PLATINUM™ Series

Configurator Software Manual
The information contained in this document is believed to be correct, but OMEGA accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.
1 Introduction

1.1 Purpose

The Platinum Configurator software has been developed to provide a PC (Windows) based configuration and monitoring support package. These software tools were originally developed for internal engineering support to specifically test the functionality of the Platinum product. The tools provide a ‘grass roots’ interface and expose all internal functionality of the Platinum product.

As an engineering tool the Platinum Configurator will continue to grow as new features and capabilities are added to the Platinum family.

The Platinum Configurator operates over one of the communication channels provided on Platinum based products. All Platinum products are provided with a USB channel that is configured to operate as a Virtual Com device (slave to HOST device).

Many products are offered with an optional serial port (RS232, RS485 etc.). These communication channels are supported, although in most instances the PC interface will rely on a USB to Serial adaptor, suggesting that the native USB connection is the most straight forward solution.

Other communication channel support may be provided in future releases.

The Platinum Configurator may be run in a ‘Virtual Device’ mode with no physical device connected. A ‘Virtual Device’ configuration may be loaded using the File/Load option, the configuration screens may be modified and the resulting configuration may be then saved. The file format used by the Load and Save command is compatible that used by the Platinum controller, allowing configurations to be updated offline.

The Platinum Configurator uses the Modbus protocol (ASCII or RTU) and has been developed and tested using Visual Studio operating under Windows 7.

NOTE

No support is provided to users of the Platinum Configurator software.

1.2 Definition of Terms and Acronyms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>I2C</td>
<td>2 wire serial interface</td>
</tr>
<tr>
<td>Base Device</td>
<td>Device connected to slave device</td>
</tr>
<tr>
<td>Smart Input</td>
<td>Device supporting 1 or more Input sensors</td>
</tr>
<tr>
<td>Smart Output</td>
<td>Device supporting 1 or more Output Elements</td>
</tr>
<tr>
<td>Sensor Element</td>
<td>One of the physical sensing elements connected to the device</td>
</tr>
<tr>
<td>AC</td>
<td>Alternating Current</td>
</tr>
<tr>
<td>DC</td>
<td>Direct Current</td>
</tr>
<tr>
<td>CS</td>
<td>Chip Select</td>
</tr>
<tr>
<td>ADC</td>
<td>Analog to Digital Converter</td>
</tr>
<tr>
<td>DAC</td>
<td>Digital to Analog Converter</td>
</tr>
<tr>
<td>RS485</td>
<td>Electrical signals used for serial communications</td>
</tr>
<tr>
<td>RS232</td>
<td>Electrical signals used for serial communications</td>
</tr>
<tr>
<td>CSV</td>
<td>Comma Separated Values</td>
</tr>
<tr>
<td>COTS</td>
<td>Commerially-Off-The-Shelf</td>
</tr>
<tr>
<td>ESD</td>
<td>Electro Static Discharge</td>
</tr>
<tr>
<td>FW</td>
<td>Firmware</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>HW</td>
<td>Hardware</td>
</tr>
<tr>
<td>I/O</td>
<td>Input/Output</td>
</tr>
<tr>
<td>LED</td>
<td>Light Emitting Diode</td>
</tr>
<tr>
<td>Hexadecimal</td>
<td>Values expressed using base 16 ($2^4$)</td>
</tr>
</tbody>
</table>
## 1.3 Applicable Documents

<table>
<thead>
<tr>
<th>Doc. #</th>
<th>Name / Description</th>
<th>Rev. #</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Platinum Modbus Interface</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Platinum Load and Save File Format</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Platinum Ramp and Soak Processing</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>MODBUS APPLICATION PROTOCOL SPECIFICATION V1.1b3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Device Serialization and Version Information</td>
<td>Rev 1.1</td>
</tr>
<tr>
<td></td>
<td>Omega Engineering Coding Standard</td>
<td>Rev 1.2.0</td>
</tr>
</tbody>
</table>
2 Installation

The Installation of the Platinum Configurator on a Windows based platform consists of two components, a ‘device interface’ which allows the Window application to communicate with the Platinum device and the Platinum Configurator application program.

2.1 Device Interface

The Platinum Configurator application supports three ‘com channel’ device interfaces: USB, Ethernet and Serial. Within the Windows operating system serial and Virtual Com devices are treated equivalently although the Serial channel requires establishing specific baud rate, parity, start bits and stop bit information.

