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Chipkin™ OPW® Gateway
USER MANUAL

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DOCUMENT REVISION HISTORY

REVISION	DATE	AUTHOR	NOTE
1	2018-Feb-13	ACF	- Created document

1. PREFACE

1.1 WELCOME

As a new owner of Chipkin Automation Systems'™ (CAS) Gateway you have joined thousands of satisfied customers who use Chipkin's protocol gateways, data clients and integration services to meet their building and industrial automation requirements. Our configuration expertise in this field combined with free BACnet and other tools ensure your success; and our customer support via phone, email and remote desktop tools means that we're there when you need us. Thank you for choosing Chipkin's products.

1.2 CHIPKIN

Chipkin offers expert solutions for your building and industrial automation requirements. We develop, configure, install and support gateways (protocol converters), data loggers, and remote monitor and controlling applications. Founded in October 2000, Chipkin provides expert solutions for converting BACnet®, Modbus®, and Lonworks®—to name just a few—and enabling interfaces for HVAC, fire, siren, intercom, lighting, transportation and fuel systems. The high-quality products we offer (including those from other vendors) interface with Simplex™, Notifier™, McQuay™, GE™ and many others—so you can rest assured that Chipkin will select the most appropriate solution for your application.

1.3 SAFETY WARNINGS

The CAS Gateway User Manual provides information on how to install and configure the gateway and is intended for engineers, project management consultants and building management services. Before you install the device, please observe the safety warnings described in in this manual.

1.4 PRODUCT SUMMARY

Chipkin's™ OPW® gateway is a protocol converter that can read data and alarms from OPW® ATG Consoles using the VeederRoot TLS protocol and serves the data as Modbus, BACnet or Web data. The gateway supports all these options simultaneously, use the data you want and ignore the other. The Gateway connects to the panel, reads data and stores it internally. When a remote system requests data, this data is served in a form that is appropriate to the protocol. If the connection to the panel is lost, or data cannot be read, the gateway can signal this to the remote data client.

1.5 CUSTOMER SUPPORT

Chipkin is a small responsive company, and we live or die by the quality of our service—and with offices in two time-zones—we can provide support when you need it. For information on sales, service, obtaining documentation or submitting a service request, please call us toll free at 1-866-383-1657. Thanks for choosing Chipkin's protocol gateways, data clients and integration services to meet your building and industrial automation requirements.

SALES AND CUSTOMER SUPPORT

TOLL FREE: 1-866-383-1657
FAX: 1-416-915-4024
Email: salesgroup1@chipkin.com

GENERAL

TOLL FREE: 1-866-383-1657
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2. OVERVIEW

2.1 SYSTEM OVERVIEW

The CAS 2700-40 OPW® Gateway is a protocol converter that converts data from one protocol and makes it available to devices that support a different protocol. The gateway typically sends polling messages, extracts any data values, and stores the values in an internal database. The data is then made available via other protocol specific formats.

For this device, the gateway polls for data using the VeederRoot® TLS protocol over serial or TCP/IP. The data is then served via Modbus (TCP or RTU), BACnet IP, or HTTP. All of these options are available simultaneously.

2.2 OPTIONAL EXPANSION MODULES

The CAS 2700-40 OPW® Gateway does not have any optional expansion modules.

2.3 INSTALLATION AND CONFIGURATION SUMMARY

For more information on how to install and setup the CAS 2700-40 OPW® Gateway please refer to the Getting Started with CAS Gateway.pdf document. For instructions on configuring this device, please refer to the Configuration and Settings Section of this document. Configuration of the device is completed primarily through a web interface.

2.4 DEVICE WIRING REQUIREMENTS

For more information on how to wire up the CAS 2700-40 OPW® Gateway, please refer to the Connections Section of this document. The Connections Section contains wiring pictures and diagrams as well as port pin-outs.

3. CONNECTIONS

3.1 NETWORK CONNECTIONS

This block diagram lists common network connections that can monitor from OPW® devices using BACnet IP, Modbus (TCP or RTU), and HTTP protocols.

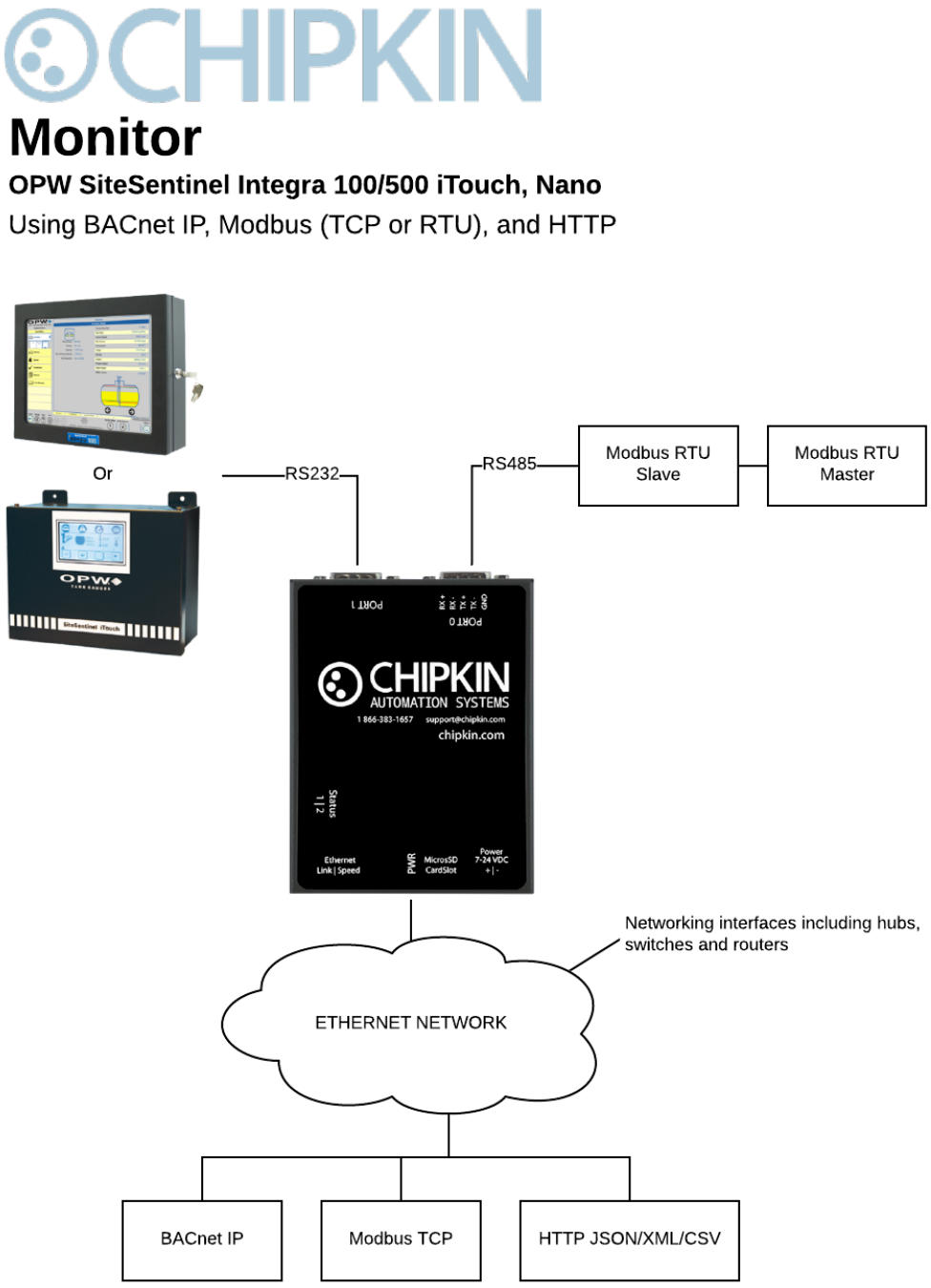


Figure 3.1-1 - Block Diagram

3.2 WIRING CONNECTIONS

The following sections describe the wiring connections used by the various ports of the CAS 2700-40 OPW® Gateway. This includes pictures and diagrams of provided cables and the pin-outs of the ports for the protocols that are used.

3.2.1 CABLES

VeederRoot RS232 Serial Patch Cable

The photographs in the figure below show the cable that is shipped with the gateway. If you would like to replace the Ethernet patch cable with a longer segment, use the pin-out information to assemble your own.

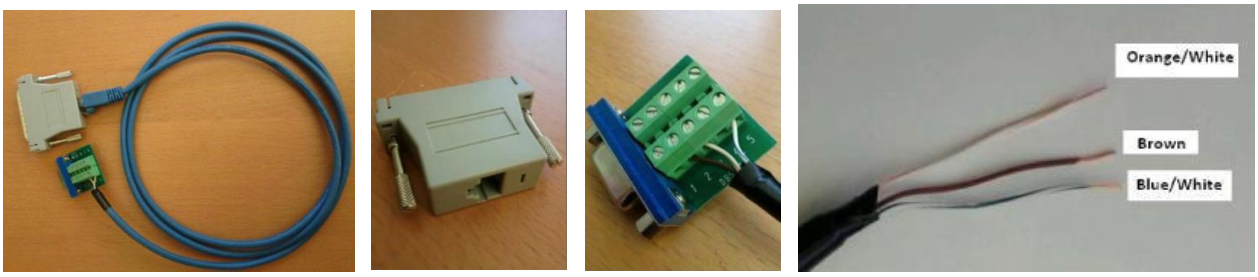


Figure 3.2-1 - Veeder Quick Assembly Cable for RS232

Modbus RTU RS485 Terminal Block

The following picture shows the connector needed if using Modbus RTU on RS485. See the following section for a description of the Pin-out

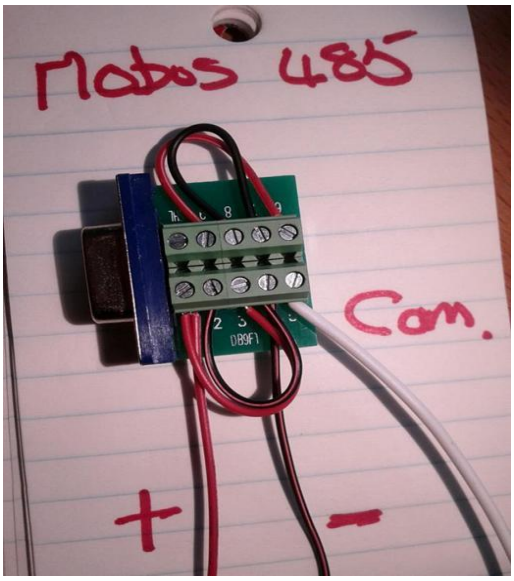


Figure 3.2-2 - Modbus RTU 485 Terminal Block

3.2.2 PIN-OUT

The CAS 2700-40 OPW® Gateway has two serial ports. This section describes the pin-out for using the port with a specific protocol.

Port 0 – RS485 – Modbus RTU

Pin-out for the DB9 Terminal Block for Modbus RTU communication – See Figure above (Figure 3.2-2) for a visual of what it should look like.

- Pin 1 jumped to Pin 3 => wire connected to Pin 1 connects to the positive terminal of the Modbus Device.
- Pin 2 jumped to Pin 4 => wire connected to Pin 4 connects to the negative terminal of the Modbus Device.
- Pin 5 connects to the ground or common terminal of the Modbus Device.
- Pin 6 jumped to Pin 9
- Pin 7 jumped to Pin 8.

Port 1 – RS232 – VeederRoot® Serial

The following shows the pin-out required for the VeederRoot serial communication.

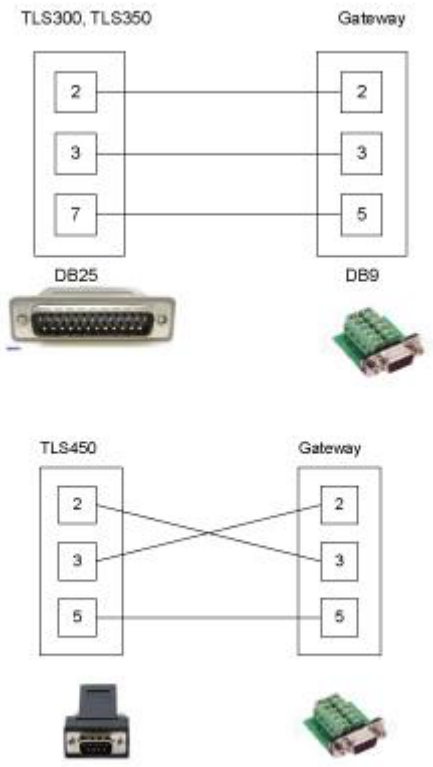


Figure 3.2-3 - RS232 Pin-out for Port 1 to the VeederRoot panel

Note: Some models of OPW panels use an RJ45 port for their serial communication. The pin-out for that would be:

RJ45 (OPW) --	DB9 (Port 1 on CAS Gateway)
4	2
5	3
3	5

4. CONFIGURATION AND SETTINGS

This section contains instructions and screenshots on how to configure this device. All configuration is handled via the web pages of the device.

The CAS 2700-40 OPW® Gateway uses a meta-configurer. This means that during the configuration process, the end points (BACnet IP Objects and Modbus Registers) are automatically generated. There are two ways for configuring the unit, standard and advanced. The Standard configuration is useful if the VeederRoot® panel has 10 or less Tanks and 10 or less Sensors. If there are more than 10 Tanks or Sensors, then you must use the Advanced Configuration.

There are also two protocols to choose from for VeederRoot® communication, Serial or TCP/IP. The configuration process for both is very similar and any differences will be described in the following sections.

The next sections contain the steps on how to do both configurations and screenshots of the web pages.

4.1 VeederRoot® Standard Configuration

As mentioned above, the Standard Configuration has a limit of configuring up to 10 Tanks and 10 Sensors. If the OPW® panel has more, then you must use the Advanced Configuration.

To access the Standard configuration webpage, open a web browser and type in the following:

- http://{ipAddress}/bin/veederrootserial/config/ for VeederRoot® Serial or
- http://{ipAddress}/bin/veederroottcp/config/ for VeederRoot® TCP/IP

where {ipAddress} is the IP Address of the CAS 2700-40 device.

Note: To determine the IP Address of the device, please refer to section 6.2 Discover Gateway's IP Address

The config web page contains a simple form to fill out to complete the configuration.

Veeder Root Configuration

BACnet Server

Port (?)	Device ID (?)
47808	389001

Modbus Slave

RTU Baud Rate (?)	Device ID (?)	TCP Port (?)
9600	1	502

Veeder Root Configuration

Baud Rate(?)	Data Bits(?)	Parity(?)	Stop Bits(?)
9600	8	None	1

VeederRoot Settings

Default Value (?)	0
Scan Interval (in seconds) (?)	10
Timeout Time (in seconds) (?)	3
Number of Retries after a Timeout (?)	3
Time between Retries (in seconds) (?)	1
Disconnect Time (in seconds) (?)	120
Units	Metric

Tank Configuration

#	Name(?)	Address(?)	Suffix(?)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Figure 4.1-1 - Standard Configuration

Sensor Configuration

#	Name(?)	Address(?)	Suffix(?)	Type(?)
1				Liquid Sensor
2				Liquid Sensor
3				Liquid Sensor
4				Liquid Sensor
5				Liquid Sensor
6				Liquid Sensor
7				Liquid Sensor
8				Liquid Sensor
9				Liquid Sensor
10				Liquid Sensor

Vacuum Sensor Configuration

#	Name(?)	Address(?)	Suffix(?)
1			
2			

Relay Configuration

#	Name	Address
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Tank Deliveries

Tank Deliveries

System Configuration

System Alarms

Save Configuration

Figure 4.1-2 - Standard Configuration continued

The images above are for the Standard VeederRoot® Serial configuration.
Here is a breakdown of each of the individual configuration sections:

4.1.1 BACnet Server Configuration

Figure 4.1-3 - BACnet Server configuration

This section is for specifying the settings for the BACnet IP server device.

- **Port –** This is the BACnet IP Port that the gateway will use as a BACnet IP Server device. The default is 47808.
- **Device ID –** This is the BACnet Device ID that will be assigned to the gateway. This must be unique throughout the entire BACnet network on site. The default is 389001.

4.1.2 Modbus Slave Configuration

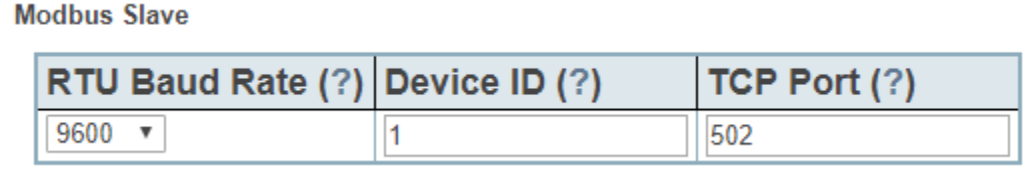


Figure 4.1-4 - Modbus Slave configuration

This section is for configuring the settings for the Modbus slave device.

