



Parallel Test Solution for Remote Monitoring, Querying, and Measurement Using Eight Power Master Analyzers (MA245xxA)

Introduction

The Power Master™ MA24507A and MA24510A is an ultra-portable, USB-based, mmWave power analyzer that provides simple, numeric, and frequency selective average power RF measurements.

The Power Master MA245xxA features two frequency coverage options between 9 kHz to 70 GHz and 9 kHz to 110 GHz. The Power Master MA245xxA provides very broadband power range coverage with a noise floor as low as -90 dBm.

Background

The next generation communication will be focused on high speed data due to the extraordinary growth of data services and emerging applications. In the past few years, the data rate of the Ethernet has been dramatically increased and is going over 400 Gbit/sec.

Due to application and technology drivers like Cloud based data centers, high definition video and data transmission need high bandwidth to support multiple devices on the network. For the optoelectronics industry, it is driving the development of high-speed light sources and detectors. Also, these optoelectronic devices will be crucial in next-generation, millimeter-wave, wireless communication systems.

The progress in ultra-high speed optical modulators, transmitters, photoreceivers, and integrated optoelectronics devices have been helping networks deploy 400G backbone networks.

Customer Problem

Customers who are testing the coherent optical products need multiple power sensors for their four to eight channel RF power measurements as part of the coherent optical receiver.

Customers who are looking to scale up their production which would require around eight sensors at a single station – and they are trying to avoid having eight computers!

Solution

There are multiple ways of remote access like web services, remote access applications, or a complex VPN. In this application brief, we are providing a solution where users can connect remotely and monitor multiple Power Master analyzers that are connected to individual mini-PCs. These mini-PCs and host PC/laptop are all connected to an Ethernet switch that connects to a local corporate network.

Now we will look at how the high speed coherent modules used in the data center and backbone network will be tested using multiple Power Master analyzers in parallel by using mini-PCs connected to an Ethernet switch or Wi-Fi and can be remotely monitored using a default Windows remote desktop application or by using Python scripting from a host PC/laptop. Figure 1 below illustrates the details.

Note: If the user wants to connect from outside the local subnet, you will need to have VPN access of your organization and make some changes to firewall configurations.

Choosing the Correct Devices and Accessories

In order to remotely access the multiple Power Master setup, we will need the following:

- Power Master MA245xxA (8)
- Mini-PC (8) (Intel® Celeron® J4125 or better)
- Ethernet switch (8 port)
- Host PC/laptop
- PowerXpert software installed on all mini-PCs and host PCs
- Python tool

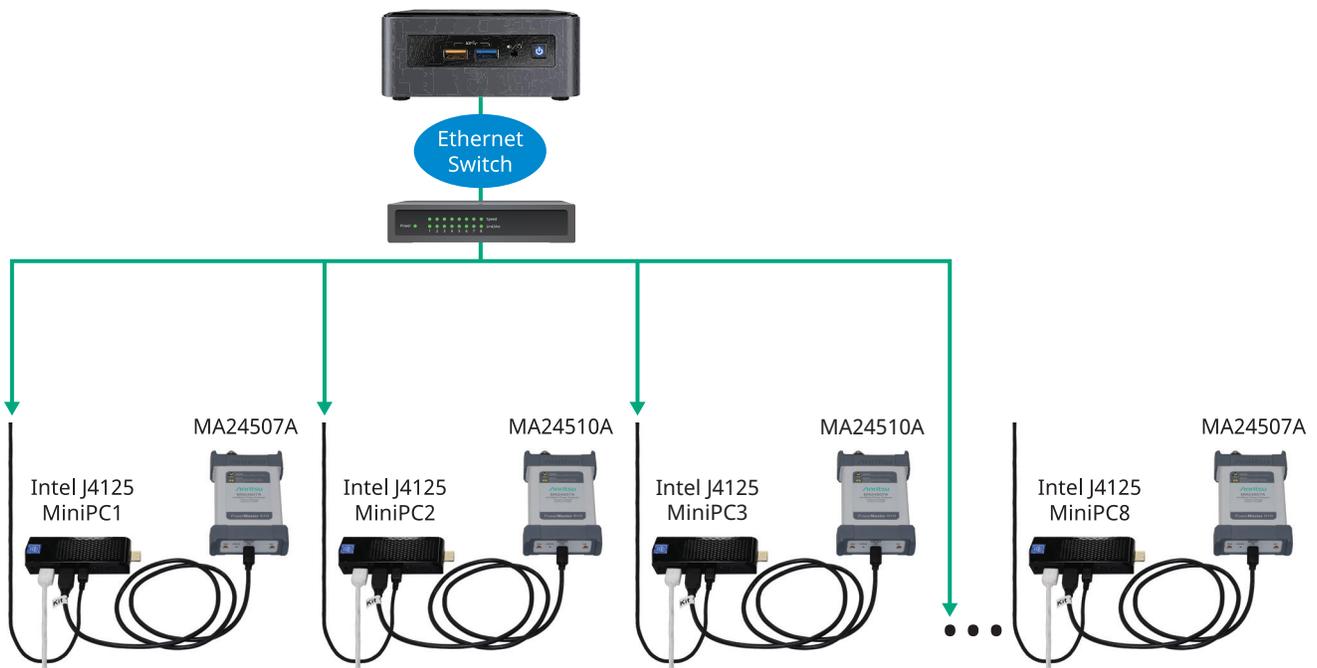


Figure 1. Power Master MA24507A and MA24510A Parallel Test Solution

Configuring Intel Mini-PC

1. Configure the Intel mini-PC by setting up the Account and Password
2. Make sure to rename these mini-PCs for easy remote access
3. Enable the default Windows Remote Desktop from remote desktop settings
4. Power and Sleep mode: Make sure the mini-PC NEVER goes to sleep and increase the performance to "Better" if you are going to use the sensors overnight
5. Install the PowerXpert software for all mini-PCs using a USB drive connected to a mini-PC

