WattPlot™

NetMATE

version 5.1.0

TCP/IP Server and Email Notifications
for Data Streams from
Renewable Energy Devices from
OutBack Power Systems

USER'S GUIDE

updated April, 2016

built by intal*lact*

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Overview

The options for monitoring your OutBack renewable energy system can be restrictive: An OutBack MATE cannot log your system data. A MATE or AXS Port cannot proactively contact you to let you know of critical system incidents. Only one computer can connect to any OutBack monitoring device.

WattPlot™ NetMATE provides a simple, sophisticated, and inexpensive solution to these shortcomings.

Main Features

- ✓ Can connect to your Outback MATE, MATE3, or AXS Port directly, by network, or over the internet.
- ✓ Provides email or text message notifications of a variety of system events, including warnings and errors, configurable by the user.
- ✓ Makes any OutBack monitoring device data accessible via the WattPlot TCP Server, allowing any other computers running WattPlot software to piggy-back onto the data stream.
- ✓ Logs incoming system data, either as raw text (.OBM extension) or as MATE3 SD Card format files (.CSV extension).

The **Getting Started** section that follows provides a step-by-step guide to getting your software installed and configured right away.

The **Using the WattPlot NetMATE Program** section provides more detailed information on each feature.

What's New in Version 5.1?

WattPlot NetMATE 5.1 catches the application up with capabilities that have been added to the other WattPlot tools. The major improvements over NetMATE 5.0 are listed below:

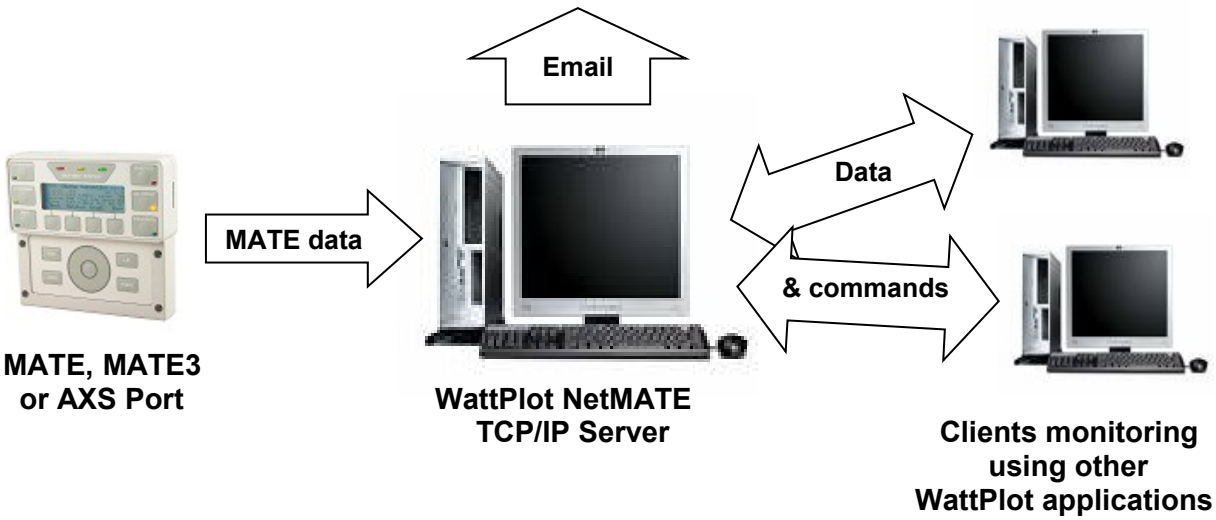
- WattPlot NetMATE can now monitor and pass on a data stream from an OutBack AXS Port device, using its serial Modbus connectivity. (*see page 11*)
- The MATE Data Source dialog box has been redesigned to offer simpler connection options and a more informative traffic screen. (*see page 17*)
- Raw MATE data capture can now be stored in compressed MATE3 SD card CSV format. (*see page 24*)
- You can now change the folder where NetMATE logs all of its data. (*see page 30*)
- The Auto-start option will now create an entry in your Windows Startup program list. (*see page 31*)

Getting Started

WattPlot™ NetMATE is part of the **WattPlot™ 5** suite of software tools for monitoring and controlling renewable energy devices such as inverters and charge controllers from OutBack Power Systems.

The **WattPlot™** NetMATE application can…

- ✓ Connect to an OutBack MATE, MATE3, or AXS Port monitoring device, accept the renewable energy performance data, and make it available to compatible TCP clients via a built-in TCP/IP Server.
- ✓ Analyse incoming data and send email notifications of critical system events.
- ✓ Convert a MATE3 data stream to the original MATE format, allowing WattPlot Monitor versions 4.7.1 and higher to monitor MATE3 data.



This **Getting Started** section will guide you through the installation and configuration of the software. The **Using the WattPlot NetMATE Program** section that follows provides more detailed information on each feature.

If you have any questions not answered in this document, or would like to send us feedback or suggestions, you can contact us at:

intallact
techsupport@WattPlot.com
http://WattPlot.com

System Requirements

In order to monitor an OutBack system using any **WattPlot™** software, you will need at least four things:

- An OutBack MATE, MATE2, MATE3, or AXS Port monitoring device
- A cable for getting data OUT of the MATE. For a MATE or MATE2 this must be an appropriate serial cable (see **Appendix A – Serial Cable Specifications**). For a MATE3, you will need a standard CAT5 network cable (unless you have the optional USB card installed). AXS Ports connect via a network cable (serial modbus protocol).
- A computer running Microsoft Windows (XP or later), or equivalent emulation
- A way of getting data IN to the computer. This might be no more than the cable referred to above, or it *might* include some combination of the following:
  - Serial/USB conversion cable and software
  - Serial modem(s) and phone/cellular connection
  - Serial-to-IP converter (and router?)
  - Internet access

The MATE and MATE2 monitoring devices are technologically equivalent. This User's Guide will usually just refer to these device types as a MATE. The MATE3 device, on the other hand, is very different, as is the AXS Port device:

MATE

MATE2

MATE3

AXS Port

Software Download

All of our software may be downloaded from: **http://WattPlot.com/download.htm**

For WattPlot NetMATE, download and save `NetMATESetup.msi` – a Windows Installer Package which will guide you through the installation process when you get to that step in the setup process.

If you are connecting WattPlot Monitor to a MATE/MATE2 device, proceed to the next section.

If you're connecting to a MATE3 device, skip down to the **MATE3 Connection Options** section.

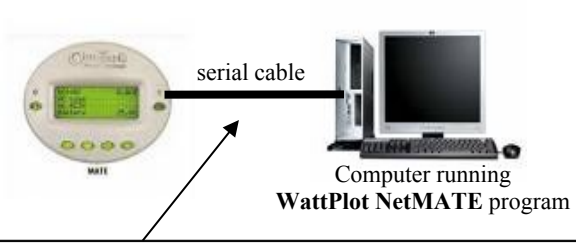
If you're connecting to an AXS Port device, skip down to the **AXS Port Connection** section.

MATE/MATE2 Connection Options

There are different ways to connect your MATE to a computer. The best option for your installation depends on individual circumstances, and may require assistance from your local network professional.

Option 1 – Local Serial Connection:

The most common scenario has the WattPlot NetMATE program running on a computer at the same location as the MATE and connected directly to it by a single serial or serial/USB cable.

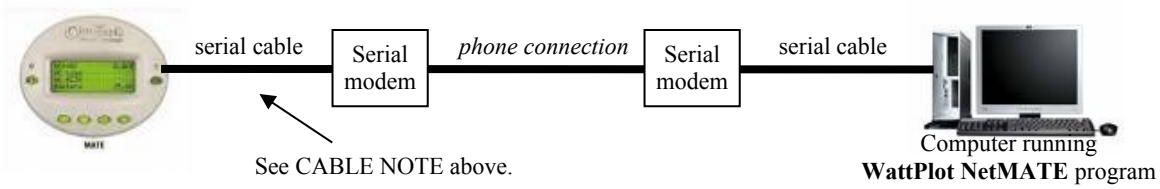


CABLE NOTE: A serial cable (**with pins 2, 3, 4, 5, and 7 straight through**) must be connected between a serial port on the back of your computer (or modem) and the DB09 serial connector on the bottom of your OutBack MATE (next to where the network cable runs from your MATE to your OutBack system). If you have a MATE2 unit, you may have to open the case to break-out the serial port access opening.

If your computer doesn't have a 9-pin serial port, there are some third-party products that convert a serial connection to a USB connection. Not all serial-to-USB conversion products work with the OutBack MATE. We post the products we know about (either that work or that don't) at **http://WattPlot.com/faq.htm#USB**.

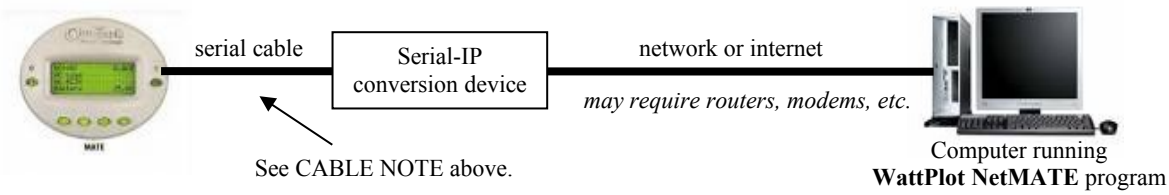
Option 2 – Remote Serial Connection:

A similar connection might also be accomplished for a MATE at a remote location, using a pair of serial modems to connect the two devices through a telephone connection:



Option 3 – TCP/IP Connection:

Another option is to use a Serial-IP conversion device to convert the MATE's serial signal to TCP/IP, which can communicate with the WattPlot NetMATE program running on a computer locally (over a Local Area Network (LAN) or remotely (over the internet):



You can read about one such device in a PDF document at **http://WattPlot.com/WattPlot_IP.pdf**. Some Serial-to-IP converters come with bundled software that allows you to convert the TCP/IP data back to a virtual serial COM port on the monitoring computer. If this is between COM1 and COM16, then WattPlot can access this data just as if it were connected directly by a serial cable. The virtual COM port is **not** required however – WattPlot can get data directly from a specified IP Address and port.

MATE/MATE2 Setup

STEP 1. Take note of your MATE serial number. You will need this for the **Activation** process. You can get the unit to display the serial number by unplugging the **network** cable (leading to your Outback system) from your MATE and then plugging it back in. It is also printed on a sticker found on the back of most MATE units. (The sticker is internal for MATE2 units.) It is also generally written on the box or in the documentation that you received with your Outback components.

STEP 2. Ensure that your MATE device is properly connected to your OutBack inverter, charge controller, or HUB, depending on your specific system configuration. (Refer to your MATE manual for details.)

STEP 3. The default setup of the OutBack MATE is **not** configured to transmit performance data. You must turn on this feature. From the main menu on the MATE select SETUP, then MATE, then PG2, then COMM, then PC, and then ON, to activate the serial communications port on the MATE.

STEP 4. If your system includes a FLEXnet DC monitor, only Shunt 1 (A) is enabled by default. If you are using Shunt 2 (B) and/or Shunt 3 (C), then they **must be enabled on the MATE** in order to receive data for them. This is done from the MATE's ADV/DC/SHUNT menu entry.

STEP 5. Connect your MATE to the monitoring computer (or modem or serial-IP conversion device) using a serial cable. (See **MATE/MATE2 Connection Options** above.)

NOTE: For MX-60 charge controller data reception, the MX itself must be displaying the **Status** screen. Going to another screen on the MX (e.g. the MISC screen) can lock data values, resulting in invalid PV Amps being reported. This is a known OutBack bug which does not apply to FLEXmax charge controllers. (The WattPlot Monitor program can sometimes detect this condition and display a warning message, but it is not detectable by WattPlot NetMATE.)

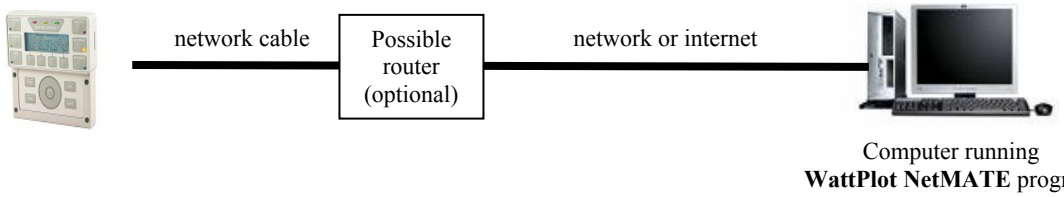
Your MATE is now ready. Proceed to STEP 6 under **NetMATE Program Installation**.

MATE3 Connection Options

There are two different ways to connect your MATE3 to a computer. The best option for your installation depends on individual circumstances, with some **key functionality differences**, as noted below.

Option 1 – UDP/IP Connection:

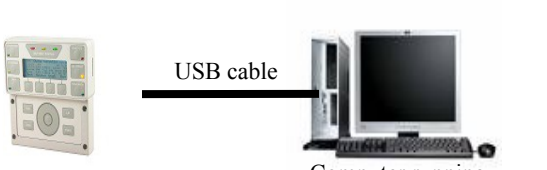
The MATE3 offers a UDP/IP data stream via a CAT5 network cable. Please refer to your MATE3 Owner's Manual for detailed instructions on completing this connection. Note that the MATE3 'pushes' data out to a single IP Address. When you are setting up the UDP Network Data Stream on the MATE3, you will be supplying **the IP Address and Listening IP Port of the monitoring computer, not the address of the MATE3.**



This connection option comes standard with the MATE3. It has one significant limitation: **You <u>cannot</u> send MATE3 commands or program MATE3 settings using the connection method.**

Option 2 – USB Connection:

An optional USB Card may be purchased and installed into the MATE3, allowing you to connect to it using a standard USB cable. Please refer to the MATE3 USB Card Manual for detailed instructions on completing this connection.