- **RTU Baud Rate –** The baud rate for the Modbus RTU RS485 serial connection. The default is 9600. The other serial connection parameters are pre-defined as 8 data bits, no parity, and 1 stop bit.
- **Device ID –** This is the Modbus Slave ID that will be assigned to the gateway.
- **TCP Port –** This is the Modbus TCP port that the gateway will use as a Modbus TCP Slave device. The default is 502.

4.1.3 Veeder Root Configuration

Depending on whether you are configuration for VeederRoot® serial or TCP, the fields in this section may differ.

For VeederRoot® serial

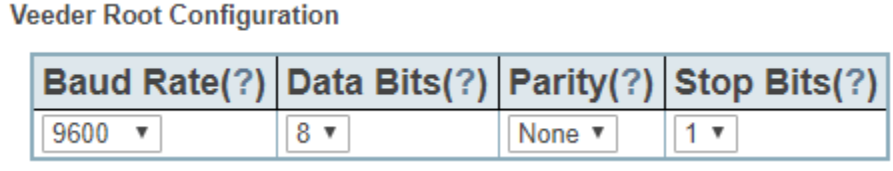


Figure 4.1-5 - VeederRoot serial configuration

- **Baud Rate –** The baud rate for the VeederRoot® RS232 serial communication. The default is 9600.
- **Data Bits –** The data bits for the VeederRoot® RS232 serial communication. The default is 8.
- **Parity –** The parity for the VeederRoot® RS232 serial communication. The default is none.
- **Stop Bits –** The stop bits for the VeederRoot® RS232 serial communication. The default is 1.

Note: For newly installed VeederRoot® Serial communication cards whose communication settings have not been changed on the VeederRoot® panel, use 1200, 7, Odd, 1.

Or VeederRoot® TCP/IP

Veeder Root Configuration

IP Address	Port

Figure 4.1-6 - VeederRoot TCP/IP configuration

- **IP Address** – The IP Address of the VeederRoot® TLS Panel.
- **Port** – The port for using the Veeder® TLS Protocol. It usually is 10001, and sometimes 3001 or 8001.

4.1.4 VeederRoot Settings

The following section contains settings used by the gateway when executing VeederRoot tasks to read data.

VeederRoot Settings

Default Value (?)	0
Scan Interval (in seconds) (?)	10
Timeout Time (in seconds) (?)	3
Number of Retries after a Timeout (?)	3
Time between Retries (in seconds) (?)	1
Disconnect Time (in seconds) (?)	120
Units	Metric

Figure 4.1-7 - VeederRoot Settings

- **Default Value –** Specifies the default value for all data points in the system. This is also used for when the gateway determines that the VeederRoot® panel has gone offline, all data in the database will be set to this value as a way of showing that the unit has been disconnected.
- **Scan Interval –** How many seconds to poll for data. The default is 10 seconds.
- **Timeout Time –** How many seconds to wait after a message has been sent to the panel before timing out. The default is 3 seconds.

- **Number of Retries after a Timeout –** How many times to attempt to retry sending the message. The default is 3.
- **Time between Retries –** How many seconds to wait between retries. The default is 1 second.
- **Disconnect Time –** How many seconds after a timed-out message to determine if the VeederRoot® panel is offline. The default is 120 seconds.
- **Units –** Specify either US or Metric.

The Disconnect Time and Default Value logic works as follows: once a message times out, the disconnect timer starts (by default 120 seconds). If the disconnect timer expires, then the system is flagged that the VeederRoot® panel has been disconnected and all values in the database are set to the Default Value.

4.1.5 Tank Configuration

Tank Configuration

#	Name(?)	Address(?)	Suffix(?)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Figure 4.1-8 - Standard Tank Configuration

In this part of the form, you can configure up to 10 tanks. As mentioned above, if the VeederRoot® panel contains more then you must use the Advanced Configuration.

- **Name –** The tank's name, this field is only used internally in the gateway.
- **Address –** The tank's address in the VeederRoot® panel. If the Tank has address 1-9, you must type 01 – 09 as addresses are 2 digits.
- **Suffix –** This is the name that gets appended to the BACnet data point. This usually is the same as the Name column entry.

4.1.6 Sensor Configuration

Sensor Configuration

#	Name(?)	Address(?)	Suffix(?)	Type(?)
1				Liquid Sensor
2				Liquid Sensor
3				Liquid Sensor
4				Liquid Sensor
5				Liquid Sensor
6				Liquid Sensor
7				Liquid Sensor
8				Liquid Sensor
9				Liquid Sensor
10				Liquid Sensor

Figure 4.1-9 - Sensor Configuration

In this part of the form, you can configure up to 10 sensors. As mentioned above, if the VeederRoot® panel contains more then you must use the Advanced Configuration.

- **Name –** The sensor's name, this field is only used internally in the gateway.
- **Address –** The sensor's address in the VeederRoot® panel. If the Sensor has address 1-9, you must type 01 – 09 as addresses are 2 digits.
- **Suffix –** This is the name that gets appended to the BACnet data point. This usually is the same as the Name column entry.
- **Type –** The type of sensor. The default is Liquid Sensor

4.1.7 Vacuum Sensor Configuration

Vacuum Sensor Configuration

#	Name(?)	Address(?)	Suffix(?)
1			
2			

Figure 4.1-10 - Vacuum Sensor configuration

In this part of the form, you can configure up to 2 vacuum sensors. As mentioned above, if the VeederRoot® panel contains more then you must use the Advanced Configuration.

- **Name –** The sensor's name, this field is only used internally in the gateway.
- **Address –** The sensor's address in the VeederRoot® panel. Addresses are 2 digits as above.
- **Suffix –** This is the name that gets appended to the BACnet data point. This usually is the same as the Name column entry.

4.1.8 Relay Configuration

Relay Configuration

#	Name	Address
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Figure 4.1-11 - Relay configuration

In this part of the form, you can configure up to 10 relays. As mentioned above, if the VeederRoot® panel contains more then you must use the Advanced Configuration.

- **Name –** The relay's name.
- **Address –** The relay's address in the VeederRoot® panel. Addresses are 2 digits as above.

4.1.9 Other Options

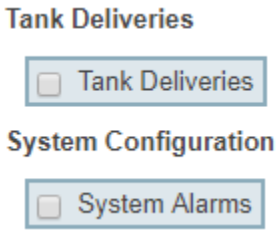


Figure 4.1-12 - Other Options

Finally, there are two other options.

- Tank Deliveries – enables all tank delivery data points for the tanks. The gateway polls and stores the 3 most recent tank deliveries.
- System Alarms – enables VeederRoot® panel system alarm and errors data points.

4.1.10 Saving the Configuration

Click on the "Save Configuration" Button once you have filled out the form.

If successful, you will see the following message:

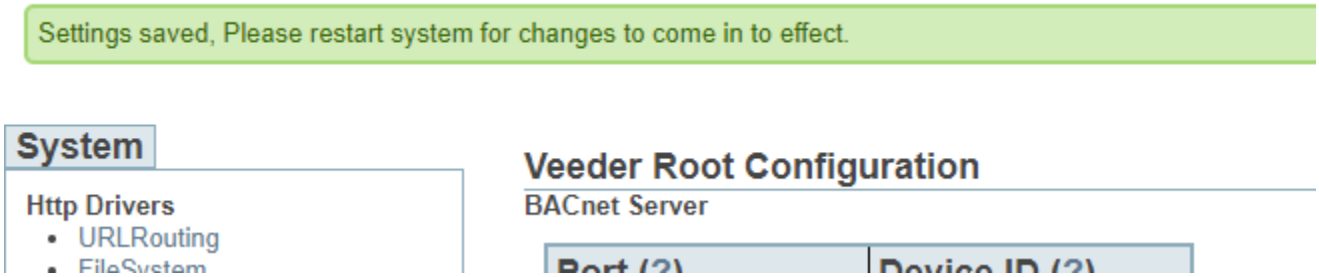


Figure 4.1-13 - Save Configuration Success

Please refer to Section 4.3 Rebooting the Gateway for next steps.

4.2 VeederRoot® Advanced Configuration

To access the Advanced configuration webpage, open a web browser and type in the following:

- http://{ipAddress}/bin/veederrootserial/config/advanced for VeederRoot® Serial or
- http://{ipAddress}/bin/veederroottcp/config/advanced for VeederRoot® TCP/IP

where {ipAddress} is the IP Address of the CAS 2700-40 device.

Note: To determine the IP Address of the device, please refer to section 6.2 Discover Gateway's IP Address

Example of the Advanced Configuration form:

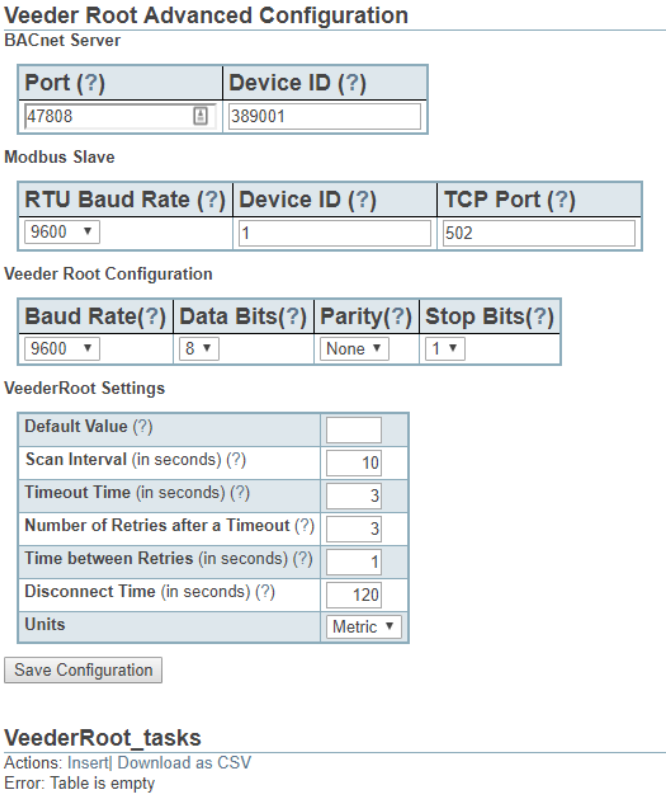


Figure 4.2-1 - Advanced Configuration

4.2.1 BACnet, Modbus, and VeederRoot® Configuration

As can be seen in Figure4.2-1 the BACnet Server, Modbus Slave, Veeder Root Configuration and VeederRoot Settings options are the same as the Standard Configuration. For more information on those sections, please review:

- 4.1.1 – BACnet Server Configuration
- 4.1.2 – Modbus Slave Configuration
- 4.1.3 – Veeder Root Configuration
- 4.1.4 – VeederRoot Settings

4.2.2 Tank Configuration

To configure a Tank, first click on the "Insert" link as seen below:

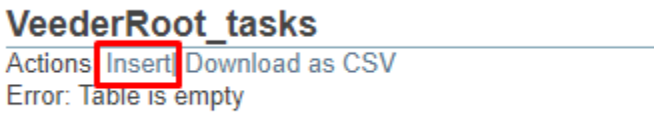


Figure 4.2-2 - Insert Advanced Configuration

Then in the "Choose a device type", select Tank. You will see the following form:

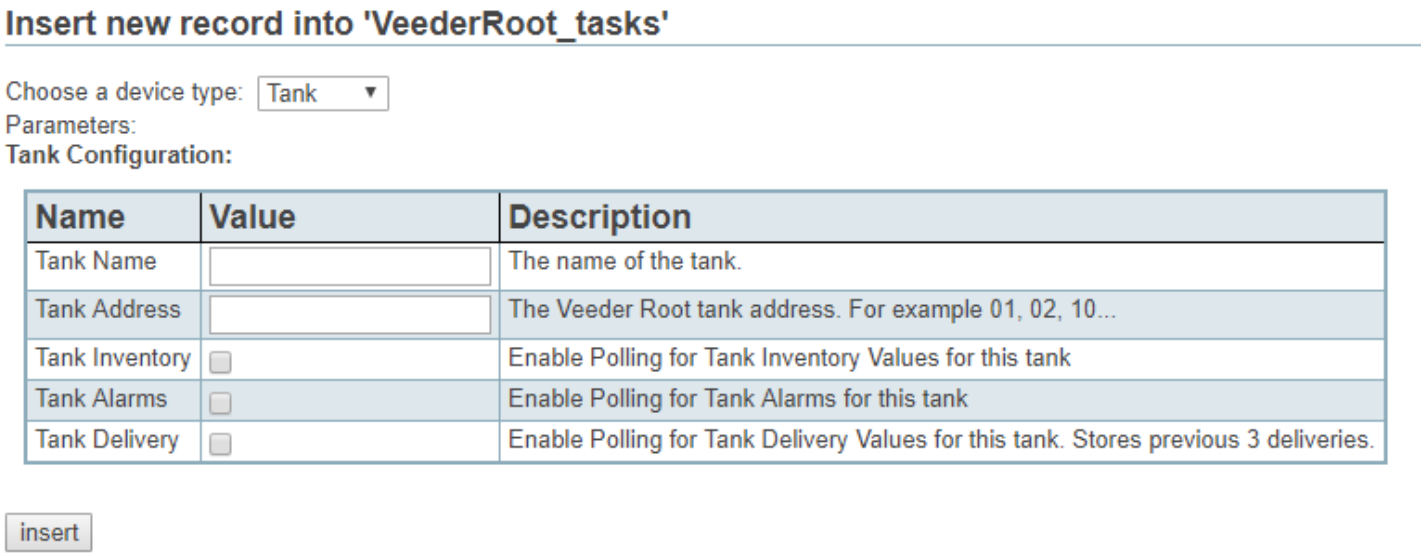


Figure 4.2-3 - Tank Advanced Configuration

Fill out the form with the Tank Name, Tank Address, and check which data points to poll for.

Finally Click the "insert" button to add the tank to the configuration.

If the tank was added successfully, you will see the following:

Success, Record #3 has been added

VeederRoot_tasks

Actions: Insert| Download as CSV

Displaying 30 records from 0-3 of a total 3

action	id	alarm_type	data_length	data_offset	data_table	device_id	message_command	name	scan	sensor_number	type
Edit | Delete	1		1	0	da_data	1	i10100	Alarms	10		read
Edit | Delete	2		9	1	da_data	1	i20101	Tank01_Inventory	10		read
Edit | Delete	3	tank	32	10	da_data	1		Tank01_Alarms	1	01	passive

Figure 4.2-4 - Tank added successfully

Repeat this process to add additional tanks.

4.2.3 Sensor Configuration

To add a sensor, click the “Insert” link and select Sensor in the “Choose a device type” and you will see the following form:

Insert new record into 'VeederRoot_tasks'

Choose a device type: Sensor

Parameters:

Sensor Configuration:

Name	Value	Description
Sensor Name		The name of the sensor.
Sensor Address		The Veeder Root sensor address. For example 01, 02, 10... If System Alarms, set address to 00.
Sensor Type	Liquid Sensor	The type of sensor.

insert

Figure 4.2-5 - Sensor Advanced Configuration

Fill out the Sensor Name and Sensor Address and select the type of sensor, then click the “insert” button.

4.2.4 Vacuum Sensor Configuration

To add a vacuum sensor, click the “Insert” link and select Vacuum in the “Choose a device type” and you will see the following form:

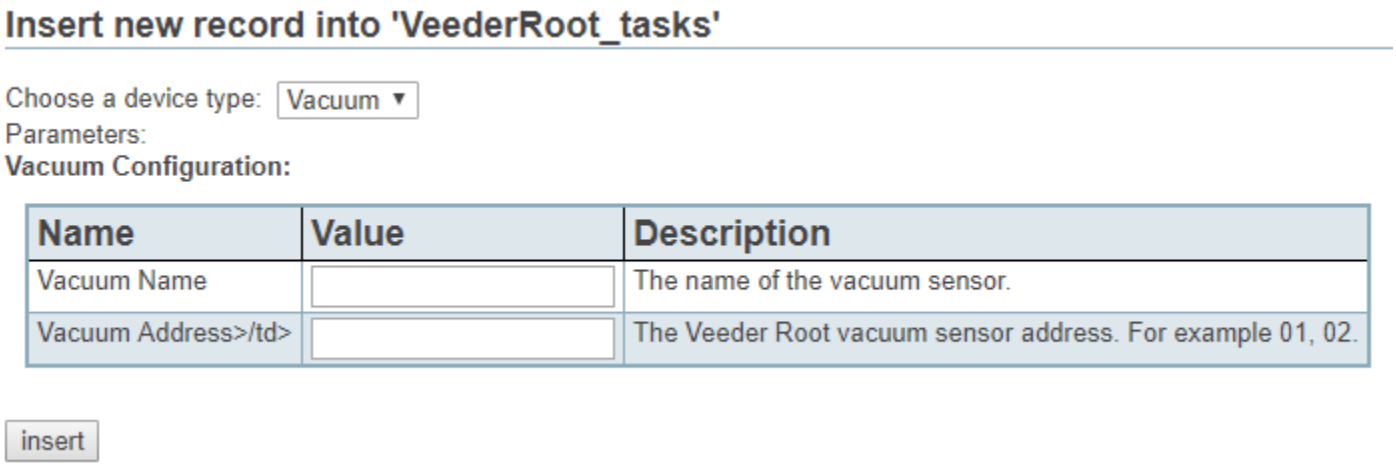


Figure 4.2-6 - Vacuum Sensor Advanced Configuration

Fill out the Vacuum Name and Vacuum Address and click the “insert” button.

