



# INTRODUCTION TO APM-MAX CONFIGURATOR SOFTWARE

# INITIAL APM-MAX CONFIGURATION SCREEN

- Connect your APM-MAX device into the computer via the recommended USB cable.
- The APM model will show in the APM-MAX configurator screen. (Image #1)

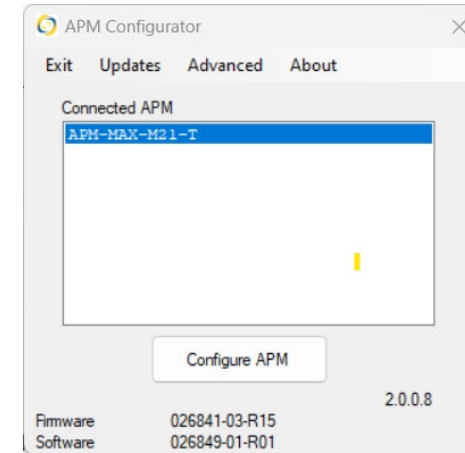


Image #1

- Check for updates for your specific model. (Image #2)
  - Click on **Updates**
  - Check to see if the Install Updates for Selected Meter is highlighted
    - If highlighted, click on **Install Updates for Selected Meter**.
- Let the updates complete and then click on **Configure APM-MAX**.

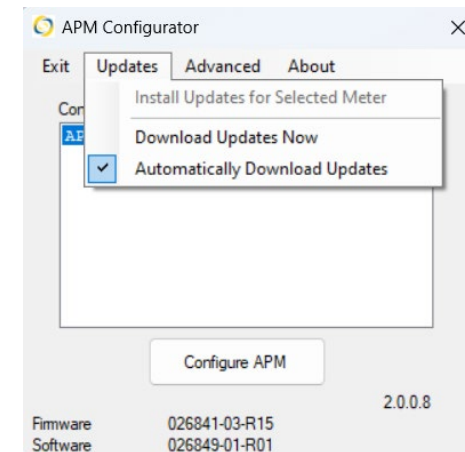


Image #2

# APM-MAX DISPLAY SCREEN

## Bar Graph Scale

- Min and Max
  - Enter the minimum and maximum values that you wish to measure.
  - Checking the **Percentage** box will give you a percentage of the input value that the APM-MAX is reading. (i.e., if you are measuring a maximum of 600V and your input is at 300V, you will see 50% on the display.
  - Checking the **Centre Zero** box will allow the display to show positive and negative values.
  - Checking the **Mirror** box will change the direction of the sweeping bar indicator. (0 will be on the right and the maximum value will be shown on the left).
- The Bar Graph Scale is limited to 1999. Values over 2000 will show with a x10 mark.
- Checking **Display Peak** provides a visual indication of the average peak value on the bar graph display.
  - The duration the peak bar is visible is configurable from a few seconds to a few minutes by adjusting the **Peak Bar** slider on the Response tab.
  - Alternatively, if you want the Peak Bar to be latched on and show the maximum value since the unit was reset, click **Peak Hold**.

## Limit Decimal Places

- You can select up to 3 decimal places to show on the display.

## Default Color

- You can change the default background color of the display (positive display) or the default color of the bar graph, value and displayed message. (negative display)

## Default Message

- This will be the 4-digit message that you see when you first power on the meter.

The screenshot shows the 'Trumeter APM Configurator' window with the 'Display' tab selected. The 'Bar Graph Scale' section includes input fields for 'Min' (0) and 'Max' (200), and checkboxes for 'Percentage', 'Centre Zero', 'Mirror' (checked), and 'Bar Swop' (checked). Below these are checkboxes for 'Display Peak (Bar)', 'Display Peak (Value)', and 'Peak Hold'. A 'Bar Graph Scale Text' table is shown with columns for 'Bottom', '1/4', '1/2', '3/4', and 'Top', with values 200, 150, 100, 50, and 0 respectively. The 'Limit Decimal Places' section has radio buttons for 3 (0.000), 2 (0.00), 1 (0.0) (selected), and 0 (0), along with a 'Rounding' checkbox. The 'Default Colour' section has radio buttons for Red, Orange, Green (selected), White, Blue, and Yellow. The 'Default Message' section shows a text box with '500' and an 'Edit' button. The 'Brightness' section features a slider from 'Low' to 'High' set at '100%'. The 'CAL Icons' section has radio buttons for 'None', 'CAL1', 'CAL2' (selected), and 'CAL5'. A 'Display Test Mode' checkbox is at the bottom.

