal operation. CV DCC messages contain the locomotive's DCC address and therefore only apply to that one locomotive. For this reason, it is not recommended that DCC addresses be changed in operational mode – though it is possible.

To enter Operational Mode Programming, tap the corresponding line on the main menu which displays the screen shown in Figure 37.

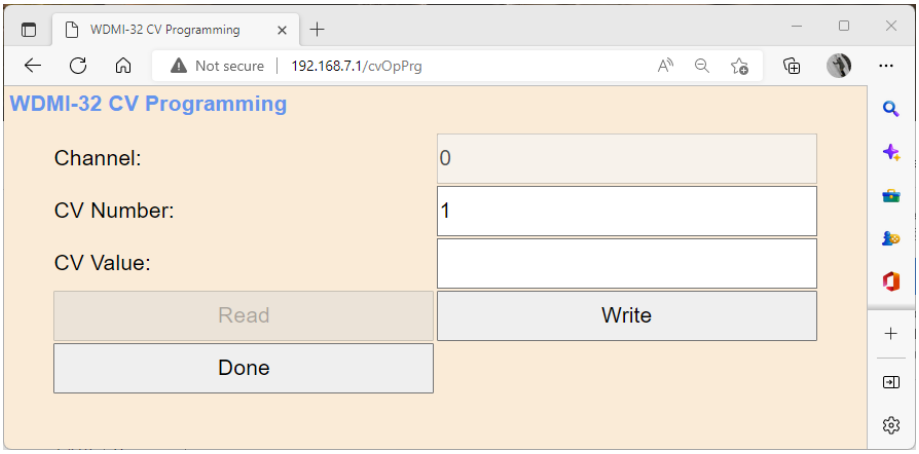


Figure 37 The Operational Mode Programming Web Page

It is not possible to read CV values in Operational Mode Programming mode, so there is no Read button. The DCC Command to write a new CV Value will be directed to the DCC Address that is present for this locomotive in the "Locomotive" page described above.

To write a value, type the CV number in the CV Number textbox and the required value in the CV Value textbox, then click the Write button. The CV Value will not be read back from the locomotive.

When you are finished, click the Done button to return to the main menu.

Factory Reset

You may factory reset your WDMI-32 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 and Accessory List will return to their default values.

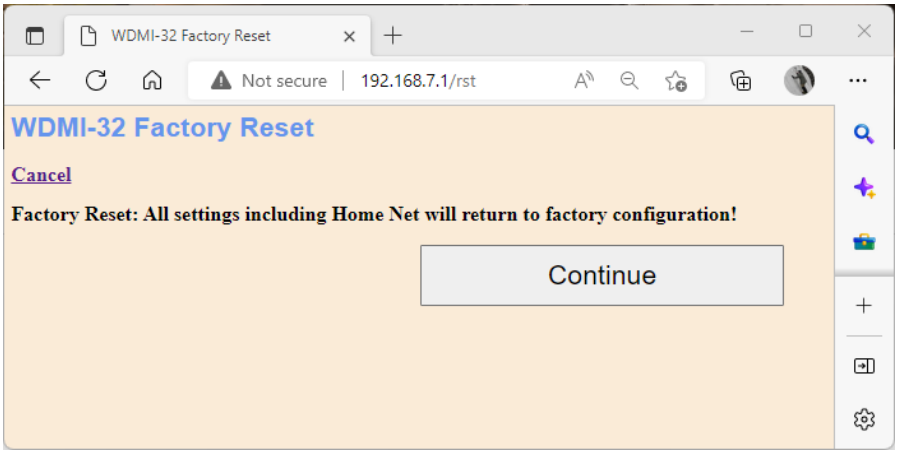


Figure 38 Factory reset confirmation page

WifiTrax Rail Mesh

WifiTrax Rail Mesh is a technology supported by many WifiTrax products that allows Loco Controllers and Layout Controllers to be shared among other modules by exchanging information using Wi-Fi at a level that is not visible to users connecting via protocols such as DCC or Hoffman WiThrottle.

Some WifiTrax modules supporting WifiTrax Rail Mesh may be designated as *Gateway Modules* which allows throttles and other control devices to connect to one of those modules as a *gateway* into the mesh and have visibility of the other modules within the mesh.

Loco Mesh

As an example, WDMI-32 has a roster of one locomotive that is communicated to any throttle device that connects to the WDMI-32 via its WiThrottle Server. Therefore, a TCS UWT-100, an instance of WiThrottle on IOS or Engine Driver on Android sees only a roster of one and can therefore only drive that loco. If this were always the case, it would not be possible to drive a consist of two locos each fitted with a WDMI-32, or to use the dual throttle capability of WiThrottle and Engine Driver to drive two locos at once. Furthermore, to drive another loco, you would have to close Engine Driver and reconnect to the other loco's WiThrottle server.

