WattPlot™ IP

(version 1.2)

Using the WattPlot Software
to Monitor an OutBack MATE
Over a Network Using TCP/IP

A How-To Case Study

Revised March, 2014

What's a How-To Case Study?

This document describes how the folks at intellact have implemented one instance of using **WattPlot™** software to monitor the performance data from an OutBack MATE over a network (such as the internet or a local Ethernet), using TCP/IP.

The method described herein is not the only way, and may not even be the best way, but it is one way that we have confirmed works.

intellact is now working on an enhanced version of **WattPlot** that would have some of the functionality described here built-in.

We connected through a local network router, and this document fully describes that process. You may have different network requirements. Consult your network administrator for assistance in defining IP addresses, if required.

System Requirements

You will need all of the following:

- A copy of the **WattPlot Monitor Program** and an **OutBack MATE**.

- Access to an existing **TCP/IP network**.

- A serial-to-IP converter. We purchased a small black box from SENA (www.sena.com) called a **HelloDevice™ LS100**. The cost was about $100 US.

- Serial cable. We had to construct a **custom serial cable** in order to get our connection working. (See the next section on **Serial Cable Specifications**.)

- IP-to-serial conversion software. We really like **Serial/IP® COM Port Redirector** from Tactical Software, LLC (www.tacticalsoftware.com). This software came with the **HelloDevice LS100**, which we ordered from IPC Hammer (www.ipchammer.com).

- You may also need a simple program to access your computer's COM port. The instructions that came with the LS100 said that you could use the Windows built-in **HyperTerminal**, or a freeware program called **Tera Term**. We couldn't get **HyperTerminal** to connect, so we recommend going with **Tera Term Web 3.1**, which you can download from http://www.ayera.com/teraterm/.

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Serial Cable Specifications

[This was the trickiest part of our installation so take careful note. Standard cables did NOT work for us!]

The serial port on the MATE is a female 9-pin (DB09) connector underneath the menu buttons and next to the network cable port. You will therefore need a serial cable with a male DB09 end at the MATE end.
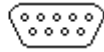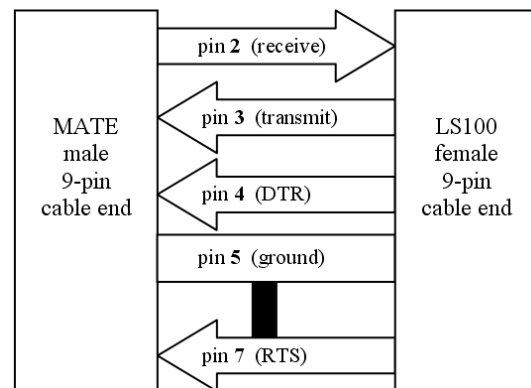
9-pin (DB09)

The serial port on the LS100 is a male 9-pin (DB09). The cable that comes with the LS100 is a Null Modem Cable (with crossed pins) and will not work with the MATE. However, you will need it to configure the LS100 from your computer.

The serial cable is a straight-through cable, as described for regular connections between the MATE and your computer, with **one important exception**. We had to jumper (connect) pins 5 and 7 together in order for the MATE to talk to the LS100 (as shown at right).

If the green Serial Rx/Tx LED comes on solid when you are attempting the conversation, then this jumpering is required.

This can be done with a bit of wire and soldering at either end of the cable, but you have to get inside the cable to pull this off. Other sites and cables may be different, but we had to do this.

MATE male 9-pin cable end — pin **2** (receive), pin **3** (transmit), pin **4** (DTR), pin **5** (ground), pin **7** (RTS) — LS100 female 9-pin cable end

Step-by-Step Guide

Step 1

Power up the LS100 and connect a valid Ethernet cable to the 10Base-T port.

Step 2

Follow the LS100 instructions for **Accessing the Console Port**. We just connected the null modem cable supplied with the unit between a COM port on our computer, and the serial port on the LS100. Note that the instructions that come with the LS100 say that you can use the Windows built-in **HyperTerminal**, or a freeware program called **Tera Term**. We couldn't get **HyperTerminal** to connect, so we recommend going with **Tera Term Web 3.1**, which you can download from http://www.ayera.com/teraterm/.

Configure the serial setup for the terminal software on your computer in order to talk to the LS100 (9600 baud, 8 data bits, no parity, 1 stop bit).

Step 3

When you are in logged in to Console mode, you will need to setup the LS100.

Working with a local router that acts as a DHCP server, we were able to use the default (DHCP mode) IP settings on the LS100. If you need to specify Static IP addresses, etc., consult the LS100 instructions for this, and your local network administrator.

You need to know the IP address of the LS100. Working in the default DHCP mode, you can get the IP address by entering this command:

```
> get status
Serial_no.: LS100-05071nnnn
MAC_address: 00-01-95-05-xx-xx
F/W_REV.: V1.4.1
Current_IP: 192.168.123.104
```

Carefully note the IP address. (192.168.123.104 in the above example.)

You then setup the serial port for talking to the MATE with the following command:

```
> set serial 19200 8 n 1 h s n 50
OK
```

You should then save the settings and reboot the LS100 as follows:

```
> save
OK
> reboot
```

Step 4

Create a new 'virtual' serial COM port on your computer, using IP-to-serial conversion software. This creates a new COM port on your computer which actually goes to an IP address instead of a physical serial port. For example, if your computer is already equipped with two serial ports (COM1 and COM2), then you can create a COM3 that goes to an IP address instead.

NOTE that WattPlot can only recognize ports between COM**1** and COM**16** inclusive!

We used the **Serial/IP® COM Port Redirector** software that came with the LS100. Configure the port's IP address to be the IP address that you noted earlier in step 3.

The IP Port number for the LS100 will be **6001**.

Step 5

Connect the LS100 to the MATE, using the serial cable described earlier. Then run WattPlot, and in the System Components screen, accessed from the Options menu, select your new virtual COM port, defined in Step 4, as the Serial Port for cable from MATE. That's it!

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Test Software

WattPlot has a Tester application which may be useful in checking out the connection between the MATE and a COM port. The application may be downloaded from http://WattPlot.com/WP_Tester.exe.

Disclaimer

Due to the complex nature of networks, and their unique characteristics, we are unable to guarantee the operation or suitability of WattPlot running in the manner described by this document. Nor are we able to provide extensive support to users who attempt this set-up, as we are still in the early stages of this work ourselves.

That being said, we do wish to hear about your experiences with monitoring MATEs over TCP/IP, and will attempt to provide a reasonable amount of assistance in this regard.

If there is anything in this document that you find unclear, missing, or simply wrong, *please* let us know so that we can set the matter straight for you and future users.

If you have an idea about how we can improve our applications or you have a specific need, we would love to try and implement your idea. Send us an email!

Good Luck, and Happy Power Production!

intel*lact*

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