2.1.1 USB Virtual Com

When using the native USB Device interface under Windows 7 a Device Driver ‘INF’ file must be installed to enable the Windows Operating system to correctly identify and enumerate the Platinum USB Device.

The file OmegaVCP.inf may be downloaded and copied to the c:/Windows/inf folder. After installing this file the system should automatically detect and enumerate the Platinum product when connected via a USB cable.

The OmegaVCP.inf file contains the following key parameters.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VID</td>
<td>0x2a72</td>
<td>Omega Engineering USB Vendor ID</td>
</tr>
<tr>
<td>PID</td>
<td>0x0400</td>
<td>Product Identification indicating the device is operating as a Virtual COM device</td>
</tr>
</tbody>
</table>

When installed the Platinum device will appear as an enumerated com device and is assigned a name such as COMxx, where xx is assigned by the operating system.

2.1.2 RS232/RS485

Windows 7 has native RS232 and RS485 device driver interfaces and no additional driver is required. The hardware (or external USB serial converters) will be assigned a name such as COMxx, where xx is assigned by the operating system.

A wide variety of USB to Serial Adaptors are available. To use a serial channel the Platinum Configurator must use the same communication parameter settings as the Platinum device. The Platinum configuration settings may be set using the front panel menu: INIT/COMM/SER/C.PAR.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bAUd</td>
<td>1200, 2400, 4800, 9600, 19.2, 57.6, 115.2</td>
<td>Data rate</td>
</tr>
<tr>
<td>PRty</td>
<td>Even, Odd, None</td>
<td>Parity Bit, inserted for data verification.</td>
</tr>
<tr>
<td>dATA</td>
<td>7, 8</td>
<td>Number of data bits. Note that Modbus/RTU requires 8 bits.</td>
</tr>
<tr>
<td>StoP</td>
<td>1, 2</td>
<td>Number of stop bits.</td>
</tr>
</tbody>
</table>
2.1.3 Ethernet

The Platinum Ethernet channel supports 10 and 100 Mbit data rates and is provided with an internal web accessible configuration page that allows setting the Ethernet channel communication parameters.

2.1.3.1 Ethernet TCP (Modbus ASCII)

When used in TCP mode the interface supports Modbus/ASCII formats. The following settings are required. The Platinum device must have the ETHN channel configured to accept Modbus ASCII data.

![Ethernet Configuration](image1)

In Ethernet serial interface must also be configured to support Modbus/ASCII data, which uses a CR+LF to Serial Data Packing Techniques must be changed from the default states as shown below.

![Ethernet Configuration](image2)

2.1.3.2 Ethernet Modbus/TCPIP

When used in Modbus/TCPIP mode the following Ethernet options are required. The Platinum device must have the ETHN channel configured to accept Modbus RTU data. Note that when ModbusTCP is...
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selected the Local Port automatically switches to 502, the port designated by Modbus for use with TCP/IP and the ‘Serial Data Packing Techniques’ options are disabled.

2.2 Installing Platinum Configurator Software

The Platinum Configurator is a self-extracting executable program which may be downloaded and installed on a Windows 7 based system.

1) Download the Platinum_Configurator.zip file.
2) Copy the OmegaVCP.inf file from the downloaded file to the c:/windows/inf directory.
3) Click on the setup.exe file. The program will install and a shortcut icon will be created on the desktop.
3 Operation

3.1 Data Formats

Fields that require data may be entered using decimal or hexadecimal notation. Hexadecimal values may be entered by preceding the value with a ‘&h’ (Basic format) or ‘0x’ (C format). When entering Hexadecimal values either upper or lower case (A…F, a..f) may be used.

Example:

123 == &h7b == 0x7C

3.2 Disabled Options

Fields which are disabled or not applicable will be shown greyed out.

3.3 Screens

The Platinum Configurator has been implemented as a series of ‘screens’, entered by selecting pull down options from the main screen tool bar or by clicking on any of the control buttons appearing on the main screen.

When a screen is loaded the device is interrogated and all screen specific data is refreshed.

A manual ‘Refresh’ button is provided on each screen to allow updating screens where information may have changed due to configuration of unrelated data.

There is no specific ‘close’ option on each of the sub-screens. The screens may be collapsed or expanded to full screen mode using the standard window options. To close a screen select the ‘X’ option.