WifiTrax Rail Mesh removes this limitation by allowing the Gateway Module to scan the collection of WifiTrax modules available and record them in its roster as temporary locos. Then, when a throttle is connected to the WiThrottle server in any loco, all the visible locos are available for driving. Thus, you may connect to one loco using IOS WiThrottle, Android Engine Driver or TCS UWT-100 and then select from any loco in the augmented roster to drive, either singly or as part of a consist.

Layout Mesh

WifiTrax Rail Mesh does not only provide sharing of locomotives, it also provides sharing of layout accessories such as switch machine controllers. If for example, you have two locos each fitted with a WDMI-32 and a WFS-47 on your layout controlling four switch machines, you can connect to the WiThrottle server in one of those locomotives and, as well as driving any of the shared locos, you can also control any of the switch machines under control of the WFS-46. The WDMI-32 module in either locomotive will scan a specified IP address range on your home net and add accessory controllers found to the Points List displayed on your IOS WiThrottle app, your Android Engine Driver app or your TCS UWT-100.

Using an Independent Gateway Module

Often it is not convenient to use one of the WDMI-32 modules in a loco as a gateway module. This is because you may not want to keep that loco powered up all the time and obviously a gateway module must remain powered up while you drive other locos through it.

To avoid this, instead of using a Loco Controller such as WDMI-32 as a Gateway Module, you can use a dedicated gateway module such as the WFD-60. This module, when powered up scans for other modules in the WifiTrax Rail Mesh and provides a WiThrottle Protocol Server with a loco and accessory roster containing all the locos and accessories that are visible. The WFD-60 actually provides two gateways into WifiTrax Rail Mesh, one via the WiThrottle Protocol over Wi-Fi, and another using DCC Protocol via its track power input terminals.

Operating a Multi-Loco Layout

Some model railroaders will want to install the WDMI-32 module in multiple locomotives and either drive two or three at a time or rapidly switch from one to the other. This section describes how this can be achieved.

Table 3 gives a summary of the options available. In the first column is the Throttle Choice either WiThrottle or Loco Operator 3. WiThrottle means an app or device that communicates with a WiThrottle Server using the Hoffman WiThrottle protocol. Apps in this category would be Engine Driver on Android or WiThrottle on Apple IOS. An example of a device in this category would be TCS UWT-100 Universal WiFi Throttle. Loco Operator 3 means the free app available for Windows and Android published by WifiTrax.

The second column in Table 3 specifies Direct mode or Home-net mode. In Direct mode, each loco provides its own Wi-Fi network that any device can connect to and provides just one WiThrottle Server. In Home-net mode, each locomotive joins the network that you specify provided by your home router and is assigned an IP address by that router. When operating in Home-net mode it is usually better to set up an IP address reservation on your router for each WDMI-32 module, and the WFD-60 if you use one. That way each locomotive gets the same IP address each time and, if you use Loco Operator 3, you will not have to keep doing a rescan because the IP addresses have changed. This is described in the Section “Reserving a Fixed IP Address”.

By the way, Rail Mesh Scanning for locos by WDMI-32 or WFD-60 will still find locos even if their IP address has changed, but with reserved IP addresses, you can set up shortcuts in your browser favourites page so you can easily go to the web pages for each loco.

Columns three and four in Table 3 show operating system and App name that you can choose as a hand-held throttle.

Columns five and six show whether consisting and accessory control is available, with remarks in column seven. Column eight gives the section in this document that describes setup and operation in more detail for any chosen mode.

Throttle Protocol	Network Option	Tablet O/S	App or Device	Consisting Available	Accessories Available	Remarks	Detail Section
Browser	Direct Mode	Windows, Apple IOS, Android etc.	Edge, Chrome, Safari etc.	No	No	Must select new Wi-Fi Network and IP Address when changing Loco	"Getting Started with a Web Browser"
	Home Net Mode	Windows, Apple IOS, Android etc.	Edge, Chrome, Safari etc.	No	No	Must Know IP Address of Loco (save in favourites). Must select new IP Address when changing Loco	
WiThrottle	Direct Mode	Apple IOS	WiThrottle	No	No	Must select new Wi-Fi Network and WiThrottle Server when changing Loco	"Getting Started with WiThrottle on Apple IOS"
		Android	Engine Driver	No	No	Must restart app, select Wi-Fi Network and WiThrottle Server when changing locos.	"Getting Started with Engine Driver on Android"
		Not Applicable	UWT-100	No	No	Must define each loco as a network and switch network when changing locos.	"Getting Started with TCS UWT-100"
	Home Net Mode	Apple IOS	WiThrottle	No	No	Must select new WiThrottle Server when changing Loco	Using Apple IOS WiThrottle without Rail Mesh
		Android	Engine Driver	No	No	Must restart app, select new WiThrottle Server when changing Loco	Using Android Engine Driver without Rail Mesh
		Not Applicable	UWT-100	No	No	Select WiThrottle server by defining different network for each locomotive. Define networks with same SSID but different IP address.	Using TCS UWT-100 without Rail Mesh
	Home Net Mode with WifiTrax Rail Mesh enabled	Apple IOS	WiThrottle	Yes	Yes	Select loco from Roster	Using Apple IOS WiThrottle with Rail Mesh
		Android	Engine Driver	Yes	Yes	Select loco from Roster	Using Android Engine Driver with Rail Mesh
		Not Applicable	UWT-100	Yes	Yes	Select loco from Roster	

