RUC-02 User Guide

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Version 1.15

Web Mountain Technologies, LLC, is a Colorado entity that develops, markets, and sells home automation products based on the advanced powerline technology known as Universal Powerline Bus, or UPB.

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Document Revisions

Date	Version Number	Document Changes
10/22/2019	1.15	First iteration using this format

1   Introduction

Congratulations on your purchase of a Web Mountain Technologies RUC-02. This controller is a state of the art controller mainly intended for use with a residential UPB (Universal Powerline Bus) network.   UPB is a home automation protocol that enables the sending of messages over a residential powerline network for the purpose of controlling and monitoring devices. The RUC-02 allows you to:
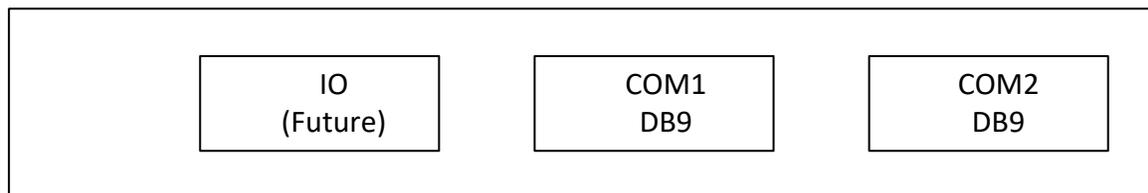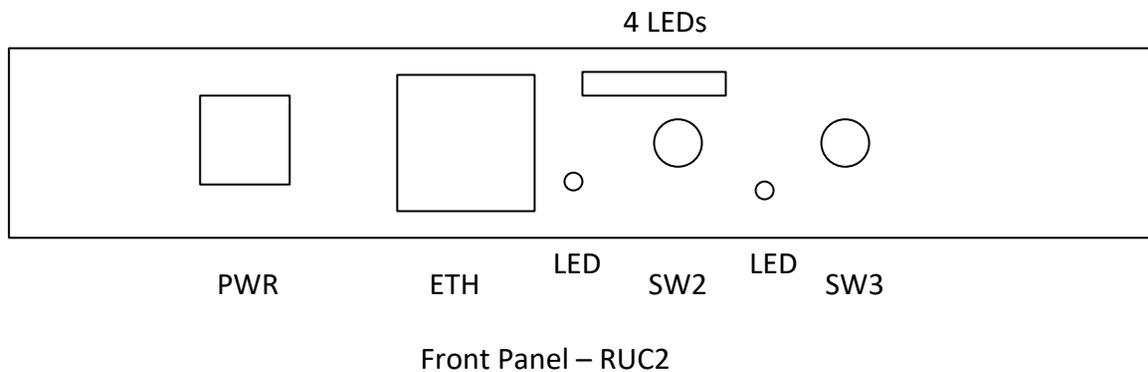
- Schedule control of devices based on time of day, including astronomical events, such as sunset and sunrise.

- Trigger control of devices based upon the receipt of commands from another device. Setup a web browser based Control Panel, with buttons, for manual control of devices.

- Control UPB devices using device commands or scene commands.

- Control devices using TCPIP messaging.

- Send GET / POST commands to control other devices, including third party controllers.

- Send out notification emails based on triggers.

- Set MODEs for HOME and AWAY activities.

- Do RANDOM scheduling, to make a home look lived in.

- Export Upstart Export files directly into the RUC-02 for easy implementation of triggers.

- Interact directly with Amazon Alexa for voice control of UPB devices.

- Easily setup remote access to the unit without having to open holes in your router's firewall.

- And, much more………..

2   Initial Setup

Please Read This Before Beginning the Install of Your New RUC2

Quick setup instructions for your new RUC-02 unit.