Note that a USB connection **<u>does</u>** support MATE3 commands, including the programming of some MATE3 settings. The WattPlot tools take full advantage of these capabilities. NetMATE can receive MATE3 Commands from other WattPlot programs and pass them on to the MATE3.

MATE3 Setup

STEP 1. Take note of your MATE3 serial number. You will need this for the **Activation** process. It is printed on a sticker on the back of the MATE3. It is also generally written on the box or in the documentation that you received with your Outback components.

STEP 2. Ensure that your MATE3 device is properly connected to your OutBack inverter, charge controller, or HUB, depending on your specific system configuration. (Refer to your MATE3 manual for details.)

STEP 3. The default setup of the OutBack MATE3 is <u>not</u> configured to transmit performance data. You must turn on this feature. From the MATE3's Main Menu, go to Settings, System, then Data Stream to setup the Network Data Stream. The setup will depend on whether you are using the UDP/IP (Network) connection or the USB (Serial) connection, as shown below.

Settings for UDP/IP (Network)

Data Stream	
Serial Data Stream	Disabled
Serial Baud Rate	19200
Network Data Stream	Enabled
Destination IP	192.168.000.003
Destination Port	57027

This primarily involves enabling the Network Data Stream and putting in the Destination IP – that being the IP address of the computer running WattPlot NetMATE.

<u>NOTE</u> that the MATE Data Source dialog box of the WattPlot NetMATE program supplies information like the computer's IP Address and recommended IP Port number, which you will need to supply in the MATE3 Network Data Stream setup.

Settings for USB (Serial)

Data Stream	
Serial Data Stream	Enabled
Serial Baud Rate	19200
Network Data Stream	Disabled
Destination IP	192.168.000.003
Destination Port	57027

All you have to do is enable the Serial Data Stream and ensure the USB driver that cam with the card is installed and set to the correct baud rate.

Note that it is acceptable to enable both Network and Serial Data Streams.

You should completely ignore the Ethernet Addresses screen on the MATE3. That information has no impact on NetMATE communications. Remember, NetMATE does not actively connect to the MATE3 – the MATE3 actively sends to the listening NetMATE PC.

Please refer to your MATE3 Owner's Manual for more detailed instructions on configuring and enabling the Network or Serial Data Stream.

STEP 4. If your system includes a FLEXnet DC monitor, only Shunt 1 (A) is enabled by default. If you are using Shunt 2 (B) and/or Shunt 3 (C), then they **must be enabled on the MATE3** in order to receive data for them. This is done from the Main Menu/Settings Menu/Battery Monitor/Shunt Enable screen on the MATE3.

STEP 5. Connect your MATE to the monitoring computer (or router) using a CAT5 network cable. (See **MATE3 Connection Options** above.)

NOTE: For MX-60 charge controller data reception, the MX itself must be displaying the **Status** screen. Going to another screen on the MX (e.g. the MISC screen) can lock data values, resulting in invalid PV Amps being reported. This is a known OutBack bug which does not apply to FLEXmax charge controllers. (The WattPlot Monitor program can sometimes detect this condition and display a warning message, but it is not detectable by WattPlot NetMATE.)

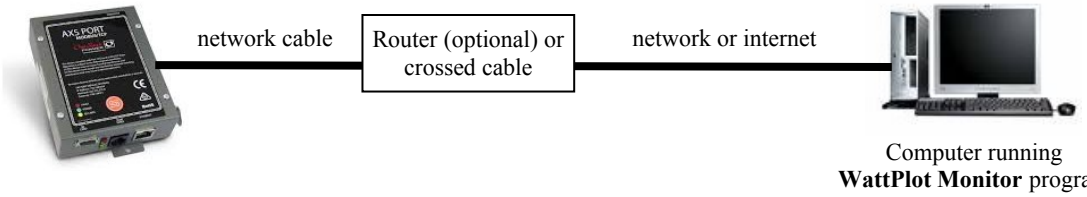
Your MATE3 is now ready. Proceed to STEP 6 under **NetMATE Program Installation**.

AXS Port Connection

The AXS Port device uses the Modbus protocol to create a link between your system and your computer. By adding it to your local network, WattPlot can query the device for system data on a regular basis.

TCP/IP Connection:

The AXS Port communicates via a CAT5 network cable. Please refer to your AXS Port Owner's Manual for detailed instructions on completing this connection. Note that unlike the MATE and MATE3 devices, the AXS Port does not specifically supply a data stream. Instead, WattPlot polls it for data every second. (The polling frequency may be user-adjustable in future releases.)



The AXS Port does support remote commands and system setting programmability, however that functionality is not implemented in WattPlot at this time.

AXS Port Setup

STEP 1. Ensure that your AXS Port device is properly connected to your OutBack inverter, charge controller, or HUB, depending on your specific system configuration. (Refer to your AXS Port manual for details.)

STEP 2. Connect your AXS Port to the network (or computer) using a CAT5 network cable.

STEP 3. The AXS Port is accessed by an IP Address. This can be dynamically set automatically by the local network (DHCP), or you can program a static IP address into the device. The DHCP setting is the default for the AXS Port device. While WattPlot supports both options, the static IP address option assumes that other software was used to program it into the AXS Port. WattPlot does not currently support this capability.

Proceed to STEP 6 under **NetMATE Program Installation** on the next page.

NetMATE Program Installation

If you've completed the steps for **MATE Setup**, **MATE3 Setup**, or **AXS Port Setup**, you can continue with program installation:

STEP 6. From **http://WattPlot.com/download.htm** , download the NetMATE setup application, called `NetMATESetup.msi`.

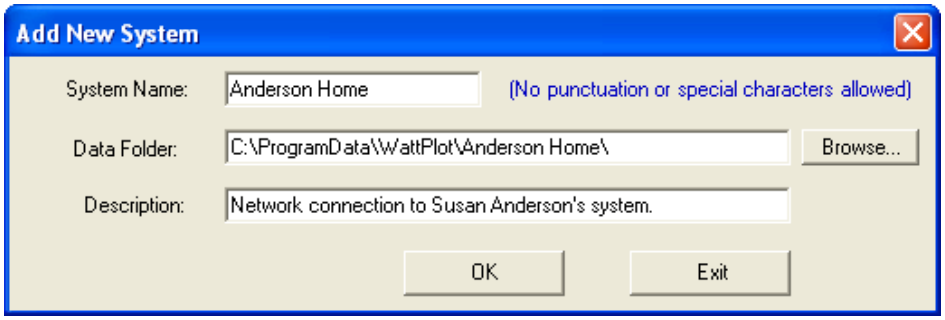
STEP 7. Save the downloaded file on your computer and run `NetMATESetup.msi` (a Windows Installer Package). The setup program will guide you through the installation process. We recommend installing the program (`NetMATE.exe`) in the default folder specified, which is `Program Files\WattPlot`. The installation process will also add a shortcut and other Resources to your Windows Start menu.

STEP 8. To run the program, click on the WattPlot NetMATE entry of the Windows Start menu (under All Programs…WattPlot). When WattPlot NetMATE is first run, you may be asked to Accept the End User License Agreement, a copy of which is included in this manual.

The remaining steps may or may not be prompted for, depending on whether this is your first WattPlot software installation, or if NetMATE can use settings that you already have on file.

STEP 9. If your computer is connected to the internet, then you will be prompted to enter your email settings. (See the **Email Settings** section.)

STEP 10. You will then be prompted to enter a brief descriptive System Name for this installation:



The System Name identifies this particular MATE connection and the OutBack system that it monitors. It will be included in any emails that WattPlot NetMATE sends out.
NOTE: System Names cannot be easily changed after they have been defined. Please contact WattPlot Support if a change is required.

The Data Folder specifies where WattPlot will store configuration and performance data. It is recommended that you accept the default. You can always change this location later.

If you are defining multiple systems or connection methods, use the Description field to provide more details.

STEP 11. After the MATE serial number has been verified, you must activate the WattPlot NetMATE program with a license code from intallact. (See **Activation** below.)

STEP 12. Configure the MATE Data Source for WattPlot NetMATE. (See **MATE Data Source Definition** below.)

STEP 13. If you are using the built-in WattPlot NetMATE TCP Server to supply the data stream to other monitoring computers or programs, you will need to configure that. (See the **WattPlot TCP/IP Server** section.)

STEP 14. Finally, you should review the program **AutoStart** and **Notification** options.

That's it! WattPlot NetMATE is now ready to monitor your OutBack system data stream, make it available to other programs or computers, and notify you of any critical system events.

More information is available in the **Using the WattPlot NetMATE Program** section.

Release Announcements and other Special Notifications

Installations of WattPlot NetMATE that are connected to the internet will check for new releases of the software and other special notifications from WattPlot. You will be advised if a new version of NetMATE has been released into production when you first run the program.

You can adjust how often NetMATE checks for such notifications, using the dropdown menu at the bottom of the notification screen, or even turn them off all together. (See **Check for New Release**.) Note that installations with AutoStart turned on will **not** receive these notifications, allowing the program to go directly to work when Windows starts.

You can also request a manual check for a new release and other special notifications, using the **Check for New Release** entry of the File menu.

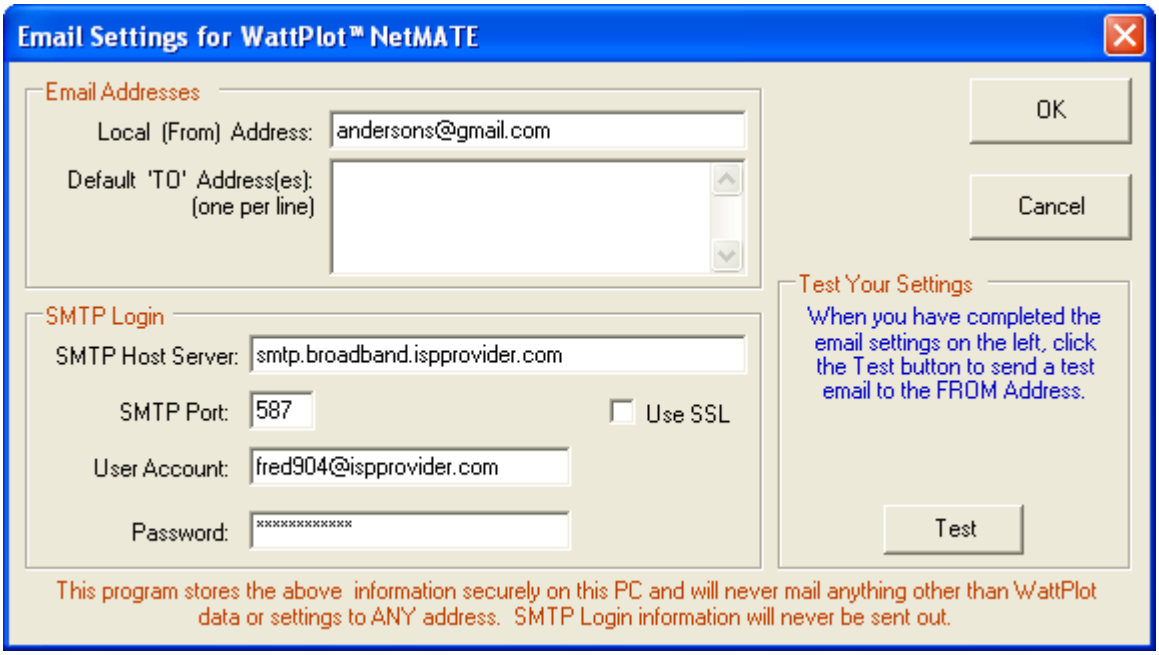
To check for a new release yourself, go to: **`http://WattPlot.com/update_nm.htm`**

Email Settings

WattPlot NetMATE has a powerful built-in email capability. Email can be used to:

- Activate your software automatically.
- Notify you of critical OutBack system events.
- Send error messages to WattPlot's technical support for fast resolution.

The Email Settings dialog box will be presented early in the installation process. You can also access it later from the Email Settings entry of the Options menu.



Local (From) Address — This is the email address that you normally send from. Emails sent by NetMATE will have this address as the 'reply-to'. It will also be the address system event notifications will be sent to if no Default 'TO' Addresses are specified.

Default 'TO' Address(es) — You can specify one or more email addresses which will receive NetMATE's system event notifications. If none are specified, the Local (From) Address will be used. All email addresses must be of the "`account@domain.ext`" format.

SMTP Login

The second section is where you specify your SMTP Server, Port number (if required), SSL Option, User Account, and Password. (The Common Providers menu has the settings for AOL, AT&T, Comcast, Gmail, Hotmail, Lycos, Outlook.com, Verizon, and Yahoo.) The server, user account, and password must be present in order to save the data on this screen. If you are not sure what these settings should be, you can often get them by looking at the settings in your regular e-mail program. If you read your mail on-line through a browser, those sites will often have instructions on how to send via SMTP as well.

Some common SMTP Host servers (such as "smtp.gmail.com") are recognized by WattPlot and will have various other settings defaulted in for you.

Your SMTP Login password and other settings are stored securely in WattPlot's local data folder in a file called `vbmail.dat`. WattPlot will only ever transmit data or settings specific to the WattPlot software. Login settings will never be transmitted.