Table 3 Options for Supporting Multiple Locomotives

Home Net Mode without WifiTrax Rail Mesh

It is possible to work with a small number of locomotives fitted with WDMI-32 by treating each one as a separate WiThrottle Server and connecting to each loco when you want to drive it. In this mode you will not be able to operate consists or control accessories.

First you need to install all the locos on your home net and assign address reservations to each. See sections “Home Net Web Page” and “Reserving a Fixed IP Address” for help on this. While you are connected to the loco’s web pages with a browser, go to the “Settings” and make sure WiThrottle Gateway is enabled and Rail Mesh Scanning is disabled as in Figure 39. Check and uncheck these two options on the Settings web page and click Save.

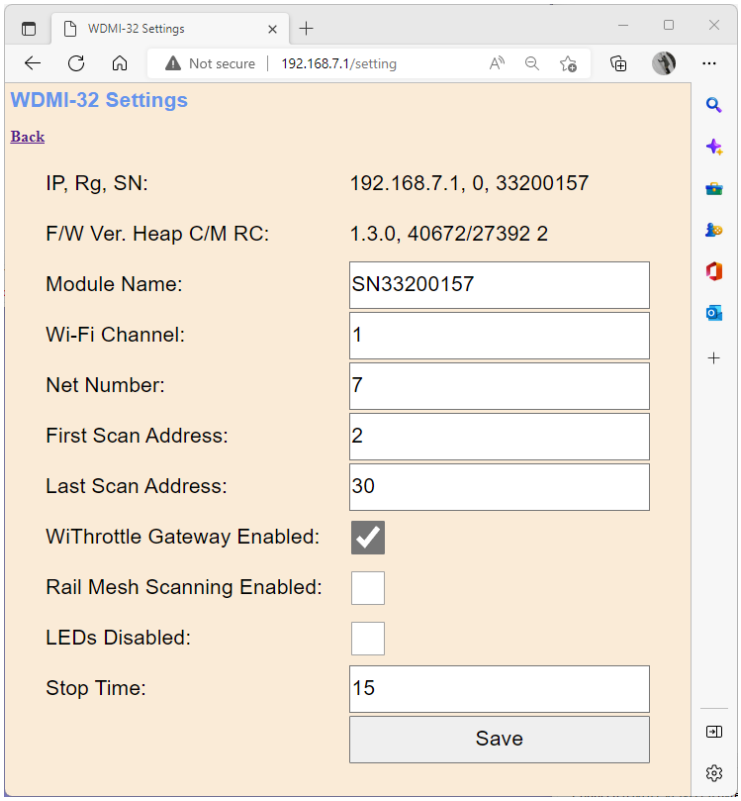


Figure 39 Enabling WiThrottle Gateway and Rail Mesh Scanning for the WiThrottle Gateway Module

Use the Settings page to give your module a name that you will recognise. A good idea is to set it to the road number of the locomotive in which the WDMI-32 module is installed. That way you will recognise its WiThrottle server and be able to easily connect to the right one with your WiThrottle app, IOS WiThrottle or Android Engine Driver.

Using Apple IOS WiThrottle without Rail Mesh

(1) Make sure your Apple device, iPhone or iPad is connected to your Home Network using the Settings App on your device.
(2) Run the WiThrottle app.
(3) You should see your locomotives listed under Available WiThrottle Servers. Tap the one you wish to drive. If you do not see your locomotive listed as an Available WiThrottle Server, tap Configure, enter its IP Address and Port 12090. This is why it is really helpful to give each loco a reserved IP address. Once you have done this once, the WiThrottle app will remember the recent servers and make it easier.

Note: The technology used to discover servers is called mDNS. It does not seem to be very reliable. Sometimes all the loco WiThrottle servers will be discovered if you wait a while, sometimes not, so this is the reason for the need to enter them manually sometimes.

(4) Once you are connected, select the loco in its roster of one, or use its DCC address to drive it. You will only be able to drive one loco at a time in this mode.

(5) When you want to drive a different loco, release the loco, then go to the Server Configuration menu in WiThrottle and use the process in (3) to select the WiThrottle Server of a different loco. Then continue as at (4).

Using Android Engine Driver without Rail Mesh

(1) Make sure your Android device, phone or tablet is connected to your Home Network using the Settings App on your device.

(2) Run the Engine Driver app.

