



# Receiver Remote Control System

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## Requirements

Hardware	Suggestions	Software
<b>Server</b>	<ul style="list-style-type: none"> <li>• 2GHz processor</li> <li>• 2GB RAM</li> </ul>	<ul style="list-style-type: none"> <li>• Ubuntu Linux Server 18.04</li> </ul> <p>(Other Linux/Unix distributions can be used if the user knows how to adapt the instructions in this document to the particular distribution)</p> <ul style="list-style-type: none"> <li>• MQTT broker (Mosquitto)</li> </ul>
<b>Desktop</b>	<ul style="list-style-type: none"> <li>• O/S 64 bits</li> <li>• Windows, Linux or Mac</li> </ul>	<ul style="list-style-type: none"> <li>• EMpower v1.54** or above</li> </ul>
<b>Receiver</b>	<ul style="list-style-type: none"> <li>• Supported receiver, for example an <b>MTU-5C receiver</b></li> </ul>	<ul style="list-style-type: none"> <li>• Firmware v1.54** or above</li> </ul>

*\*\* This manual was written using v2.1, please refer to the manual for v1.54 if you have that version of firmware and EMpower*

# Server Setup

## 1. Install Ubuntu Server 18.04

- During the installation process, answer the questions according to the hardware and local language used
- Create a system user account to administer the server (example username: `phoenix`)
- Do not install any special packages
- After the installation is complete, reboot the system

## 2. Upgrade server software

- Login to the server using the user administrator created on point 1 "`phoenix`"
- Ensure that the server is properly connected to the internet
- Run a system software upgrade

```
$ sudo apt update; sudo apt upgrade -y
```

## 3. Configure system for receiver remote control

- Install mosquitto MQTT message broker

```
$ sudo apt install mosquitto
```

## 4. Optionally, add users and passwords for MQTT connectivity

- A good guide can be found [here](#). To disable anonymous access, make sure to follow the procedure in Step 2 of the linked guide

## 5. *Ensure that your server/firewall accepts incoming connections on port 1883 (outside the scope of this document)*

## Network setup

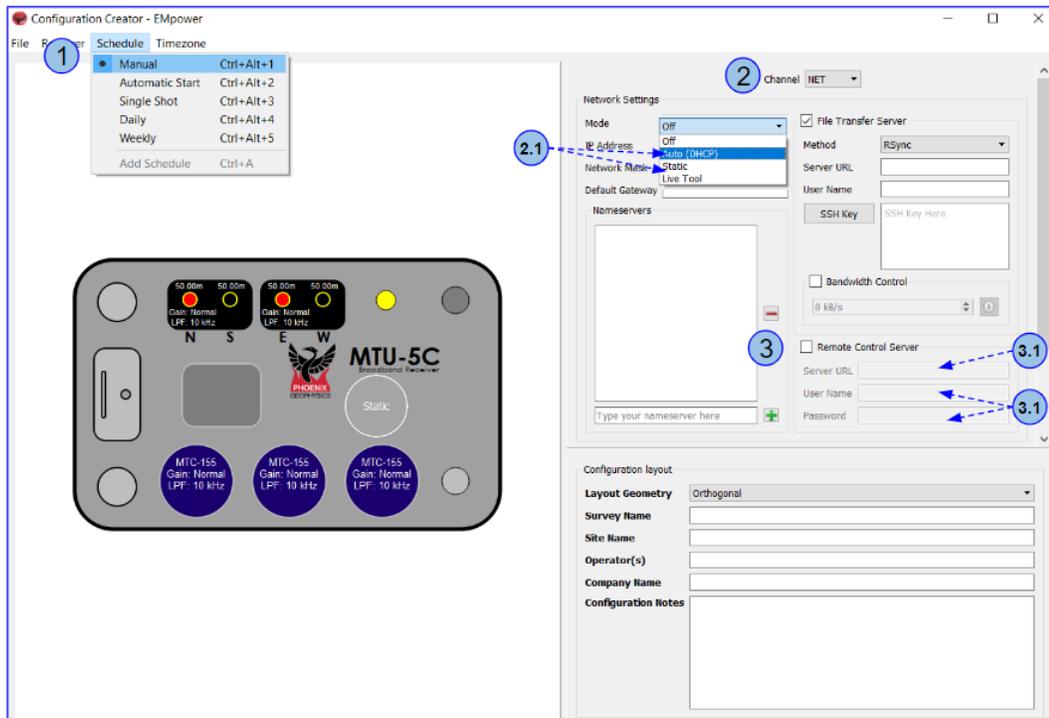
Provide a network connection between the receiver and the server. This connection can be local or it can go through the Internet. Make sure that the connection is not blocked by firewalls or other network control techniques. This is important when a third party network is used such as cell phone providers. In such cases, make sure that the provider allows connectivity to all ports in all directions.

Consult the network/system administrator for help in determining the network details and to set up the required connections.