Test

It is strongly recommended that you test your SMTP settings. You can test them by clicking the Test button. A test email message will be sent using the specified Local (From) Address as both the sender and recipient. If all of the settings are correct, you should see the test email message when you check your email at that address. Note that there may be a slight delay while the SMTP server processes the email.

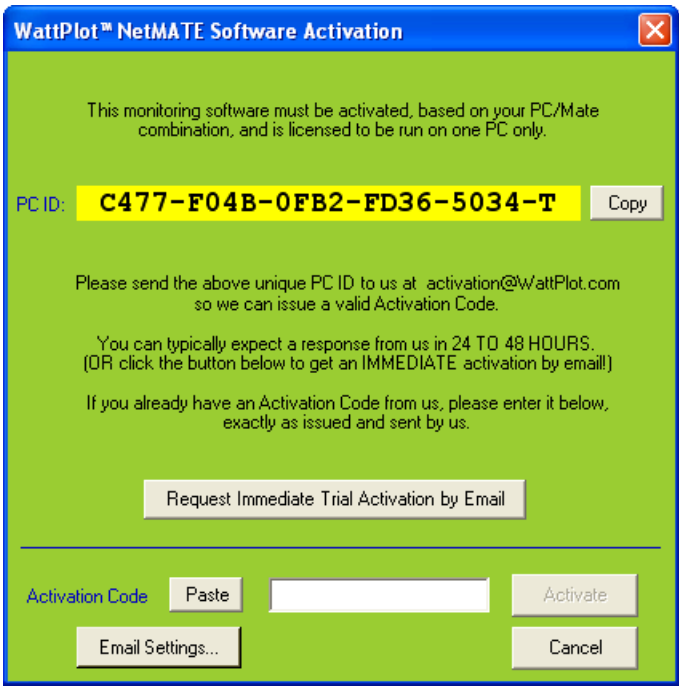
Text Messages Instead of Email

Most mobile phone providers offer an email address specific to your phone, such that an email sent to that address will be converted to a text message and passed on to your phone. By providing that email address as a Default 'TO' Address, you can have WattPlot NetMATE send critical system notifications to your phone as SMS text messages!

Even if your phone already receives email, there is often a significant time lag for notification of a new message, whereas SMS text messages are immediate.

Contact your mobile phone provider for more information.

Activation



WattPlot NetMATE will ask if you want to initiate the Activation procedure, starting with a prompt to enter your MATE serial number. (See STEP 1 of the MATE or MATE3 Setup sections.) The full serial number is required, including any leading letters. (This prompt may not apply for AXS Port devices.)

After the device serial number has been verified, the program will display a Unique PC ID for your computer and prompt for an Activation Code, as shown at right.

If you have entered **Email Settings**, and your computer can access the internet, WattPlot NetMATE can automatically register your system and issue you with a trial Activation Code, as indicated by the large button labeled Request Immediate Trial Activation by Email. If NetMATE can request an activation but cannot issue an automatic one for any reason, then this button may be labeled Request Activation Code by Email, which means that we will have to issue an Activation Code manually (usually within 24-48 hours). If email is not possible for some reason, then no such button will be visible.

If WattPlot cannot automatically email your activation request, please take note of the unique PC ID that is displayed (which will be different from the one shown above) and then click Cancel. You will have to email that PC ID to us at **`activation@WattPlot.com`** so that we can get a valid Activation Code to you. You can typically expect a response with your Activation Code in **24 to 48 hours**.

When you receive your Activation Code, run the program again and enter the code at this prompt EXACTLY as you received it. (We suggest a copy-and-paste from our email directly into the activation screen input field.) Click Activate.

Note: If you are currently working with an evaluation copy of WattPlot, and have purchased a permanent license, you can recall this window to enter your new permanent Activation Code by selecting License Activation from the File menu.

IMPORTANT NOTICE

WattPlot Activation Codes are issued ONCE. If you later want to move this license to a different PC, you can do that yourself. (See **Moving your WattPlot™ License** section.)

MATE Data Source Dialog Box

The MATE Data Source dialog box is accessed from the MATE menu. It defines where WattPlot will be getting its data from, and the communication protocol to be used. The following table gives a summary of the possible Data Sources and the corresponding Communication protocols:

Data Source	Communication Protocol	Notes
MATE / MATE2	Serial cable to COM port	Simple serial cable connection from 9-pin MATE connector to PC COM port.
	Serial/USB converter	Conversion cable connection from 9-pin MATE serial connector to PC USB port (with driver to create a virtual COM port).
	TCP/IP using Serial-to-IP converter	Serial cable connection from 9-pin MATE connector to Serial-to-IP converter. Resulting TCP/IP data stream is accessible by a specific IP address and port.
	Virtual COM port using Serial-to-IP converter	Serial cable connection from 9-pin MATE connector to Serial-to-IP converter. Resulting TCP/IP connection is converted to a virtual COM port on receiving computer.
MATE3	Network cable(UDP/IP)	This is the standard protocol for the MATE3. Data is sent through a CAT5 network cable to the specified IP Address and IP port.
	USB (optional MATE3 USB card installed)	Optional connection method for the MATE3. (Requires a USB card to be installed in the MATE3.) Data is sent directly from the MATE3 to a USB port.
AXS Port	DHCP (AXS IP address assigned by network)	WattPlot will access the AXS Port via an IP address assigned by the local network. (This is the default setting on the AXS Port.)
	Static (AXS IP address set by you)	WattPlot will access the AXS Port via an IP address specifically programmed into the device. (This assumes other software was used to program the AXS Port. WattPlot does not currently support this capability.)
TCP Server	TCP/IP to a remote WattPlot program	This application will run as a TCP Client to a WattPlot TCP Server running on another computer.
	TCP/IP to another WattPlot app. on this PC	This application will run as a TCP Client to a WattPlot TCP Server running on this computer.
Data File	Packets read from file (simulation)	Instead of getting live data from a MATE, WattPlot can work from data previously captured and stored in a text file. (See **Advanced Settings** for how to use WattPlot to create these files.)

To define a new connection, begin by selecting the Data Source from the dropdown menu at top left of the MATE Data Source dialog box. The Communication menu next to it will then contain the possible protocols for the selected data source.

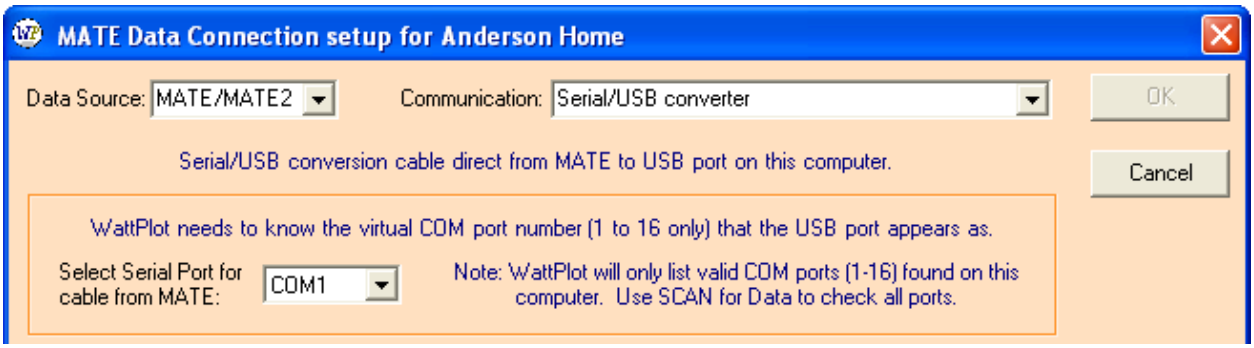
The next section of the screen will change to accept the additional settings required for the selected communication protocol, as described separately below.

(Note that the WattPlot Connection Wizard, available in past versions of WattPlot, has now been replaced by this simplified and more sophisticated MATE Data Source dialog box.)

Serial Connection (MATE/MATE2)

Serial cable to COM port
or Serial/USB converter
or Virtual COM port using Serial-to-IP converter

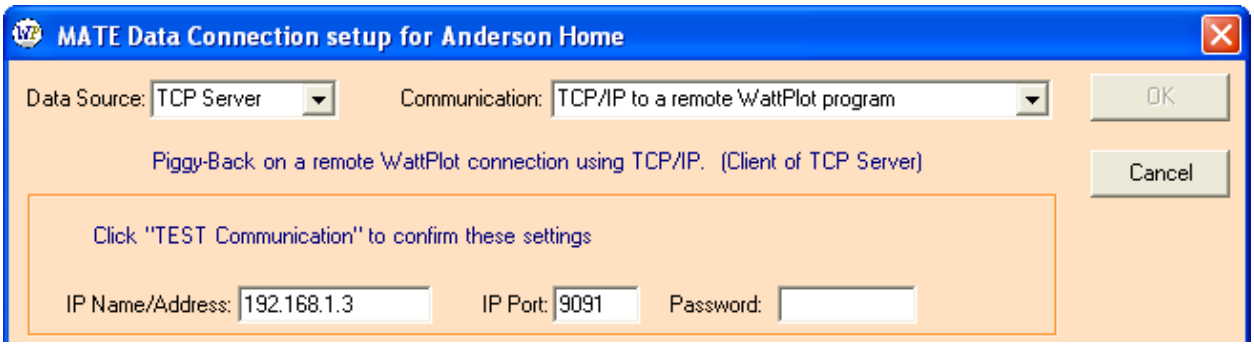
The default setup of the original OutBack MATE is **not** configured to transmit performance data. You must turn on this feature. From the main menu on the MATE select SETUP, then MATE, then PG2, then COMM, then PC, and then ON, to activate the serial communications port on the MATE.



WattPlot will ask you to specify the serial COM port that applies to the MATE connection. It could be a physical COM port, or it might be a virtual COM port created by the specific communications software that you are using. Only COM ports found by WattPlot on your computer (from COM1 to COM16) will be presented as options. See the **Data Source Dialog Box Remainder** for more information (including what to do if you are not sure of the COM Port).

TCP/IP Connection

TCP/IP using Serial-to-IP converter
or TCP/IP to a remote WattPlot program
or TCP/IP to another WattPlot app. on this PC



WattPlot will ask you to specify the IP Name/Address and IP Port, corresponding to your Serial-TCP/IP conversion device or **WattPlot TCP/IP Server**. If this is a TCP client/server connection, it will also prompt for the optional Password. See the **Data Source Dialog Box Remainder** for more information.

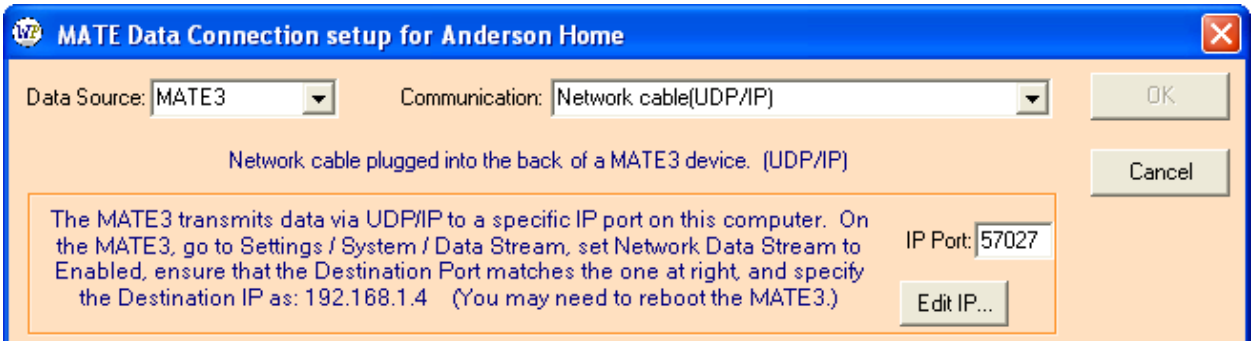
IP Name/Address	Enter the IP name or address of your Serial-TCP/IP conversion device (or separate WattPlot TCP/IP Server). Note that you cannot use TCP/IP to connect directly into your MATE3. The MATE3's TCP/IP address is for web browsers only. See the **UPD/IP Connection** instead.
IP Port	This is the IP port corresponding to your Serial-TCP/IP conversion device (or separate WattPlot TCP/IP Server – default is 9091).
Password	If you are connecting into a separate WattPlot TCP/IP Server with restricted access, you will need to enter the corresponding password here.

UDP/IP Connection (MATE3)

Network cable(UDP/IP)

The typical connection method for MATE3 devices is UDP/IP. This protocol involves the MATE3 'pushing' data out to an IP Address and port that you specify in the MATE3 settings. This is described in Step 3 of the **MATE3 Setup**. From the MATE3's Main Menu, go to Settings, System, then Data Stream to setup the Network Data Stream:

Data Stream	
Serial Data Stream	Disabled
Serial Baud Rate	19200
Network Data Stream	**Enabled**
Destination IP	**192.168.001.028**
Destination Port	**57027**



The IP Address of the PC in this example is 192.168.1.4. The only setting that WattPlot needs to know is the IP port that the MATE3 will be pushing data out to. See the **Data Source Dialog Box Remainder** for more information.

IP Port	This port should be the same port that you specified on the MATE3 as the Destination Port. (Default is 57027.)

Edit IP

The MATE3 needs a Destination IP – that being the local IP address of this computer – in this format: `###.###.###.###`. Normally WattPlot can easily determine the IP address of the computer that it's running on, and it will display it in the instructions, as shown above. However, in rare circumstances (such as when WattPlot is being run under Windows emulation software), you will have to determine the IP address yourself. (The IP address can usually be determined by going to the Windows Command Prompt and running "`ipconfig`".) You can then supply it here by clicking the Edit IP button so WattPlot has a record of it, but remember – it is the MATE3 that needs this setting, not WattPlot!