(3) You should see your locomotives listed under Discovered Servers. Tap the one you wish to drive. If you do not see your locomotive listed as a Discovered Server, tap Host Name or Address, enter its IP Address, then tap Port and enter 12090. This is why it is really helpful to give each loco a reserved IP address. When you have done this once, the Engine Driver app will remember the recent servers and make it easier.

Note: The technology used to discover servers is called mDNS. It does not seem to be very reliable. Usually all the loco WiThrottle servers will be discovered if you wait a while, sometimes not, so this is the reason for the need to enter them manually sometimes.

(4) Once you are connected, select the loco in its roster of one, or use its DCC address to drive it. You will only be able to drive one loco at a time in this mode.

(5) When you want to drive a different loco, exit the Engine Driver app, start again and repeat the process from step (3). Unfortunately, Engine Driver does not seem to provide a way of changing server without exiting the app.

Using TCS UWT-100 without Rail Mesh

The TCS UWT-100 does not readily support working with multiple WiThrottle servers on the same network as described in the previous sections. Rather than try to do this, if you use UWT-100 it will be better to enable Rail Mesh through a gateway module or do not use a home net.

Home Net Mode with WifiTrax Rail Mesh enabled

This section explains how you can set up and operate a layout with multiple large-scale locomotives each with a WDMI-32 and decoder, by using your home network and enabling a gateway module. The gateway module may be any module that supports WiThrottle Server capability and Rail Mesh Scanning. It can be one of the WDMI-32 modules in a locomotive or it can be a separate module such as the WFD-60 that is dedicated to that function.

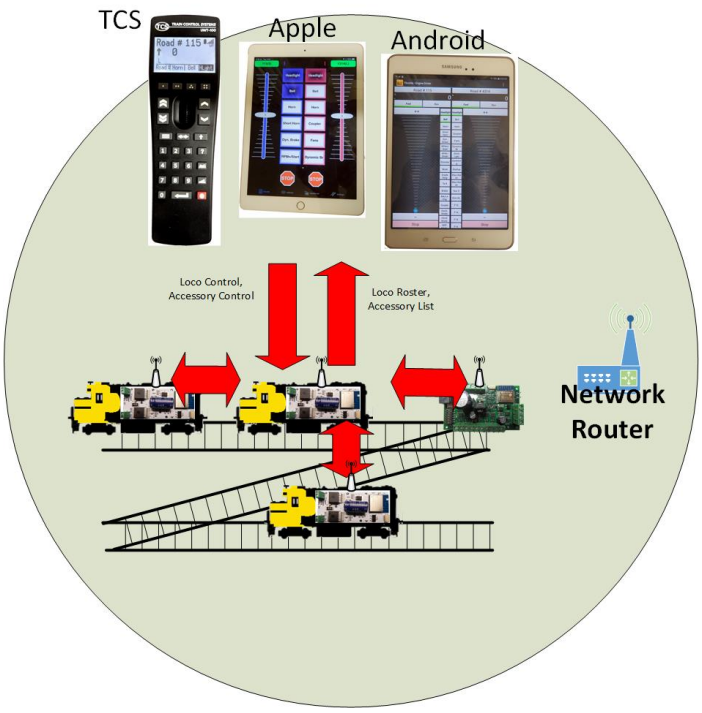


Figure 40 Using WifiTrax Rail Mesh to Control Multiple Locomotives and Accessories using one Loco as a Gateway Module

In Figure 40 one of the locomotives having a WDMI-32 is used as the gateway. The WiThrottle protocol devices used as throttles are shown at the top. Each one needs to join to a WiThrottle Server and receive a Loco Roster in order to select a loco for driving. In the case shown in Figure 40, there are three locomotives and a Wi-Fi switch machine controller such as the WFS-46. The gateway module must have both WiThrottle Gateway and Rail Mesh Scanning enabled as in Figure 41. Check these two options on the Settings web page and Save.

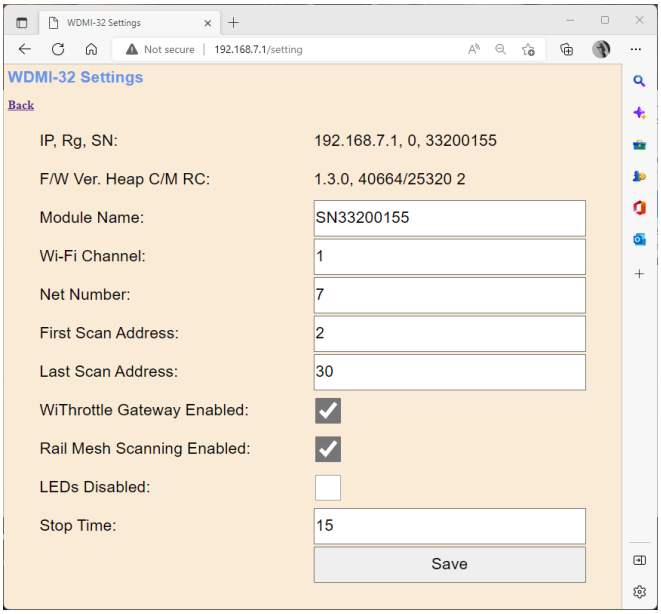


Figure 41 Enabling WiThrottle Gateway and Rail Mesh Scanning for the WiThrottle Gateway Module