4.2.5 Relay Configuration

To add a relay, click the “Insert” link and select Relay in the “Choose a device type” and you will see the following form:

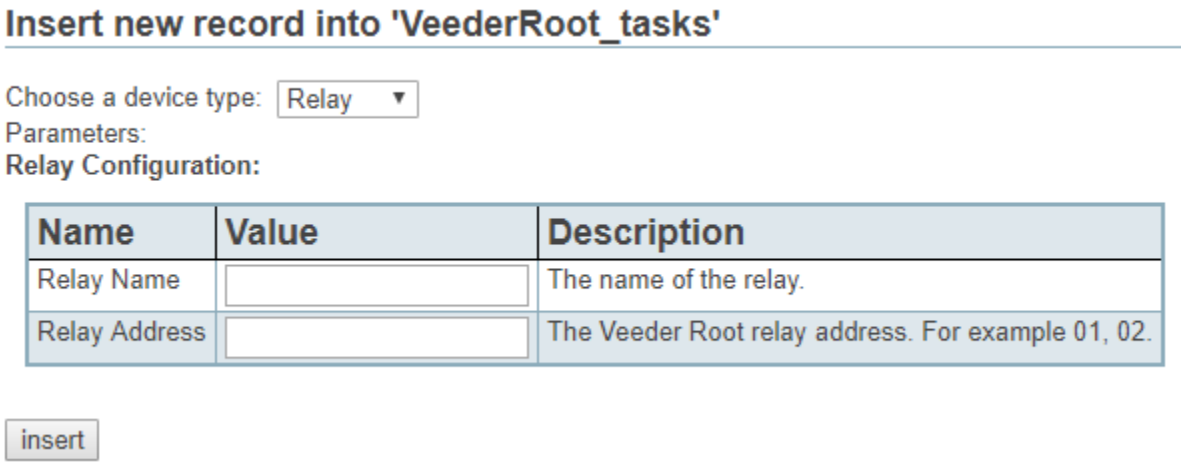


Figure 4.2-7 - Relay Advanced Configuration

4.3 Interpreting the Setup Report

Typically to complete an OPW configuration, a setup report needs to be printed from the OPW panel.

The setup report contains the communication port settings and the list of tanks, sensors, and relays that are installed on the panel. The following images are examples of setup reports and how to interpret them to configure the gateway. The example below is from a VeederRoot TLS 350 panel.

4.3.1 System Units

One of the first sections is the System Setup. In this section of the report, we can determine the units.

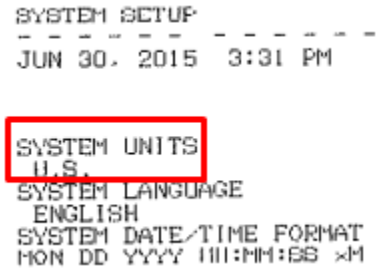


Figure 4.3-1 - Setup Report – TLS 300/350 – System Units

The units are configured as part of the VeederRoot Settings.

4.3.2 Communications Setup

The Communications Setup contains information about the comm ports installed on the VeederRoot panel. For VeederRoot serial, look for a RS232 COMM Board. For VeederRoot TCP/IP, look for a Ethernet COMM Board.

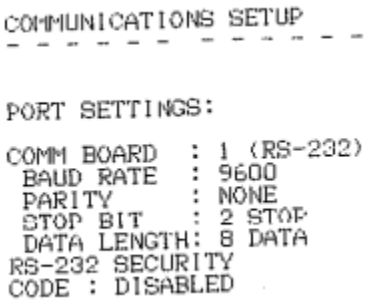


Figure 4.3-2 - Setup Report – TLS 300/350 – Communication Setup

The communication settings are configured in the Veeder Root Configuration section.

4.3.3 In-Tank Setup

The In-Tank Setup section of the report contains all the information we need to configure the tanks. See image below for an example:

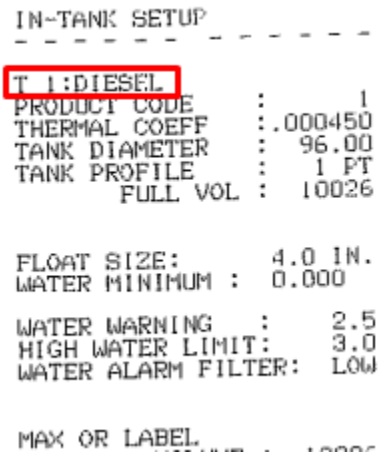


Figure 4.3-3 - Setup Report – TLS 300/350 – Tank Setup

The highlighted section read T1: Diesel. The T1 is the Tank Number. When we configure the tank either using the Tank Standard Configuration or Tank Advanced Configuration, we would specify the Tank address as 01. Diesel is the name of the tank, so we could configure it to have a name of Tank01_Diesel in our system. Continue this for each tank listed in the report.

4.3.4 Sensor Setup

There may be multiple Sensor Setup sections in the report if the VeederRoot panel contains multiple sensor types. The most common is Liquid Sensor. Here is an example of a Liquid Sensor Setup:

Figure 4.3-4 - Setup Report – TLS 300/350 – Liquid Sensor Setup

Like the Tank Setup, each sensor has a letter and number specification. In the example above, L1: Tank 1 Interstitial. When configuring the sensor using the Sensor Standard Configuration or Sensor Advanced Configuration, we would specify the address as 01, the type as Liquid Sensor, and the name / suffix as L01_Tank1_Interstitial.

Other sensor types will have separate sections in the setup report. Here are some examples of letter specifications for other sensors:

- L – Liquid Sensor
- V – Vapor Sensor
- G – Ground-water Sensor
- C – Type-A Sensor
- H – Type-B Sensor

4.3.5 Relay Setup

Finally, there is a Relay Setup section in the report. Here is an example of the Relay Setup:

```
OUTPUT RELAY SETUP
- - - - - - -  - - - - - - -

R 1:LOW LEVEL TANK 1
TYPE:
  STANDARD
NORMALLY CLOSED


IN-TANK ALARMS
 T 1:LOW PRODUCT ALARM

R 2:LOW LEVEL TANK 2
TYPE:
```

Figure 4.3-5 - Setup Report – TLS 300/350 – Relay Setup

Like the Tank Setup, each relay has a letter and number specification. In the example above, R1: Low Level Tank 1. When configuring the relay using the Relay Standard Configuration or Relay Advanced Configuration, we would specify the address as 01 and the name as R01_Low_Level_Tank_1.

4.4 Completing the Configuration

Once the configuration process has finished, either using the Standard or Advanced configuration, you will need to reboot the system for the new configuration to take effect.

First, return to the main system page by typing in the follow URL into a web browser:

- http://{ipAddress}/bin/system/ where {ipAddress} is the IP Address of the gateway.

From this page, under the System actions, first click the “Save Database” link to save all changes.

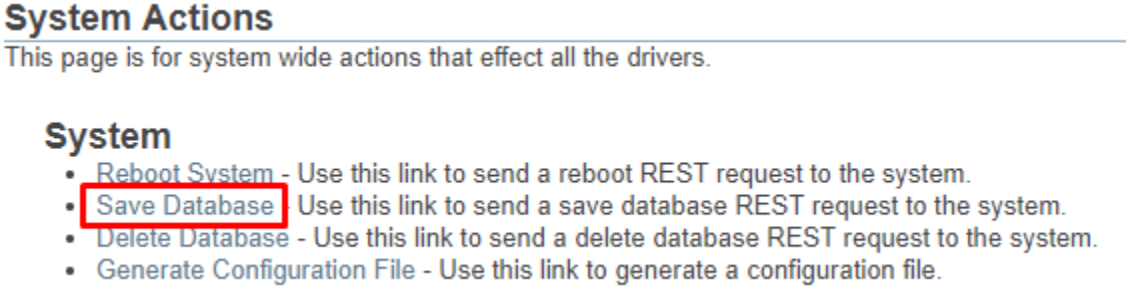


Figure 4.4-1 - Save Database Link

Click “Ok” when prompted and you will see the following XML, check that the response status is OK.

```
▼<HttpXML rest_version="0.20" version="0.09">
  ▼<query>
    ▼<Accept>
       text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/apng,*/*;q=0.8
     </Accept>
     <Accept-Encoding>gzip, deflate</Accept-Encoding>
     <Accept-Language>en-US,en;q=0.9</Accept-Language>
     <Connection>keep-alive</Connection>
     <Host>192.168.1.202</Host>
     <Referer>http://192.168.1.202/bin/system/</Referer>
     <Upgrade-Insecure-Requests>1</Upgrade-Insecure-Requests>
    ▼<User-Agent>
       Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/63.0.3239.132 Safari/537.36
     </User-Agent>
     <act>set</act>
     <query_string>act=set&save=1</query_string>
     <save>1</save>
     <uri>bin/xml/</uri>
   </query>
  ▼<response status="OK" count="1">
     <save>OK</save>
   </response>
 </HttpXML>
```


Figure 4.4-2 - Save Database Successful

Click the back button in your web browser and then click the “Reboot System” link:

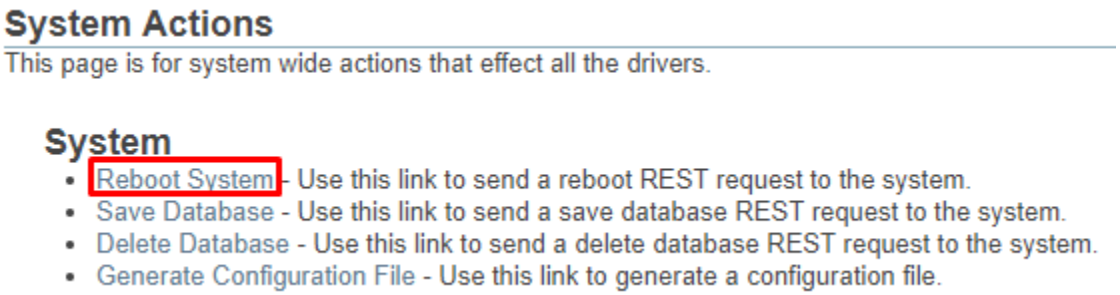


Figure 4.4-3 - Reboot System Link

Click “Ok” when prompted and you will see the following screen with a timer counting up:

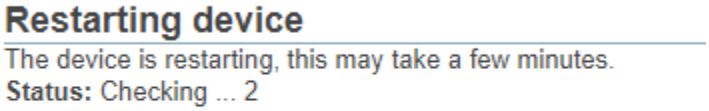


Figure 4.4-4 - Reboot System Count

The system page will refresh once the device has been properly rebooted.

4.5 Resetting the Gateway or Deleting the Configuration

Sometimes you want to delete the entire configuration and begin again. To do this, return to the system page as described in the Completing the Configuration section above. Then click on the "Delete Database" Link:

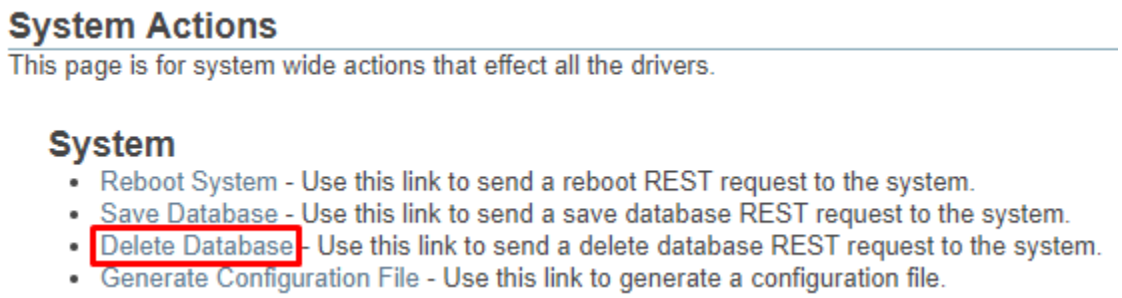


Figure 4.5-1 - Delete Database Link

Click "Ok" when prompted and verify that the result XML has a response status of OK:

Figure 4.5-2 - Delete Database Successful

Click the back button in the web browser and then follow the instructions in the Completing the Configuration section.

4.6 Exporting the Configuration

To save a copy of the configuration, return to the system page as described in the Completing the Configuration section above. Then click on the "Generate Configuration File" Link:

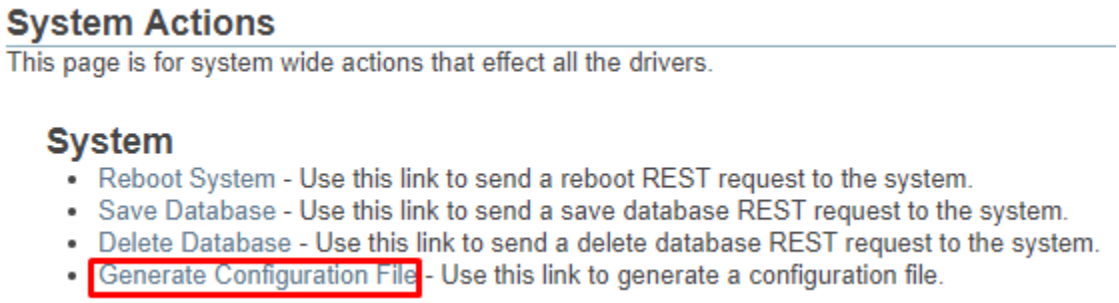


Figure 4.6-1 - Generate Configuration File Link

After a while, a link to "Export Configuration" will appear. Click on the link to download the config.csv file which is the configuration of the gateway.

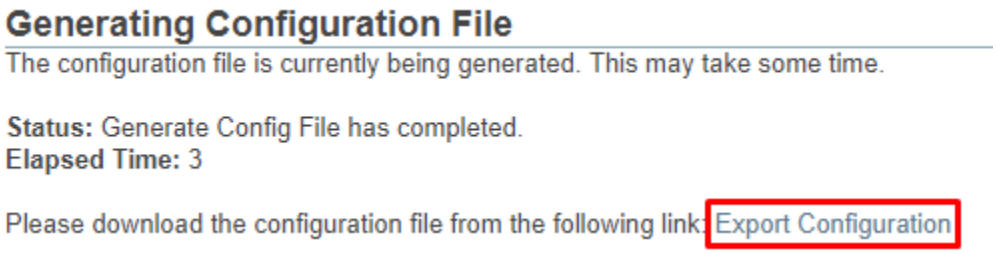


Figure 4.6-2 - Export Configuration

4.7 Importing the Configuration

Sometimes Chipkin will send you a configuration file to load onto the Gateway, or you would like to load an older configuration file that you may have saved. To do this, return to the system page as described in the Completing the Configuration section above.

Then find the section titled "Import Configuration":

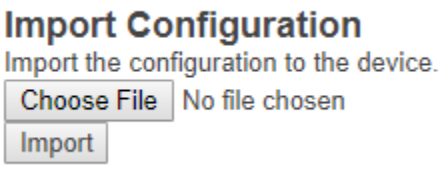


Figure 4.7-1 - Import Configuration

Click the "Choose File" button to open a file browser. Browse to the csv configuration file you wish to import and Click "Open".