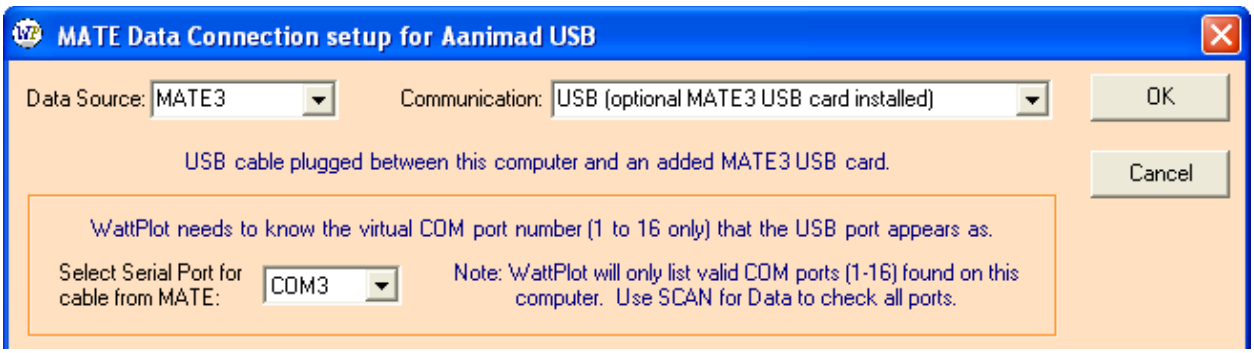
USB Connection (MATE3)

USB (optional MATE3 USB card installed)

By installing the optional MATE3 USB Card from OutBack, you can add a new level of powerful connectivity to your MATE3, including support for sending commands to control your MATE3 remotely. The MATE3 setup for USB is described in Step 3 of the **MATE3 Setup**. From the MATE3's Main Menu, go to Settings, System, then Data Stream to enable the Serial Data Stream:

Data Stream	
Serial Data Stream	**Enabled**
Serial Baud Rate	**19200**
Network Data Stream	Disabled
Destination IP	192.168.001.028
Destination Port	57027

You will also need to install the USB driver that came the USB card on to your computer. This driver will make the MATE3 USB connection available as a regular serial COM port. See your MATE3 Owner's Guide for details.

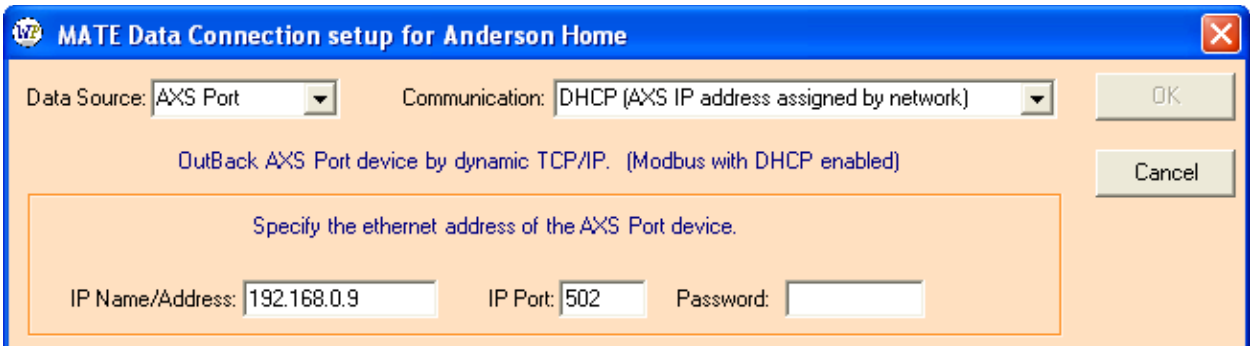


WattPlot will ask you to specify the serial COM port that was created by the USB driver. Only COM ports found by WattPlot on your computer will be presented as options. See the **Data Source Dialog Box Remainder** for more information (including what to do if you are not sure of the COM Port).

AXS Port Connection

DHCP (AXS IP address assigned by network)
Static (AXS IP address set by you)

The OutBack AXS Port device is accessed by TCP/IP, either at an IP address assigned by the network (with DHCP enabled) or at a user-specified IP address (with DHCP disabled).



WattPlot will ask you to specify the AXS Port IP Name/Address and IP Port. See the **Data Source Dialog Box Remainder** for more information (including what to do if you are not sure of the IP address).

IP Name/Address	Enter the IP name or address of your AXS Port device.
IP Port	This is the IP port that your AXS Port is using for Modbus communication. (The default is 502.)
Password	If you have programmed your AXS Port with a password, you will also need to supply it here.

Note that AXS Port data is polled by WattPlot. The default frequency for monitoring system data is once per second. This can be modified in Advanced Settings (see **Advanced Settings**).

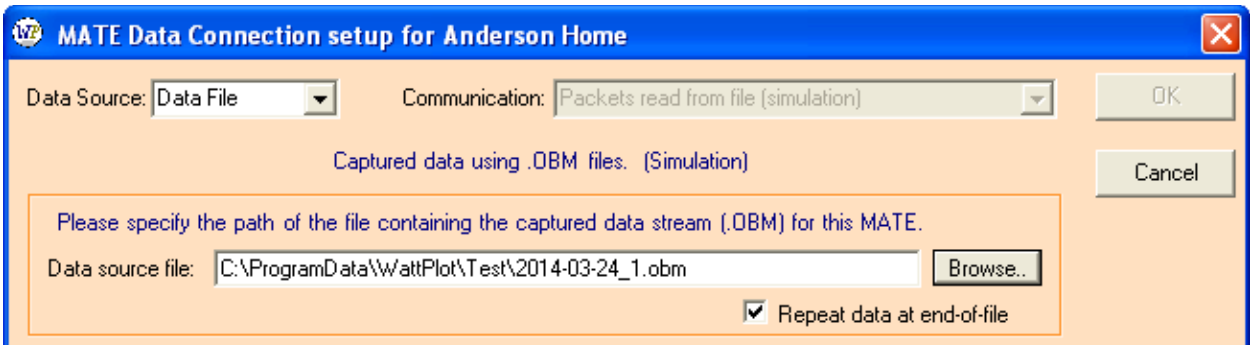
Data File Connection

Packets read from file (simulation)

It is sometimes useful to be able to demonstrate the operation of WattPlot when there is no live MATE currently connected to the system, especially when trying to explain the operation of the program or of the OutBack system. This simulation functionality is built into WattPlot.

To use existing data instead of a live system connection, select Data File as the Data Source. WattPlot will prompt you for a Data Source file (with an `.OBM` extension – see **Advanced Settings** for how to create these). The Advanced Settings will also let you select a data stream running at twice the normal speed for faster simulations.

Note that any changes made to the various WattPlot settings (such as display options, window placement, etc.) will be saved to the configuration file, just as if WattPlot was running live.



See the **Data Source Dialog Box Remainder** for more information.

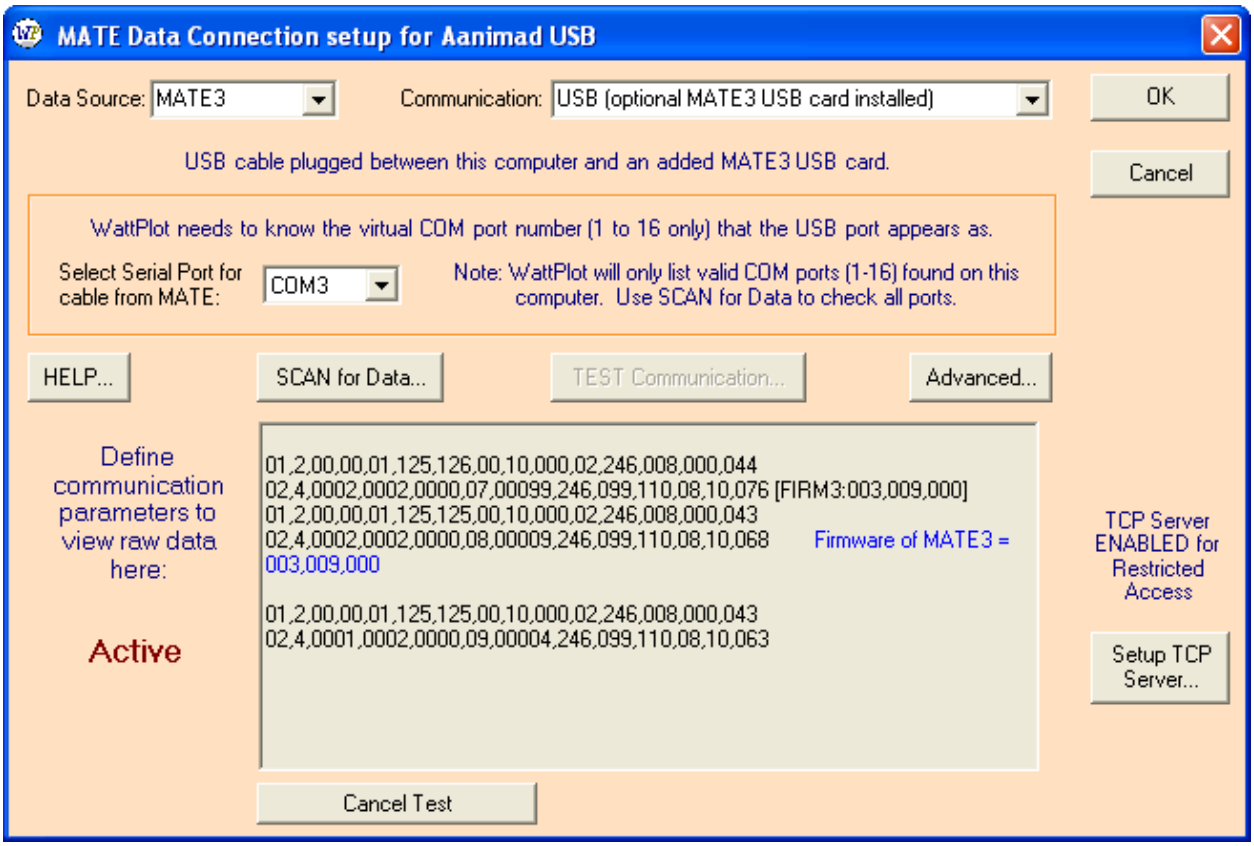
Data source file	The file containing the raw MATE data strings, created by an earlier run of the Monitor program or other WattPlot tool. These files typically have an `.OBM` extension (for OutBack MATE data). If the file exists, then the first few lines of data will be shown in the display window. **NOTE:** If the devices in the data file don't match the devices in your system, it is recommended that you create a new **System Definition** so that you can keep the configurations separate.
Browse	Allows you to find the Data source file you want to use.
Repeat data at end-of-file	If this option is checked, then when WattPlot reaches the end of the captured data, it will return to the beginning. If the option is not checked, then WattPlot will stop when it gets to the end of the data.

When the status is "Active" and you see MATE data scrolling through the display area, you have completed the definition of your connection and it is ready for WattPlot NetMATE. You will likely next want to set up the **WattPlot TCP/IP Server**.

Once all is ready, click OK to save your setup. (This dialog box can be recalled by selecting MATE Data Source from the Options menu.)

Data Source Dialog Box Remainder

WattPlot only allows you to click the OK button when the communication settings have been confirmed. In this case, you will typically see OutBack system data in the large results window, and the status in the lower left will be Active, as shown:



There are also a few other features worth noting:

HELP

Some communication protocols require special set ups on the connection device itself. Clicking the HELP button will display any special set up instructions.

SCAN for Data

If you are not certain of the connection parameters, but all hardware connections have been made, WattPlot can do some sophisticated scanning of your PC communication ports in an attempt to find the correct settings. For example, if the selected protocol uses a COM port, WattPlot can scan COM ports 1 through 16, looking for OutBack system data.

Better yet, if you are unsure of an IP address **on a local network**, WattPlot can scan a range of addresses, based on the PC's own IP address, and assuming that the default IP port applies. Scans for data always display the results for each attempt.
NOTE: Allowing for time-outs etc., this process can take a while.

TEST Communication — After you have changed some communication parameters, you can test the new settings by clicking this button. You may have to click this button in order to enable the OK button so that you can save your settings.

Advanced — Takes you to advanced settings, described in the **Advanced Settings** section.

Cancel Test/Port Scan — Click this button to cancel a communication test or port scan, and suspend any data stream.