The module used as the WiThrottle Gateway will scan the range specified beginning at IP Address 2 on its subnet and ending with the Last Scan Address specified in Figure 41. This range will be scanned continuously providing no loco is currently being driven through that module. The other

two locos shown in Figure 40 will be discovered and added to the loco roster delivered via the WiThrottle protocol to the app or device. Thus, in addition to its own roster of one loco, in which it is mounted, the roster will include locos discovered by via the scanning process.

Similarly, accessories such as switch machine controllers will also be discovered and their control channels displayed in the "Points" list on the devices.

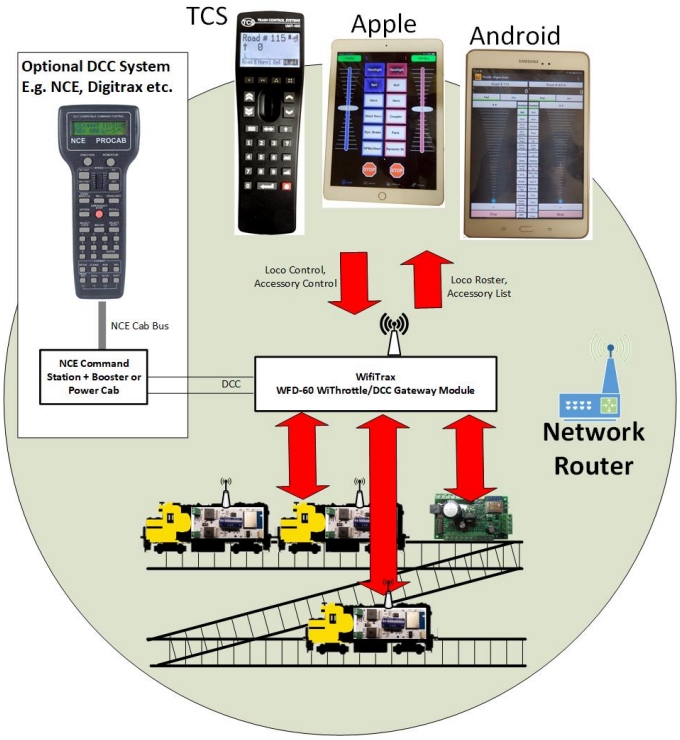


Figure 42 Using WifiTrax Rail Mesh to Control Multiple Locomotives and Accessories via a WFD-60 Gateway Module

An obvious problem with this approach is that the loco used as the WiThrottle gateway must always be powered even though is may not be being driven. The WDMI-32 is intended for use in battery locos, so it is not desirable to leave a loco powered continuously. One can enable WiThrottle Gateway in more than one module and switch from one to another. For example, if you want to drive a consist, one loco can be used as the gateway and the other driven through it.

A better approach however, is to use the configuration in Figure 42 where a separate, stationary module is used as the WiThrottle Gateway. The WFD-60 serves this purpose and also acts as a gateway to a DCC signal connected to its input terminals. If DCC is not connected, the WFD-60 module must be powered by connecting 12 – 18 volts DC to its DCC terminals, or via a mains adapter. The WiThrottle gateway is now permanently powered and can be used to drive any locomotive on the layout. In this configuration, all the other locomotives using WDMI-32 can be set with WiThrottle Gateway and Rail Mesh Scanning disabled.

Using Apple IOS WiThrottle with Rail Mesh

(1) Make sure your Apple device, iPhone or iPad is connected to your Home Network using the Settings App on your device.
(2) Run the WiThrottle app.
(3) You should see your gateway module (or modules) listed under Available WiThrottle Servers. Tap the one you wish to drive. If you do not see your locomotive listed as an Available

WiThrottle Server, tap Configure, enter its IP Address and Port 12090. This is why it is really helpful to give your locos and gateway module a reserved IP address. Once you have done this once, the WiThrottle app will remember the recent server and make it easier.

Note: The technology used to discover servers is called mDNS. It does not seem to be very reliable. Sometimes all the loco WiThrottle servers will be discovered if you wait a while, sometimes not, so this is the reason for the need to enter them manually sometimes.

(4) Once you are connected, select the loco you wish to drive from the roster which should show all the scanned locos (you may have to wait a while) in its roster, you cannot select a scanned loco using its DCC address. You will be able to drive more than one loco at a time in this mode.

(5) When you want to drive a different loco, release the loco and select a new one from the roster.

