

Chipkin™ BACnet® IP Data Client USER MANUAL



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DOCUMENT REVISION HISTORY

REVISION	DATE	AUTHOR	NOTE
0	2017-Nov-10	ACF	- Added Mods Configuration - Added Data Logging Configuration
1	2018-Mar-19	ACF	- Updated Style of Document.

Table 1 - Document Revision History

1. PREFACE

1.1 WELCOME

As a new owner of Chipkin Automation Systems'™ (CAS) Data Client 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 Data Client 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 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

FAX: 1-416-915-4024

EMAIL: support@chipkin.com

SHIPPING ADDRESS

3381 Cambie St., #211

Vancouver, BC, Canada V5Z 4R3

2. OVERVIEW

2.1 PRODUCT SUMMARY

Chipkin™ BACnet® IP Data Client is a device that connects to BACnet® IP devices, and reads and stores the data. The data client operates by reading data from the configured registers and stores the values in an internal database. These values can then be logged to an archive file or can be accessed via the data clients REST API as XML, JSON, or CSV data using HTTP Get requests. Log files can be accessed by a Web Browser or FTP client.

The device requires minimal configuration and can be considered a 'plug and play' component of any network system. It's ready to operate 'out of the box' and can be installed without an engineer's approval.

2.2 SYSTEM OVERVIEW

The CAS2500-04 is a data client that polls for data and stores trending data over time. The data client typically sends polling messages, extracts any data values, and stores the values in an internal database. These values are then viewable via webpages or are archived into comma-separated-value spreadsheets that can be retrieved from the file system. Archived data files can be generated hourly, daily, monthly, or all in one large file.

2.3 OPTIONAL EXPANSION MODULES

The CAS2500-04 has the following expansion modules:

- HTTP Push Driver – tasks that can push data to a 3rd party server as a JSON payload using HTTP POST or PUT.

2.4 INSTALLATION AND CONFIGURATION SUMMARY

For more information on how to install and setup the CAS2500-04 please refer to the CAS Gateway Quick Start Guide. 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.

2.5 DEVICE WIRING REQUIREMENTS

For more information on how to wire up the CAS2500-04, 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 and log data from BACnet® IP devices.