# APM-MAX INPUT SCREEN

## Input Source

- AC or DC Voltage – 600V
- AC or DC Current (Direct) – 5A
- AC or DC Current (Shunt) – 500mV DC
- \*DC Power (Direct)
- \*DC Power (Shunt)
- \*AC Active Power (CT – W)
- \*AC Reactive Power (CT – VAr)
- \*AC Reactive Power (Shunt – VAr)
- \*AC Apparent Power (CT – VA)
- \*AC Apparent Power (Shunt – VA)
- \*AC Power Factor (CT)
- \*AC Power Factor (Shunt)
- Frequency

\*values calculated by measured inputs

## Input Characteristics

- **Primary CT Current Rating** – this will be your max amperage that you will be inputting to the CT (Primary Side)
- **Secondary CT Current Rating\*** – this will be the amperage output of your CT – not to exceed 5A maximum (Secondary Side)
- **Shunt Current Rating** – this will be the maximum amperage that is specified by the shunt manufacturer.
- **Shunt Voltage Rating** - this will be the voltage output of your Shunt – not to exceed 500mV DC

The screenshot shows the 'Trumeter APM Configurator' window. The 'Analogue Input' tab is selected. Under 'Input Source', 'DC Current (Direct)' is selected. Under 'Input Characteristics', the following values are entered: Primary CT Current Rating: 5 Amps, Secondary CT Current Rating: 5 Amps, Shunt Current Rating: 100 Amps, Shunt Voltage Rating: 100 mV, and Shunt Resistance: 1 mR.

Input Source	Input Characteristics
<input type="radio"/> DC Voltage	Primary CT Current Rating: 5 Amps
<input checked="" type="radio"/> DC Current (Direct)	Secondary CT Current Rating: 5 Amps
<input type="radio"/> DC Current (Shunt)	Shunt Current Rating: 100 Amps
<input type="radio"/> DC Power (Direct)	Shunt Voltage Rating: 100 mV
<input type="radio"/> DC Power (Shunt)	Shunt Resistance: 1 mR
<input type="radio"/> AC Voltage	
<input type="radio"/> AC Current (CT)	
<input type="radio"/> AC Current (Shunt)	
<input type="radio"/> AC Active Power (CT) (W)	
<input type="radio"/> AC Active Power (Shunt) (W)	
<input type="radio"/> AC Reactive Power (CT) (VAr)	
<input type="radio"/> AC Reactive Power (Shunt) (VAr)	
<input type="radio"/> AC Apparent Power (CT) (VA)	
<input type="radio"/> AC Apparent Power (Shunt) (VA)	
<input type="radio"/> AC Power Factor (CT)	
<input type="radio"/> AC Power Factor (Shunt)	
<input type="radio"/> Frequency	

\*A CT with an output current rating greater than 5A can be used, but it must be derated for the input current to not exceed the 5A output current e.g., a 100:10A CT can only be used up to 50A on the input.