Setup

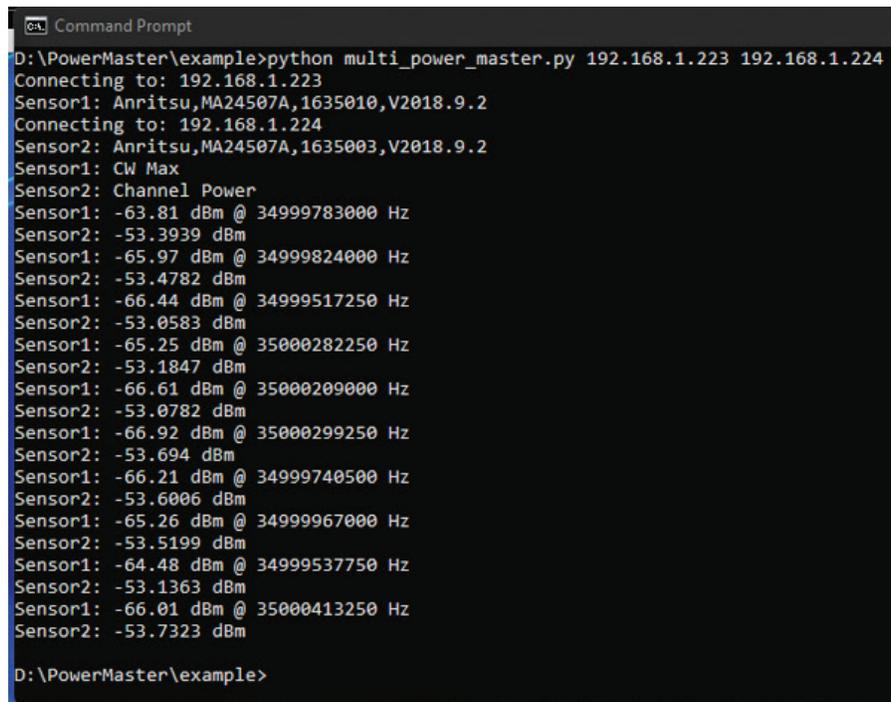
- Now connect each Power Master (MA24507A or MA24510A) to an individual mini-PC
- Connect all the mini-PCs and Host PC to an Ethernet switch which is connected to the local network
- From the host PC, now we can open the remote desktop and log into the mini-PCs and start taking the measurements

Note: We have also tried the setup over Wi-Fi, and it works well. We only need to have good bandwidth for querying and taking measurements.

Querying Devices with PYTHON and PYVISA – Power Master Remote Programming Interface

The Power Master MA245xxA utilizes Super Speed USB 3.0 technology for speed and power and communicates using SCPI commands. In order to provide the SCPI interface via a TCPIP socket, the Anritsu Device Monitor must be running on the PC where the device is connected. The Anritsu Device Monitor will recognize when the device is plugged in and launch the necessary background software automatically.

Applications may handle the network socket communication and control the Power Master MA245xxA using the SCPI command set. The IP address of the instrument is the IP address of the PC to which the Power Master MA245xxA is physically connected. If the software is running on the same PC, then the address would be “localhost” or 127.0.0.1, and the network socket port number used by the Power Master MA245xxA is 9001. If using a newer version of Windows 10, then the network socket port number used by the Power Master MA245xxA is 59001. The Power Master MA245xxA can also be controlled remotely using National Instruments’ VISA using TCPIP mode. We could query from the Host machine using Python and PYVISA as shown below.



```
Command Prompt
D:\PowerMaster\example>python multi_power_master.py 192.168.1.223 192.168.1.224
Connecting to: 192.168.1.223
Sensor1: Anritsu,MA24507A,1635010,V2018.9.2
Connecting to: 192.168.1.224
Sensor2: Anritsu,MA24507A,1635003,V2018.9.2
Sensor1: CW Max
Sensor2: Channel Power
Sensor1: -63.81 dBm @ 34999783000 Hz
Sensor2: -53.3939 dBm
Sensor1: -65.97 dBm @ 34999824000 Hz
Sensor2: -53.4782 dBm
Sensor1: -66.44 dBm @ 34999517250 Hz
Sensor2: -53.0583 dBm
Sensor1: -65.25 dBm @ 35000282250 Hz
Sensor2: -53.1847 dBm
Sensor1: -66.61 dBm @ 35000209000 Hz
Sensor2: -53.0782 dBm
Sensor1: -66.92 dBm @ 35000299250 Hz
Sensor2: -53.694 dBm
Sensor1: -66.21 dBm @ 34999740500 Hz
Sensor2: -53.6006 dBm
Sensor1: -65.26 dBm @ 34999967000 Hz
Sensor2: -53.5199 dBm
Sensor1: -64.48 dBm @ 34999537750 Hz
Sensor2: -53.1363 dBm
Sensor1: -66.01 dBm @ 35000413250 Hz
Sensor2: -53.7323 dBm
D:\PowerMaster\example>
```

Figure 3. Example of Query Results

Summary

We can monitor multiple Power Master analyzers using a single host PC/laptop. The Power Master MA245xxA can also be remotely controlled using Python scripting and remote desktop.

For more product information or to request a quote, refer to the product page linked below:
<https://www.anritsu.com/en-us/test-measurement/products/ma245xxa>

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