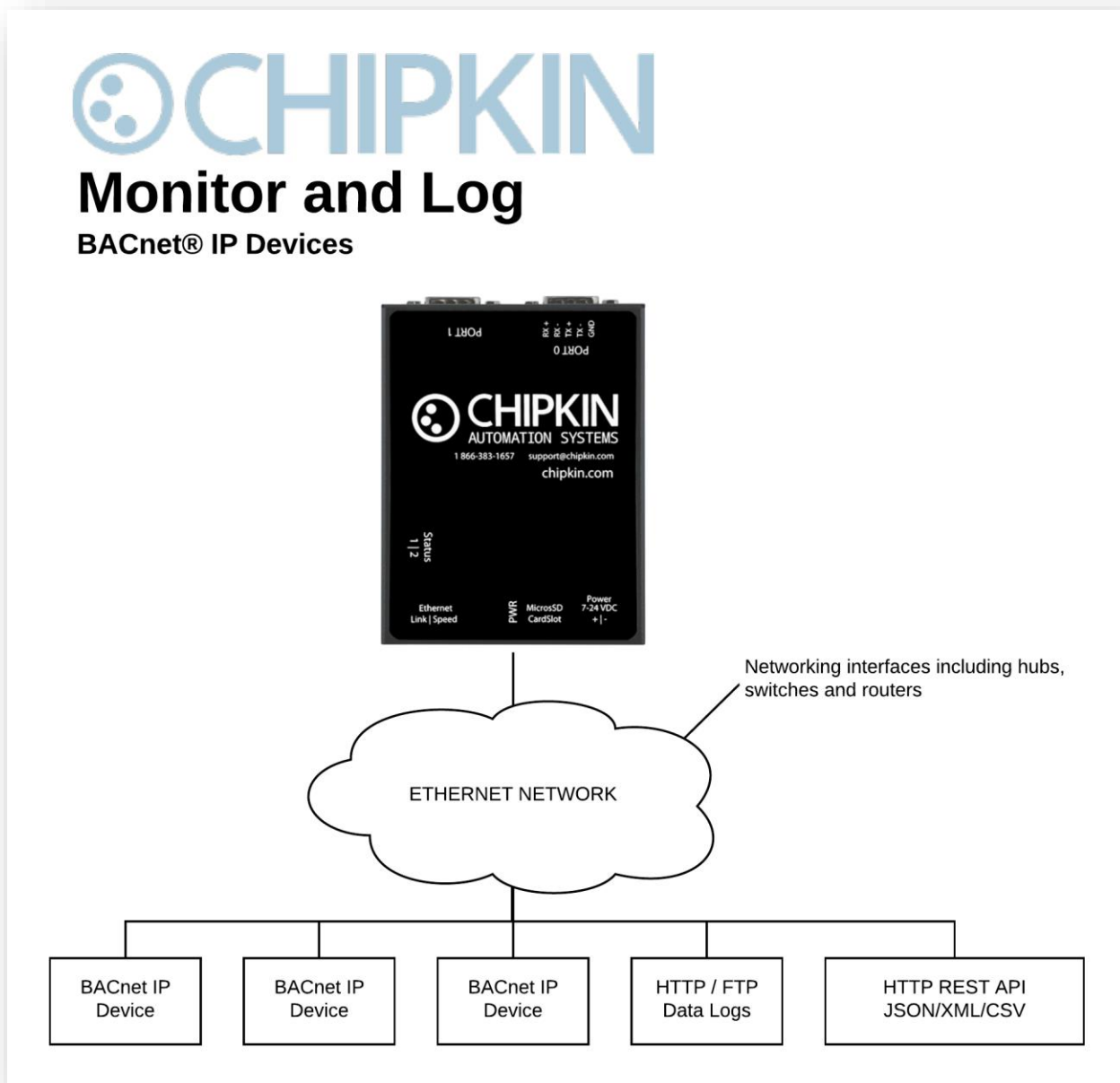


Figure 3.1-1 - Network Connections Block Diagram

3.2 COMMUNICATION PORTS

The Gateway uses the following ports for communication over the ethernet port.

Protocol	Port	Notes
HTTP	TCP 80	Web server.
Syslog	UDP 514	Can be disabled.
FTP	TCP 21	Can be disabled.
BACnet	UDP 47808	Configurable

Table 2 - Communication Ports

3.3 WIRING CONNECTIONS

The following sections describe the wiring connections used by the various ports of the CAS2500-04. This includes the pin-outs of the ports for the protocols that are used.

3.3.1 PIN-OUT

The CAS2500-04 has two serial ports, but they are not used on this device.

4. CONFIGURATION AND SETTINGS

This section contains instructions and screenshots on how to configure this device

4.1 BACNET IP CONFIGURATION SETTINGS

To configure the device for reading BACnet IP data, follow these steps:

4.1.1 BACnet IP Configuration Page

First, browse to the configuration page by either using the BACnet IP Client Config link as displayed below:

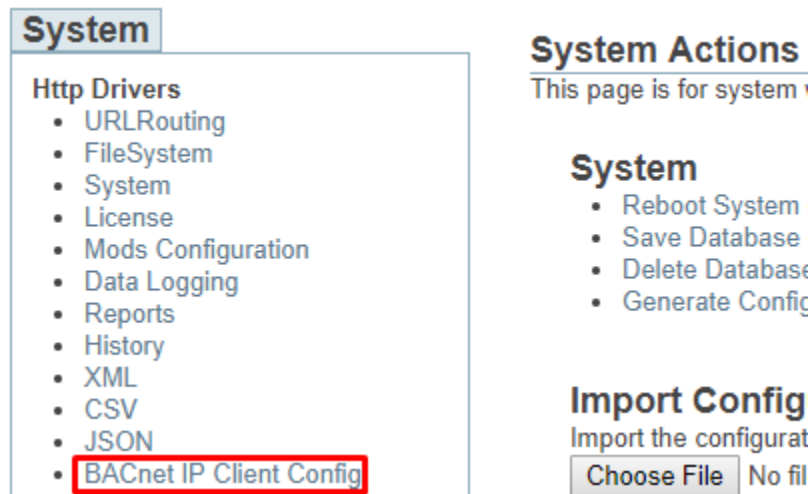


Figure 4.1-1 – BACnet IP Configuration Link

Or by typing the following URL into a web browser:

<http://{ipaddress}:{port}/bin/bacnetipclient/config/> where {ipaddress} is the IP Address of the data client and {port} is the port 8080 if using the Software version. If using the hardware version of the data client, please omit {port}.