# APM-MAX ANALOGUE OUTPUT

## Enable Analogue Output

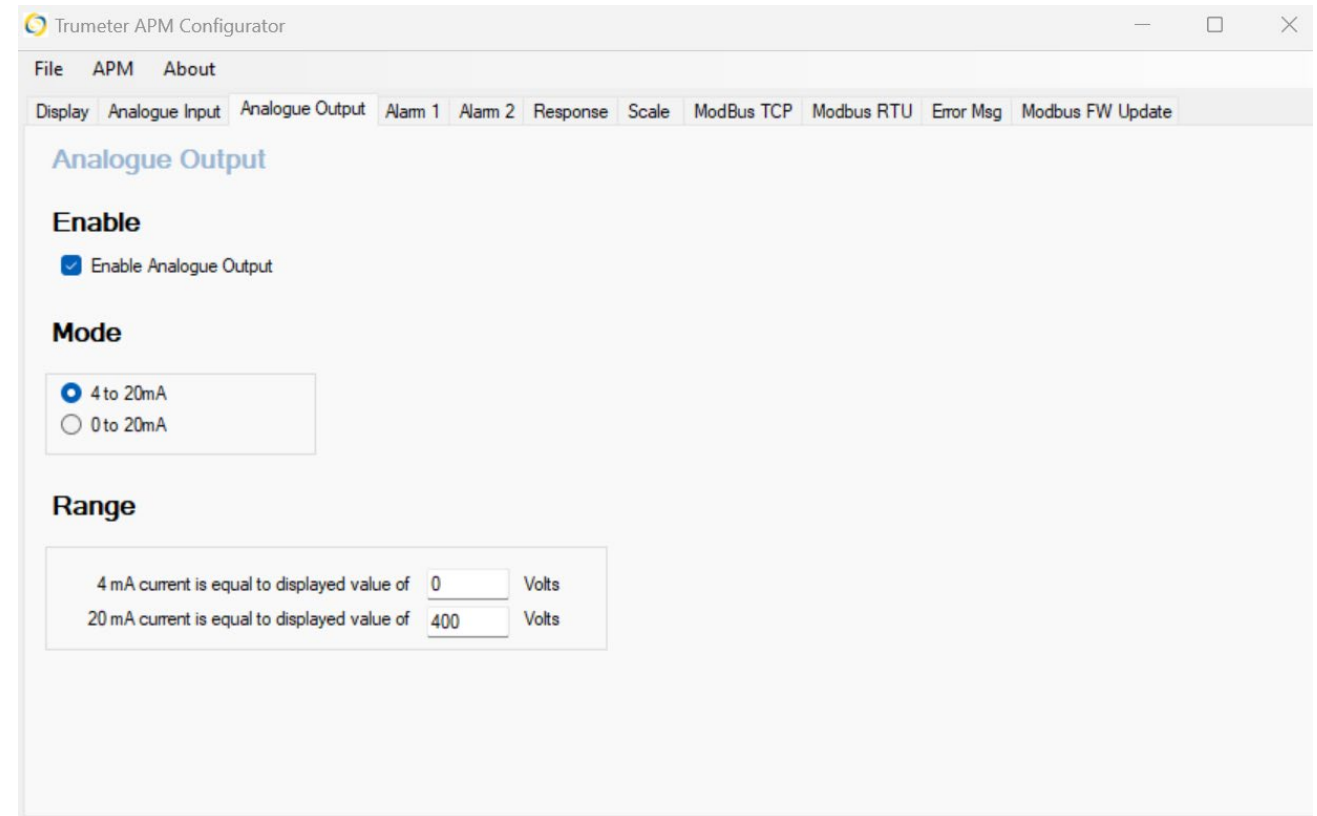
- Check this box to enable the Analogue Output

## Analogue Output

- The 4-20mA output is a current source that will deliver a current between 4mA and 20mA into a maximum resistance of 250 ohms.

## Analogue Range\*

- The Analogue Range is used to determine what the 4mA and 20mA output values will be. (i.e., 4mA set to 0 volts and 20mA set to 400 volts. The Analogue Output of 20 mA will show 400 volts if the input voltage is at 400 volts.)



The screenshot shows the 'Trumeter APM Configurator' window. The 'Analogue Output' tab is selected in the top navigation bar. Under the 'Analogue Output' section, the 'Enable' checkbox is checked. The 'Mode' section has two radio buttons: '4 to 20mA' (selected) and '0 to 20mA'. The 'Range' section contains two rows of input fields: '4 mA current is equal to displayed value of' with a value of '0' and 'Volts', and '20 mA current is equal to displayed value of' with a value of '400' and 'Volts'.