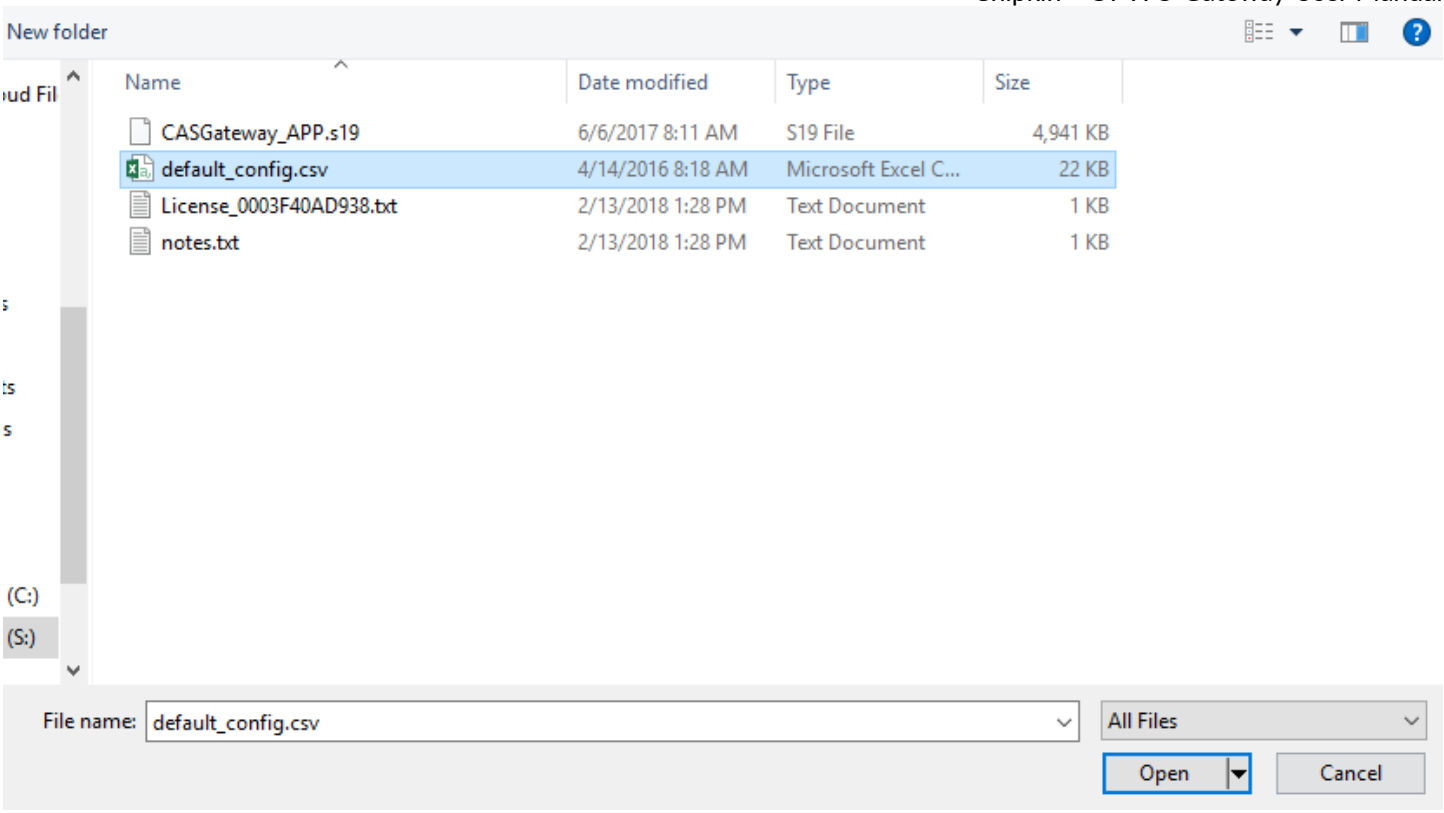


Figure 4.7-2 - Import File Browser

The file should now be displayed next to the “Choose File” button.

Figure 4.7-3 - Configuration File Ready for Import

Finally, click the “Import” Button. The file will be parse and the output will be displayed. Here is an example of the output:

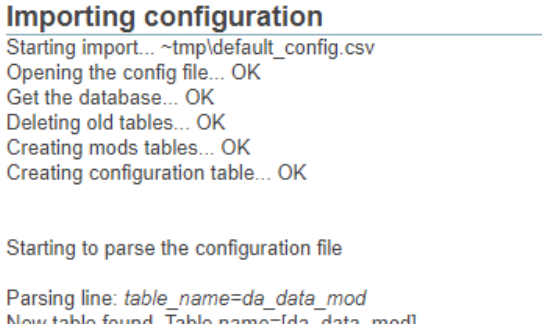


Figure 4.7-4 - Importing the Configuration File

Scroll to the bottom of the page to see the if the Import was successful. You should see the following:

Figure 4.7-5 - Import Successful

After this, return to the system page and follow the instruction in the Completing the Configuration section to finish and apply the new configuration.

5. READING DATA AND TEST PROCEDURE

This section contains information on how to view the OPW data.

Important Note: These next sections display sample data using a default configuration. The Modbus Map and BACnet objects are generated during the configuration process, so they will change and will be different than what is described here.

5.1 READING DATA USING HTML / WEB Browser

To view the data on the device's webpage, enter the following URL into a web browser: http://{ipaddress}/bin/veederrootserial/reports where {ipAddress} is the IP Address of the gateway.

The link will open a web page containing a table of the stored values as well as the Modbus Register and BACnet IP object and units associated with that data point. See the image below for an example of the data.

VeederRoot mapping and current status

Viewing 164 records

VeederRoot	BACnet IP	Modbus	Value	Units
Tank01_tank_product_code	analog_input (1)	40001	0	no_units
Tank01_tank_tank_status	analog_input (2)	40002	0	no_units
Tank01_tank_volume	analog_input (3)	40003	0	us_gallons
Tank01_tank_tc_volume	analog_input (4)	40004	0	us_gallons
Tank01_tank_ullage	analog_input (5)	40005	0	us_gallons
Tank01_tank_height	analog_input (6)	40006	0	inches
Tank01_tank_water	analog_input (7)	40007	0	inches
Tank01_tank_temperature	analog_input (8)	40008	0	degrees_Fahrenheit
Tank01_tank_water_volume	analog_input (9)	40009	0	us_gallons
Tank02_tank_product_code	analog_input (101)	40101	0	no_units
Tank02_tank_tank_status	analog_input (102)	40102	0	no_units
Tank02_tank_volume	analog_input (103)	40103	0	us_gallons
Tank02_tank_tc_volume	analog_input (104)	40104	0	us_gallons

Figure 5.1-1 - Example Reports Page

5.2 READING MODBUS DATA

You can access Modbus register data from the gateway by using a Modbus RTU or TCP client. To find out what registers exist on the device, please refer to the Modbus Register Map. For some guides on Modbus, please refer to the following links:

- Modbus For Field Technicians
- Modbus FAQ

- What is Modbus?
- Testing Modbus Communication

5.2.1 Interpreting Modbus Data

Modbus does not have a mechanism for reporting the validity of data. If the gateway loses its connection to the Veeder-Root device (or a data point cannot be read), it will disregard previous data as unreliable.

Unreliable data will be tagged with the value 65535 (-1, configurable) in the registers.

Some values have been encoded as IEEE754 format floating point numbers. These values use 2x16-bit registers and are clearly identified in the Modbus map. Since Modbus does not support floating point numbers, all values are served as whole numbers.

5.2.2 Modbus Functions Supported (RTU and TCP)

This device supports the following functions:

- 01 (0x01) Read Coils
- 02 (0x02) Read Discrete Inputs
- 03 (0x03) Read Holding Registers
- 04 (0x04) Read Input Registers

Most masters should be configured to use function 3, read holding registers.

5.2.3 Modbus Register Map

The sections contain an example of the Modbus Register Map for this gateway.

Important Note: As mentioned above, this map is based on sample data using a default configuration. The Modbus Map is generated during the configuration process, so it will change and will be different than what is described here. You can view the current Modbus Map by reviewing the Reports page. Follow the instructions found in Section 5.1.

VeederRoot	Modbus	# of Registers	Units
Tank01_tank_product_code	40001	1	no_units
Tank01_tank_tank_status	40002	1	no_units
Tank01_tank_volume	40003	1	us_gallons
Tank01_tank_tc_volume	40004	1	us_gallons
Tank01_tank_ullage	40005	1	us_gallons
Tank01_tank_height	40006	1	inches
Tank01_tank_water	40007	1	inches
Tank01_tank_temperature	40008	1	degrees_Fahrenheit

Tank01_tank_water_volume	40009	1	us_gallons
Tank02_tank_product_code	40101	1	no_units
Tank02_tank_tank_status	40102	1	no_units
Tank02_tank_volume	40103	1	us_gallons
Tank02_tank_tc_volume	40104	1	us_gallons
Tank02_tank_ullage	40105	1	us_gallons
Tank02_tank_height	40106	1	inches
Tank02_tank_water	40107	1	inches
Tank02_tank_temperature	40108	1	degrees_Fahrenheit
Tank02_tank_water_volume	40109	1	us_gallons
Tank03_tank_product_code	40201	1	no_units
Tank03_tank_tank_status	40202	1	no_units
Tank03_tank_volume	40203	1	us_gallons
Tank03_tank_tc_volume	40204	1	us_gallons
Tank03_tank_ullage	40205	1	us_gallons
Tank03_tank_height	40206	1	inches
Tank03_tank_water	40207	1	inches
Tank03_tank_temperature	40208	1	degrees_Fahrenheit
Tank03_tank_water_volume	40209	1	us_gallons
Tank04_tank_product_code	40301	1	no_units
Tank04_tank_tank_status	40302	1	no_units
Tank04_tank_volume	40303	1	us_gallons
Tank04_tank_tc_volume	40304	1	us_gallons
Tank04_tank_ullage	40305	1	us_gallons
Tank04_tank_height	40306	1	inches
Tank04_tank_water	40307	1	inches
Tank04_tank_temperature	40308	1	degrees_Fahrenheit
Tank04_tank_water_volume	40309	1	us_gallons
Tank01_tank_common_alarm	40010	1	0 = Normal, 1 = Alarm
Tank01_tank_setup_data_warning	40011	1	0 = Normal, 1 = Alarm
Tank01_tank_leak_alarm	40012	1	0 = Normal, 1 = Alarm
Tank01_tank_high_water_alarm	40013	1	0 = Normal, 1 = Alarm
Tank01_tank_overfill_alarm	40014	1	0 = Normal, 1 = Alarm
Tank01_tank_low_product_alarm	40015	1	0 = Normal, 1 = Alarm
Tank01_tank_sudden_loss_alarm	40016	1	0 = Normal, 1 = Alarm
Tank01_tank_high_product_alarm	40017	1	0 = Normal, 1 = Alarm
Tank01_tank_invalid_fuel_level_alarm	40018	1	0 = Normal, 1 = Alarm
Tank01_tank_probe_out_alarm	40019	1	0 = Normal, 1 = Alarm

Tank01_tank_high_water_warning	40020	1	0 = Normal, 1 = Alarm
Tank01_tank_delivery_needed_warning	40021	1	0 = Normal, 1 = Alarm
Tank01_tank_maximum_product_alarm	40022	1	0 = Normal, 1 = Alarm
Tank01_tank_gross_leak_test_fail_alarm	40023	1	0 = Normal, 1 = Alarm
Tank01_tank_periodic_leak_test_fail_alarm	40024	1	0 = Normal, 1 = Alarm
Tank01_tank_annual_leak_test_fail_alarm	40025	1	0 = Normal, 1 = Alarm
Tank01_tank_periodic_test_needed_warning	40026	1	0 = Normal, 1 = Alarm
Tank01_tank_annual_test_needed_warning	40027	1	0 = Normal, 1 = Alarm
Tank01_tank_periodic_test_needed_alarm	40028	1	0 = Normal, 1 = Alarm
Tank01_tank_annual_test_needed_alarm	40029	1	0 = Normal, 1 = Alarm
Tank01_tank_leak_test_active	40030	1	0 = Normal, 1 = Alarm
Tank01_tank_no_csld_idle_time_warning	40031	1	0 = Normal, 1 = Alarm
Tank01_tank_siphon_break_active_warning	40032	1	0 = Normal, 1 = Alarm
Tank01_tank_csld_rate_increase_warning	40033	1	0 = Normal, 1 = Alarm
Tank01_tank_accuchart_calibration_warning	40034	1	0 = Normal, 1 = Alarm
Tank01_tank_hrm_reconciliation_warning	40035	1	0 = Normal, 1 = Alarm
Tank01_tank_hrm_reconciliation_alarm	40036	1	0 = Normal, 1 = Alarm
Tank01_tank_cold_temperature_warning	40037	1	0 = Normal, 1 = Alarm
Tank01_tank_missing_delivery_ticket_warning	40038	1	0 = Normal, 1 = Alarm
Tank01_tank/line_gross_leak_alarm	40039	1	0 = Normal, 1 = Alarm
Tank01_delivery_density_warning	40040	1	0 = Normal, 1 = Alarm
Tank01_tank_unknown_alarm	40041	1	0 = Normal, 1 = Alarm
Tank02_tank_common_alarm	40110	1	0 = Normal, 1 = Alarm
Tank02_tank_setup_data_warning	40111	1	0 = Normal, 1 = Alarm
Tank02_tank_leak_alarm	40112	1	0 = Normal, 1 = Alarm
Tank02_tank_high_water_alarm	40113	1	0 = Normal, 1 = Alarm
Tank02_tank_overfill_alarm	40114	1	0 = Normal, 1 = Alarm
Tank02_tank_low_product_alarm	40115	1	0 = Normal, 1 = Alarm
Tank02_tank_sudden_loss_alarm	40116	1	0 = Normal, 1 = Alarm
Tank02_tank_high_product_alarm	40117	1	0 = Normal, 1 = Alarm
Tank02_tank_invalid_fuel_level_alarm	40118	1	0 = Normal, 1 = Alarm
Tank02_tank_probe_out_alarm	40119	1	0 = Normal, 1 = Alarm
Tank02_tank_high_water_warning	40120	1	0 = Normal, 1 = Alarm
Tank02_tank_delivery_needed_warning	40121	1	0 = Normal, 1 = Alarm
Tank02_tank_maximum_product_alarm	40122	1	0 = Normal, 1 = Alarm
Tank02_tank_gross_leak_test_fail_alarm	40123	1	0 = Normal, 1 = Alarm
Tank02_tank_periodic_leak_test_fail_alarm	40124	1	0 = Normal, 1 = Alarm
Tank02_tank_annual_leak_test_fail_alarm	40125	1	0 = Normal, 1 = Alarm

Tank02_tank_periodic_test_needed_warning	40126	1	0 = Normal, 1 = Alarm
Tank02_tank_annual_test_needed_warning	40127	1	0 = Normal, 1 = Alarm
Tank02_tank_periodic_test_needed_alarm	40128	1	0 = Normal, 1 = Alarm
Tank02_tank_annual_test_needed_alarm	40129	1	0 = Normal, 1 = Alarm
Tank02_tank_leak_test_active	40130	1	0 = Normal, 1 = Alarm
Tank02_tank_no_csld_idle_time_warning	40131	1	0 = Normal, 1 = Alarm
Tank02_tank_siphon_break_active_warning	40132	1	0 = Normal, 1 = Alarm
Tank02_tank_csld_rate_increase_warning	40133	1	0 = Normal, 1 = Alarm
Tank02_tank_accuchart_calibration_warning	40134	1	0 = Normal, 1 = Alarm
Tank02_tank_hrm_reconciliation_warning	40135	1	0 = Normal, 1 = Alarm
Tank02_tank_hrm_reconciliation_alarm	40136	1	0 = Normal, 1 = Alarm
Tank02_tank_cold_temperature_warning	40137	1	0 = Normal, 1 = Alarm
Tank02_tank_missing_delivery_ticket_warning	40138	1	0 = Normal, 1 = Alarm
Tank02_tank/line_gross_leak_alarm	40139	1	0 = Normal, 1 = Alarm
Tank02_delivery_density_warning	40140	1	0 = Normal, 1 = Alarm
Tank02_tank_unknown_alarm	40141	1	0 = Normal, 1 = Alarm
Tank03_tank_common_alarm	40210	1	0 = Normal, 1 = Alarm
Tank03_tank_setup_data_warning	40211	1	0 = Normal, 1 = Alarm
Tank03_tank_leak_alarm	40212	1	0 = Normal, 1 = Alarm
Tank03_tank_high_water_alarm	40213	1	0 = Normal, 1 = Alarm
Tank03_tank_overfill_alarm	40214	1	0 = Normal, 1 = Alarm
Tank03_tank_low_product_alarm	40215	1	0 = Normal, 1 = Alarm
Tank03_tank_sudden_loss_alarm	40216	1	0 = Normal, 1 = Alarm
Tank03_tank_high_product_alarm	40217	1	0 = Normal, 1 = Alarm
Tank03_tank_invalid_fuel_level_alarm	40218	1	0 = Normal, 1 = Alarm
Tank03_tank_probe_out_alarm	40219	1	0 = Normal, 1 = Alarm
Tank03_tank_high_water_warning	40220	1	0 = Normal, 1 = Alarm
Tank03_tank_delivery_needed_warning	40221	1	0 = Normal, 1 = Alarm
Tank03_tank_maximum_product_alarm	40222	1	0 = Normal, 1 = Alarm
Tank03_tank_gross_leak_test_fail_alarm	40223	1	0 = Normal, 1 = Alarm
Tank03_tank_periodic_leak_test_fail_alarm	40224	1	0 = Normal, 1 = Alarm
Tank03_tank_annual_leak_test_fail_alarm	40225	1	0 = Normal, 1 = Alarm
Tank03_tank_periodic_test_needed_warning	40226	1	0 = Normal, 1 = Alarm
Tank03_tank_annual_test_needed_warning	40227	1	0 = Normal, 1 = Alarm
Tank03_tank_periodic_test_needed_alarm	40228	1	0 = Normal, 1 = Alarm
Tank03_tank_annual_test_needed_alarm	40229	1	0 = Normal, 1 = Alarm
Tank03_tank_leak_test_active	40230	1	0 = Normal, 1 = Alarm
Tank03_tank_no_csld_idle_time_warning	40231	1	0 = Normal, 1 = Alarm