1. Remove from box and connect Ethernet (to switch or router – cable not provided), COM1 to SPIM, and power supply to PWR. **IMPORTANT – make sure Ethernet cable is connected before powering unit. Failure to do this could cause a multiple minute delay before remote access is available.**

4 LEDs

Front Panel – RUC2

PWR	ETH	LED SW2 LED SW3

IO (Future)	COM1 DB9	COM2 DB9

Left Side Panel

2. Once power is applied, look at the front panel. Next to the Ethernet jack, you will see a slot that has four small blue LEDs in it. After a few seconds, those blue LEDs should light up and start flashing in a random pattern. If they don't light up, remove power from the unit, count to 10, then repower the unit.

3. Give it a couple of minutes to allow the unit to completely boot up, then from your phone or a PC, open a browser and go to:

http://www.wmtremote.com:xxxxx where xxxxx is the remote port associated with your unit, and shown on the postcard taped to the unit or on the label on the back of the unit. (something like 10130).

You should be challenged for a user name and password.

User = admin

Password = yyyyyyyyyyyy where yyyyyyy= the 13 digit admin password on the card/ back label.

Alternatively, you can use user wmtruc (however this user can't access the Admin tab on the menu):

user – wmtruc

Password = zzzzzzzzzzzzz where zzzzzzzzzz = the 13 digit admin password on the card/ back label.

Port xxxxx is a unique port and only used by this unit.

A note on the passwords:

These are complicated passwords, but you can change them if you so desire. Change wmtruc from the home page,(wmtruc can't access the admin page) and change the admin password from the admin page. (You will have to be logged in as admin in order to access the admin page). However, be advised that if you ever do a full complete factory reset on the unit, it will go back to these passwords, even if you have changed them. We created these challenging, unique passwords, to improve security. So, make sure you keep the card with the unique passwords where you can find it. If you're not worried about a user getting into the unit, just tape the card to the RUC2 unit.

In case you can't access the unit using the remote access port

In case you never get challenged for a user name and password and get an error message stating this website can't be accessed, then you will need to find the local IP address of the unit. Look in your router's user interface, for connected devices, and look for a host name of WMTRUC or a MAC address that matches the serial number of your RUC (shown on the index card that came with your unit that provided the unit passwords or on the back of the unit). Take note of the IP address and enter that into your browser, i.e., 10.0.0.15. This address will normally be something like 10.0.x.xxx or 192.168.x.xxx. There are also freely available to download applications for your PC that will scan your local network and provide you with the local IP address, again, looking for the host name or MAC address. One such example of a freely downloadable program is https://www.advanced-ip-scanner.com/.

Networking Configuration Setup

Now that you're logged into the unit, click on the Networking tab on the left menu. On this page, you will see the local IP address assigned to the unit by the on-premises router. Make note of this IP address.

Also, verify the IP addresses in the Primary DNS field. The Primary DNS address should match your router's IP address. If it shows weird characters, enter in the IP address of your router, or you can use a public DNS address such as 8.8.8.8 or 8.8.4.4 (You can put these addresses in the

Secondary DNS field as well). Not having a valid DNS address can prevent remote access from working on the unit. If the checkbox for "Enable DHCP" is checked, uncheck it so that you can make entries in this field. Unchecking this box will cause the unit to have the Fixed IP address that shows up in the IP Address field.

Normally, the Gateway field will be the IP address of your router and the Subnet Mask will be set to 255.255.255.0.

The Remote Access ports can't be changed. Make note of the Remote Web Port field – this is the port used for remote access – www.wmtremote.com:xxxxx where the xxxxx is the number in the Remote Web Port field.

If you make any changes in the Networking Configuration Setup screen, click on the Save Config button to save these changes. Once you click on this button, it will cause a reboot of the unit. Give it a couple of minutes for the unit to completely reboot.

Device Configuration Setup

Now, click on the Device Config tab on the left menu. Enter in the appropriate Latitude and Longitude (can find from www.zipinfo.com) and select the appropriate time zone. In almost all instances, DST (Daylight Savings Time) should be left as enabled. Then, scroll to the bottom of the page and click on the button Save Config. If the Latitude, Longitude, and time zone are not setup, then scheduling for sunrise and sunset will not be correct for your installation.

3 Trigger Setup

Click on the Triggers tab on the left menu.

