

## MAVOWATT 2XX 3G/4G Cellular Wireless Applications

### INTRODUCTION

MAVOWATT Energy and Power Quality Analyzers have state-of-the-art communications capabilities that allow for full remote control of the instrument and data downloading from any location with connectivity to the instrument. The MAVOWATT 2XX instruments offer standard VNC communications for remote control and a free App is also available for Apple and Android devices.

These remote capabilities greatly enhance the user's safety and productivity. MAVOWATT 2XX instruments can easily connect to any Ethernet and Wi-Fi (model dependent) network, but what can you do if there isn't a network available?

Cellular wireless data networks are a great way to overcome this situation. This application note describes how to use the MAVOWATT 2XX instrument with a typical cellular wireless router.

### 3G/4G CELLULAR MODEM APPLICATION

Cellular modems use the same data networks as Smartphones, but are dedicated to data communications. Cellular wireless modems can be purchased from a cellular carrier or 3<sup>rd</sup> party sellers, and like any smartphone, they require a contract or data plan. Note that the cellular modem and data plan/contract is the responsibility of the end user and is not included in the purchase of the MAVOWATT 2XX instrument.

The cellular modem bridges the MAVOWATT 2XX instrument to the Internet, making it available for VNC remote control, the App and data downloading from any Internet connected computer.

Most 3G and 4G cellular modems connect to the MAVOWATT 2XX by using Ethernet communications, although some newer models can connect to the instrument using a Wi-Fi connection (model dependent). Regardless, they work very much the same. An example using Ethernet is shown in Figure #1. The Ethernet link from the cellular modem to the instrument can be a direct connection (as shown), or through a local Ethernet router or switch.



**Figure 1. Typical Wireless Modem Application**

For all remote communications, including cellular wireless, the MAVOWATT 2XX instrument must be assigned an IP address that's addressable from the remote network that the computer, tablet, or Smartphone is connected to. In other words, if you want to use the Internet, both the MAVOWATT 2XX and the remote computing device being used to communicate with the instrument must be properly connected to the Internet. The same is true for any network -public or private. In this application, the cellular modem connects to the Internet and assigns an IP address to the instrument. The VNC viewer or other remote application communicates with the cellular modem which acts as a go-between and 'forwards' information between the Internet and instrument.

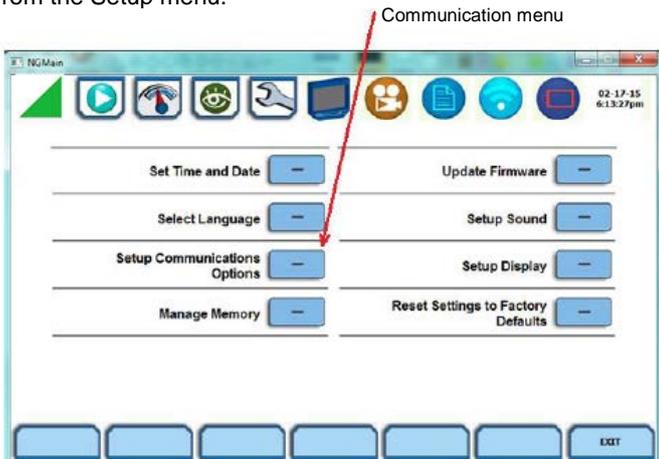
There are two types of IP addresses – Dynamic (DHCP) and Static. Dynamic IP addresses are usually automatically assigned by the networking hardware. Dynamic IP addresses can change regularly, so the IP address assigned today can be different tomorrow. Static IP addresses are pre-assigned by the network administrators and don't change. **It's for this reason that it's highly desirable to obtain a Static IP address for your cellular modem from your wireless carrier -the cellular modem is what's connected to the Internet and it's much better for it to be fixed and not changed automatically.**

### MAVOWATT 2XX INSTRUMENT SETUP

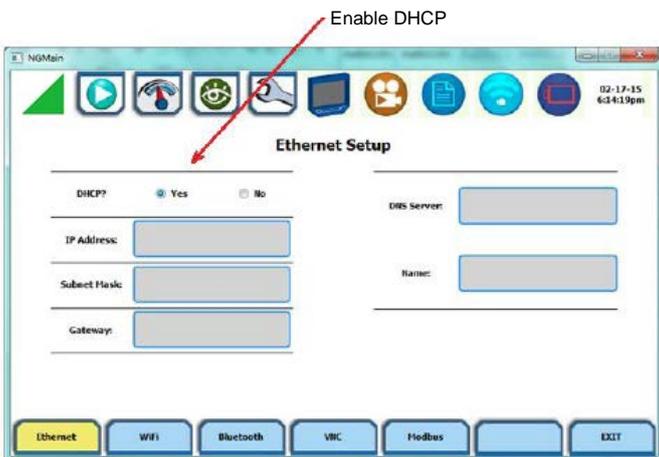
When using a cellular modem, the communications setup of the MAVOWATT 2XX instrument is very straightforward and is the same as when used on most networks.

## Application Note

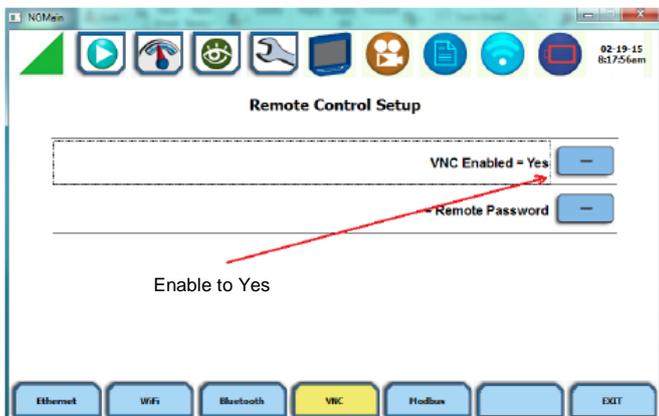
**Step #1** – Select ‘Setup Communications Options’ from the Setup menu.



**Step #2** -Select the Ethernet tab (bottom left) and select “Yes” for DHCP. Dynamic Host Configuration Protocol (**DHCP**) is a network protocol that enables a server to automatically assign an IP address to a device. In this case the cellular modem is providing the Dynamic IP address to the instrument. A static IP address can also be used, but the cellular modem must be configured for this option.



**Step #3** – Select the “VNC” tab and make sure that VNC communications are enabled and “VNC Enabled = Yes”.

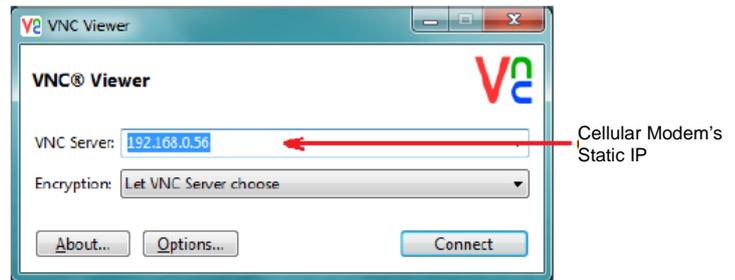


## CELLULAR MODEM SETUP

The setup of the cellular modem is manufacturer and model dependent and there are too many variations to describe here. As mentioned above, regardless of where you purchase your cellular modem, you will have to work with a cellular carrier and obtain a data plan/contract. It's also recommended that you ask that a Static IP address is assigned to your cellular modem so the IP address doesn't change.

## COMMUNICATING WITH A REMOTE MAVOWATT 2XX

A VNC viewer is needed on your computer, tablet or Smartphone to remotely control the MAVOWATT 2XX. These are readily available for download on the Internet and most will work well. 'Real VNC' is commonly used for PC applications and there are also versions available on the Apple and Android stores for tablets and Smartphones. Once you've installed the VNC viewer, you can easily communicate with the MAVOWATT 2XX by entering the IP address of the cellular modem.



If everything is working, you will then be prompted for a password, which is “Dranetz” by default.