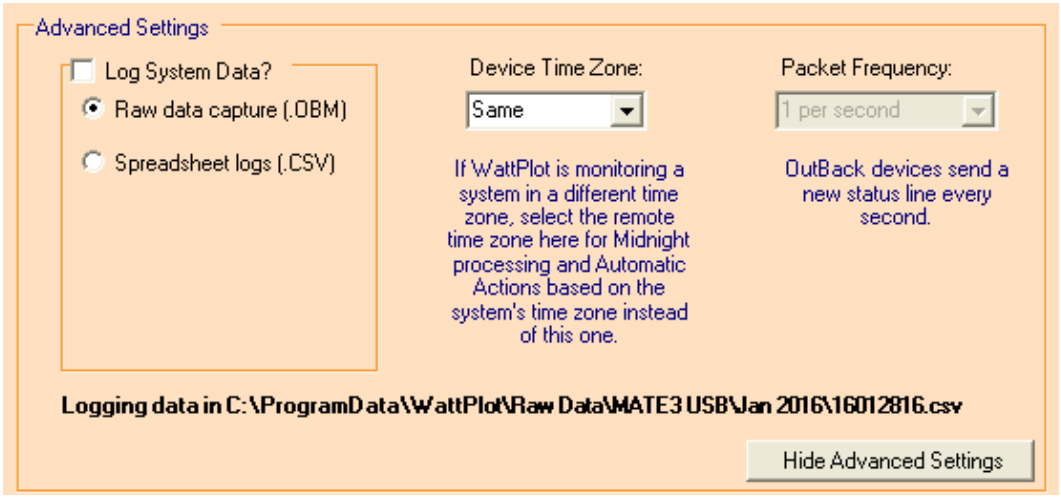
Setup TCP Server — Click this button to configure the **WattPlot TCP/IP Server**.

The large Results Window in the center of the MATE Data Source dialog box will show the progress of your setup activities. The contents are color-coded:

Black	Actual system data coming over the link
Green	Requests or actions being undertaken by WattPlot
Blue	Information derived by WattPlot
Red	Error messages

Advanced Settings

Clicking the Advanced button of the Data Source dialog box takes you to Advanced Settings:



Advanced settings presently consist of the following:

Log System Data — WattPlot can capture raw system data and write it to text files. This capability is applicable to all connection types (except Data File), and is turned on or off with the Log System Data box. There are two supported formats:

Raw data capture (OBM)	There is one file per MATE per day, found in the WattPlot Data folder and named *yyyy-mm-dd_n*.obm, where *yyyy-mm-dd* is the date and *n* is the number of the MATE (typically "1"). Files of this format can be used for simulations, using a Data Source of Data File. **NOTE:** The MATE transmits approximately **3 KB** per minute for **each device**, so the captured data file will grow by over **175 KB per device every hour**.
Spreadsheet logs (.CSV)	Creates the equivalent of the MATE3 SD Card data files (compressed format). There is one file per hour, found in the WattPlot Data folder and named *yymmddhh*.csv, where *yymmddhh* is the date and hour. (This option is not available to systems defined with more than one MATE.) **NOTE:** Each hourly data file will be about **185 KB per device every hour**.
Device Time Zone	Certain events and tally resets take place at midnight. If the system you are monitoring is in a different time zone, you can select it here in order to keep your data and automatic actions synchronized with the actual system events. Otherwise, we recommend that you just leave it as "Same".
Packet Frequency	Some communication protocols (AXS Port and Data File) support variable data frequency. This allows less frequent polling of an AXS Port, or faster simulations from data files. Most OutBack devices are fixed at status data being sent every second. **NOTE:** The TCP/IP Server function is not available when using the Fast setting for Data File simulations, since clients will not be expecting data packets at twice the frequency.
Hide Advanced Settings	Hides the Advanced Settings panel and returns you to the full Data Source dialog box.

The bottom of line of the Advanced Settings panel tells you where WattPlot is logging system data. This can be altered from the Options menu.

NOTE: WattPlot only allows you to click the OK button when the communication settings have been confirmed. In this case, you will typically see OutBack system data in the results window and a Status of Active in the bottom left of the dialog box. Even if you have not changed you communication parameters, you may in some cases have to click the Test Communication button in order to enable the OK button so that you can save other settings.

Using the WattPlot™ NetMATE Program

Program Display

Once the WattPlot NetMATE program is configured, there is very little user interaction required. There are six main display components. The two main Status boxes on the left are colour-coded:

GREEN – everything is running normally
YELLOW – something is not (yet) running
RED – there is a problem that requires user intervention.

System Status

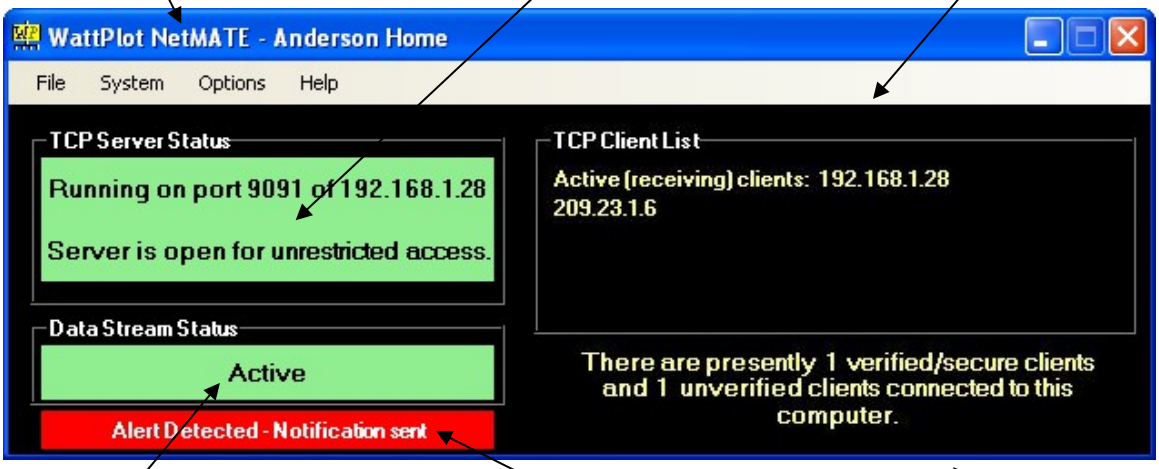
The system name and some basic system information (such as battery voltage, state-of-charge, main device operational mode – specifics depend on what devices are being monitored) will be shown in the blue title bar.

TCP Server Status

This shows the current status of NetMATE's TCP Server. It will tell you what IP Address and port TCP clients should use to piggy-back on to the data stream. It also gives an indication of whether or a password is required to connect in.

TCP Client List

WattPlot NetMATE will attempt to show as much identifying information as possible about the TCP clients currently receiving copies of the MATE data stream.



Data Stream Status

This shows the current status of the communication link to the MATE. If you minimize the program down to your Windows Task Bar, the program caption will reflect the current Data Stream Status.

Alert Detected

If the program encounters an alert that triggers an email notification, a red box will appear below the Data Stream Status, informing you that a notification has been sent. This box will disappear when the alert condition that triggered the notification is cleared.

TCP Client Summary

The text in the bottom right corner is a summary of the present TCP client connections.

Program Menus

All of WattPlot NetMATE's functional configuration is accessible by menu entries, as described below.

File – License Activation

When you first download and install WattPlot NetMATE, you will be issued with a trial activation, good for about two weeks. If you decide to order a permanent activation, WattPlot will issue you with a permanent activation key, which must be entered from this menu option. Selecting Licence Activation will present you with the **Activation dialog box**, where you may enter the activation key.

File – Move License to New PC

(Please see the section on **Moving Your WattPlot NetMATE License**.)

File – Check for New Release

If NetMATE is running on a computer with internet access, you can ask it to check for new releases of the program itself. This is similar to what it already does automatically when you first run the program. All notifications will include a few notes about the program changes, and a link to read more details and to download the latest version.

The frequency with which you will be informed of a new release is configurable using the drop-down menu at the bottom of the Special Notifications screen:

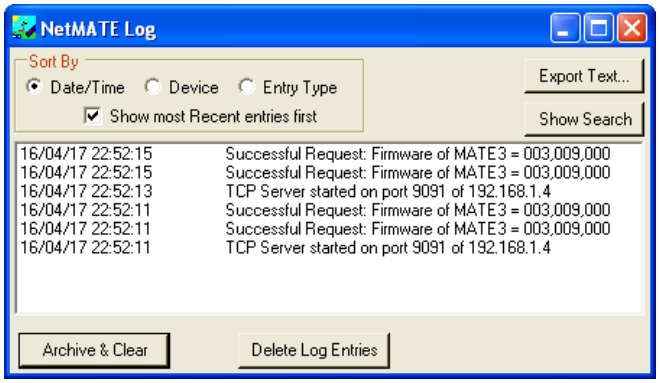
Selected Option	Effect
List new releases, checking every 10 days	Whenever a new version of WattPlot NetMATE is released into production, the program will notify you no more often than every 10 days.
List new releases, checking every 24 days	Whenever a new version of WattPlot NetMATE is released into production, the program will notify you no more often than every 24 days. *(Default)*
List new releases, checking every 90 days	Whenever a new version of WattPlot NetMATE is released into production, the program will notify you no more often than every 90 days.
Disable all release and special notifications	You will not be automatically notified of any new releases or special notifications. **If you select this option, it is recommended that you do a manual check from the Options menu every 6 months.**

Note that normally special notifications are one-time messages that only appear once (at program start up) and will not be repeated. However, if you use this menu option to check for new releases and special notifications, all current special notifications will be shown.

File – View Current Log

Opens the current log of program and system events, including warnings, errors and notifications.

See the **NetMATE Log Window** section for more information



File – Open Archived Log

Prompts you to select an archived NetMATE log and opens it in the standard WattPlot Log window, as shown at right. See the **NetMATE Log Window** section for more information.

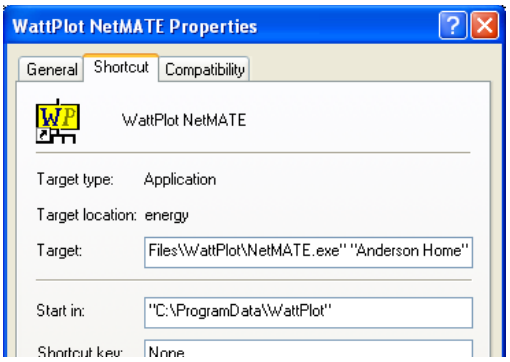
File – Exit

Shuts down WattPlot NetMATE and exits the application.

System – *System Name*

WattPlot NetMATE can be used to monitor several different MATEs. Each is defined by a separate System Name. The program can only monitor and pass on the data stream from one MATE at a time – the current one being indicated by a check mark. However, you can have more than one running instance of NetMATE in order to connect to multiple MATEs simultaneously, each with a different system selected. Note that if you are using the TCP Server functionality, you would need to select a different IP Port for each system.

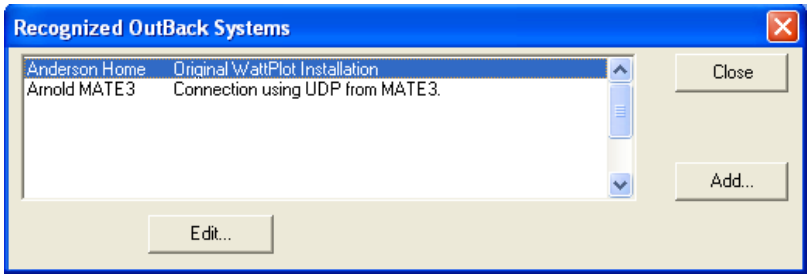
If you have multiple systems defined, WattPlot NetMATE will prompt you for which system to connect to when it is first run. You can create shortcuts specific to a pre-selected system which will bypass this prompt. To do so, create a new Windows shortcut for NetMATE, then go to the Properties window of the shortcut, and append a space and the System Name (in quotes) to the Target, as shown in the screen fragment at right. (Note that the full target is not shown – `"C:\Program Files\WattPlot\NetMATE.exe"`.)



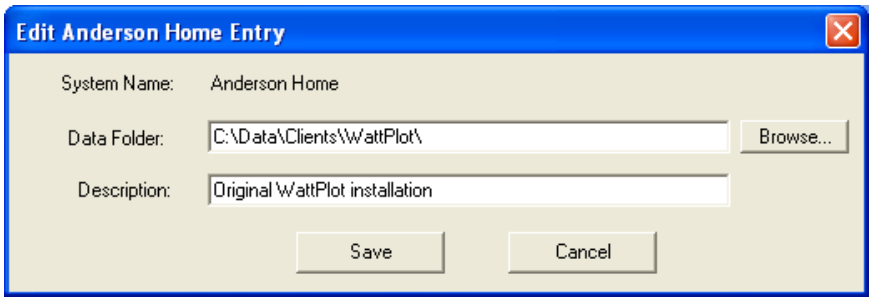
You may also wish to rename the shortcut so that you know which system it refers to.

System – Add/Edit/Remove System

When WattPlot NetMATE is first installed and run, it will prompt you for the first System Name. For most installations, this is the only System Name that will ever be needed. If you have multiple MATEs to connect to, you may wish to define more systems. Selecting this menu option will present you with a list of defined systems:



Choose the Add button to add a new system definition, or the Edit button to edit the selected system. The Add and Edit functions use the following screen:



System Name — This is a brief descriptive name which identifies a particular MATE connection and the OutBack system that it monitors. It will be included in any emails that WattPlot NetMATE sends out. Note that System Names are set in the Add screen and are not editable in the Edit screen. To change the name, add a new system under the new name and remove the old one.

Data Folder — This specifies where WattPlot will store configuration and performance data. It is recommended that you accept the default, unless you already have WattPlot data elsewhere, or you have a particular need to store data in a separate location. The folder will be created when you click the Save button, if it is not already present.

Description — Use this free text field to give a more detailed description of the system.

Once a new system is added, it will be appended to the list under the WattPlot System menu.

Options – MATE Data Source

This menu selection takes you to the **MATE Data Source dialog box**. This dialog box allows you to adjust the communication type and parameters for the MATE connection. It also gives access to the **TCP/IP Server Setup dialog box**. See the **MATE Data Source Dialog Box** section for details.