3.4 Transaction Monitor

When the application starts it opens the Transaction Monitor screen, allowing the user to select the com channel to be used.

3.4.1 Serial / USB Connections

Serial and USB channels provide a list of available Windows COMM channels in a pull down menu. Select the com channel from the pull down list and press the Connect button.
If no com devices are available the Connect button will be disabled. Ensure that the Platinum device is connected and press the ‘Refresh’ option to update the device list.

If the Serial channel option is selected the Comm Parameters button is enabled to allow selecting the serial parameters to be used.

### 3.4.2 Ethernet Connections

If the Ethernet channel is selected the serial/usb com device list is disabled and the Comm Parameter button will allow setting the Ethernet options for the Platinum Configurator software.

NOTE: If the TCP/IP option is selected the Ethernet port is fixed at 502.

### 3.4.3 Modbus Format

The available Modbus formats are determined by the Platinum Channel selected.

If Ethernet / TCPIP is selected the USB and Serial options will be disabled. To select one of these channels first select Ethernet/ASCII, which re-enables all three channel types.
### 3.4.4 Assured Connection

If the **USB Channel** option and **Modbus RTU** format are selected it enables the 'Force Channel' check box. When establishing a connection on the USB channel the Force Channel option will cause the Platinum Configurator to:

1. Attempt connecting using Modbus/RTU format
2. If no response is received the Configurator attempts to set the USB channel on the Platinum controller to MODBUS/RTU using the appropriate Omega Protocol command.
3. Again attempt to connect using the Modbus/RTU format.
4. If no response is received the Configurator attempts to set the USB channel on the Platinum controller to MODBUS/RTU using the appropriate Modbus ASCII command.
5. Again attempt to connect using the Modbus/RTU format. If no response is received an error will be reported.

If no connection is established a warning message is displayed. After fixing the USB connection the Connect button may be retried.

![No devices available](image)

To ensure that the correct com channel is being selected:

1. Start the Platinum Monitor. The Transaction screen will be shown
2. Select the USB channel and Modbus RTU format
3. Disconnect the USB connector and select the Refresh button to refresh the available ports
4. Reconnect the USB connector and again select the Refresh button
   a. If a new port (USB device) does not show in the drop down list ensure that the USB driver file has been installed
5. Select the ‘new’ device from the pull down list and press the Connect button.

### 3.4.5 Version Verification

If the Application or Bootloader firmware of the device requires upgrading a warning message will be displayed. Operation may continue, but errors may occur.
The Platinum Configurator uses Modbus formatted packets (ASCII, RTU or TCP/IP) and these may be displayed when the Display Transaction box is checked with an optional time stamp. In most cases these options should remain disabled to avoid the overhead of formatting and displaying these strings.

Double clicking the Count and Errors display boxes will clear the respect counts.

The Clear button will clear all previous transactions.

The Save As Defaults button will save all the current connection data as default values which will be reloaded on the next session.

The Auto Refresh option will cause the auto refresh function in the main screen to be started when the connection is established.

The Transaction Monitor screen will be automatically closed when the connection is established. The screen may be re-opened under the Tools/View Transactions option on the main program screen.

NOTE: Using the ‘X’ (top menu bar) to close the screen will clear all the information in the transaction window.
3.5 Main Screen

The main screen is entered following the connection process. When connected to a physical device the Auto Refresh is enabled with a refresh time of 1.0 seconds.

The main screen has a 'tool bar' across the top that provides access to File operations (LOAD/SAVE), Tools (Options, View Transactions) and a Help button.

The Main screen can be automatically refreshed at a user selectable 'rate'. It is recommended that a minimum of 1 second refresh timing be used.

The Main Screen provides a Device Information summary, a pseudo image of what appears on the Platinum display, individual ‘buttons’ within the Configuration Group that allow programming and configuring the functional parameters of the device.

On the pseudo image of the Platinum device both Setpoint 1 and Setpoint 2 values are shown. If these parameters are configured as absolute values (see setpoint configuration) they may be changed by entering a new value.

If Setpoint 1 is configured as a Remote Setpoint, or if Ramp and Soak is active the Setpoint 1 value will be displayed but cannot be updated.

If Setpoint 2 is configured as a Deviation Setpoint the effective Setpoint 2 value will be displayed but cannot be updated.