Using Android Engine Driver with Rail Mesh

(1) Make sure your Android device, phone or tablet is connected to your Home Network using the Settings App on your device.

(2) Run the Engine Driver app.

(3) You should see your locomotives listed under Discovered Servers. Tap the one you wish to drive. If you do not see your locomotive listed as a Discovered Server, tap Host Name or Address, enter its IP Address, then tap Port and enter 12090. This is why it is really helpful to give each loco a reserved IP address. When you have done this once, the Engine Driver app will remember the recent servers and make it easier.

Note: The technology used to discover servers is called mDNS. It does not seem to be very reliable. Usually all the loco WiThrottle servers will be discovered if you wait a while, sometimes not, so this is the reason for the need to enter them manually sometimes.

(4) Once you are connected, select the loco in its roster of one, or use its DCC address to drive it. You will only be able to drive one loco at a time in this mode.

(5) When you want to drive a different loco, exit the Engine Driver app, start again and repeat the process from step (3). Unfortunately, Engine Driver does not seem to provide a way of changing server without exiting the app.

Customizing Decoder Model Information

Each time you connect one of the 3rd-party apps, that use the WiThrottle protocol, to the WDMI-32, the WDMI-32 sends its locomotive roster and accessory list. When you select a locomotive from the roster on the app, the WDMI-32 sends some more information to the hand-held including a list of function labels. You then see the function buttons with meaningful names, Lights, Bell, Horn etc. rather than just Function Numbers, F0, F1, F2 etc. That's how it works between the hand-held device app and the WDMI-32 module.

How do we get the function key information into the WDMI-32 module? Well, there are two ways.

Setting Function Information using the WDMI-32 Web Pages

You can connect to the WDMI-32 web pages from a hand-held device app like WiThrottle Full Version or Engine Driver, then select the WebServer tab at the bottom of the WiThrottle screen or the Web menu item from the Engine Driver "3-dots" menu at the top right. You can also use any browser such as Internet Explorer, Edge, Google Chrome or Safari to connect directly to the IP Address of the WDMI-32. Please see the section "Setup Advanced Features using a Web Browser" for more information on this.

Once you are displaying the Main Menu page, refer to the section "Function Labelling Web Page" which describes setting function labels. You will need to release and reconnect to the loco from your hand-held device app, using the JMRI Roster option, before the new function labels will display.

Tips to Manage your Home Network

Connection to your Home Router

When you set a WDMI-32 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, it will give up after about 30 seconds and revert back to 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 of some internal hang-up problem and 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 WDMI-32 always uses the Wi-Fi channel of the router that it is connected to.

Home Net IP Address Assignment

Every device connected to a network needs an IP Address and when your WDMI-32 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 WDMI-32, the lease will have expired and the router will give it a different IP Address.

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 WDMI-32 modules using a protocol called Multicast DNS. The WDMI-32 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 WDMI-32 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 "General 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 Web 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 by opening a Windows command console and typing the ipconfig command:

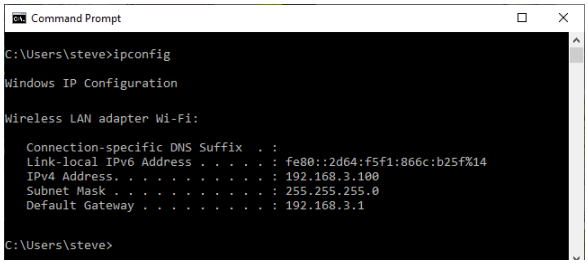


Figure 43 Using ipconfig to find your computer's ip address and default gateway

(3) Figure 43 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.

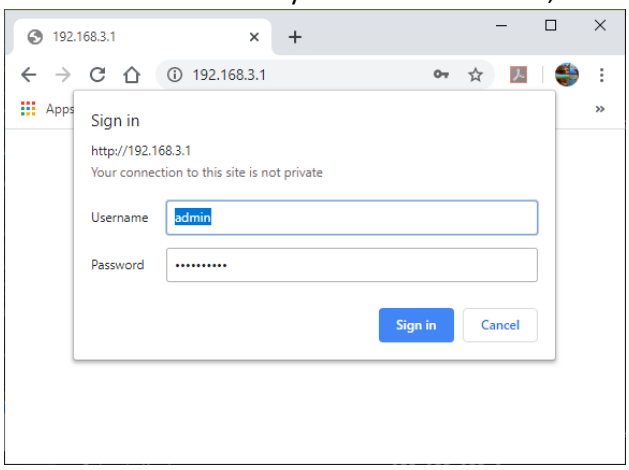


Figure 44 Access your router by using the IP Address of your default gateway in a browser

(4) The browser will ask for your user name 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.