Tank03_tank_siphon_break_active_warning	40232	1	0 = Normal, 1 = Alarm
Tank03_tank_csld_rate_increase_warning	40233	1	0 = Normal, 1 = Alarm
Tank03_tank_accuchart_calibration_warning	40234	1	0 = Normal, 1 = Alarm
Tank03_tank_hrm_reconciliation_warning	40235	1	0 = Normal, 1 = Alarm
Tank03_tank_hrm_reconciliation_alarm	40236	1	0 = Normal, 1 = Alarm
Tank03_tank_cold_temperature_warning	40237	1	0 = Normal, 1 = Alarm
Tank03_tank_missing_delivery_ticket_warning	40238	1	0 = Normal, 1 = Alarm
Tank03_tank/line_gross_leak_alarm	40239	1	0 = Normal, 1 = Alarm
Tank03_delivery_density_warning	40240	1	0 = Normal, 1 = Alarm
Tank03_tank_unknown_alarm	40241	1	0 = Normal, 1 = Alarm
Tank04_tank_common_alarm	40310	1	0 = Normal, 1 = Alarm
Tank04_tank_setup_data_warning	40311	1	0 = Normal, 1 = Alarm
Tank04_tank_leak_alarm	40312	1	0 = Normal, 1 = Alarm
Tank04_tank_high_water_alarm	40313	1	0 = Normal, 1 = Alarm
Tank04_tank_overfill_alarm	40314	1	0 = Normal, 1 = Alarm
Tank04_tank_low_product_alarm	40315	1	0 = Normal, 1 = Alarm
Tank04_tank_sudden_loss_alarm	40316	1	0 = Normal, 1 = Alarm
Tank04_tank_high_product_alarm	40317	1	0 = Normal, 1 = Alarm
Tank04_tank_invalid_fuel_level_alarm	40318	1	0 = Normal, 1 = Alarm
Tank04_tank_probe_out_alarm	40319	1	0 = Normal, 1 = Alarm
Tank04_tank_high_water_warning	40320	1	0 = Normal, 1 = Alarm
Tank04_tank_delivery_needed_warning	40321	1	0 = Normal, 1 = Alarm
Tank04_tank_maximum_product_alarm	40322	1	0 = Normal, 1 = Alarm
Tank04_tank_gross_leak_test_fail_alarm	40323	1	0 = Normal, 1 = Alarm
Tank04_tank_periodic_leak_test_fail_alarm	40324	1	0 = Normal, 1 = Alarm
Tank04_tank_annual_leak_test_fail_alarm	40325	1	0 = Normal, 1 = Alarm
Tank04_tank_periodic_test_needed_warning	40326	1	0 = Normal, 1 = Alarm
Tank04_tank_annual_test_needed_warning	40327	1	0 = Normal, 1 = Alarm
Tank04_tank_periodic_test_needed_alarm	40328	1	0 = Normal, 1 = Alarm
Tank04_tank_annual_test_needed_alarm	40329	1	0 = Normal, 1 = Alarm
Tank04_tank_leak_test_active	40330	1	0 = Normal, 1 = Alarm
Tank04_tank_no_csld_idle_time_warning	40331	1	0 = Normal, 1 = Alarm
Tank04_tank_siphon_break_active_warning	40332	1	0 = Normal, 1 = Alarm
Tank04_tank_csld_rate_increase_warning	40333	1	0 = Normal, 1 = Alarm
Tank04_tank_accuchart_calibration_warning	40334	1	0 = Normal, 1 = Alarm
Tank04_tank_hrm_reconciliation_warning	40335	1	0 = Normal, 1 = Alarm
Tank04_tank_hrm_reconciliation_alarm	40336	1	0 = Normal, 1 = Alarm
Tank04_tank_cold_temperature_warning	40337	1	0 = Normal, 1 = Alarm

Tank04_tank_missing_delivery_ticket_warning	40338	1	0 = Normal, 1 = Alarm
Tank04_tank/line_gross_leak_alarm	40339	1	0 = Normal, 1 = Alarm
Tank04_delivery_density_warning	40340	1	0 = Normal, 1 = Alarm
Tank04_tank_unknown_alarm	40341	1	0 = Normal, 1 = Alarm

Table 5.2-1 - Example Modbus Map

5.2.4 Test Procedure Using the CAS Modbus Scanner

You can test the Modbus TCP data using the free test software provided by Chipkin Automation Software. The software can be downloaded at http://www.chipkin.com/cas-modbus-scanner.

To Configure the CAS Modbus Scanner:

1. Add a connection (specify the IP address of the gateway)
2. Add a device to the connection (specify the configured slave ID)
3. Add a request to the device (read holding register offset=1 Length=100)
4. Click the Poll button
5. Use the values found in the int16 column and the data map table to review the data.

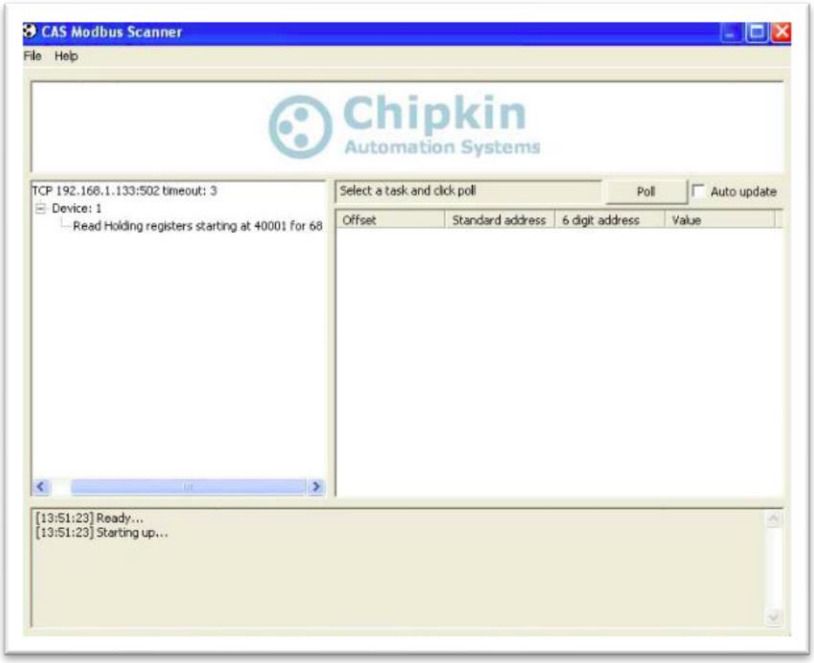


Figure 5.2-1 - Configuring the CAS Modbus Scanner

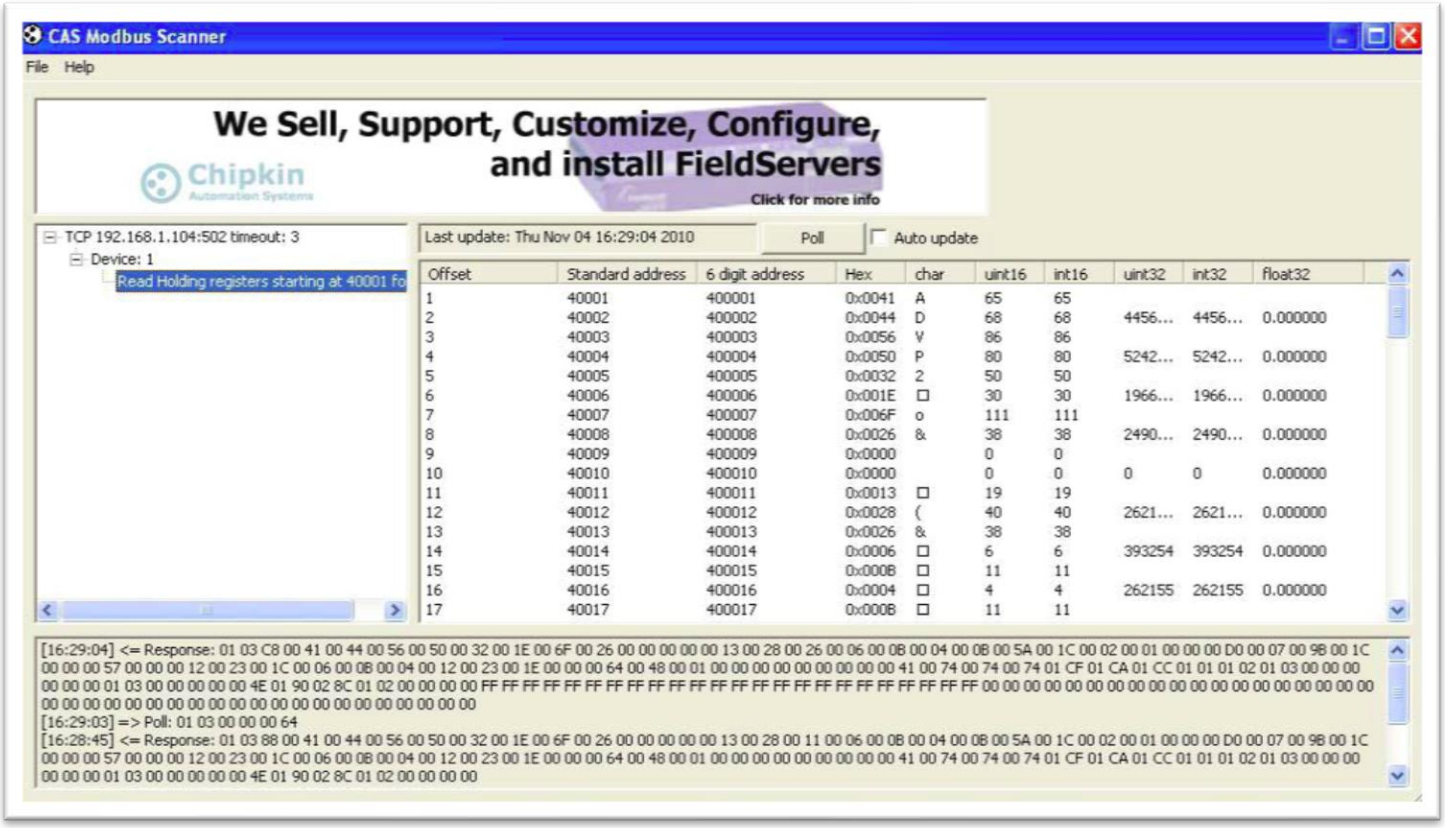


Figure 5.2-2 - Reviewing Data with the CAS Modbus Scanner

5.3 READING BACNET DATA

You can access BACnet report data from the OPW device by using discover to detect gateway objects and their properties. Although each BACnet device (including the gateway) needs to have a unique instance number, discovery does not require the number to be known in advance. Discovery will not occur if the device or application reading the data is on another subnet. This can be resolved by changing the gateway's IP address to match the subnet or by installing BBMD. It's the responsibility of the company installing the BAS system to provide BBMD. For more information about reading BACnet data or installing BBMD, please refer to these guides:

- http://www.chipkin.com/bacnet-solutions
- http://www.chipkin.com/articles/bacnet-bbmd

You can discover the device and poll for values using the CAS BACnet Explorer. For more information about the CAS BACnet Explorer, please visit: http://store.chipkin.com/products/tools/cas-bacnet-explorer

5.3.1 Interpreting BACnet Data

BACnet has a mechanism for reporting the validity of data. If the gateway loses its connection to the OPW device (or a data point cannot be read), the data object's out of service property is set to true

and it will disregard previous data as unreliable. The value of the present value property is not changed, so the last good value will be shown.

5.3.2 BACnet Object List

The sections contain an example of the BACnet Object List for this gateway.

Important Note: As mentioned above, this list is based on sample data using a default configuration. The BACnet Object List is generated during the configuration process, so it will change and will be different than what is described here. You can view the current BACnet Object List by reviewing the Reports page. Follow the instructions found in Section 5.1.

VeederRoot	BACnet IP	Units
Tank01_tank_product_code	analog_input (1)	no_units
Tank01_tank_tank_status	analog_input (2)	no_units
Tank01_tank_volume	analog_input (3)	us_gallons
Tank01_tank_tc_volume	analog_input (4)	us_gallons
Tank01_tank_ullage	analog_input (5)	us_gallons
Tank01_tank_height	analog_input (6)	inches
Tank01_tank_water	analog_input (7)	inches
Tank01_tank_temperature	analog_input (8)	degrees_Fahrenheit
Tank01_tank_water_volume	analog_input (9)	us_gallons
Tank02_tank_product_code	analog_input (101)	no_units
Tank02_tank_tank_status	analog_input (102)	no_units
Tank02_tank_volume	analog_input (103)	us_gallons
Tank02_tank_tc_volume	analog_input (104)	us_gallons
Tank02_tank_ullage	analog_input (105)	us_gallons
Tank02_tank_height	analog_input (106)	inches
Tank02_tank_water	analog_input (107)	inches
Tank02_tank_temperature	analog_input (108)	degrees_Fahrenheit
Tank02_tank_water_volume	analog_input (109)	us_gallons
Tank03_tank_product_code	analog_input (201)	no_units
Tank03_tank_tank_status	analog_input (202)	no_units
Tank03_tank_volume	analog_input (203)	us_gallons
Tank03_tank_tc_volume	analog_input (204)	us_gallons
Tank03_tank_ullage	analog_input (205)	us_gallons
Tank03_tank_height	analog_input (206)	inches
Tank03_tank_water	analog_input (207)	inches
Tank03_tank_temperature	analog_input (208)	degrees_Fahrenheit

Tank03_tank_water_volume	analog_input (209)	us_gallons
Tank04_tank_product_code	analog_input (301)	no_units
Tank04_tank_tank_status	analog_input (302)	no_units
Tank04_tank_volume	analog_input (303)	us_gallons
Tank04_tank_tc_volume	analog_input (304)	us_gallons
Tank04_tank_ullage	analog_input (305)	us_gallons
Tank04_tank_height	analog_input (306)	inches
Tank04_tank_water	analog_input (307)	inches
Tank04_tank_temperature	analog_input (308)	degrees_Fahrenheit
Tank04_tank_water_volume	analog_input (309)	us_gallons
Tank01_tank_common_alarm	binary_input (10)	0 = Normal, 1 = Alarm
Tank01_tank_setup_data_warning	binary_input (11)	0 = Normal, 1 = Alarm
Tank01_tank_leak_alarm	binary_input (12)	0 = Normal, 1 = Alarm
Tank01_tank_high_water_alarm	binary_input (13)	0 = Normal, 1 = Alarm
Tank01_tank_overfill_alarm	binary_input (14)	0 = Normal, 1 = Alarm
Tank01_tank_low_product_alarm	binary_input (15)	0 = Normal, 1 = Alarm
Tank01_tank_sudden_loss_alarm	binary_input (16)	0 = Normal, 1 = Alarm
Tank01_tank_high_product_alarm	binary_input (17)	0 = Normal, 1 = Alarm
Tank01_tank_invalid_fuel_level_alarm	binary_input (18)	0 = Normal, 1 = Alarm
Tank01_tank_probe_out_alarm	binary_input (19)	0 = Normal, 1 = Alarm
Tank01_tank_high_water_warning	binary_input (20)	0 = Normal, 1 = Alarm
Tank01_tank_delivery_needed_warning	binary_input (21)	0 = Normal, 1 = Alarm
Tank01_tank_maximum_product_alarm	binary_input (22)	0 = Normal, 1 = Alarm
Tank01_tank_gross_leak_test_fail_alarm	binary_input (23)	0 = Normal, 1 = Alarm
Tank01_tank_periodic_leak_test_fail_alarm	binary_input (24)	0 = Normal, 1 = Alarm
Tank01_tank_annual_leak_test_fail_alarm	binary_input (25)	0 = Normal, 1 = Alarm
Tank01_tank_periodic_test_needed_warning	binary_input (26)	0 = Normal, 1 = Alarm
Tank01_tank_annual_test_needed_warning	binary_input (27)	0 = Normal, 1 = Alarm
Tank01_tank_periodic_test_needed_alarm	binary_input (28)	0 = Normal, 1 = Alarm
Tank01_tank_annual_test_needed_alarm	binary_input (29)	0 = Normal, 1 = Alarm
Tank01_tank_leak_test_active	binary_input (30)	0 = Normal, 1 = Alarm
Tank01_tank_no_csld_idle_time_warning	binary_input (31)	0 = Normal, 1 = Alarm
Tank01_tank_siphon_break_active_warning	binary_input (32)	0 = Normal, 1 = Alarm
Tank01_tank_csld_rate_increase_warning	binary_input (33)	0 = Normal, 1 = Alarm
Tank01_tank_accuchart_calibration_warning	binary_input (34)	0 = Normal, 1 = Alarm
Tank01_tank_hrm_reconciliation_warning	binary_input (35)	0 = Normal, 1 = Alarm
Tank01_tank_hrm_reconciliation_alarm	binary_input (36)	0 = Normal, 1 = Alarm
Tank01_tank_cold_temperature_warning	binary_input (37)	0 = Normal, 1 = Alarm