Where appropriate the Configuration Group buttons show current ‘values’ of the primary underlying parameters. Digital (ON/OFF) parameters are shown as small ‘display’ lights that change to GREEN when active.
3.5.1 Operating Mode

The 6 control buttons (Wait, Run, Idle, Stop, Standby and Pause) may be selected to change the operating mode of the device.

3.5.2 Run Mode Options

The Run Mode option buttons (Peak, Valley, Latch Clear) mimic the functionality found in the Platinum Run Mode.

The Peak and Valley buttons include the current Peak/Valley values. Pressing either will clear the current value.

Clicking the Latch Reset button allows clearing latched alarms.

3.5.3 Manual Control

The Manual Control button operates similar to the OPER/MANL option on the Platinum controller. Selecting this button will open a separate form which allows manually setting the Input value or Control Value.

The unit will be put into the IDLE mode.

Selecting the Output option allows setting the Control Output and any outputs configured as PID may be set from from 0 – 100% of full power.

Selecting the Input Option allows generating a ‘pseudo input’ within the range defined by the Input Range value.

The Disable option disables both the Input and Output function.

3.6 Configuration Group Screens

The Configuration Group screens allow configuring each of the internal control blocks of the Platinum Controller.

When entered the current configuration information is read and used to build the screen.
If a change is made to the current configuration the 'Update' button will appear, allowing the selection to be recorded.

3.6.1 Input Configuration

The Input Configuration screen allows configuring all of the Input parameters. The Input Type 'pull down' option will enable the applicable option areas.

The View Settings option in the Process Input selectin, which moves the 'aqua' colored highlight will allow viewing the settings for each of the different input scaling options without changing the input range. The radio buttons allow selecting different input ranges.

3.6.2 Auxiliary Input

The Auxiliary Input Configuration screen (also referred to as Remote Setpoint) allows configuring all of the Auxiliary Input parameters.
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The View Settings, which moves the ‘aqua’ colored highlight will allow viewing the settings for each of the different input scaling options without changing the input range. The radio buttons allow selecting different input ranges.

The input value is shown on the main screen.

3.6.3 Digital Input

The Platinum Configurator includes (disabled) parameters not currently offered in the Platinum controller digital input.

The state of the digital input (ON/OFF) is shown on the main screen.

3.6.4 PID Control
The PID configuration screen allows setting the PID control parameters as well as initiating an Autotune cycle.

If the Auto Tune button is selected the system will start an AUTOTUNE cycle and the status / input value is shown on the main screen. At the completion of the cycle the REFRESH button may be used to review the calculated P, I and D values.

The calculated PID Output power is shown on the main screen. Following an Autotune cycle select the Refresh button to update the new P, I and D parameters.

**NOTE: Before initiating an Autotune cycle ensure that the appropriate output has been configured for PID control.**

### 3.6.5 Setpoints

The Setpoint configuration screen allows setting the mode for Setpoint 1 and Setpoint 2.

Setpoint 1 mode on the Platinum is implicitly set by enabling the Ramp & Soak or Remote Setpoint functions. On the Platinum Configurator the setpoint mode may be explicitly set.

Setpoint 2 mode may be explicitly set to either Absolute or to be a Deviation (+/-) from setpoint 1. The value displayed on the pseudo device image of the main screen will be the effective value.

**Example (Setpoint 2 Deviation mode)**

Setpoint 1 = 100.0
Setpoint 2 Deviation value = 5
Effective Setpoint 2 value = 105

### 3.6.6 Ramp & Soak

The Platinum controller supports up to 99 Ramp and Soak profiles, with each profile supporting up to 8 ramp/soak segments. The ramp and soak profiles may be chained together using a profile LINKING option.

The Ramp & Soak Control section allows programming the overall Ramp and Soak control, including enabling the Ramp & Soak mode, the starting profile to use, the tracking mode, number of segments in each specific profile and the action to be taken at the end of the profile.

The Profile select control allows selecting which profile data is to be displayed.

The time format is maintained in minutes.seconds. The RE and SE checkboxes allow enabling the annunciators and outputs based on the Ramp and Soak states.
3.6.7 Annunciators

Platinum annunciators appear on the front display and may be activated based on the state of the Alarms and Outputs.