## Configuring a receiver for remote network control

To create a configuration file that allows a receiver to receive remote commands, open EMpower on the Prepare module and select the Receiver type

1. Use an Automatic Start Schedule. This is required for the remote network control feature
2. Configure the network by selecting the "NET" Channel
  - 2.1. Choose the Network Mode, select *Auto (DHCP)* for automatic configuration or use *Static* to configure connection parameters manually, namely the receiver's IP Address, Network Mask, Default Gateway, and Nameservers
3. Configure the parameters to access the Remote Control Server
  - 3.1. Enter the Server URL, examples: `servername.com`, or `192.168.1.77`
  - 3.2. Optionally enter the Username and Password if you created user(s) for accessing the server in step 4 of the section Server Setup above

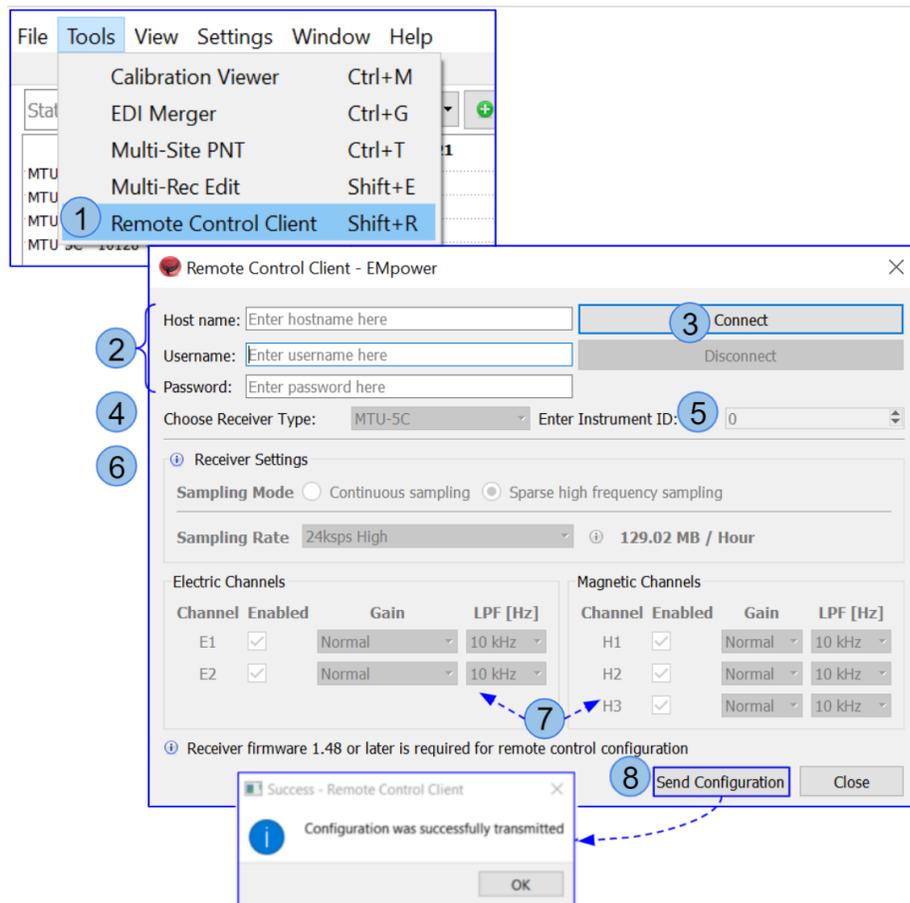


*\*Configure recording details as desired (gains, filters, etc) and Save the configuration file to SD card*

## Using Remote control

To send commands from a computer, via the server, to an MTU or RXU receiver to change its mode of operation, the receiver must have been configured as per the previous section. Then in EMpower open the Manage module and:

1. Select **Remote Control Client** from the **Tools** menu
2. Provide a valid **Host name**, **Username** and **Password**
3. Click on the **Connect** button to establish a connection
4. Choose the **Receiver Type**
5. Enter the **instrument ID** (i.e. serial number)
6. Configure receiver decimation settings
7. Configure Electric and Magnetic channels as needed
8. Click on the **Send Configuration** button
  - The new configuration on the receiver will take at least three minutes to update



## Note:

When you send a remote configuration command to a receiver, this configuration is stored in the server until the receiver connects to retrieve the configuration. The receiver then retrieves the configuration and deletes it from the server.

Be aware that if a receiver loses connectivity or is powered off, and a configuration is sent to the receiver in that period, this configuration will wait to be retrieved.

If you have a receiver that has been powered off for maintenance or it lost connectivity for a long period, we recommend that you send to the server the latest configuration you want this receiver to have. This will prevent old configurations in the server from changing the configuration of the receiver when it connects back to the network.

Once a receiver comes back online, you can ensure that the receiver has the desired configuration by either checking the configuration on the receiver screen, if you happen to be at the location of the receiver, or by reviewing the configuration reported in the time series being uploaded to the server.



Please check out the **FAQs** <https://phoenixgeophysics.freshdesk.com/>  
Or email us at: [support@phoenix-geophysics.com](mailto:support@phoenix-geophysics.com)