4.1.2 BACnet IP Task Configuration

To configure tasks to read BACnet IP data points, first click on the “Insert” link as shown in the picture below:

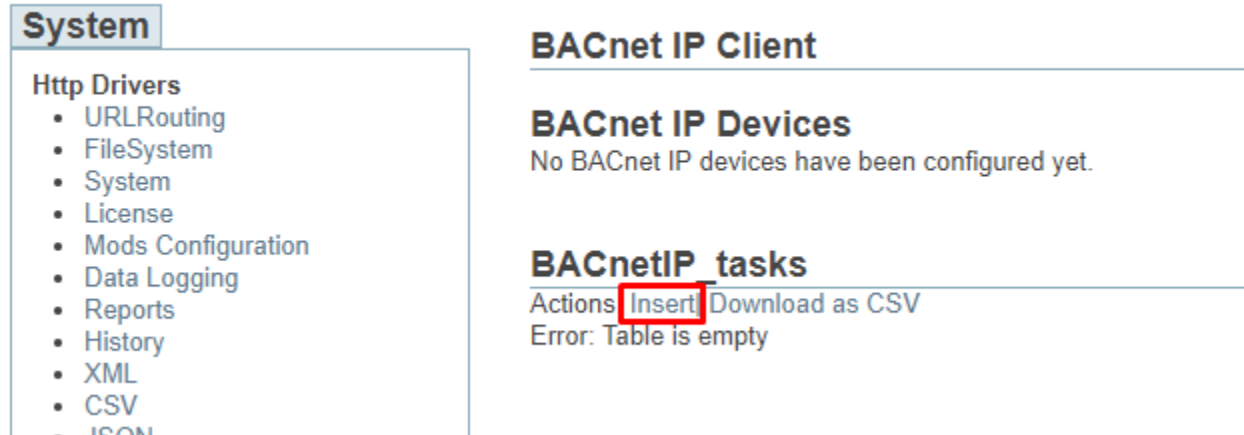


Figure 4.1-2 - Insert BACnet IP Task Link

Clicking on the insert link will show the following table

BACnet IP Client

Insert new record in to 'BACnetIP_tasks'

Name	Value	Description
Name	<input type="text"/>	The name of the task. This can be anything and is used to help identify the task.
Network	<input type="text"/>	The network that the BACnet device is on
Device ID	<input type="text"/>	The ID of the BACnet device.
IP Address	<input type="text" value="0.0.0.0"/>	The IP Address of the BACnet device
Port	<input type="text" value="47808"/>	The IP Port for the BACnet device. Default: 47808
SADR	<input type="text"/>	Optional: The Source Address of the BACnet device. Must be in Hex. Example: 01E843
Object Type	<input type="text" value="Analog Input"/>	The object type of the BACnet object being polled. Example: Analog Output
Object ID	<input type="text"/>	The ID of the BACnet object being polled.
Property	<input type="text" value="present_value"/>	The property of the BACnet object being polled. Default: present_value
Service	<input type="text" value="Read Property"/>	Read Property: Sends a ReadProperty message for the configured object and property. Read Property Multiple: Combines other ReadPropertyMultiple tasks into one ReadPropertyMultiple message.
Units	<input type="text" value="no_units"/>	The units of the property of the BACnet object being polled. Default: no_units
Scan	<input type="text" value="30"/>	How often to poll for this object in seconds.

Figure 4.1-3 – BACnet IP Task Form

Fill out the following fields to being polling for data:

- **Name** – The name of the task. This can be anything and is used to help identify the task.
- **Network** – The network that the BACnet device is on
- **Device ID** – The ID of the BACnet device.
- **IP address** – The IP Address of the BACnet device.
- **Port** – The IP Port for the BACnet device. Default: 47808
- **SADR – Optional:** The Source Address of the BACnet device. Must be in Hex.
- **Object Type** – The object type of the BACnet object being polled. Example: Analog Input.
- **Object ID** – The ID of the BACnet object being polled.

- **Property** – The property of the BACnet object being polled. Default: present_value.
- **Service** – The service to use for reading values.
- **Units** – The units of the property of the BACnet object being polled. Default: no_units.
- **Scan** – How often in seconds to run this task.

After filling out the form, click the “insert” button.