\*the 4-20mA output range can be used in reverse, such that as the input voltage increases, the current output decreases.  
e.g., 4mA set to 400 volts and 20mA set to 0 volts. An analog output of 4mA will show 400 volts if the input voltage is 400 volts.

# APM-MAX ALARMS SCREEN

## Enable

- Select the **Enable Alarm** box to setup the alarm

## Trigger

- Select **Condition** - use this section to setup the measurement values to trigger the Alarm.
  - Above the value in the Active box
  - Below the value in the Active box
  - Between the value in the Active box
  - Outside the value in the Active box
- Select **Values**
  - Hysteresis – allows for setting a percentage above or below a certain value
  - Defined – Set a range of values to trigger the alarm

## Actions

- Control the Digital Output
  - Switch from default setting (NO or NC).
- Edit the Alarm Message
  - This will be the message that shows on the display when the Alarm is active.
- Change the backlight of the display on an Alarm
  - Flash or Steady
  - Color
  - Red, Green, Blue, Yellow, Orange or White

The screenshot shows the 'Trumeter APM Configurator' window with the 'Alarm 1' tab selected. The interface is divided into three main sections: 'Enable', 'Trigger', and 'Actions'.

- Enable:** The 'Enable Alarm 1' checkbox is checked.
- Trigger:**
  - Condition:** 'Below' is selected with a radio button.
  - Values:** 'Use hysteresis' is selected. The 'Active Below' value is set to 400. The 'Hysteresis' slider is set to 1%.
- Actions:**
  - 'Switch Output 1' is checked, with 'Norm Open' selected.
  - 'Show Message' is checked, with the message 'WARN' displayed.
  - 'Change Backlight' is checked, with 'Steady' and 'Yellow' selected.

A note at the bottom states: 'NOTE For Backlight and Messages, Output 2 has priority over Output 1'.

# APM-MAX RESPONSE SCREEN

## Response

### 4 Digit

- This setting allows to slow down or speed up the refresh rate of the 4-digit readout on the display.

### Bar Graph

- This setting allows to slow down or speed up the refresh rate of the bar graph on the display.

### Alarm

- This setting allows to slow down or speed up the refresh rate of the displayed Alarm.

### Analogue Out

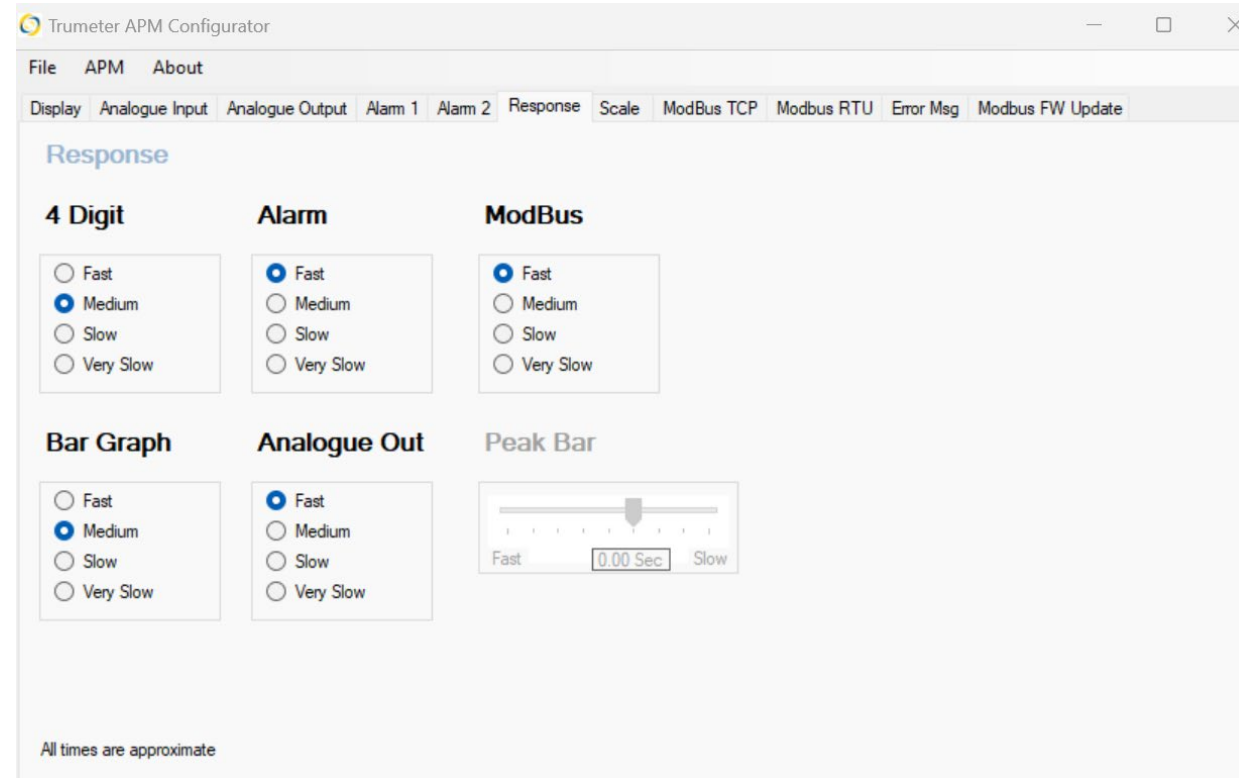
- This setting allows to slow down or speed up the Analogue out transmission rate.