To setup a **scheduled trigger**, make sure the Command Type dropdown under "Receive Command" is set to Sched. First, provide a short but descriptive Trigger Name (ie, Front Lights On Sunset). Then, enter in the time in the H (Hours) and M (minutes) text boxes (24 hour clock, so 3 PM = 15 hours). Alternatively, you can select a time based on sunrise or sunset by selecting the check box for those options rather than "Actual Time". Then, the hours and minutes above relate to the sunrise or sunset time. For example, if you want the schedule to be 15 minutes after sunset, set H to 0, M to 15, and select "Time after sunset".

Then, under "Send Command", make sure under Command Type, you select UPB Direct (controls a single device) or UPB Link (sends a Link or Scene command), and the port (by default, COM1 – whichever port you have the SPIM connected to). Then, select the NID of your UPB system, the Device ID or Scene ID you want to control, and the command (normally Activate or Deactivate). Then, click on Add Trigger.

NOTE: At the current time, you cannot have two triggers set to run at the same scheduled time. Either move triggers apart by a minute or so, or setup new UPB links (scenes) that control all the devices you want to control at a particular time.

To setup a **Button Trigger**, under Receive Command, make sure the Command Type dropdown is set to Button. Then, provide a short descriptive name (i.e., Front Lights On), then select the Page # and button # where you want the Button to show up on the Control Panel. Then, enter in the text that you want to show up on the actual Button. This text can match the Trigger Name or be different.   You can only have one trigger per button. NOTE: Buttons show up on the Control Panel and the app with buttons 1 – 5 on the left and 6 – 10 on the right.

Then, just like with the Scheduled Trigger, under "Send Command", make sure under Command Type, you select UPB Direct (controls a single device) or UPB Link (sends a Link or Scene command), and the port (by default, COM1 – whichever port you have the SPIM connected to). Then, select the NID of your UPB system, the Device ID or Scene ID you want to control, and the command (normally Activate or Deactivate). If you have not exported your Upstart file into the RUC, make sure the dropdown next to DID or LID under Send Command is set to Other or Other Device. Then, click on Add Trigger.

Button triggers show up on the Control Panel page of the RUC2 user interface.

To setup a **Command Trigger**, select Command in the Type dropdown, enter in a name for the trigger, then enter in the actual command you want to trigger on. You can capture this command using the Receive Log (don't include the PU that shows up at the front of the command). Then, setup the Send command as for the other triggers.

At the bottom of the Triggers page, you can view your added triggers by clicking on the dropdown next to the type of trigger you want to view – Scheduled, Button, or Command.

4   App Setup

You first need to setup Button triggers as desired. Whatever buttons are setup will be the buttons seen on the mobile app. Refer to the Triggers section for information on how to do this.

You can download the free apps for the RUC unit from the iTunes or Google Play store (search for Universal Home Automation) to your mobile device.

Android https://play.google.com/store/apps/details?id=com.webmtn.android.app
iOS   https://apps.apple.com/us/app/universal-home-automation/id639479362?ls=1

To setup the app, access the settings menu of the app – on Android, click on the three vertical dots, normally at the top right of the app screen. On iOS, click on "Settings".

On the setup page for the app, enter in the information as follows:

Remote Host / IP:
www.wmtremote.com:xxxxx where xxxxx is the remote port shown on the Networking Config page

Local Host / IP:
Enter in the IP address that you noted earlier from the Network Config page.

Local Network Name:
Assuming you're connected to the local wireless network, click on the Current button and this field will be populated for you. Otherwise, type in the name of your local WiFi.

Enter in the admin user and password, or the wmtruc user and password.

Select your desired color theme.