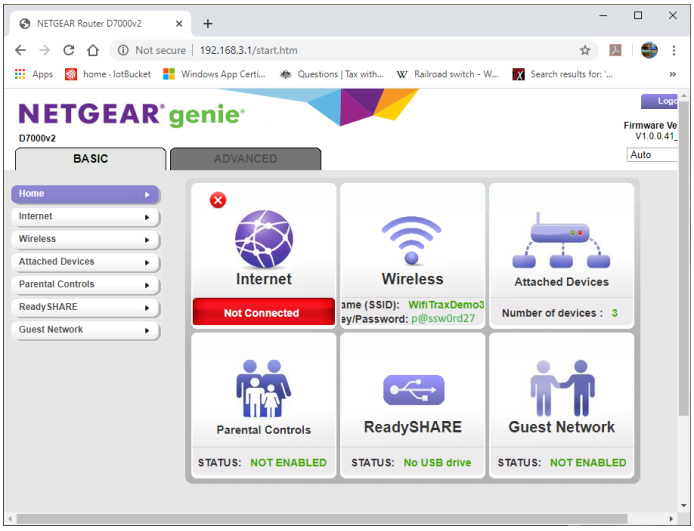
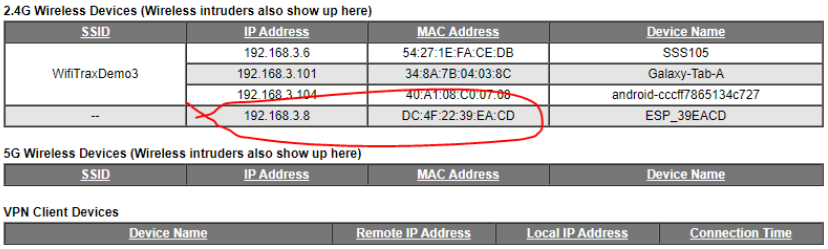


Figure 45 A typical router admin page

(5) Once you have given the credentials, you will see the admin page. A typical one is shown in Figure 45. Find the "Attached Devices" option and click on it.



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

SSID	IP Address	MAC Address	Device Name
WifiTraxDemo3	192.168.3.6	54:27:1E:FA:CE:DB	SSS105
	192.168.3.101	34:8A:7B:04:03:8C	Galaxy-Tab-A
	192.168.3.104	40:A1:08:C0:07:08	android-cccff7865134c727
--	192.168.3.8	DC:4F:22:39:EA:CD	ESP_39EACD

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 46 Typical "Attached Devices" page of a router

(6) You will see a screen something like Figure 46. Find the row where the MAC address matches that printed on the bag label of your WDMI-32 device. Here the MAC Address `DC:4F:22:39:EA:CD` matches the STA MAC Address on the bag label, so the IP Address is `192.168.3.8`

(7) Now open another tab in your browser and type the IP Address, `192.168.3.8` in this case, into the address bar to get the main menu web page.

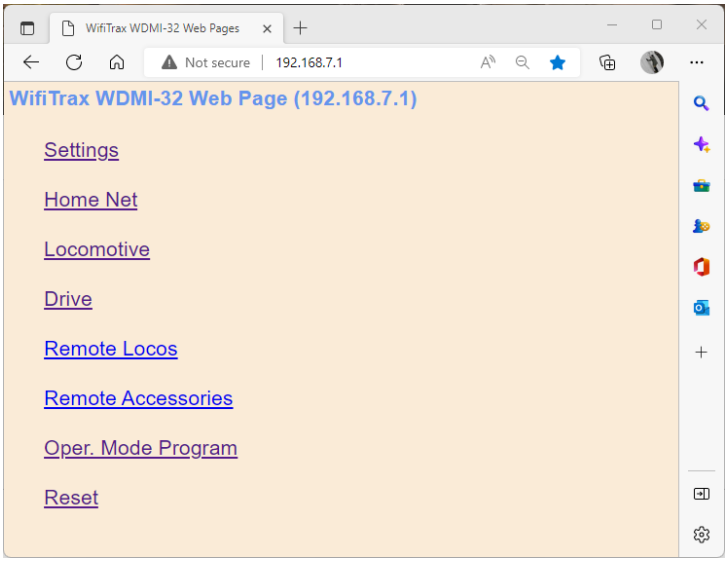


Figure 47 Use the IP Address to open the main menu web page

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!