Tank01_tank_missing_delivery_ticket_warning	binary_input (38)	0 = Normal, 1 = Alarm
Tank01_tank/line_gross_leak_alarm	binary_input (39)	0 = Normal, 1 = Alarm
Tank01_delivery_density_warning	binary_input (40)	0 = Normal, 1 = Alarm
Tank01_tank_unknown_alarm	binary_input (41)	0 = Normal, 1 = Alarm
Tank02_tank_common_alarm	binary_input (110)	0 = Normal, 1 = Alarm
Tank02_tank_setup_data_warning	binary_input (111)	0 = Normal, 1 = Alarm
Tank02_tank_leak_alarm	binary_input (112)	0 = Normal, 1 = Alarm
Tank02_tank_high_water_alarm	binary_input (113)	0 = Normal, 1 = Alarm
Tank02_tank_overfill_alarm	binary_input (114)	0 = Normal, 1 = Alarm
Tank02_tank_low_product_alarm	binary_input (115)	0 = Normal, 1 = Alarm
Tank02_tank_sudden_loss_alarm	binary_input (116)	0 = Normal, 1 = Alarm
Tank02_tank_high_product_alarm	binary_input (117)	0 = Normal, 1 = Alarm
Tank02_tank_invalid_fuel_level_alarm	binary_input (118)	0 = Normal, 1 = Alarm
Tank02_tank_probe_out_alarm	binary_input (119)	0 = Normal, 1 = Alarm
Tank02_tank_high_water_warning	binary_input (120)	0 = Normal, 1 = Alarm
Tank02_tank_delivery_needed_warning	binary_input (121)	0 = Normal, 1 = Alarm
Tank02_tank_maximum_product_alarm	binary_input (122)	0 = Normal, 1 = Alarm
Tank02_tank_gross_leak_test_fail_alarm	binary_input (123)	0 = Normal, 1 = Alarm
Tank02_tank_periodic_leak_test_fail_alarm	binary_input (124)	0 = Normal, 1 = Alarm
Tank02_tank_annual_leak_test_fail_alarm	binary_input (125)	0 = Normal, 1 = Alarm
Tank02_tank_periodic_test_needed_warning	binary_input (126)	0 = Normal, 1 = Alarm
Tank02_tank_annual_test_needed_warning	binary_input (127)	0 = Normal, 1 = Alarm
Tank02_tank_periodic_test_needed_alarm	binary_input (128)	0 = Normal, 1 = Alarm
Tank02_tank_annual_test_needed_alarm	binary_input (129)	0 = Normal, 1 = Alarm
Tank02_tank_leak_test_active	binary_input (130)	0 = Normal, 1 = Alarm
Tank02_tank_no_csld_idle_time_warning	binary_input (131)	0 = Normal, 1 = Alarm
Tank02_tank_siphon_break_active_warning	binary_input (132)	0 = Normal, 1 = Alarm
Tank02_tank_csld_rate_increase_warning	binary_input (133)	0 = Normal, 1 = Alarm
Tank02_tank_accuchart_calibration_warning	binary_input (134)	0 = Normal, 1 = Alarm
Tank02_tank_hrm_reconciliation_warning	binary_input (135)	0 = Normal, 1 = Alarm
Tank02_tank_hrm_reconciliation_alarm	binary_input (136)	0 = Normal, 1 = Alarm
Tank02_tank_cold_temperature_warning	binary_input (137)	0 = Normal, 1 = Alarm
Tank02_tank_missing_delivery_ticket_warning	binary_input (138)	0 = Normal, 1 = Alarm
Tank02_tank/line_gross_leak_alarm	binary_input (139)	0 = Normal, 1 = Alarm
Tank02_delivery_density_warning	binary_input (140)	0 = Normal, 1 = Alarm
Tank02_tank_unknown_alarm	binary_input (141)	0 = Normal, 1 = Alarm
Tank03_tank_common_alarm	binary_input (210)	0 = Normal, 1 = Alarm
Tank03_tank_setup_data_warning	binary_input (211)	0 = Normal, 1 = Alarm

Tank03_tank_leak_alarm	binary_input (212)	0 = Normal, 1 = Alarm
Tank03_tank_high_water_alarm	binary_input (213)	0 = Normal, 1 = Alarm
Tank03_tank_overfill_alarm	binary_input (214)	0 = Normal, 1 = Alarm
Tank03_tank_low_product_alarm	binary_input (215)	0 = Normal, 1 = Alarm
Tank03_tank_sudden_loss_alarm	binary_input (216)	0 = Normal, 1 = Alarm
Tank03_tank_high_product_alarm	binary_input (217)	0 = Normal, 1 = Alarm
Tank03_tank_invalid_fuel_level_alarm	binary_input (218)	0 = Normal, 1 = Alarm
Tank03_tank_probe_out_alarm	binary_input (219)	0 = Normal, 1 = Alarm
Tank03_tank_high_water_warning	binary_input (220)	0 = Normal, 1 = Alarm
Tank03_tank_delivery_needed_warning	binary_input (221)	0 = Normal, 1 = Alarm
Tank03_tank_maximum_product_alarm	binary_input (222)	0 = Normal, 1 = Alarm
Tank03_tank_gross_leak_test_fail_alarm	binary_input (223)	0 = Normal, 1 = Alarm
Tank03_tank_periodic_leak_test_fail_alarm	binary_input (224)	0 = Normal, 1 = Alarm
Tank03_tank_annual_leak_test_fail_alarm	binary_input (225)	0 = Normal, 1 = Alarm
Tank03_tank_periodic_test_needed_warning	binary_input (226)	0 = Normal, 1 = Alarm
Tank03_tank_annual_test_needed_warning	binary_input (227)	0 = Normal, 1 = Alarm
Tank03_tank_periodic_test_needed_alarm	binary_input (228)	0 = Normal, 1 = Alarm
Tank03_tank_annual_test_needed_alarm	binary_input (229)	0 = Normal, 1 = Alarm
Tank03_tank_leak_test_active	binary_input (230)	0 = Normal, 1 = Alarm
Tank03_tank_no_csld_idle_time_warning	binary_input (231)	0 = Normal, 1 = Alarm
Tank03_tank_siphon_break_active_warning	binary_input (232)	0 = Normal, 1 = Alarm
Tank03_tank_csld_rate_increase_warning	binary_input (233)	0 = Normal, 1 = Alarm
Tank03_tank_accuchart_calibration_warning	binary_input (234)	0 = Normal, 1 = Alarm
Tank03_tank_hrm_reconciliation_warning	binary_input (235)	0 = Normal, 1 = Alarm
Tank03_tank_hrm_reconciliation_alarm	binary_input (236)	0 = Normal, 1 = Alarm
Tank03_tank_cold_temperature_warning	binary_input (237)	0 = Normal, 1 = Alarm
Tank03_tank_missing_delivery_ticket_warning	binary_input (238)	0 = Normal, 1 = Alarm
Tank03_tank/line_gross_leak_alarm	binary_input (239)	0 = Normal, 1 = Alarm
Tank03_delivery_density_warning	binary_input (240)	0 = Normal, 1 = Alarm
Tank03_tank_unknown_alarm	binary_input (241)	0 = Normal, 1 = Alarm
Tank04_tank_common_alarm	binary_input (310)	0 = Normal, 1 = Alarm
Tank04_tank_setup_data_warning	binary_input (311)	0 = Normal, 1 = Alarm
Tank04_tank_leak_alarm	binary_input (312)	0 = Normal, 1 = Alarm
Tank04_tank_high_water_alarm	binary_input (313)	0 = Normal, 1 = Alarm
Tank04_tank_overfill_alarm	binary_input (314)	0 = Normal, 1 = Alarm
Tank04_tank_low_product_alarm	binary_input (315)	0 = Normal, 1 = Alarm
Tank04_tank_sudden_loss_alarm	binary_input (316)	0 = Normal, 1 = Alarm
Tank04_tank_high_product_alarm	binary_input (317)	0 = Normal, 1 = Alarm

Tank04_tank_invalid_fuel_level_alarm	binary_input (318)	0 = Normal, 1 = Alarm
Tank04_tank_probe_out_alarm	binary_input (319)	0 = Normal, 1 = Alarm
Tank04_tank_high_water_warning	binary_input (320)	0 = Normal, 1 = Alarm
Tank04_tank_delivery_needed_warning	binary_input (321)	0 = Normal, 1 = Alarm
Tank04_tank_maximum_product_alarm	binary_input (322)	0 = Normal, 1 = Alarm
Tank04_tank_gross_leak_test_fail_alarm	binary_input (323)	0 = Normal, 1 = Alarm
Tank04_tank_periodic_leak_test_fail_alarm	binary_input (324)	0 = Normal, 1 = Alarm
Tank04_tank_annual_leak_test_fail_alarm	binary_input (325)	0 = Normal, 1 = Alarm
Tank04_tank_periodic_test_needed_warning	binary_input (326)	0 = Normal, 1 = Alarm
Tank04_tank_annual_test_needed_warning	binary_input (327)	0 = Normal, 1 = Alarm
Tank04_tank_periodic_test_needed_alarm	binary_input (328)	0 = Normal, 1 = Alarm
Tank04_tank_annual_test_needed_alarm	binary_input (329)	0 = Normal, 1 = Alarm
Tank04_tank_leak_test_active	binary_input (330)	0 = Normal, 1 = Alarm
Tank04_tank_no_csld_idle_time_warning	binary_input (331)	0 = Normal, 1 = Alarm
Tank04_tank_siphon_break_active_warning	binary_input (332)	0 = Normal, 1 = Alarm
Tank04_tank_csld_rate_increase_warning	binary_input (333)	0 = Normal, 1 = Alarm
Tank04_tank_accuchart_calibration_warning	binary_input (334)	0 = Normal, 1 = Alarm
Tank04_tank_hrm_reconciliation_warning	binary_input (335)	0 = Normal, 1 = Alarm
Tank04_tank_hrm_reconciliation_alarm	binary_input (336)	0 = Normal, 1 = Alarm
Tank04_tank_cold_temperature_warning	binary_input (337)	0 = Normal, 1 = Alarm
Tank04_tank_missing_delivery_ticket_warning	binary_input (338)	0 = Normal, 1 = Alarm
Tank04_tank/line_gross_leak_alarm	binary_input (339)	0 = Normal, 1 = Alarm
Tank04_delivery_density_warning	binary_input (340)	0 = Normal, 1 = Alarm
Tank04_tank_unknown_alarm	binary_input (341)	0 = Normal, 1 = Alarm

Table 5.3-1 - Example BACnet Object List

5.3.3 BACnet Test Procedure

CAS BACnet Explorer is a software application that can discover, test and document objects and properties on a network system. You can download the software at http://www.chipkin.com/files/resources/Installer_CAS%20BACnet%20Explorer.exe and use the USB key to activate the application. If you don't have a key, the software can also be activated through an internet connection.

Perform the set-up procedure below, or refer to the video and these articles for more information:

- http://store.chipkin.com/articles/cas-bacnet-explorer-software-activation
- http://store.chipkin.com/articles/bacnet-how-to-overcome-cas-bacnet-explorer-usbsoftware-activation-problems
- http://store.chipkin.com/products/tools/cas-bacnet-explorer/license-agreement

To Set-up BACnet Explorer:

1. Start the application
2. Click **Settings**
3. Check **IP** and uncheck **MSTP and Ethernet**
4. Click on the network card you will use
5. Click **OK**
6. Click **Discover**
7. Click **Send**

Figure 5.3-1 - CAS BACnet Explorer - Devices were discovered.

8. Click on the '**+**' icon to see the list of discovered devices.

Figure 5.3-2 - CAS BACnet Explorer – Device Selection

9. Select the device you wish to further discover and click the **Discover** button.

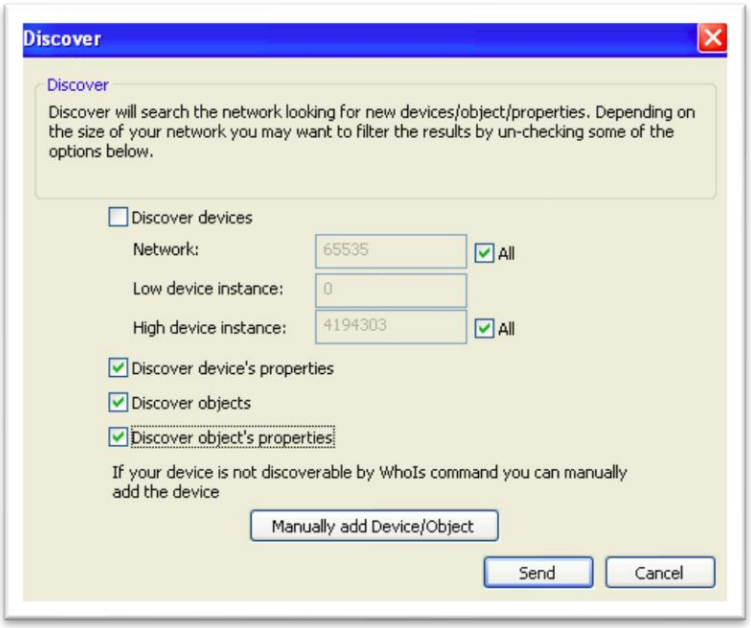


Figure 5.3-3 - CAS BACnet Explorer - Discover Dialogue

10. Check the **Discover device's properties**, **Discover object**, and **Discover object's properties** check boxes and click the **Send** button.

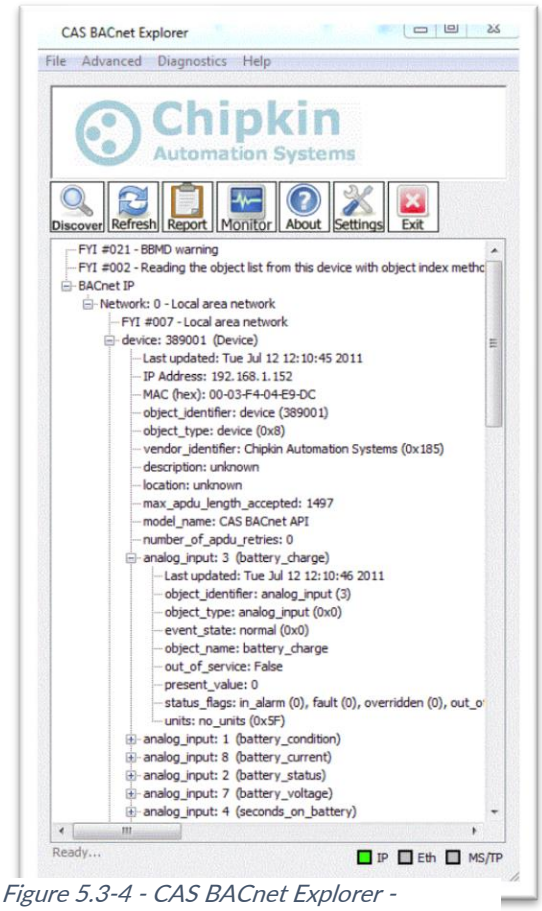


Figure 5.3-4 - CAS BACnet Explorer - Discovered Objects

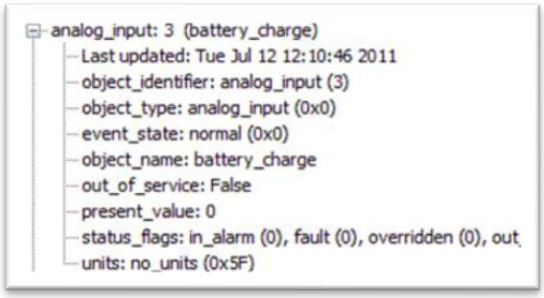


Figure 5.3-5 - CAS BACnet Explorer - Single Object

11. **Read** the BACnet object properties Present-Value is the current value of the data point. Here is a list of some the important properties:
    - **Present Value:** The current value of the object
    - **Reliability:** On the CAS Gateway or Data Client, represents the validity of the data
    - **Status Flags:** Various flags that show the state of the object.
    - **Units:** If the object has units, this will show the unit type.

6. COMMISIONING, DIAGNOSTICS, AND TROUBLE-SHOOTING

6.1 WHAT TO TAKE TO SITE FOR COMMISSIONING

Below is a list of software and hardware tools that should be taken to site for the install installation. Some of these tools are depend on the type of installation and drivers on the gateway. Most of the software tools can be found on the included USB drive.

6.1.1 Software

- **IP Setup Tool** - Used to update the IP address of the CAS Gateway. Free http://www.chipkin.com/cas-gateway-ip-address-tool
- **Auto Update Tool** - Used to update the firmware on the CAS Gateway. Free http://www.chipkin.com/cas-gateway-firmware-download-tool/
- **Wirehark** - Used to capture and log network traffic. Free https://www.wireshark.org/
- **CAS BACnet Explorer** – Used to test BACnet IP configurations. Trial http://www.chipkin.com/products/software/bacnet-software/cas-bacnet-explorer/
- **CAS Modbus Scanner** – Used to test Modbus TCP and Modbus RTU configurations. Free http://store.chipkin.com/articles/modbus-scanner-what-is-the-cas-modbus-scanner

6.1.2 Hardware

- **A laptop** –Used to configure and diagnose the gateway. The laptop should include a ethernet port.
- **RS232 to USB converter** – Used when communicating with drivers that use RS232 such as VeederRoot serial.
- **RS485 to USB converter** – Used when communicating with drivers that use RS485 such as Modbus RTU or BACnet MSTP.
- **Ethernet patch cable** – Useful for connecting the gateway to your laptop or into a local switch. Included in the accessory kit.
- **Micro screw driver set** – Useful for securing wires into screw terminals. Included in the accessory kit.
- **Ethernet hub -** Use a hub (and not a switch) as a last resort for troubleshooting problems with Modbus TCP or BACnet IP. A **hub is not a switch**, that most switches are not supervised and that only a supervised switch can be used as an alternative. For more information about hubs and switches, please refer to this article: http://www.chipkin.com/articles/hubs-vs-switches-using-wireshark-to-sniff-networkpackets
- **Db9 gender changer -** Connector make-up kits are always useful but not required if you have tested your cable prior to attending the site.