If successful, you will see the following screen:

BACnet IP Client

Success, Record #1 has been added

BACnet IP Devices

ID	IP Address	Device Instance	Network	SADR	Port
1	192.168.1.113	12345	0		47808

BACnetIP_tasks

Actions: Insert| Download as CSV

Displaying 30 records from 0-1 of a total 1

action	id	data_offset	device_id	name	object_id	object_type	object_units	priority	property	scan	service
Edit Delete	1	11	1	AI1	1	analog_input	no_units		present_value	30	readProperty

Figure 4.1-4 - Successfully added a BACnet IP Task

Click “Insert” again to add other tasks or to poll for data from other BACnet IP devices.

4.2 DATA LOGGING CONFIGURATION

This section describes how to setup the data client for data logging.

First, for data logging to work, there must be data. The data logging uses its own data table. By this point you have seen 1 other data tables:

1. da_data – this is the default data table used to store raw data read from the BACnet devices.

This other data table, da_data_logging, is used to store the data that will be logged and archived to csv.

There are a few ways to get the data for logging into the da_data_logging. This will be covered in the next few sections, [4.2.1 - Logging Data](#).

Following these sections will be [4.2.2 - Configuring Data Logging](#), which will describe how to setup the data client for logging.

4.2.1 Logging Data

Normally, this data is stored in da_data. To change it to store the values in da_data_logging, follow these steps:

First, return to the “System Page” by clicking on the “System” link as shown in the image below:

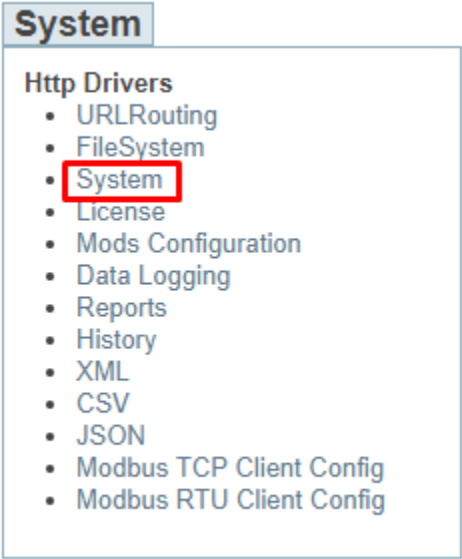


Figure 4.2-1 - System Page Link

Next, find the “Database” side bar menu and click either the “BACnetIP_tasks” link. See image below:

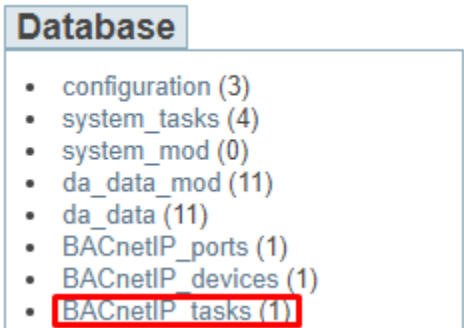


Figure 4.2-2 - BACnet IP Tasks Link

You will see the following screen:

BACnetIP_tasks

Actions: Insert Download as CSV

Displaying 30 records from 0-1 of a total 1

Action	ID	Cov_confirmed	Cov_increment	Data_length	Data Offset	Data_table	Device ID	Modified	Name	Object_id	Object_type	Object_units	Priority	Property	Scan	Service	Type
<div>Edit</div> <div>Delete</div>	1			1	11	Da_data	1	0	All	1	0	95		85	30	ReadProperty	Read

Figure 4.2-3 - BACnet IP Tasks

Click the “Edit” link as shown above to edit the task. You will see the following table:

Edit: BACnetIP_tasks {1}

Name	Value
id	1
Cov_confirmed	<input type="text"/>
Cov_increment	<input type="text"/>
Data_length	1
Data Offset	11 ▼
Data_table	da_data
Device ID	1
Modified	0
Name	AI1
Object_id	1
Object_type	0
Object_units	95
Priority	<input type="text"/>
Property	85
Scan	30
Service	readProperty
Type	read

Figure 4.2-4 - Edit BACnet Task

Change the Data_table from da_data to da_data_logging and click the “save” button. If successful, you will see the following updated table entry:

Success, Record #1 has been saved

BACnetIP_tasks

Actions: Insert | Download as CSV

Displaying 30 records from 0-1 of a total 1

Action	ID	Cov_confirmed	Cov_increment	Data_length	Data Offset	Data_table	D IC
Edit Delete	1			1	11	Da_data_logging	1

Figure 4.2-5 - Task Data Table Changed

The data will now be stored directly in to the da_data_logging table ready for logging.