The Platinum Configurator extends the annunciator options to allowing triggering the annunciator based on individual RE.ON or SE.ON states as well as ‘any RAMP’ or ‘any SOAK’ status.
The Platinum controller supports 2 alarm control blocks. The state of each alarm is shown on the main screen.
3.6.9 Outputs

The Platinum controller supports 3 outputs (future products may expand this capability) and each output configuration may be refreshed or updated independently.

The pull down Output Mode selection allows assigning the output to a specific mode of operation, which in turn defines which parameters are applicable and enables the corresponding control blocks. The state of each output is shown on the main screen.

3.6.10 Display, Safety, Excitation

The Display, Safety and Excitation control screens have been grouped into one miscellaneous control screen.

Note that several control values, such as Time Format have been grouped within the miscellaneous screen due to common functionality and may appear in alternate menu positions on the actual device. Each of the sub-groups may be individually refreshed or updated.
3.6.11 Communications

The Platinum product supports 3 comm channels: USB, Ethernet and Serial. USB is standard on all products.

Each comm channel supports either Omega or Modbus protocol. Within the Omega protocol there are a variety of options. Within the Modbus protocol both Modbus RTU and Modbus ASCII formatting are supported.

The serial channel supports a variety of data formats and transmission speeds.

NOTE

The channel used by the Platinum Configurator must be configured for Modbus RTU, Modbus TCP/IP or Modbus ASCII. Following a Factory Default (F.DFT) selection the device will revert to Omega Protocol.

The Serial channel has additional parameters allowing the setting of baud rate, parity, stop and start bits. Changing these values while connected thru a serial channel will result in a loss of communications.
3.7 Configuration

The Configuration screen allows reviewing the current device configuration, order part numbers and versions of the device firmware.
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Configuration:

- **Device ID**: 000004D2
- **Version**: 1.0.3.4
- **Bootloader Version**: 1.1.0.0
- **Base Output Version**: 1.0.0.0
- **Smart Output Version**: 1.5.0.0

**Configuration**: PT8DPT-125-C24-EIP

Refresh
3.8 Graphing

The Graphing option opens a data charting function.

The Graphing screen provides two line graphs, the upper graph showing process variable/setpoint information and the lower graph showing the PID control output.

The process graph can show the process value, the process setpoint which is calculated during Ramp and Soak cycles, Setpoint 1 and Setpoint 2. The associated checkboxes allow disabling the display of any or all of the variables.

The control output graph can show the current PID control parameter which will take on values between 0 – 100%.

Disabling all of the variables for a particular graph will cause the graph to be hidden, allowing the second graph to fill then entire graph area.

The X axis shows the sample count. Operating the auto-refresh at 1 second intervals results in the X axis showing 1 second intervals.

Example of 1000 second, process executing a multi-stage ramp and soak profile.

3.9 Configuration Files

Configuration data for a device may be saved or loaded as standard "txt" files using file formats compatible to those used by the Platinum Controller LOAD/SAVE commands. The Platinum Configurator may be used to read in a configuration file previously saved from a Platinum device on a USB thumb drive, modify the configuration and then SAVE the updated configuration to a USB Memory stick to be reloaded to the device.
3.9.1 File Options Dialog

The File Options dialog may be opened under the Tools/Options or the File/Options menu selections.

The File Options screen allows adding additional 'meta data' to the file. This information is retained in the file but is not used by the Platinum device.

The File name will be updated when the file is SAVED and recovered when the file is LOADED.

The LOAD and SAVE option blocks allow selecting what data is to be transferred from file.

3.9.2 File LOAD / SAVE

The File LOAD and File SAVE options open a standard Windows dialog, allowing the selection of the specific file.
WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **61 months** from date of purchase. OMEGA’s WARRANTY adds an additional one (1) month grace period to the normal **five (5) year product warranty** to cover handling and shipping time. This ensures that OMEGA’s customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA’s Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA’s WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA’s control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:
1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

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2. Model and serial number of the product, and
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OMEGA’s policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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- Recorders, Controllers & Process Monitors
- Infrared Pyrometers

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- Load Cells & Pressure Gages
- Displacement Transducers
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- Benchtop/Laboratory Meters
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- Data Logging Systems
- Recorders, Printers & Plotters

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- Cartridge & Strip Heaters
- Immersion & Band Heaters
- Flexible Heaters
- Laboratory Heaters

**ENVIRONMENTAL MONITORING AND CONTROL**
- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
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- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments