

This file describes USB peripherals that have been successfully used by L&M Instruments with the RTG-OM devices. Because the RTG-OM devices is USB-compliant, utilizing the industry-standard FTDI USB chip set, we are yet to see any incompatibility issues with any other USB devices. The list below simply describes our experience with some interesting peripherals. L&M Instruments has no affiliation with these companies, and does not provide any warranty or guarantee for fit and function of the products below within your application.

USB Hubs

We have used a multitude of USB hubs with the RTG-OM. Most of these hubs were purchased online and are typically no-name, unbranded devices. This includes both USB-powered hubs (no additional AC adapter) and powered hubs. As expected, all devices have tested flawlessly. For USB-powered hubs, only 3 RTG-OM devices can be connected. This is because the USB power line supplies 500mA, and the 3 RTG-OM's will consume between 400 and 450mA, while the hub itself consumes some power.

The only issue with USB Hubs is upgrading RTG-OM firmware on multiple RTG-OM's. Today, RTG-OM firmware is best upgraded with each device connected directly to a PC.

USB Extension Cable

We have successfully used Item Number 23-109-135, "Long Distance USB Extension Cable – 40 ft" from www.ShowMeCables.com. We have also chained three of these together, per the manufacturer's specifications, to achieve a 120 ft extension cable. These cables are USB-powered, so the best scenario is to connect these to an AC/line-powered USB Hub to ensure the downstream RTG-OM's have sufficient power (i.e., from the Hub).



Ethernet to USB Converter

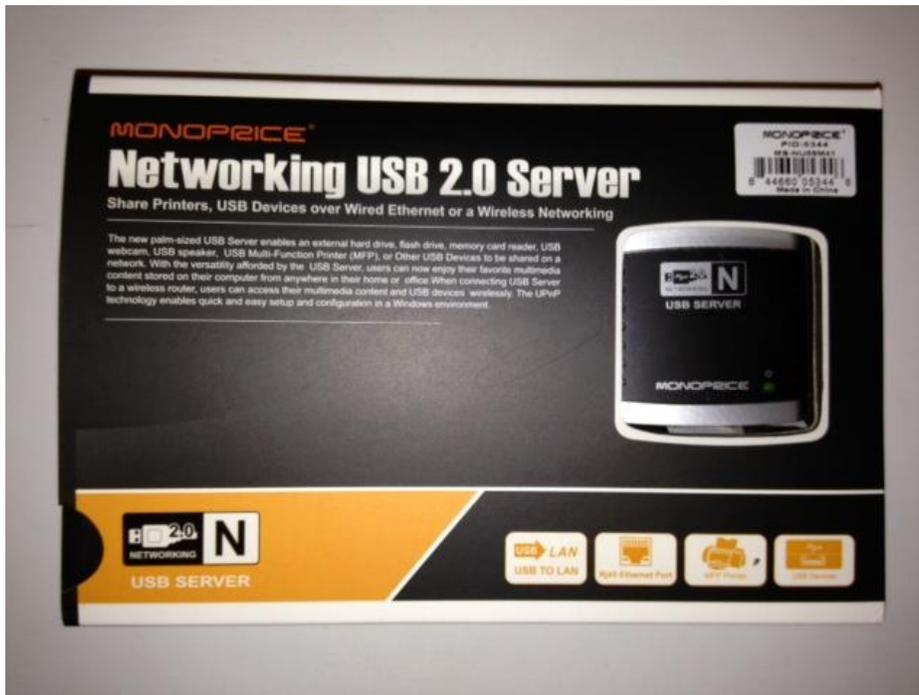
We have successfully used the Monoprice Networking USB2.0 Server (NUS) to connect the RTG-OM's to Ethernet networks as follows:

PC -> Wired Ethernet -> NUS -> RTG-OM

PC -> Wired Ethernet -> NUS -> USB Hub -> Multiple RTG-OM's

PC -> Wireless Network -> NUS -> RTG-OM

PC -> Wireless Network -> NUS -> USB Hub -> Multiple RTG-OM's



This provides tremendous flexibility to be able to locate the RTG-OM's away from the computer, and anywhere there is a wired or wireless Ethernet network.

Some usage notes for this particular device:

- It really “just works”. The installation package installs drivers and software that automatically discovers devices connected to the NUS (note that a reboot is required). The software is then point-and-click to connect the device such that it appears as a local USB device. L&M software such as CLI, Trend, and Bar can then be run and will automatically detect and use the device as if it were connected locally.
- Communication speed will depend on network speed. On a 54Mb/s wireless networks, we see RTGOM-Trend update about 6 to 7 times in 10 seconds. This compares to 15 to 20 times for a USB-attached device.
- It appears the original manufacturer of the device is www.win-star.com. This is important as this is where it appears one needs to go to download software and updates. The device comes with an installation disk, but drive-less computers will need to download the package from this site. Also note that the site uses .RAR files, which do not open natively in Windows. We use 7-zip from www.7-zip.org to open the .RAR files.

- We do see one issue on XP whereby Trend and Bar produce a BSOD upon USB device disconnect from the NUS. This was witnessed when running the 1.26 NUS driver/software version. This is likely due to a race condition in the driver stack when commands are active during disconnect. Windows 7, with the NUS 1.29 software, does not experience this issue.

USB Battery Pack

The RTG-OM provides the ability to capture and store data in its flash memory, while not connected to a computer. The basic procedure is as follows:

1. Use either the L&M or OEM supplied GUI, the RTGOM-CLI program, or a terminal server to program the device to capture data at a configurable period.
2. The device immediately starts capturing data.
3. The device can then be disconnected from the computer, and reconnected to a power source (AC or battery powered). When the device is reconnected it automatically knows to continue to capture data to flash memory.
4. When the device is reconnected to a computer, the data is downloaded into CSV (Comma Separated Value) format for use with any spreadsheet program. The data includes time-stamps and data values. Time stamps are accurate to +/- 2min per day of run time.

The Tenergy Mobile Power Model 01367 USB pack has been used by L&M to capture data in this fashion. The device can be charged by AC power (it has a convenient, retractable plug as seen below), or through a computer USB port. We charged exclusively with AC power. Results show that, after multiple charge/discharge cycles to ensure the device is working optimally, the 3500mAh pack can run the RTG-OM for approximately 10.5 hours. While we would expect on the order of 23 hours (3500mAh / 150mA RTG-OM current draw), 3500mAh for 10 hours operation is probably a safe planning number.