NOTE: WattPlot NetMATE tracks the 'device signature' of every system that it is connected to. If you alter the MATE Data Source and the program detects a change in the 'device signature', you will be prompted to either add a new system definition or confirm that the device signature has changed. This can happen when you are switching to a different MATE3 or when you change the devices connected to your OutBack HUB.

Options – Email Settings

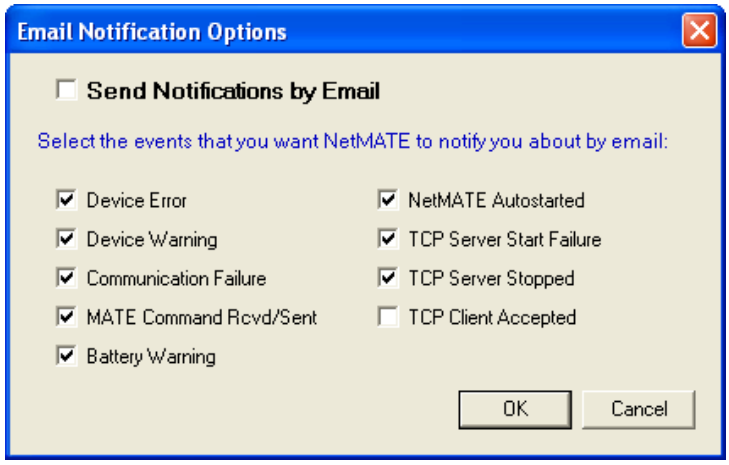
WattPlot NetMATE can use its built-in email functionality to activate your software, notify you of critical OutBack system events, and send error messages to WattPlot's technical support for fast resolution. For details on configuring this functionality, see **Email Settings**.

Options – Data Log Folder

NetMATE can log all incoming system data in a daily raw data file (with a .OBM extension) or hourly MATE3 SD card format files (with a .CSV extension). See **Advanced Settings** of the **MATE Data Source dialog box** for more information on turning this option on or off, or for changing the file format. Use this menu entry to change the default folder that the program will use to store these daily files.

Options – Notification Options

WattPlot NetMATE can notify you of various important OutBack system events. This menu entry allows you to turn various categories of notification on or off, depending on your specific preferences:



Send Notifications by Email	The top check box turns **all** notifications on or off. If this box is blank, no email notifications will be sent and the settings below have no effect.
Device Error	You're notified if an OutBack device logs an error condition. The email will identify the system, the device, and the error.
Device Warning	You're notified if an OutBack device logs an warning condition. The email will identify the system, the device, and the warning.
Communication Failure	You're notified if NetMATE detects a communication error condition.
MATE Command Rcvd/Sent	You're notified if NetMATE receives a MATE command from a TCP client and passes it on to the MATE.
Battery Warning	You're notified if NetMATE itself detects an abnormal battery voltage condition.
NetMATE Autostarted	You're notified if the NetMATE program is started from the Windows Startup menu. This may indicate a system reboot.
TCP Server Start Failure	You're notified if the NetMATE TCP Server fails to start.
TCP Server Stopped	You're notified if the NetMATE TCP Server stops unexpectedly.

TCP Client Accepted — You're notified if the NetMATE TCP Server accepts a connection from a TCP client.

Options – Windows AutoStart

Many WattPlot NetMATE installations run unattended or have NetMATE running full-time. In such cases, you may want NetMATE to be started automatically when Windows starts. To do this, simply click on the Windows Autostart entry of the Options menu to click it ON (indicated by a check mark). NetMATE will create a shortcut in your Windows Startup menu called "`WPNetMateAutoStart systemname.lnk`", where *`systemname`* is the name of the currently selected system.

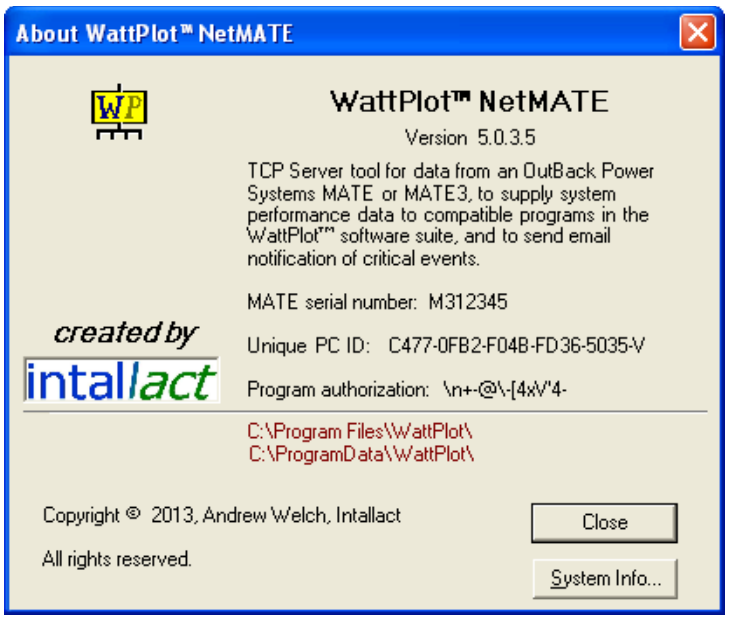
You use the same menu entry to turn AutoStart OFF and remove the shortcut. Note that there is a separate entry in the **Notification Options** dialog box for NetMATE to notify you whenever the program is auto-started from this shortcut (which may indicate a Windows reboot).

Help – NetMATE User's Guide

This menu entry will call up this User's Guide as a hyperlinked and searchable PDF file.

Help – About

WattPlot NetMATE's About screen provides useful information such as the current program version number, the unique PC ID, etc., as shown at right. The two paths in red indicate where the program EXE file is running from and what the default data folder is for this system.

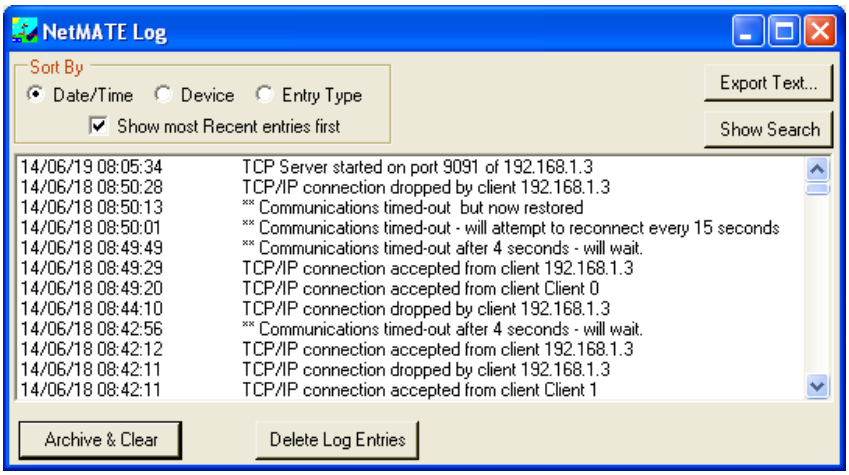


Help – WattPlot.com

This menu entry has a sub-menu with three options. Each one will take you directly to a different page of the WattPlot website: Frequently Asked Questions, Home Page, and Order Page (for purchasing licenses).

NetMATE Log Window

WattPlot™ NetMATE keeps its own log of significant events, notifications, communication errors, etc. These can be viewed by selecting View Log from the File menu, which presents the NetMATE Log Window, as shown at right:



Searching and Sorting Logs

The log window has a built-in search capability to find entries with specific text, accessible from the Show Search button. Also, the log may be viewed sorted by date, device, or entry type. In each case, it may also be viewed with the most recent entries first or last.

Archived Logs

To view archived logs, use the File…Open menu entry and select the log that you wish to view. Archived logs are stored in a `NetMATE` sub-folder of the Logs folder, using a dated file name. For example:

```
C:\ProgramData\WattPlot\Anderson Home\NetMATE\2006-03-07_NetMATE.log
```

Exporting Log Contents to a Text File

The contents of any text log may be exported to a text file by clicking the Export Text… button, and specifying a text file. The text is exported with the same sorting as is shown in the current log display.

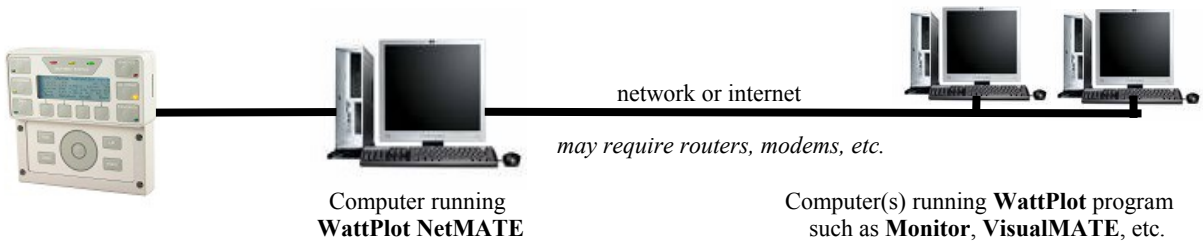
Archiving / Clearing Logs

To archive log entries into a separate log file, click the log's Archive & Clear button. The current file will be copied to an archive file, and then the currently file will be deleted and the displayed entries will be cleared.

Clicking the Delete Log Entries button will **permanently delete** the entries from the current log file and clear the displayed entries.

Getting Data from WattPlot™ NetMATE

One of the primary functions of WattPlot NetMATE is to supply a MATE or MATE3 data stream to other WattPlot programs. The following describes the steps required to set up WattPlot NetMATE's TCP/IP Server. The next section will cover the steps to perform on the TCP/IP Client computer that is to 'piggy-back' on to the Server to receive the data. Note that any number of computers can receive the same data stream concurrently. Also the same computer may be used as both Server and Client, but this may require some extra set up, as described in **Server and Client on Same Computer**.



TCP/IP Server Setup

STEP 1. From the Options menu, choose MATE Data Source to call up the **MATE Data Source Dialog box**.

STEP 2. Click on the Setup TCP Server button. The **WattPlot TCP/IP Server Dialog box** will be displayed, as described in the next section.

STEP 3. Select the level of security that you desire for access and MATE Command transmission. Specify an IP Port of your choosing, and set a Password if required by your selected security level. If you are connecting to a MATE3 in order to feed data to the older WattPlot 4 Monitor program (version between 4.7.1 and 5.0.0), then check the Original MATE data format box to convert the MATE3 data stream to a compatible format. Save your settings. You can just Cancel from the MATE Data Source dialog box.

STEP 4. That's it! WattPlot NetMATE's main screen should now reflect the fact that the TCP Server is running and waiting for connection requests.

NOTE: You may get a warning message from your resident protection software, informing you that the WattPlot NetMATE program has opened a TCP port to the outside world. For example:

As this could be a security issue if the program were doing it without your knowledge, you are being asked to confirm permission for the WattPlot TCP Server to make data available to other programs. In the example above, you will need to select Unblock for NetMATE's TCP Server to be able to accept requests from other programs for data. This warning will only be presented once.

TCP/IP Client Setup

STEP 1. Start up the WattPlot program that is to receive the data. Examples include the WattPlot Monitor program (version 4.7.1 and higher), WattPlot VisualMATE, WattPlot ShowMATE, etc.

STEP 2. If the receiving program has a System menu, you might want to add a new System definition to correspond to WattPlot NetMATE as a MATE Data Source. (See the **System Add** function.) If the receiving program is on the same computer, this is not optional. (See **Server and Client on Same Computer)**.

STEP 3. From the Options menu of the receiving program, choose MATE Data Source to call up the **MATE Data Source Dialog box**.

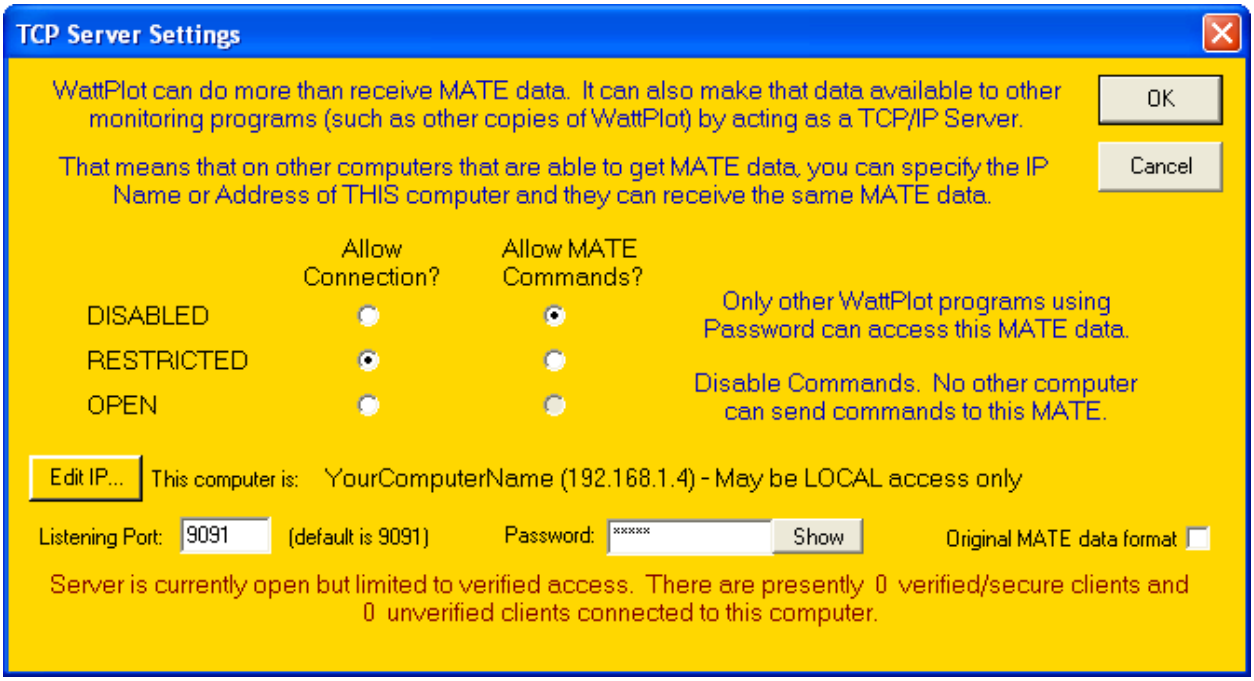
STEP 4. Select the TCP/IP connection method, and enter the IP name or address of the computer running WattPlot NetMATE with the TCP Server enabled. (This may be the same computer - see **Server and Client on Same Computer**.) You will also need to enter the IP port that you defined on the TCP Server as the Listening port, and the password if you defined one. See the **MATE Data Source dialog box** section for details.