### Modbus

- This setting allows to slow down or speed up the Analogue out transmission rate.

### Peak Bar

- This setting allows to slow down or speed up the refresh rate of the Peak Bar on the display. This feature is only active when Display Peak Bar box is checked on the Bar Graph screen.



# APM-MAX DIGITAL OUTPUT WIRING

## Output 1 & Output 2

### Digital Output

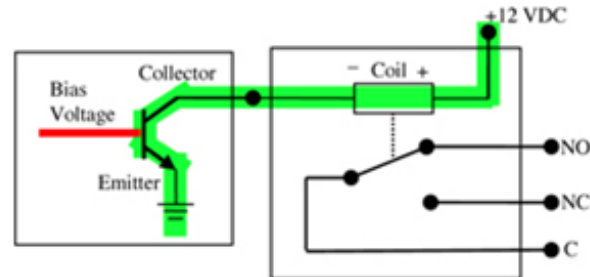
- Open Collector Transistor
- The maximum current that the APM-MAX can sink is 500mA. The APM-MAX can therefore be connected to a load of up to 12W. Please note that the maximum voltage that can be connected to the outputs is 24VDC.
- Can be used to control a relay or buzzer.
- You can select the digital output to be Normally Open (NO) or Normally Closed (NC).

### The APM SP1, and SP2 are NPN outputs.

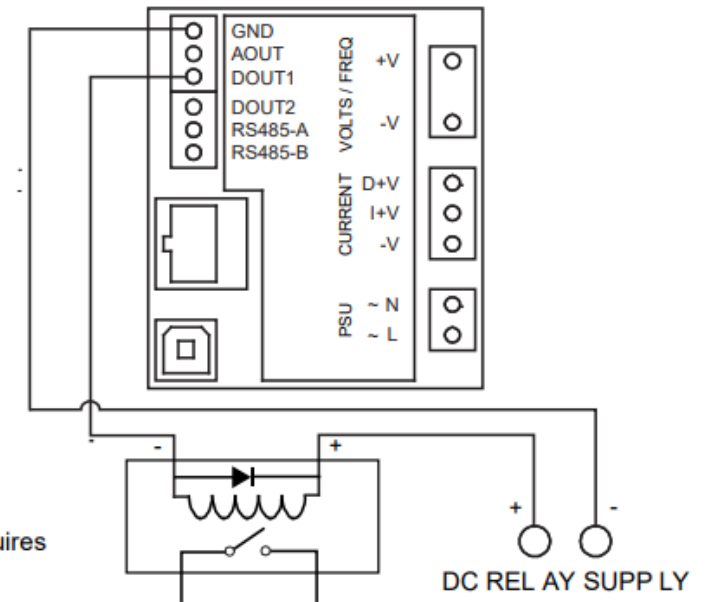
- Use a 12-24VDC external relay and wire the **plus** connection directly to the relay. The (-) of PSU (12-24VDC only) needs to go to the **common** terminal. This signal (ground) will come out on SP1 or SP2 to turn on the external relay.