4.2.2 Configuring Data Logging

Once there is data in the da_data_logging table, we can finally configure the data client to log the data.

First click on the “Data Logging” link as shown below:



Figure 4.2-6 - Data Logging Configuration Link

This screen will show all the data that is currently in the da_data_logging table.

To properly log these values, click on the “Edit” link of each item and provide the name for each data point. See image below for an example:

Data Points for Logging

Success, Record #3 has been saved

Da_data_logging

Actions: Insert | Download as CSV

Displaying 30 records from 0-30 of a total 50

Next > | Last >>

Action	ID	Modified	Name	Value
Edit Delete	1	0	Point 1	1
Edit Delete	2	0	Point 2	2
Edit Delete	3	0	Point 3	3
Edit Delete	4	0		0

Figure 4.2-7 - Data Logging Points

Next, after all the data points have been named, find the Navigation Sidebar menu and click the “Configuration” link. See image below:

System

- Http Drivers
 - URLRouting
 - FileSystem
 - System
 - License
 - Mods Configuration
 - Data Logging
 - Reports
 - History
 - XML
 - CSV
 - JSON
 - Modbus TCP Client Config
 - Modbus RTU Client Config

Navigation

- Configuration**
- List of Log Files

Data Points for Logging

Success, Record #3 has been saved

Da_data_logging

Actions: Insert| Download as CSV

Displaying 30 records from 0-30 of a total 50

Next > | Last >>

Action	ID	Modified	Name	Value
Edit Delete	1	0	Point 1	1
Edit Delete	2	0	Point 2	2
Edit Delete	3	0	Point 3	3
Edit Delete	4	0		0
Edit Delete	5	0		0
Edit Delete	6	0		0
Edit Delete	7	0		0
Edit Delete	8	0		0
Edit Delete	9	0		0
Edit Delete	10	0		0
Edit Delete	11	0		0

Figure 4.2-8 - Data Logging Task Configuration Link

You will see the following screen:

Data Logging Tasks

Actions: **Insert** | Download as CSV

Error: Table is empty

Figure 4.2-9 - Data Logging Task Insert Link

Click the “Insert” link to add a Data Logging Task. You will see the following form:

Insert new record in to 'Data Logging Tasks'

Name	Value
Name	<input type="text"/>
Log Format	singleRow ▼
Log Filename	Log
Log Type	Interval Log ▼
Max Age	0
Archive Format	Hourly ▼
Data Table	da_data_logging
Data Offset	1 ▼
Data Length	<input type="text"/>
Scan	30

Figure 4.2-10 - Data Logging Task Form

Fill out the form for the specific type of log. The fields are as follows:

- **Name** – The name of the logging task.
- **Log Format** – Currently there is only one format, singleRow
- **Log Filename** – The prefix for all the log files.
- **Log Type** – The type of log to take, currently only the interval log is available. Interval logs are logs where each entry is entered each time interval. For example, if Scan is set to 30, there will be an entry every 30 seconds.
- **Max Age** – always set to 0.
- **Archive Format** – this is how the data is separated into different files. If set to Hourly, there will be one file generated for each hour. Example: Log_2017111001.csv, Log_2017111002.csv, etc. The file timestamp is YYYYMMDDHH. For Daily, files are generated YYYYMMDD. For Monthly, YYYYMM, and finally for yearly, YYYY.
- **Data Table** – always set to da_data_logging
- **Data Offset** – always set to 1.
- **Data Length** – the number of data points to log.
- **Scan** – how often in seconds to log the data.