Then click Accept.
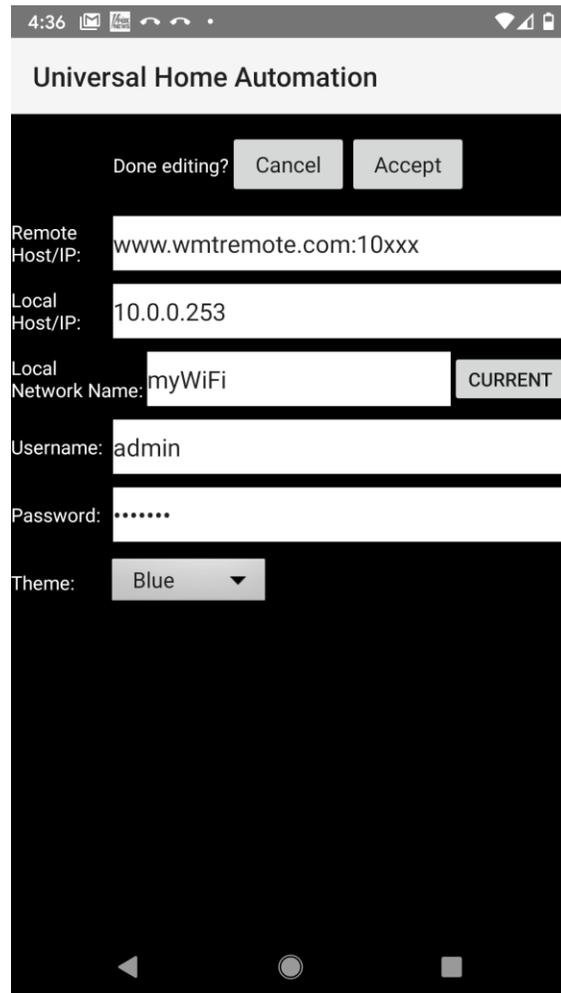
Remote Upstart

When we say Remote Upstart, we are referring to using the RUC2 as an Ethernet PIM for Upstart. In Upstart, go to Network, Configure. You'll see the UPB Interface Setup window popup. On the Interface Type dropdown, select "WMT RUC1 and RUC2". Now, the rest of the setup is based upon your situation – whether you are connecting from the local network, or remotely outside the local network.

Local connection.
You will need to know the IP address assigned to the RUC2 in our local network. This is found on the Networking Config screen of the RUC. It will be something like 192.168.1.12 or 10.0.0.17. Configure this screen as follows:

TCP Port   9761

Select "By IP Address"

Enter the IP address (ie, 10.0.0.17) in the field next to By IP Address.

Then click on Connect.

You should see blue or green arrows next to each line in the Connect Log at the bottom of this window and it will tell you that the selected powerline interface is now operational.

Remote Connection

The remote access port assigned to your unit and shown on the label ends in a "0", for example, 10130. This is the remote webserver port. When you use this in a browser, you get to the webserver on the RUC2 unit and you can view the configuration pages. To do a remote Upstart session outside the local network, you will use the remote access port +1 if you have your SPIM connected to COM1 (ie, 10131) and the remote access port +2 if you have your SPIM connected to COM2 (ie, 10132). Keep this in mind.

However, before you configure Upstart for these new settings you must first enable Remote COM ports within the RUC2 user interface. Get into the user interface by entering the local IP address of the RUC2 or www.wmtremote.com:xxxxx. Login with the Admin user and password. Go to the Admin tab on the left menu.

Now, go down to the Remote Access section (right below the registration part of the screen). By default and as shipped, this selection is set to "Turn on remote web browser access and leave comm ports off". Use the dropdown and select "Turn on remote web browser access and all comm ports with no timeout" (You can also elect to use this option with a 2 hour timeout so in case you forget to turn it back off when you're through with Upstart, it will turn itself off after 2 hours).   Then, click on the button "Change the remote access".

The unit will enable the remote comm ports. Allow a minute or two for this change to take effect. The reason we follow this procedure is that there is no option in Upstart to password protect an Upstart session. If this were activated all the time, someone outside the network could potentially access a network through the unprotected application.

Now, go back into Upstart. Assuming you have your SPIM connected to COM1, do the configuration as follows:

Interface Type: WMT RUC1 and RUC2

TCP port   xxxx1 (your remote access port +1, ie, 10131).

Select "By Name"

To the right of "By Name", enter in *www.wmtremote.com*

Then, click on Connect.