### Standard Open Collector Output

- The external relay or buzzer must not draw more than 500mA from the supply.



### RELAY OUTPUT



NOTE: Relay requires protection diode



# APM-MAX SCALING SCREEN

## Scale

- In certain applications, you may want to apply a correction factor to the displayed value. As an example, if you want 1 volt of the input to equal 10 volts on the display then all you need to do is select Scale & Offset and enter 10 in the Scale box.

## Offset

- If you want the displayed value to be the input value plus 3 volts, then enter 3 in the Offset box. If your input is 4 volts and you add 3 in the Offset box, your display will show 7 volts.

## Scale and Offset

- If you set both a Scale and an Offset, then APM-MAX will apply the Offset first followed by the Scale. For example, applying a Scale of 0.01 and an Offset of 2 will result in the values to the right.
- In the example here, applying 20V to the meter the displayed value would be  $(20V + 2) \times 0.01 = 0.22V$ .



The screenshot shows the 'Trumeter APM Configurator' window with the 'Scale' tab selected. Under the 'Scale' section, the 'Scale & Offset' radio button is selected. Below this, a 'Scale & Offset' sub-section contains two input fields: 'Scale' with the value '1' and 'Offset' with the value '0'. The window also features a menu bar with 'File', 'APM', and 'About', and a tab bar with 'Display', 'Analogue Input', 'Analogue Output', 'Alarm 1', 'Alarm 2', 'Response', 'Scale', 'Modbus TCP', 'Modbus RTU', 'Error Msg', and 'Modbus FW Update'.

## Example

Input	Displayed Value
0	0.02
10	0.12
20	0.22
30	0.32
40	0.42
50	0.52

# APM-MAX MODBUS TCP/IP SCREEN

## Modbus Enable

- Enables the TCP/IP Ethernet option

## Modbus TCP

- DHCP – Enabled
  - Allows for the device to search for an available IP address within your LAN network.
- DHCP – Disabled
  - Allows for the user to set the Static IP Address and LAN information required for connection to their LAN network.

## Current Status

- When the APM-MAX is connected to a LAN network, this section will provide the user with the current status of the LAN network and the connections made.

More information on setting up the Modbus RS485 can be found at the following link.

<https://www.trumeter.com/wp-content/uploads/APM-MAX-Modbus-Communications.pdf>

The screenshot displays the 'AutomationDirect ADM200-CE Configurator' window. The 'ModBus TCP' tab is selected, showing the 'ModBus Enable' section with the 'Enabled' radio button selected. Below this, the 'ModBus TCP' section contains a 'DHCP Client' section with the 'Enabled' radio button selected, and a 'Static IP Address' section with fields for IP, Subnet Mask, Gateway, DNS 1, and DNS 2. The 'Current Status' section on the right shows the current status of the Modbus TCP connection, including MAC Address, IP Address, Subnet Mask, Gateway, DNS 1, DNS 2, Hostname, Interface Name, Modbus Port Address, Modbus Status, and Firmware.

Field	Value
MAC Adr	0 0 0 0 0 0
IP Adr	0 0 0 0
Subnet Mask	0 0 0 0
Gateway	0 0 0 0
DNS 1	0 0 0 0
DNS 2	0 0 0 0
Hostname	APM MAX
Interface Name	Trumeter Tech
Modbus Port Adr	0
Modbus Status	0
Firmware	

# APM-MAX MODBUS RTU SCREEN

## Slave ID

- This setting allows the user to setup the Modbus RS485 Slave ID number.