STEP 5. If WattPlot NetMATE is already Active, you can click the Test button in the MATE Data Source dialog box on the receiving computer to confirm that you are receiving the data stream correctly. Click OK to save the new MATE Data Source settings.

STEP 6. That's it! Your receiving WattPlot program will now operate as a TCP Client, just as if it were connected directly to the MATE. Note that you can connect as many TCP Clients as you like to the main WattPlot NetMATE TCP Server.

WattPlot TCP/IP Server Dialog Box

The first step in sharing WattPlot data between computers is to setup the built-in WattPlot TCP/IP Server. This is done from the **MATE Data Source dialog box** (of the WattPlot already connected to the MATE) by clicking the WattPlot as TCP Server button, which will present the following window:



OK — Click this button to save your settings and to immediately apply them, including restarting the TCP server. For example, if you change the password or restrict access, then all current TCP clients will be disconnected and they will have to reconnect using the new password.

Allow Connection? — There are three levels of Server access, which determine which TCP/IP clients will be able to connect in to this program's data stream:

DISABLED.....No connections will be accepted.
RESTRICTED…Only WattPlot connections using the Password defined on this screen will be accepted.
OPEN.....All connections will be accepted.

Allow MATE Commands? — There are three levels of MATE command access, which determine which TCP/IP clients will be able to send commands to the MATE being monitored by this program:

DISABLED.....No MATE commands will be accepted.
RESTRICTED…Only WattPlot connections using the Password defined on this screen can send commands.
OPEN.....Any connections can send a MATE command **(NOT RECOMMENDED)**.

Edit IP	A potential TCP Client needs a Server IP – that being the local IP address of this computer – in this format: `###.###.###.###`. Normally WattPlot can easily determine the IP address of the computer that it's running on, and it will display it in the instructions, as shown above. However, in rare circumstances (such as when WattPlot is being run under Windows emulation software), you will have to determine the IP address yourself. (The IP address can usually be determined by going to the Windows Command Prompt and running "`ipconfig`".) You can then supply it here by clicking the Edit IP button so WattPlot has a record of it, but remember – it is the TCP Client that needs this setting, not the Server!
This computer is	The IP name and address of this computer will be shown. If the IP address begins with "192.168…", then this is likely a local network address that is not accessible outside the network (i.e. over the internet). Contact your network administrator and/or internet service provider to inquire about Static internet-accessible IP addresses. When you are configuring another WattPlot to connect in to this TCP Server, this is the IP address that you will specify to use for that connection.
Listening Port	This is the IP port where this TCP server will be listening for connection requests from outside TCP clients. Your computer may be using various IP ports for a variety of tasks. We recommend using the default (9091) unless you are familiar with IP networking. When you are configuring another WattPlot to connect in to this TCP Server, this is the IP port that you will specify to use for that connection.
Password	If you have specified RESTRICTED access for either the data or MATE commands, you will need to specify the password required. When you are configuring another WattPlot to connect in to this TCP Server, this is the password that you will specify to use for that connection.
Show/Hide	Click this button to temporarily unmask this password display.
Original MATE Data Format	If the Server is monitoring a MATE3 data stream, it is possible by checking this option to have it send the same data out to all TCP Clients in the original MATE data format (which is slightly different. Now that all WattPlot tools can recognize both formats, this legacy feature should no longer be required.

The WattPlot TCP Server will automatically start every time the program is run, so long as Allow Connection? is set to Restricted or Open. Exiting the program will close the TCP server.

Server and Client on Same Computer

WattPlot NetMATE can run as a TCP Server, sending data to other WattPlot applications on the same computer, however you will have to define multiple systems in order to keep all of the communication parameters separate.

If you are adding NetMATE to an existing WattPlot set up (e.g. system already defined as "Anderson Home"), then you should define a separate system for NetMATE (e.g. new system of "Anderson Home MATE3").

If you are adding an different WattPlot application to an existing NetMATE installation (e.g. system already defined as "Anderson Home"), then you should define a separate system for the new application (e.g. new system of "Anderson Home NetMATE").

The MATE Data Source for your NetMATE TCP Server will be the MATE/MATE3 itself, so the NetMATE system will be configured for whatever communication protocol is being used.

The MATE Data Source for your Client program's system will be a TCP/IP connection into the NetMATE application. This is why two system definitions are needed if both applications are running on the same computer.

When multiple systems are defined, you will be prompted to specify which system to open with for each WattPlot application. You can avoid this step by specifying the system name in the shortcut to each application. (See how to do this in the **System Name** section.)

Here is the optimum sequence of installation steps for a new installation:

PART 1

1. Download and run the installation program for WattPlot NetMATE.

2. When you are prompted to enter a system name, put in a descriptive name for your OutBack system, such as "Anderson Home". (See **NetMATE Program Installation**, STEP 10.)

3. Once your NetMATE trial is activated, define the MATE Data Source for your MATE3, using either the UDP/IP or serial/USB connection types, depending on the hardware installed in your MATE3. (See **MATE Data Source Definition.**)

4. Setup your MATE3 for data transmission. (See **MATE3 Setup**.)

5. When you have confirmed that NetMATE is Active and monitoring your MATE3 data stream, go back to the MATE Data Source Dialog Box and set up the TCP Server function. Remember to check the "Original MATE Data Format" box! (See **WattPlot TCP/IP Server Dialog Box**.)

6. Now go to the NetMATE Systems menu, and Add a new system definition. We suggest naming it something like "Anderson Home MATE3", but changing its Data Folder to be the same as for the original system that you defined (e.g. "c:\ProgramData\WattPlot\Anderson Home"). (See **System - Add/Edit**.)

7. Do not define a MATE Data Source for the new system definition – the new system will be defined and used by the other WattPlot application. Instead, switch NetMATE back to the original system (e.g. "Anderson Home") by selecting it from the Systems menu.

8. Exit WattPlot NetMATE.

PART 2

9. Download and run the installation program for the other WattPlot application.

10. When you run it, the program should present you with a selection of the two systems defined in NetMATE. Select the second system that you defined (e.g. "Anderson Home MATE3").

11. Start WattPlot NetMATE to start the TCP/IP Server, then leave it running and come back to the other WattPlot program.

12. From the Options menu of the other WattPlot program, define the MATE Data Source as being a TCP/IP Server connection, and point it to the TCP/IP Server of NetMATE. (See **TCP/IP Connection**.)

13. If all has been setup properly, you should be seeing your MATE3 data coming into the WattPlot Monitor program.

Licensing, Updates, and Upgrades

Once your one-time license fee payment is received and processed, you will be sent a permanent activation code by email. The WattPlot NetMATE software will be licensed to run for a specific combination of PC and OutBack MATE/MATE3.

At this time, updates to any of the application programs may be downloaded free of charge, from **http://WattPlot.com/update.htm** , and do not require repeat licensing. If the program is running on a computer that has internet access, you will be informed of significant updates automatically, or you can have the program check on request using the **Manual Release Check** function.

Moving your WattPlot™ NetMATE License

Your WattPlot NetMATE program license is unique to the PC and hard drive that you installed it on. If you wish to move WattPlot to another computer or hard drive, you will need to remove the current license and get a new activation. In some situations, you can do this yourself, so long as you have configured WattPlot's **Email Settings** and your computer can access the internet. Otherwise, when you remove the license, WattPlot will issue you with a temporary license so that you may continue to use the product while waiting for the new activation from intallact.

Note that certain hardware changes to a computer can render a WattPlot license invalid. If WattPlot detects this condition, it will revert to a temporary license so that you may continue to use the product while waiting for a license update from intallact. If you know that you will be changing the hard drive where WattPlot is installed, we recommend doing a license move first, if possible, even if you have not yet installed WattPlot NetMATE in the new location.

If you have to move your license back to the original location, this can also be done, but it typically requires us to process the new Activation Code and send it to you. Or you can simply order a new license if you will require more than one.

The WattPlot Licence Move function is initiated by selecting the Move License to New PC option, under the File menu. Note that this is a license *move*, not *copy*. WattPlot will no longer be licensed at the old location after the move. The following steps outline the recommended procedure for removing your current license and moving it to a new location. Please follow whichever steps are possible in your situation.

1. If applicable, fully install the WattPlot NetMATE program on the new computer or hard drive, as described in the **NetMATE Program Installation** section at the start of this manual. [***Note*** that the version of program running in the new location must be at least equal to or more recent than the version of the currently licensed copy.]

2. Run WattPlot NetMATE in the new location in order to get the Unique PC ID. Write this down carefully.

3. Run WattPlot NetMATE at the old location, where it is already licensed, and select the Move License to New PC option, under the File menu. A confirmation message will be displayed. Click

the Yes if you have the new Unique PC ID. Otherwise, click No to complete the first step of removing the current license.

4. The **Activation Dialog Box** will be displayed. If you have the new PC ID, enter it now (including hyphens) in the yellow PC ID field, and then press the Enter key.

5. The main action button of the Activation Dialog Box will show the next possible step, based on your current situation. The button will have one of the following labels:

   Receive New Activation Code by Email
   You can move this license yourself. Your new activation code will be emailed to you automatically within minutes.

   Request New Activation Code by Email
   You can remove your current license and receive an immediate interim activation. Intallact will be given your new PC ID and will send a you new Activation Code (usually within 24-48 hours).

   Proceed With License Move or Remove This Activation License
   You can remove your current license and receive an immediate interim activation. When you have your new PC ID, You will have to email us at **`activation@WattPlot.com`** so that we can get a valid Activation Code to you. Note that we will also need to know your old PC ID and the License Removal Confirmation Code, as issued by this process.

6. You will probably want to copy the full contents of the WattPlot folder and any sub-folders to your new computer or hard drive, in order to retain all of your logged data and current system settings (most of which can be found in your `WPConfig.ini` and *`SystemName`* `config.ini` files).

7. When you receive your new Activation Code, go to the new installation of WattPlot NetMATE and use the new Activation Code to activate your license, as described in the **Activation** section.

Problems, Feedback, & Suggestions

You will quickly learn that intallact is one of the most responsive developers around. We are driven by the comments and ideas from our users, and rapidly address problems or implement enhancements.

Questions

If you have questions about how to use any of the WattPlot suite of programs, or what they can do, your best resource is to start with the Frequently Asked Questions section of our web site. Go to:

http://WattPlot.com/faq.htm

If the question or answer you seek is not there, please refer to one of the other resources described below.

Solving or reporting problems

If you have a question or you encounter some other difficulty, you are encouraged to contact us by email. A screen shot is often useful, acquired by holding down the Ctrl and Alt keys and pressing the Print Scrn key. (You can then Paste the screen shot into an email or Word document, sent as an attachment.) We will work hard to get your issue resolved as soon as possible.

WARNING: Do NOT try to uninstall and reinstall the software. It won't help and you will likely corrupt your system and data files. Contact WattPlot support first.

Making suggestions

If there is anything in this User's Guide that you find unclear, missing, or incorrect, *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!

intallact techsupport@WattPlot.com
http://WattPlot.com

Appendix A - Serial Cable Specifications

Your OutBack MATE must be connected to your computer in order for the monitor program to receive data from your MATE. This connection is via a serial cable. 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. The other end of the cable plugs into an RS-232 serial communications port on your computer. Serial ports on computers come in three types:

USB Port 9-pin (DB09) 25-pin (DB25)

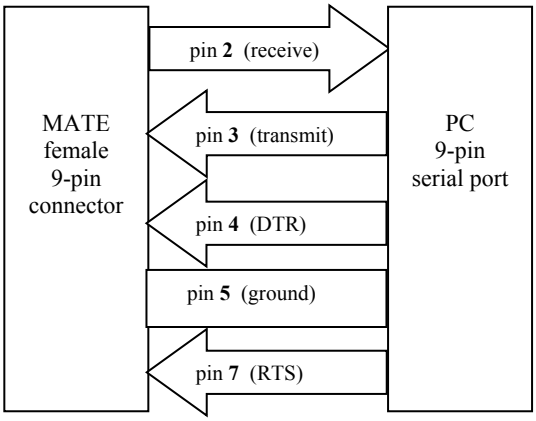
USB port

The latest standard found on computers are USB ports. Adaptors can be purchased at computer accessories suppliers to convert USB ports to conventional serial ports. The adaptor will convert it to either a 9-pin or a 25-pin serial port (see below). **NOTE: Not every serial/USB conversion kit on the market seems to work with the opto-isolated serial port of the OutBack MATE!**

9-pin (DB09) port

Until recently, many computers came with a male 9-pin serial port on the back. If your computer has one of these, then the computer end of your serial cable should be a female 9-pin. Note that the serial cable uses pins 2, 3, 4, 5, and 7 (as shown at right).