You should see blue arrows next to each line in the Connect Log at the bottom of this window and it will tell you that the selected powerline interface is now operational.

Now, use Upstart as desired. If you want to export your Upstart UPE file, see the next section.

5   Exporting from Upstart to the RUC2

The RUC-02 adds a new capability as compared to the first generation RUC-01. With the RUC-02, you can export your Upstart settings directly to the RUC-02 which will populate all the dropdowns in the Triggers section with the devices and scenes from your Upstart configuration. In addition, this information also allows the RUC-02 to be used with Amazon Alexa.

First, setup your UPB network as normal and as desired. A couple of hints about this. One quick comment – make sure you are using Upstart Version 8.2 Build 110 or higher.

First, the Alexa capability will use the room names and devices names you setup in Upstart. You can't change those within the Alexa app or within the RUC2. You can only change those within Upstart. For example, if you provide a room name for a device such as "Master Bedroom" and a device name for a device such as "Lamp", then the command Alexa will recognize will be "Turn on Master Bedroom Lamp" Or "Turn off Master Bedroom Lamp". You want to think your naming conventions through before finalizing the network design. You don't want a long string for the room and device names, plus you want something easily remembered. For example, you might not want to use a room of Bedroom 1 and device Right Lamp, or "Turn on Bedroom 1 Right Lamp". Instead, use Todds for the room name and Lamp for the device name, or "Turn on Todds Lamp".

One word of caution – **DO NOT** use quote marks (") for any names in Upstart. The quote marks will break the export to the RUC unit. Actually, don't use quote marks, apostrophes, or ampersands (actually, don't use any punctuation symbols) for any naming within the RUC either (Buttons, etc).

Once you have the UPB network designed and programmed as you want it, then go to the circle with "UPB" inside it in the far upper left corner of the Upstart main screen, and click on SAVE AS, if this file has never been saved before, or click on SAVE if you are editing an existing file. Then, once the file is saved, click on the circle again, and select Export, Export to WMT RUC. Assuming you're on the local LAN, and your RUC is connected and accessible, in the top box, "Export to Local RUC", enter the IP address and password for the **wmtruc user** on your RUC unit, then click Begin Export. After some time, it will show that this activity has completed. **Note: For large networks, this can take multiple minutes.**

Occasionally, for larger networks, Upstart might display an error message that the application in not responding. Ignore this and just wait – it should eventually complete.

If for some reason, the Export doesn't work, there is an alternative method. Once you have your UPB network designed as you want it, make sure you Save the UPB file. Then, within Upstart, click on the circle at the top left, then select Export, then Export to File (UPE). Save the UPE file to your computer somewhere. Now, go into the RUC's user interface, select the menu item Export Upload. Click on Choose File, then browse to the location where you stored the UPE file on your computer, click on it, then click Open at the bottom right. You'll see a spinner on the Export Upload page that shows its working on the Export. Once it finishes, you'll get a popup window saying "Done". **Again, for large networks, this can take multiple minutes.**

Now, to verify that the export worked, open a browser on any PC or mobile device on your network, and navigate to the home page of the RUC (just type in the IP address of the RUC on your local network, ie, 10.0.0.12 or 192.168.1.12). Enter in the user (either admin or wmtruc) and the appropriate password. Then, click on the Triggers menu item on the left hand side of the page.

Note: For large networks, it might take a minute or so to refresh the Triggers page to show the devices in the dropdown.

In the Send Command box at the bottom, next to DID, use the dropdown where it says "Other Device" and verify that you can see all of your devices as identified in Upstart. If so, the Export was successful.

6   Using the RUC-02 with Amazon Alexa (Echo)

The RUC-02 can also be used with Amazon Echo devices and with the Alexa service to allow voice control of devices and scenes within your local UPB network. For more details, please see the separate document *"Using the Web Mountain RUC-02 with Amazon Echo (Alexa)"*.

However, some additional information. If you click on the left hand menu item Export / Voice, you will see two options – Voice Commands and Edit Voice Commands. Voice commands will generate a listing of the actual commands that can be issued to Alexa while the Edit Voice Commands section will allow you to disable commands that you might not ever want to use.