Click the “insert” link to add the logging task. If successful, you will see the following result table:

Success, Record #5 has been saved

Data Logging Tasks

Actions: Insert| Download as CSV

Displaying 30 records from 0-1 of a total 1

Action	ID	Data Length	Data Offset	Data Table	device_id	Name	Parameters	Scan	service
Edit Delete	5	3	1	da_data_logging		LogTest	("logFormat":"singleRow","filename":"Log","logType":"0","maxAge":"0","archiveFormat":"1","archiveParameters":"YYYYMMDDHH")	30	logData

Figure 4.2-11 - Inserted Data Logging Task

Once logging starts and files are generated, you can click on the “List of Log Files” link in the Navigation sidebar. See image below:

System

- Http Drivers
 - URLRouting
 - FileSystem
 - System
 - License
 - Mods Configuration
 - Data Logging
 - Reports
 - History
 - XML
 - CSV
 - JSON
 - Modbus TCP Client Config
 - Modbus RTU Client Config

Success, Record #5 has been saved

Data Logging Tasks

Actions: Insert| Download as CSV

Displaying 30 records from 0-1 of a total 1

Action	ID	Data
Edit Delete	5	3

Navigation

- Configuration
- List of Log Files

Figure 4.2-12 - Data Logging Files Link

The List of Log Files to display a list of the existing log files. You can click the “View” button to view the entries or click the “Download” button to download that csv log file. If you need to delete the file, check the checkbox and click the “Delete Selected Files” button. See image below for example:

List of Data Logs

Delete Selected Files

	Select	Filename	Action
1	<input type="checkbox"/>	Log_2017111009.csv	<input type="button" value="Download"/> <input type="button" value="View"/>

Delete Selected Files

Figure 4.2-13 - Log Files

4.3 Completing the Configuration

Once the configuration process has finished, 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/>

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

System Actions

This page is for system wide actions that effect all the drivers.

System

- [Reboot System](#) - Use this link to send a reboot REST request to the system.
- [Save Database](#) - Use this link to send a save database REST request to the system.
- [Delete Database](#) - Use this link to send a delete database REST request to the system.
- [Generate Configuration File](#) - Use this link to generate a configuration file.

Figure 4.3-1 - 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 4.3-2 - Save Database Successful

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

System Actions

This page is for system wide actions that effect all the drivers.

System

- **Reboot System** - Use this link to send a reboot REST request to the system.
- Save Database - Use this link to send a save database REST request to the system.
- Delete Database - Use this link to send a delete database REST request to the system.
- Generate Configuration File - Use this link to generate a configuration file.

Figure 4.3-3 - Reboot System Link

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

Restarting device

The device is restarting, this may take a few minutes.

Status: Checking ... 2

Figure 4.3-4 - Reboot System Count

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

4.4 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:

System Actions

This page is for system wide actions that effect all the drivers.

System

- [Reboot System](#) - Use this link to send a reboot REST request to the system.
- [Save Database](#) - Use this link to send a save database REST request to the system.
- **[Delete Database](#)** - Use this link to send a delete database REST request to the system.
- [Generate Configuration File](#) - Use this link to generate a configuration file.