Figure 6.1-1 - DB9 Gender Changers

- **Serial RS232 mini-tester** – Useful for testing to ensure that a serial cable has the correct pinout.

Figure 6.1-2 - RS232 Mini-Tester

- **Serial cable** – A Null modem or crossover serial cable can be useful when communicating with drives that use serial connections such as Modbus RTU and VeederRoot serial

6.2 DISCOVER GATEWAY'S IP ADDRESS

By default, the gateway is shipped with an IP address of 192.168.1.113. The IP address may have been changed since being installed on site. The following techniques can be used to discover the new gateways IP address.

6.2.1 Setup reference card

By default, the gateways are shipped with a setup reference card attached to the bottom of the gateway. This setup reference card will show the configured IP address as well as the job reference number.

Figure 6.2-1 - Setup reference card

6.2.2 Using the IP Setup tool

1. Download the IP Setup tool from chipkin's website http://www.chipkin.com/cas-gateway-ip-address-tool
2. Run the IP Setup Tool application and you will see the following window

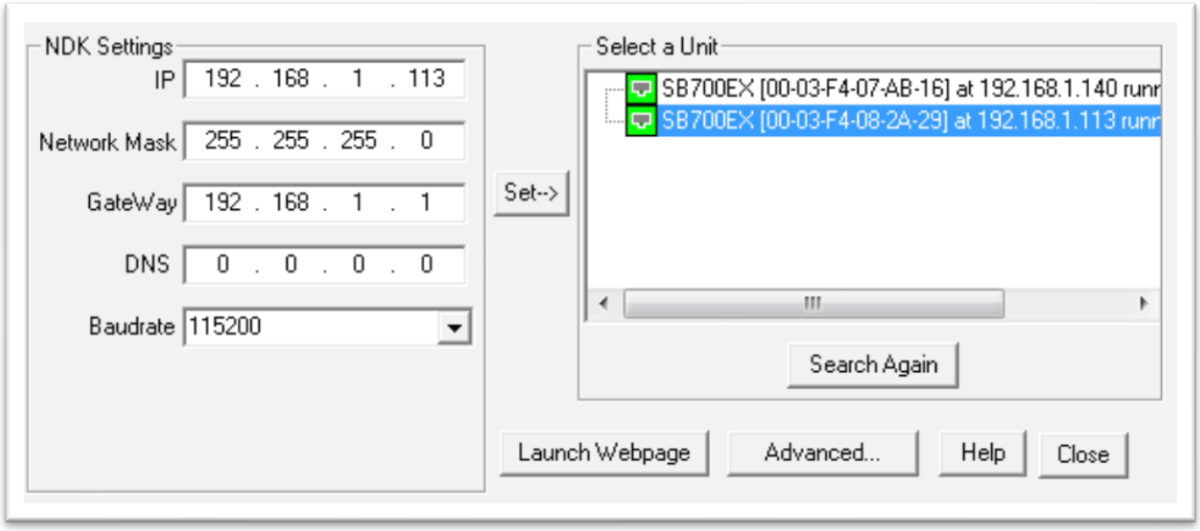


Figure 6.2-2 - IP Setup tool

3. The IP address of the CAS Gateway will be shown on the right-hand side.

6.3 DEFAULT USERNAME AND PASSWORD

To view or change the settings on the gateway, a username and password will need to be entered. By default, the username and passwords are

Username: admin
Password: admin

The default password can be changed on the system page. http://<IPAddress>/bin/system

6.4 DEBUG LOG OR WIRESHARK LOG

If a problem is discovered on site, you may be asked to take a debug log, or a Wireshark log.

6.4.1 Debug logging

By default, the gateway has a debug logging level of 10 (important messages only) and logs messages to the syslog port (514). These settings can be changed on the system page.
http://<IPAddress>/bin/system

Settings

- **Log to file** - Logs the system and driver messages to a log file on the SD card of the gateway. This log file can be viewed and downloaded by going to "log messages" page http://<IPAddress>/bin/system/log. The log file will automatically be disabled if the free space on the SD card is less than 10% of the total. **Default:** Disabled.
- **Log to Syslog** – Sends syslog (UDP 514) message for each system and driver log message. These log messages can be viewed by taking a Wireshark log. **Default:** Enabled.
- **Logging level** – The logging level that messages will be created. The higher the number the more messages that will be created. Logging levels higher than NORMAL (50) may impact the performance of the gateway. **Default:** IMPORTANT (10)

6.4.2 Wireshark log

Wireshark is a free utility used for capturing and logging network traffic. This tool can be instrumental in resolving local network issues. Wireshark can be downloaded for free from
https://www.wireshark.org/

6.5 CHANGE THE GATEWAY IP ADDRESS

By default, the gateway is shipped with a static IP address of 192.168.1.113. The default IP address can be changed using the IP setup tool.

4. Download the IP Setup tool from chipkin's website http://www.chipkin.com/cas-gateway-ip-address-tool

5. Run the IP Setup Tool application and you will see the following window

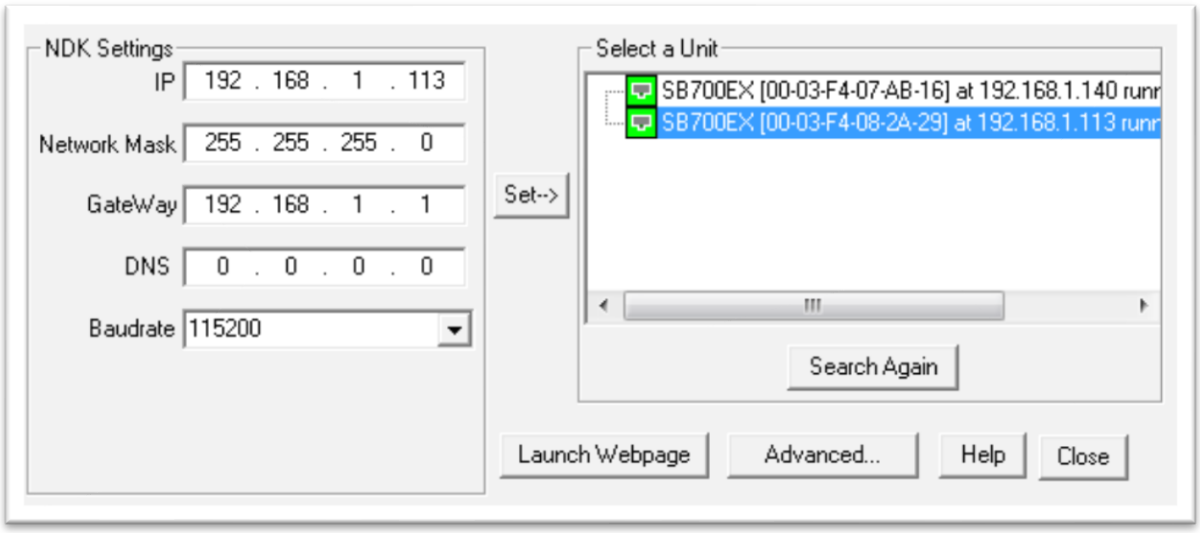


Figure 6.5-1 - IP Setup tool

6. Select the Gateway from the list on the left.
7. Change the "NDK Settings" as required.
   Note: Please do **NOT** change the Baudrate value.
8. Click the "Set -->" button to apply the new changes to the CAS Gateway. The gateway will automatically reboot with the new assigned IP address.

6.6 UPDATE FIRMWARE

This document assumes that you have successfully connected to the gateway and can see the gateway in the IP Setup Tool.

Note: Usually, the firmware is already loaded on the CAS Gateway when it is shipped. However, if there was a specific requirement that was developed or a bug fix, you may have to download an updated firmware which you will receive from Chipkin Automation Systems (CAS). All updated firmware files should come from CAS.

Do Not upload any other firmware files with this tool unless CAS specifically advices to do so.

To download the firmware to the gateway, follow the steps below:

1. Download the CAS Gateway AutoUpdate tool from the following link:
http://www.chipkin.com/cas-gateway-firmware-download-tool/

2. Running the AutoUpdate application will display the following window:

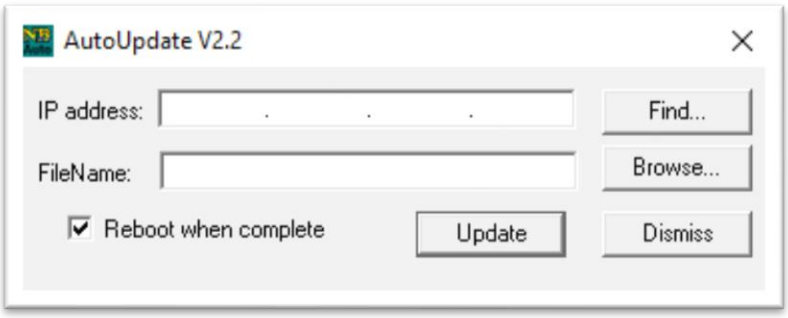


Figure 6.6-1 - AutoUpdate tool window

The IP Address of the gateway should be filled out in the "**IP address**" section. If not, or if the IP address is wrong, then click the "**Find**" button and it will display the IP addresses of gateways on the network. Select the IP address of the gateway to download the firmware.

3. Click the "**Browse...**" button. This will open a file explorer. Navigate to the firmware file and click the "**Open**" button. The file path will be inserted into the "**FileName**" field.

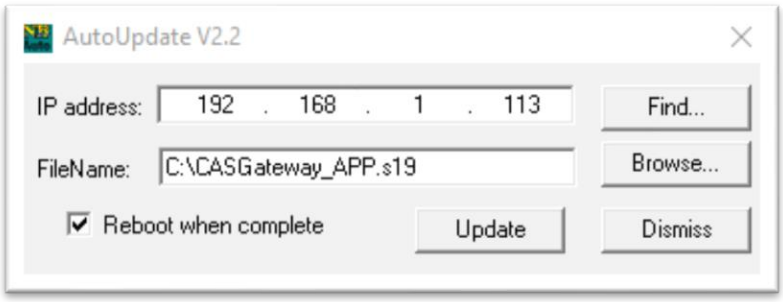


Figure 6.6-2 - AutoUpdate tool window

Image 2 – AutoUpdate tool with firmware file name

4. Verify that "**Reboot when complete**" is checked, as shown above.

5. **Before** pressing the "**Update**", disconnect the Power from the gateway. Then reconnect the power.

6. As the gateway is booting, press the "**Update**" button. You will see a progress bar begin to fill up.

Note: If the progress bar does not fill after 60 seconds, there may be an issue with other Network adapters being enabled. Go to the Network and Sharing Center and disable all network adapters except for the Local Area Connection.

7. If the update was successful, you will see the following message:

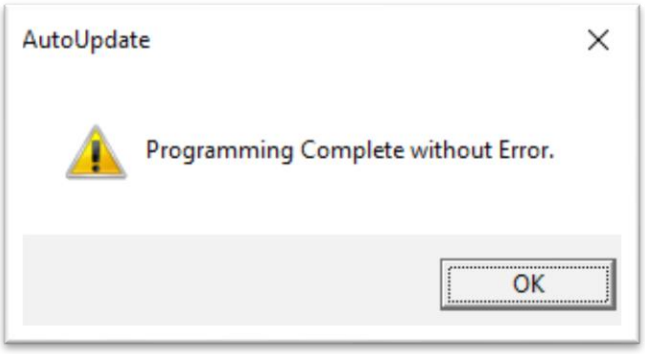


Figure 6.6-3 - Firmware update success

If the update fails, you will see either “Update Failed” or “Updated Timeout”. If either of these messages appear, please contact us for support.

If a message appears stating that “The Gateway does not have enough RAM”, please return to step 5 and repeat.

LIMITATIONS AND BEST PRACTICES

The CAS 2700-40 OPW Gateway has the following limitations:

Important: The gateway can only be connected to one OPW panel. This is a limitation of RS232 and of the TLS protocol.

CAS 2700-40 OPW Gateway best practices:

Tip: We recommend a 10 m. maximum length for the RS232 cable (a well-made cable in a clean environment can run up to 30 m. and provide satisfactory performance).

APPENDIX A: SAFETY WARNINGS

BEFORE YOU INSTALL THE DEVICE, OBSERVE THE IMPORTANT SAFETY INSTRUCTIONS IN THIS SECTION.

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Save these instructions.

WARNING: Ultimate disposal of this product should be handled according to all national laws and regulations

WARNING: Read and understand all instructions in the documentation that comes with the gateway before connecting it to a power source.

WARNING: Do not install or use this gateway near water or when you are wet

WARNING: Install the gateway securely on a stable surface.

WARNING: Install the gateway in a protected location where no one can step or trip over the connecting cables or power cords.

WARNING: Install the Gateway where the cables and power cords can't be damaged.

WARNING: There are no user serviceable parts inside. Refer servicing to qualified servicing personnel.

IMPORTANT: If the gateway doesn't operate normally, please contact Chipkin's Engineer Services, Development and Support

APPENDIX B: HARDWARE SPECIFICATIONS

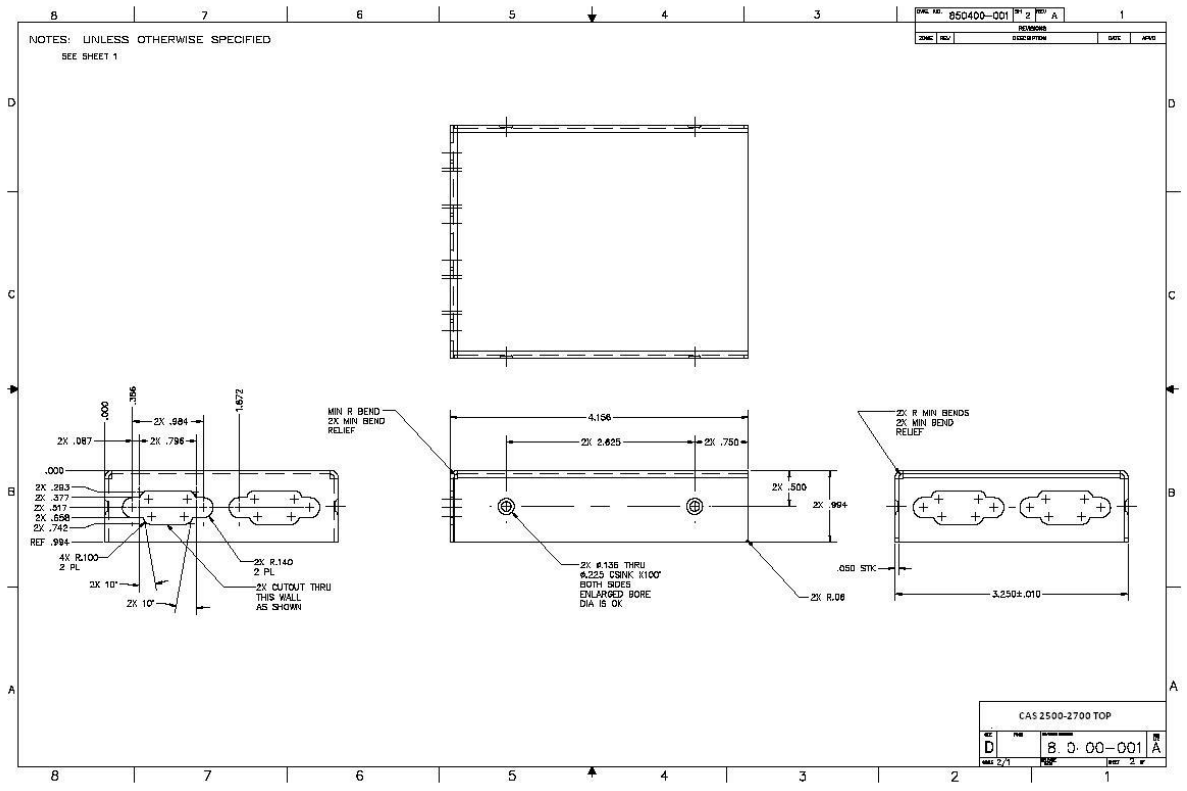
The following specifications for the CAS gateway are common to all Chipkin Gateways.

- UL, C/UL, CE, FCC approved
- 10/100BASE-T with RJ-45 connector
- 1x RS232 port
- 1x RS485 port (different models have additional ports)
- Power: 7 – 24 VDC @90 mA
- Operating temperature: 0 – 70 °C (32 – 158 °F)
- LEDs: link, speed/data, power
- Dimensions (LxWxH): 107 x 83 x 25 mm (4.2 x 3.25 x 1 in.)