Remember, the Alexa commands mirror the devices and scenes you've setup in Upstart.

7   Software Update

From time to time, Web Mountain will provide software updates to add new features and capabilities and correct issues. At the current time, the software update process is a manual process. To do a software update, go to the Admin page, then scroll down to the bottom and use the Choose File button to select the Update file. This file will be provided by WMT. You will download it or receive it in an email. Download it to a location on your computer, then use this Choose file button to select the file. Then, click on **Update the RUC now.**

Allow a couple of minutes for the unit to do the update, and reboot. Then, you should see the updated version number on the home page.

8   Other Miscellaneous Information of Importance

Resets

Press SW103 as follows:

- More than 3 seconds, but less than 6 seconds. LED will flash 3 times at 3 seconds – Reboot unit

- More than 6 seconds, but less than 10 seconds. LED will flash 6 times at 6 seconds – reset to DHCP.
- More than 10 seconds, but less than 20 seconds. LED will flash 10 times at 10 seconds. Complete Reset of unit.
- More than 20 seconds.   LED will flash 5 times at 20 seconds. Unit will send email to WMT with IP address, passwords, etc.

RUC scheduling:

The current date and time are shown on the home page, and are dependent upon the settings provided in the Device Configuration menu item. The user cannot set the time on the RUC. Time is generated by accessing an online NIST server. If your time is not being displayed correctly on the Home page, make sure the RUC-02 can access the Internet. Daily calculated sunset / sunrise times are displayed on the home page as well.

Other Information:

- Do not setup two schedule triggers to fire at the same time. This can lead to flaky operation where one or the other trigger might not fire on any given day. Two workarounds – first, offset the two triggers by one minute.   As an example, setup one trigger to fire at Sunset, and the second to fire at Sunset +1. Second, if these are UPB triggers, using Upstart, add both devices to a new Scene, and then fire a scene trigger, rather than a device trigger.   This will be a complicated fix, so the priority on correcting this is low and we have no defined schedule for correction.
- Flaky schedule trigger operation can occur if the Noise Log is enabled from the UPB transmission page and left enabled for long periods of time. Once you have your desired information from the noise log, we recommend disabling the noise log. We have incorporated a fix for this issue – in Version 8.0015.
- If an abrupt power or networking glitch occurs to the RUC-02, remote access might take as long as 10 minutes to resynch. This is not an issue so much with the RUC-02, but rather with the middleground server that provides for remote access. The remote access connection has a timeout on it and we're waiting for the timeout to complete. At the current time, we are not looking at any changes for this issue. If this situation happens and you can't connect remotely using www.wmtremote.com :1xxxx, then wait longer than 10 minutes and it should reconnect. This only impacts remote access, not local access using the device IP address.

Amazon Alexa might give you an error response, "Device x is not responding, please relink the skill". Before relinking, first try repeating the voice command. Oftentimes, the voice command will work on the second try – the Echo device either didn't capture the command properly, or the command information didn't get transmitted properly into the Amazon network. There is anecdotal data indicating that the quality of the wifi connection can make a difference as to the frequency of these error messages. In the worst case, you might have to relink the skill.

Now, just let the RUC2 sit there and work! If you have any questions, contact Web Mountain at 303-627-1856 or sales@webmtn.com.

RUC-02 Errata

Revision History Information

Date	Version	Description
2/12/2018	0.183	Terminating 0.x revisions If you have a device running these older versions, talk to us. before attempting to update your unit.
2/12/2018	8.001	Updated Linux distribution
2/12/2018	8.006	Putting revisions under revision control
4/24/2018	8.008	
5/17/2018	8.009	
7/21/2018	8.0011	
8/21/2018	8.0012	
9/6/2018	8.0013	
10/15/2018	8.0014	Changes to support going to 10 pages of buttons on the mobile app
1/24/2019	8.0015	Added Status webpage, fixed bug with checksum generation. changed Noise Log to sample at 15 seconds past the minute