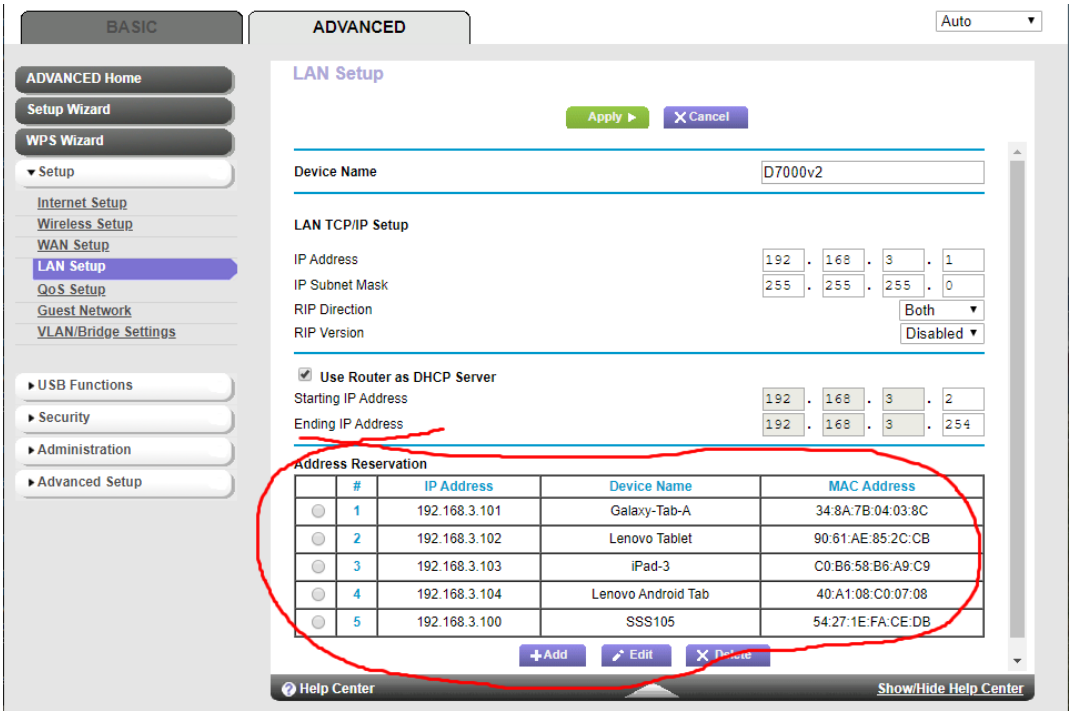


Figure 48 An IP Address reservation table in a router

Well, while you're in the router admin page you can *reserve a fixed IP Address* for your WDMI-32 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 1 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 46, give the reservation a name "WDMI-32" and hit Add as Figure 49.

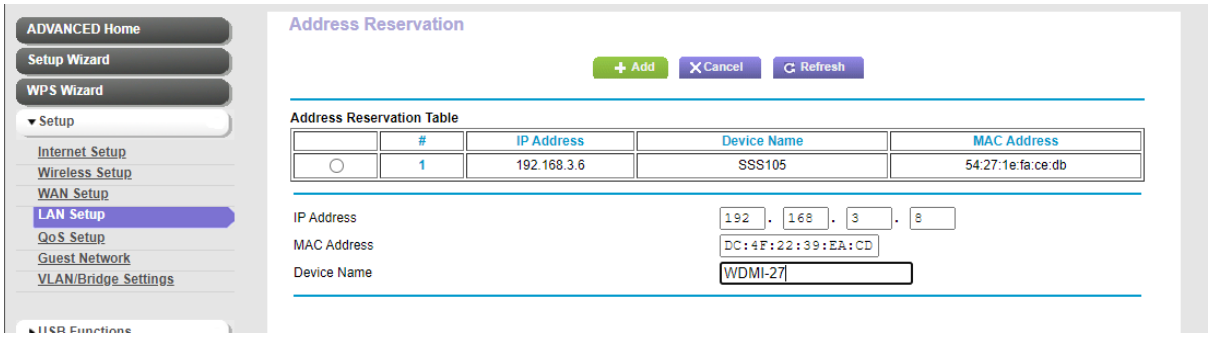


Figure 49 Adding an address reservation

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.

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

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 appariel 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.

EU Declaration of Conformity

1. Radio equipment: WifiTrax Model WDMI-32 Wi-Fi/DCC Interface Module

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 WDMI-32 Wi-Fi/DCC Interface Module as pictured in Figure 50 and identified by a label on underside of module bearing the model number WDMI-32.

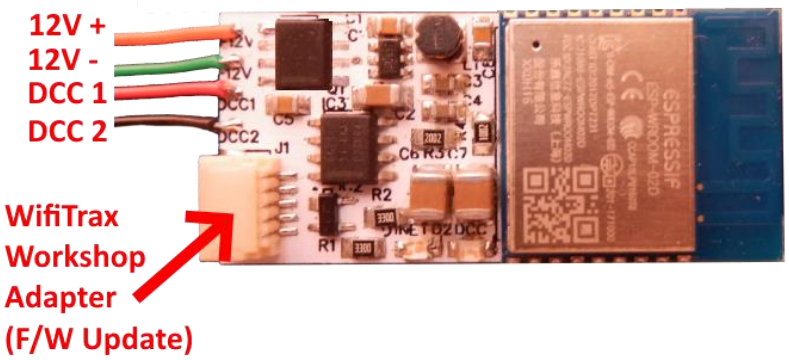


Figure 50 Identifying Illustration for WifiTrax Model WDMI-32 EU Declaration of Conformity

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