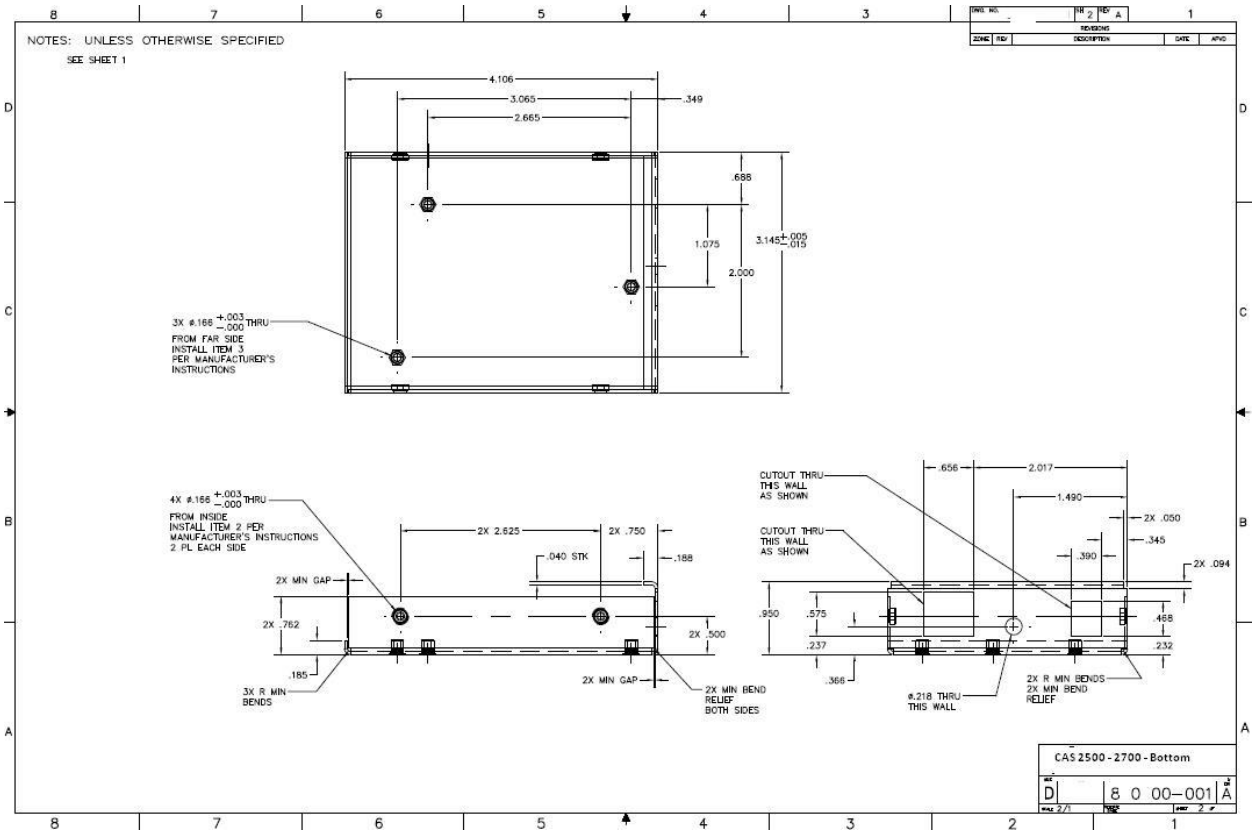
MECHANICAL DRAWINGS

Applies to all CAS2500 and CAS2700 products.

Top View



Bottom View



Front Panel

Back Panel

Serial Protocols Supported

RS-232, RS-422, and RS-485

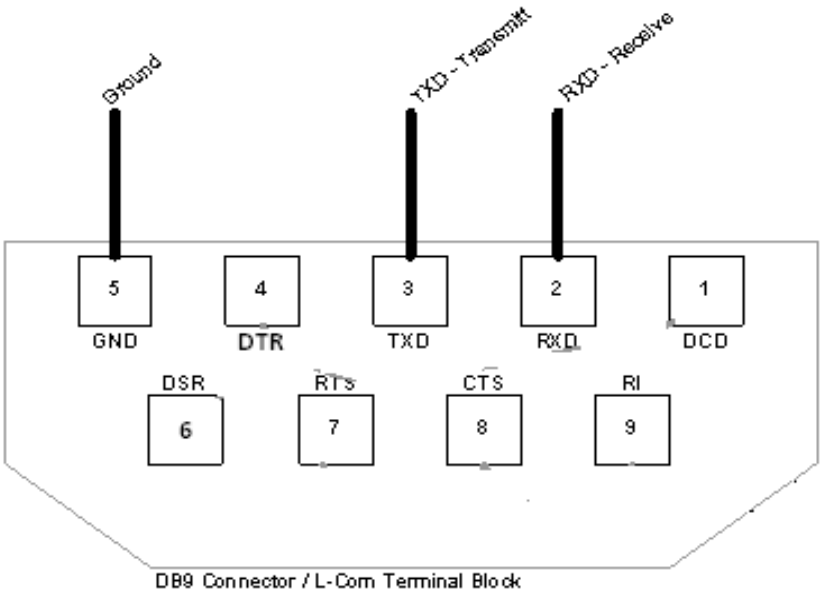
Serial Configurations

The two UARTs can be configured in the following ways:

- Two RS-232 ports
- One RS-232 port, one RS-485/422 port

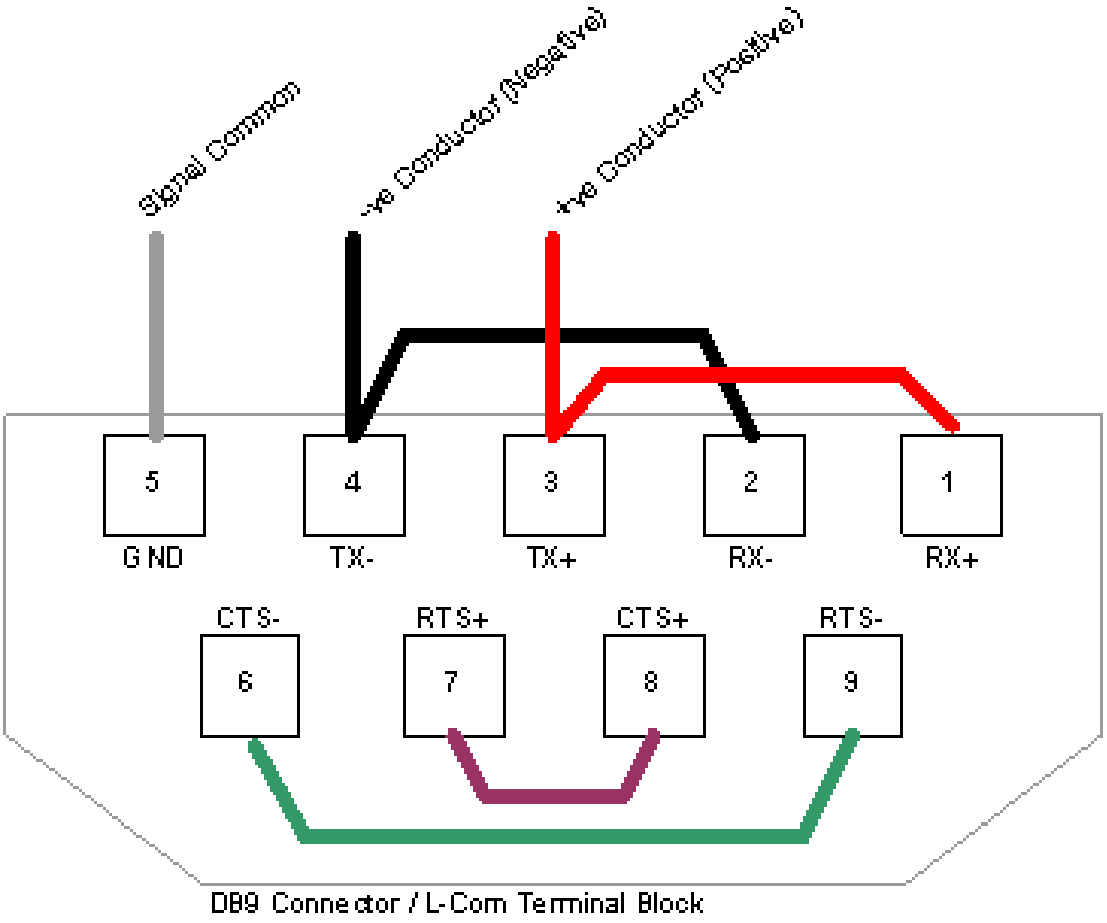
DB9 Pinout

RS232- 3 Wire [No Handshaking]



RS485 – Half Duplex also known as 2 Wire

All 4 jumpers required for 2 wire operation.
CAS recommends the use of 3 conductors for so called 2-Wire RS485.
The signal common is there for purpose.



APPENDIX C: LIMITED WARRANTY

LIMITED WARRANTY

Chipkin Automation Systems provides a 30-Day Return Window (see Return of Non-Defective Products below) and the following limited warranty. This limited warranty extends only to the original purchaser.

Please note that any warranty services or questions must be accompanied by the order number from the transaction through which the warranted product was purchased. ***The order number serves as your warranty number and must be retained.*** Chipkin Automation Systems will offer no warranty service without this number.

Chipkin Automation Systems warrants this product and its parts against defects in materials or workmanship for *three years labor and one year parts* from the original ship date. During this period, Chipkin Automation Systems will repair or replace defective parts with new or reconditioned parts at Chipkin Automations Systems option, without charge to you. Shipping fees incurred from returns for under-warranty service in the first 30-days will be paid by Chipkin Automation Systems. All shipping fees both to and from Chipkin Automation Systems following this 30-day period must be paid by the customer. All returns, both during and following the 30-day period, must be affected via the Procedures for Obtaining Warranty Service described below.

All original parts (parts installed by Chipkin Automation Systems at the original system build) replaced by Chipkin Automation Systems or its authorized service center, become the property of Chipkin Automation Systems. Any after-market additions or modifications will not be warranted. The gateway system owner is responsible for the payment, at current rates, for any service or repair outside the scope of this limited warranty.

Chipkin Automation Systems makes no other warranty, either express or implied, including but not limited to implied warranties of merchantability, fitness for a particular purpose, or conformity to any representation or description, with respect to this computer other than as set forth below. Chipkin Automation Systems makes no warranty or representation, either express or implied, with respect to any other manufacturer's product or documentation, its quality, performance, merchantability, fitness for a particular purpose, or conformity to any representation or description.

Except as provided below, Chipkin Automation Systems is not liable for any loss, cost, expense, inconvenience or damage that may result from use or inability to use the gateway. Under no circumstances shall Chipkin Automation Systems be liable for any loss, cost, expense, inconvenience or damage exceeding the purchase price of the gateway.

The warranty and remedies set forth below are exclusive and in lieu of all others, oral or written, expressed or implied. No reseller, agent or employee is authorized to make any modification, extension or addition to this warranty.

WARRANTY CONDITIONS

The above Limited Warranty is subject to the following conditions:

1. This warranty extends only to products distributed and/or sold by Chipkin Automation Systems. It is effective only if the products are purchased and operated in Canada or the USA. (Within the USA including US 48 States, Alaska and Hawaii.)
2. This warranty covers only normal use of the gateway. Chipkin Automation Systems shall not be liable under this warranty if any damage or defect results from (i) misuse, abuse, neglect, improper shipping or installation; (ii) disasters such as fire, flood, lightning or improper electric current; or (iii) service or alteration by anyone other than an authorized Chipkin Automation Systems' representative; (iv) damages incurred through irresponsible use, including those resulting from viruses or spyware, overclocking, or other non-recommended practices.
3. You must retain your bill of sale or other proof of purchase to receive warranty service.
4. No warranty extension will be granted for any replacement part(s) furnished to the purchaser in fulfillment of this warranty.
5. Chipkin Automation Systems and its Authorized Service Center accepts no responsibility for any software programs, data or information stored on any media or any parts of any products returned for repair to Chipkin Automation Systems.
6. All pre-installed software programs are licensed to customers under non-Chipkin Automation Systems software vendor's term and conditions provided with the packages.
7. This warranty does not cover any third party software or virus related problems.
8. Chipkin Automation Systems makes no warranty either expressed or implied regarding third-party (non-Chipkin Automation System) software.
9. Thirty-day Return Window does not include opened software, parts, special order merchandise and shipping and handling fees.

RETURN OF NON-DEFECTIVE PRODUCTS

A non-defective product may be returned to Chipkin Automation Systems within thirty (30) days of the invoice date for a refund of the original purchase price with the following amendments/fees:

1. Chipkin Automation Systems will refund neither the original shipping cost nor the shipping and handling fees incurred from the products return. If the original purchase was made under a "Free Shipping" promotion then a standard $40 fee will be deducted from any return in counter to that offer.
2. No refund will be granted for software which has been opened, used, or tampered with in any way which jeopardized Chipkin Automation Systems ability to remarket or resell the product. Chipkin Automation Systems maintains full discretion in decisions regarding a products fitness for return.
3. Any non-defective returns are subject to a 15% restocking fee, which percentage is taken from the final purchase price less any shipping or handling charges.
4. Quantity purchases of five systems or more are not eligible for return.

To return a defective product, please contact our Customer Service Department for a Return Merchandise Authorization (RMA) number and follow the Return of Products Instructions below. The RMA is valid for 10 days from date of issuance. **Returns will not be accepted without an RMA**. Manufacturer restrictions do apply. Any item missing the UPC on the original packaging may not be returned.

PROCEDURES FOR OBTAINING WARRANTY SERVICE

RMA (Returning Merchandise Authorization) Policy:
If repairs are required, the customer must obtain an RMA number and provide proof of purchase. RMA and services are rendered by Chipkin Automation Systems only. Any shipping costs after 30 days (starting from the original date of purchase) on any item returned for repair is the customers' responsibility. All returned parts must have an
RMA number written clearly on the outside of the package along with a letter detailing the problems and a copy of the original proof of purchase. No COD packages will be accepted. No package will be accepted without an RMA number written on the outside of the package. RMA numbers are only valid for 30 days from the date of issue.

Should you have any problems with your gateway, please follow these procedures to obtain the service:

1. If you have purchased our on-site warranty, please find your warranty# (the order number from the transaction through which the warranted product was originally purchased) and contact Chipkin Automation Systems Customer Service by phone at 1-866-383-1657 (Toll free) or 1-647-557-3330.
2. If the gateway must be repaired, an RMA number (Return Merchandise Authorization Number) will be issued for shipment to our repair department. Please follow the instructions given by Chipkin Automation Systems technical support staff to ship your gateway. Chipkin Automation Systems will not accept any shipments without an RMA number.
3. Pack the gateway in its original box or a well-protected box, as outlined in the Return Shipping Instructions. Chipkin Automation Systems will not be responsible for shipping damage/loss of any product outside the original 30-day Chipkin Automation Systems-paid service period. It is very important that you write the RMA number clearly on the outside of the package. Ship the gateway with a copy of your bill of sale or other proof of purchase, your name, address, phone number, description of the problem(s), and the RMA number you have obtained to:

   Chipkin Automation Systems RMA#_____
   3381 Cambie St., #211
   Vancouver, B.C. Canada, V5Z 4R3

4. Upon receiving the gateway, Chipkin Automation Systems will repair or replace your gateway (at Chipkin Automation Systems discretion) and will ship it back to you within 2 weeks (dependent on parts availability) via UPS.

5. Cross-exchange (Parts only): You will need to provide a valid credit card number as a deposit guarantee when the RMA number is issued. Once approval has been obtained on your credit card, the part(s) will be shipped UPS. You will need to ship defective part(s) back to Chipkin Automation Systems within 15 days to avoid charges to your credit card. If such charges are incurred, the shipped part(s) will be billed at the then current price.
6. Chipkin Automation Systems will pay for shipping to and from the customer only within the first thirty days following the original product ship date. Following this 30-day period all shipping fees both for under warranty and post warranty repairs are the sole responsibility of the customer. The customer also assumes full liability for losses or damages resulting from shipping as well as all responsibility to pursue remuneration for such issues with their selected carrier.

AFTER ONE-YEAR WARRANTY – POST WARRANTY REPAIR

For post warranty repair, the procedure is the same as outlined above for RMA and shipping. However, you are responsible for shipping charges both ways, current labor ($75 per hour if not under warranty), and the current price of part(s) used in repair.

THANK YOU

Thanks for choosing Chipkin's protocol gateways, data clients and integration services to meet your building and industrial automation requirements!

Chipkin Automation Systems™ (Chipkin) is a building and industrial automation protocol expert. We develop, configure, install and support gateways (protocol converters), data loggers and remote monitor and controlling applications.

Founded in October 2000, Chipkin provides expert solutions for converting BACnet®, Modbus®, and Lonworks®—to name just a few—and enabling interfaces for HVAC, fire, siren, intercom, lighting, transportation and fuel systems. The high-quality products we offer (including those from other vendors) interface with Simplex™, Notifier™, McQuay™, GE™ and many others—so you can rest assured that we will select the most appropriate solution for your application.

With Chipkin you are buying a solution. Our configuration expertise in this field combined with free BACnet tools and other tools ensure your success; and our customer support via phone, email and remote desktop tools means that we're there when you need us. Chipkin is a small responsive company, and we live or die by the quality of our service—and with offices in two-time zones—we can provide support when you need it. Give us a call now!

Sales and Customer Service
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Email: salesgroup1@chipkin.com