## Baud Rate

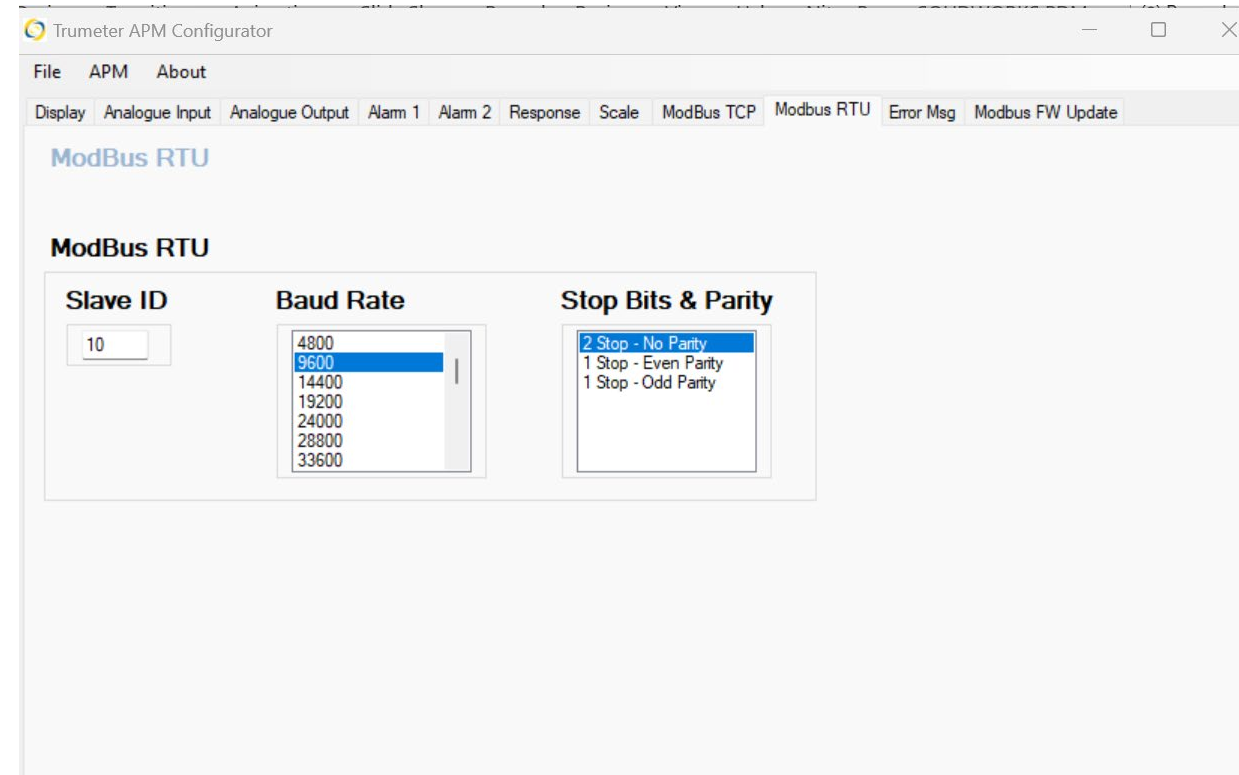
- This setting specifies the baud rate to be used when configuring the Modbus RS485.

## Stop Bits & Parity


- This setting allows the user to setup the Stop Bits and Parity setting of the Modbus RS485.

More information on setting up the Modbus RS485 can be found at the following link.

- <https://www.trumeter.com/wp-content/uploads/APM-MAX-Modbus-Communications.pdf>



# APM-MAX ERROR MESSAGE SCREEN

 Trumeter APM Configurator

FileAPMAbout

DisplayAnalogue InputAnalogue OutputAlarm 1Alarm 2ResponseScaleModBus TCPModbus RTUError MsgModbus FW Update

## Error Messages

### Max Digit Value Exceeded

This message is displayed when the value exceeds 9999. Default message is "OVER"

☐ Enable Message

INF

Edit

### Max Bar Value Exceeded

This message is displayed when the value exceeds the max bar value. No default message

☐ Enable Message

INF

Edit

### Linearization Exceeded

This message is displayed when the value exceeds the max bar value. No default message

☐ Enable Message

INF

Edit

### Min Digit Value Exceeded

This message is displayed when the value exceeds -9999. Default message is "UNDR"