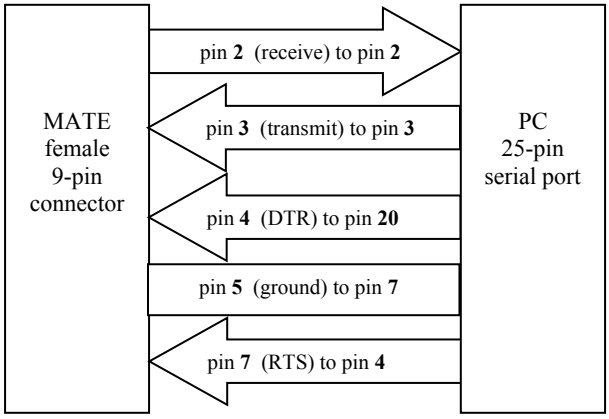
All pins are straight through with no jumpering.



25-pin (DB25) port

Older computers came with a (typically) male 25-pin serial port on the back. This should not be confused with the typically female 25-pin parallel (printer) ports. If you have one of these 25-pin male serial ports, you will need an adapter to convert from 9-pin to 25-pin. This adapter must produce the result shown, where the pin numbers on the left are for the 9-pin and those on the right are for the 25-pin:

All pins are straight through with no jumpering.



Note that computer accessories suppliers also sell male-to-female and female-to-male converters (for both 9-pin and 25-pin types) if you need to change the kind of end found on your cable.

Serial cable lengths in excess of 25 feet are not usually recommended, as they can lead to increased communication errors.

Appendix B - OutBack Warnings and Errors

The Outback MATE can detect a number of different warning and error conditions coming from inverters and charge controllers, which are passed on in the data stream. WattPlot NetMATE can notify you of these device errors or warnings by email, if you turn on that functionality. See **Notification Options**.

FX warnings will not shutdown the inverter affected, but errors will. An error on the Master inverter will shut the OutBack system down.

This appendix describes some of the errors and warnings detected (**sorted alphabetically by message**), how they are noted, and what they mean.

Inverter Warnings

Warning	Trigger	Meaning/Response
AC Input Frequency High	AC Input frequency is above 66 Hz (55 Hz on export models)	The FX is approaching the upper limit of its frequency window and will drop the AC source if the frequency gets much higher.
AC Input Frequency Low	AC Input frequency is below 54 Hz (45 Hz on export models)	The FX is approaching the lower limit of its frequency window and will drop the AC source if the frequency gets much lower.
Buy Amps Exceeds Input Size	The AC Input current exceeds the rating allowed for that model of inverter.	The AC loads are drawing more current than the rating of the FX allows. Exceeding this current limit for an extended period of time could cause the FX to fail. Reduce the loads on the FX's AC output to prevent damage.
Communication Error	An internal communication error has been detected between the Mate and the FX.	This warning may occur if the communication lines between the FX and the MATE have been severed. If this is the case, turn the FX "off" and then "on" through the DC disconnect. If this does not solve the problem, call OutBack for assistance.
Fan Failure	The fan mounted above the transformer inside the FX has stopped working or is not functioning properly.	This will eventually cause an Over Temperature inverter error if the cause of the fan failure is not fixed. Restart the FX and listen for the fan to verify a fan failure. The fan should run for about 15 seconds on start-up.
Input VAC High	AC source voltage exceeds the upper limit defined in the Mate's ADV/FX/GRID menu. Default is 140 VAC (270 VAC on export models).	The AC source (grid or generator) input voltage is too high. If an AC source was just applied to the FX, the FX will not connect to that source until the voltage drops below the upper limit.
Input VAC Low	AC source voltage exceeds the lower limit defined in the Mate's ADV/FX/GRID menu. Default is 108 VAC (208 VAC on export models).	The AC source (grid or generator) input voltage is too low. If an AC source was just applied to the FX, the FX will not connect to that source until the voltage rises above the lower limit. A power outage will often trigger this warning. NOTE: FX inverters occasionally detect an induced voltage on the AC Input terminals of up to 10 VAC, even if they are not connected to an AC source or the grid is down. WattPlot suppresses this warning at such voltage levels.
Temperature Sensor Failed	One of the temperature sensors internally located in the FX is not working correctly.	The FX needs to be checked by a qualified repair technician. Note that the AirTemp, FETtemp and CapTemp warnings listed in the Mate's STATUS/FX/WARN menu can help with troubleshooting.

Inverter Errors

Error	Trigger	Meaning/Response
Backfeed	Another AC source of power was connected to the AC output of the FX.	Usually this is an installation issue. It often occurs when there is an X-240 transformer in the system that hasn't been installed properly. Also, check that there are no connections between the AC input and AC output circuitry.
High Battery	The battery voltage rose above the high battery voltage level (40.0 volts for a 24V FX) for 10 seconds.	The inverter will restart once the battery voltage drops below the high battery voltage level (40.0 volts for a 24V FX) for at least 1 second.
Low Battery	The battery voltage dropped below the Low Battery Cut-Out (LBCO) voltage set point for 5 minutes. (Default LBCO is 21.0 volts for a 24V FX.)	The inverter will restart once the battery voltage exceeds the Low Battery Cut-In (LBCI) voltage set point for 10 minutes. (Default LBCI is 25.0 volts for a 24V FX.)
Low VAC Output	The inverter was not able to maintain adequate AC output voltage to power the loads connected. AC output dropped below 105 VAC (200 VAC for export models).	This is typically caused by the AC loads demanding more power than the inverter is able to deliver.
Over Temperature	The FX reached its maximum allowed internal operating temperature.	This can be caused by powering large AC loads or charging for too long. It can also be caused by restricting the amount of air which is able to flow around the casting, or by operation in high temperature environments. The inverter will automatically reset and resume operation once it cools down.
Phase Loss	n/a	Phase Loss error detection has not yet been implemented by Outback, and is not operational at this time. Please inform **intallact** if this error is triggered on your system.
Shorted Output	The inverter immediately reached its maximum current and shut down.	This is usually caused by a short circuit condition on the AC output, but can also be caused by attempting to operate a load which far exceeded the inverter output capability.
Stacking Error	A problem has occurred with the communication cabling between stacked inverters, or the inverters are stacked incorrectly.	Check the stacking programming on the Mate. If this condition persists contact your dealer for servicing instructions.

WattPlot Data Communication Errors

Error	Trigger	Meaning/Response
Communication Check Sum Failed	MATE status line check-sum was incorrect. Data integrity error.*	Every status line sent by the MATE has a check-sum to ensure data integrity. If the check-sum test does not pass, it suggests that some data corruption happened with that packet and the check-sum error is logged.
Communication Delimiter Check Failed	Missing or extra delimiters, or unexpected characters in MATE status line. Data integrity error.	MATE status lines begin with a linefeed character (ASCII 010), end with a carriage-return character (ASCII 013), and are divided into separate fields by delimiters (commas). Everything else is a numeric character. Taking away all of the numeric characters should leave the same delimiters every time. If it doesn't, then the status line is invalid and this error is logged.
Communication Delimiter Positions Check Failed	Unexpected characters in delimiter positions in MATE status line. Data integrity error.	MATE status lines are divided into separate fields by delimiters (commas) in fixed positions. If all of the commas are not in the expected positions, then the status line is invalid and this error is logged.
Communication Packet Too Short	MATE status line had fewer than 49 characters. Data integrity error.	All status lines sent by the MATE should be at least 49 characters (bytes) long. WattPlot detected a status line that appeared to be missing characters.
Communication s Timed Out	WattPlot did not detect any data coming from the MATE for about 9 seconds.	Status lines should be sent by the MATE every second. No data for about 9 seconds, triggers this error. If nothing is received for about a minute, then the program will give-up and close the data receiving session, unless the Auto-Start option is turned on.
Component Address Undefined	Port address in Mate status line is for a component that was not defined in the WattPlot System Components window.	The MATE can send data for a number of components. Each status line corresponds to a single component, identified by a port address. WattPlot received a status line for a component that was not defined in the WattPlot System Components screen. All components attached to the MATE or OutBack Hub should be defined so that WattPlot can expect the data and handle it correctly. The System Components window is accessible from the WattPlot Options menu.
Component Address Invalid	Invalid port address character in Mate status line. Data integrity error.	The MATE can send data for a number of components. Each status line corresponds to a single component, identified by a port address. WattPlot detected a status line with an invalid component port address, suggesting data corruption or a MATE problem.
Invalid Status Line From Mate	Invalid leading character for Mate status line. Data integrity error.*	All valid status lines from the MATE begin with a LineFeed character (ASCII 010). If a different character is detected as the leading character, it is noted and this error is logged.

* Certain errors are flagged as a "Data integrity error". One or two of these might be expected when a data receive session is first started (before WattPlot and the MATE are synchronised), or if buttons are being pressed on the MATE, and **do not indicate a problem**. If they are more frequent, and occurring mid-session with no MATE buttons being pressed, it usually indicates a problem in the serial cable connection or length. (See **Appendix B – Troubleshooting Serial COM Port**.)

WattPlot Data Communication Errors - continued

Error	Trigger	Meaning/Response
Invalid Port Number	The serial COM port selected does not exist or is not accessible.	WattPlot typically does not include such ports in the dropdown list of your System Components screen, so this error is rare. Go to the MATE Data Source screen (from the Options menu), and select the correct COM port that the Mate cable plugs into.
No Serial COM Ports Accessible from Windows Environment	Either there are no serial ports on your computer, or Windows did not detect them.	To check this outside WattPlot, (in most Windows environments) right-click on the "My Computer" icon and choose Properties. From the "Hardware" tab, click on "Device Manager". There should be an entry called "Ports (COM & LPT)". Expand the entry to see the list of ports detected and look for problems that Windows may have detected. Right-clicking the port icon and choosing "Properties" will give you more information about a specific port.
Port Already in Use by Another Program	The serial COM port selected for WattPlot is already in use by another program.	If you have other MATE monitoring software, PDA synchronization software, or a serial mouse, any one of these may already be using the serial port selected. You will have to select a different serial COM port and ensure that the cable from your MATE is plugged into the port selected.
TCP/IP connection closed by MATE server	The remote WattPlot TCP server closed this connection.	The remote WattPlot program providing MATE data to this program has closed the connection. Perhaps the remote WattPlot was closed down or the user there changed the TCP/IP Server permissions.
Unable to open communication link to MATE	Any unrecoverable connection error preventing link from being opened.	The reasons for this error will vary, but are most commonly related to the settings chosen for the MATE Data Source.

WattPlot Program Errors

Error	Trigger	Meaning/Response
Activation Code Expired	User attempted to activate WattPlot with an expired activation code.	There are two kinds of activation codes from **intallact**: Evaluation and Permanent. An evaluation activation code is typically valid for about 15 days **from the date it is sent to you**, not the date that you first use it. If the code expired before you could use it, contact us at `activation@WattPlot.com`.
Authorization Failed	Invalid activation code or other licensing error.	There are a number of things that can trigger this error. Please send the exact text of the error message to us at `activation@WattPlot.com`.
Configuration Corrupted	An inconsistency in the WattPlot configuration file.	WattPlot keeps a lot of configuration information in a data file (*`systemname`* `config.ini`) in its application folder. If WattPlot detects an inconsistency in this file, then this error will be generated. If you get this error, attach the configuration file to an email & send it to us at `techsupport@WattPlot.com`.
Encountered invalid log data	Unexpected values in WattPlot's own data files.	Data corruption error, indicating a data storage problem, inappropriate manual editing, or a program bug that we should know about. Please send data file to us at `techsupport@WattPlot.com`.

(continued on next page)

WattPlot Program Errors - continued

Error	Trigger	Meaning/Response
Installation Aborted (Licensing Error Code)	Internal error from a Windows function.	This is an internal licensing error related to Windows. Please contact us at activation @ WattPlot .com if you get this error.
Installation Aborted (Unrecognized MATE Serial Number)	User entered an invalid MATE serial number.	For MATE/MATE2 devices: Be sure to include the "MA" and all leading zeroes when entering your MATE serial number. For MATE3 devices: Be sure to include the "M" when entering your MATE serial number.
Invalid Serial COM Port	WattPlot cannot use specified COM port to receive data.	(See the specific error in the preceding **WattPlot Data Communication Errors** section.)
Software Expired	Expiry date of temporary evaluation license has passed.	An evaluation activation code is typically valid for about 15 days from the date it is sent to you, not the date that you first use it. If you need an evaluation period extension, contact us at activation @ WattPlot .com. You can get information about ordering a permanent WattPlot license at our web site: WattPlot.com/order.htm
Unrecoverable Communications Error	Too much invalid data received OR Insufficient data to pass integrity checks OR No data detected on serial port OR Serial Port closed unexpectedly while still attempting to receive data from Mate.	This error has one of four causes as listed at left. Most will log other errors and well, and all of them will result in WattPlot closing the link to MATE. The first three typically suggest a serious serial cable, port, or MATE problem. The fourth trigger is an unexpected Windows error.
Unrecoverable Error - Inform **intallact**	Internal programming error.	While we have attempted to anticipate every possible error condition, it is always possible that the WattPlot software will encounter an internal programming error. While these are more and more rare, they almost always indicate something that our developer must address immediately. This error is usually accompanied by extra information which, if emailed to us, will allow our programmer to quickly track down the cause of this error.