☐ Enable Message

UNDR

Edit

### Min Bar Value Exceeded

This message is displayed when the value exceeds the min bar value. No default message

☐ Enable Message

UNDR

Edit

### Linearization Under

This message is displayed when the value exceeds the min bar value. No default message

☐ Enable Message

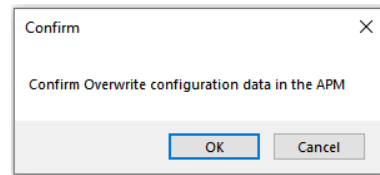
INF

Edit

# WRITE, READ, SAVE AND LOAD FACTORY DEFAULTS

## Write the Configuration to APM-MAX

- Once you are finished with your configuration settings, you must write the program to the APM-MAX.
  - Select **APM-MAX** and then **Write Configuration to APM-MAX**
  - You will receive a confirmation notice.
    - Select **OK**



## Read the Configuration of an Already Programmed APM-MAX

- Useful when you purchase the same type of APM-MAX, and you want the load the same configuration as your current APM-MAX.
  - Connect the current APM.
  - Select **APM-MAX** and then **Read Configuration from APM-MAX**
    - This will read the configuration of the APM-MAX that you have plugged in.
    - Connect the new meter and follow step 1 above.

## Open, Save and Load Factory Defaults (Image #2)

- The APM-MAX configurator allows for the saving and opening of your custom configuration files.
- Load Factory Defaults

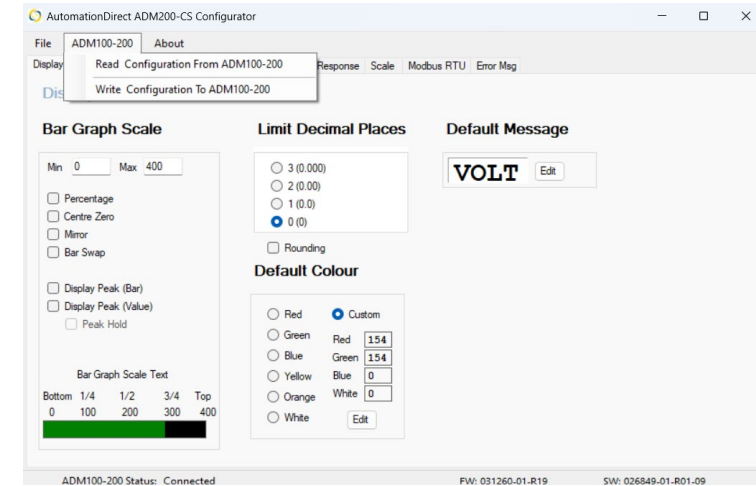


Image #1

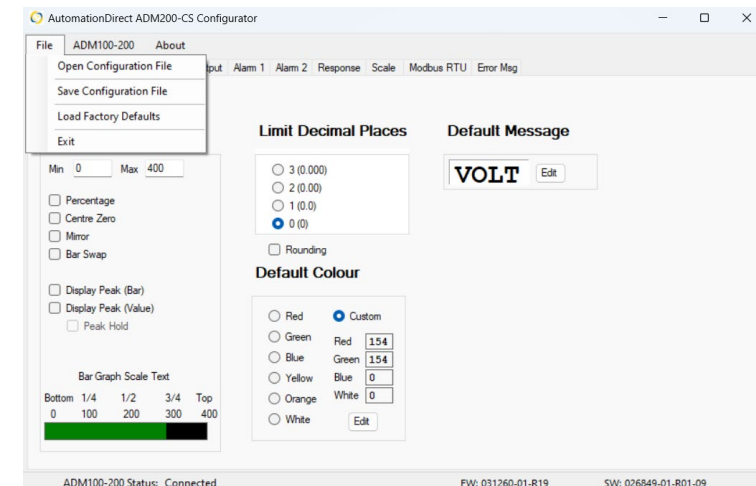


Image #2



Deerfield Beach, FL USA | Manchester, England | Penang, Malaysia