Figure 4.4-1 - Delete Database Link

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

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<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>
  </query>
  <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>
  <delete_database>1</delete_database>
  <query_string>act=set&delete_database=1</query_string>
  <uri>bin/xml</uri>
</query>
  <response status="OK" count="1">
    <delete_database>OK</delete_database>
  </response>
</HttpXML>
```

Figure 4.4-2 - Delete Database Successful

Click the back button in the web browser and then follow the instructions in the [Completing the Configuration](#) section.

4.5 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:

System Actions

This page is for system wide actions that effect all the drivers.

System

- [Reboot System](#) - Use this link to send a reboot REST request to the system.
- [Save Database](#) - Use this link to send a save database REST request to the system.
- [Delete Database](#) - Use this link to send a delete database REST request to the system.
- [Generate Configuration File](#) - Use this link to generate a configuration file.

Figure 4.5-1 - 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.

4.6 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”:

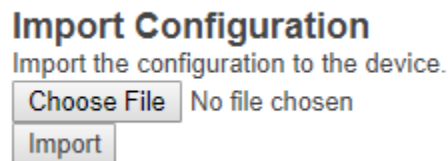


Figure 4.6-1 - Import Configuration

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

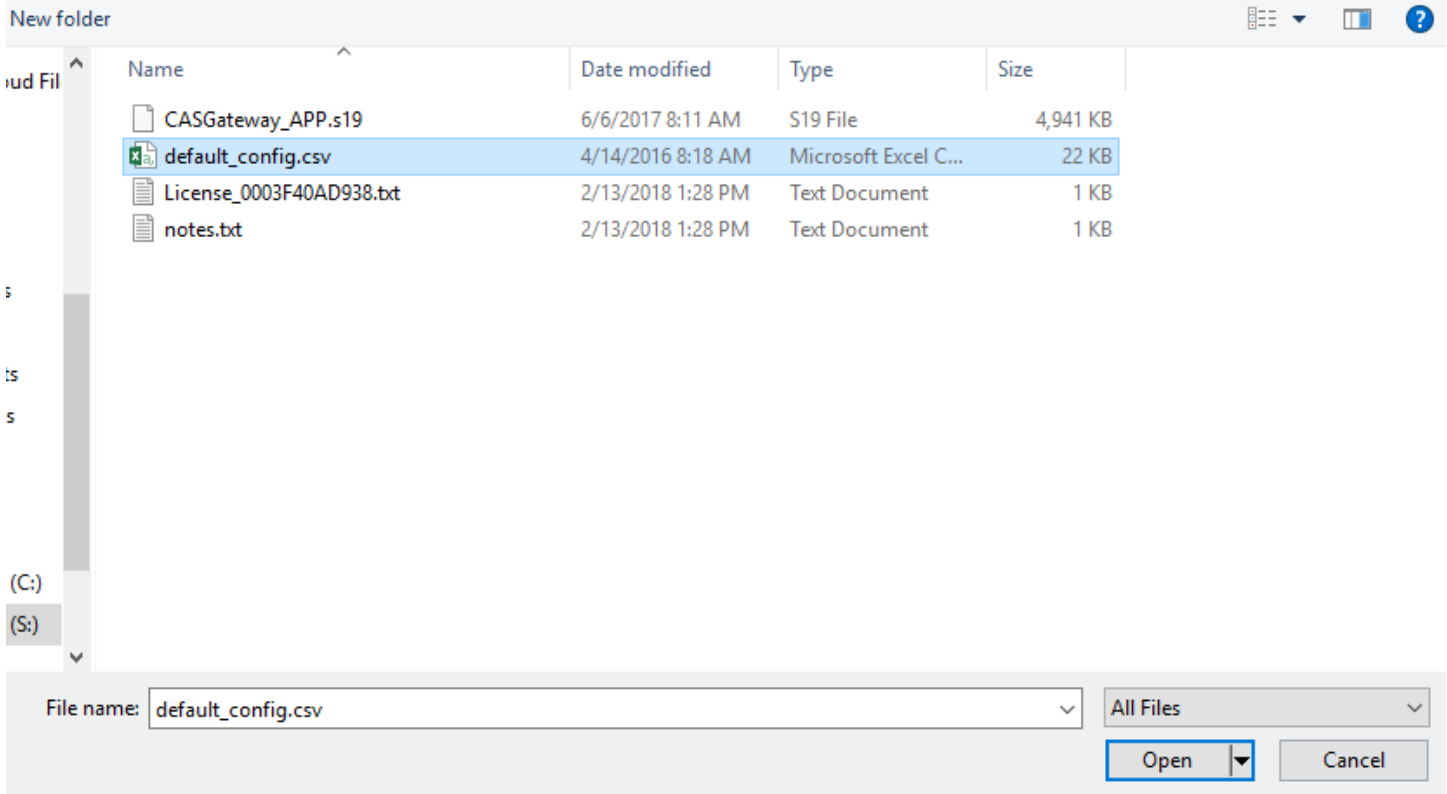


Figure 4.6-2 - Import File Browser

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

Import Configuration

Import the configuration to the device.

Choose File default_config.csv

Import

Figure 4.6-3 - 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:

Importing configuration

Starting import... ~tmp\default_config.csv
Opening the config file... OK
Get the database... OK
Deleting old tables... OK
Creating mods tables... OK
Creating configuration table... OK

Starting to parse the configuration file

Parsing line: table_name=da_data_mod
New table found. Table name=da_data_mod

Figure 4.6-4 - Importing the Configuration File

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

Parsing line: 02,64,32,210,da_data,1,8,,Tank03_TankAlarms,1,03,passive
Importing data in to table. Table=[VeederRoot_tasks]... OK

Parsing line: 02,96,32,310,da_data,1,9,,Tank04_TankAlarms,1,04,passive
Importing data in to table. Table=[VeederRoot_tasks]... OK
Finished parsing the configuration file
Saving the database...OK

Import Successful - Please restart the Gateway

Figure 4.6-5 - 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.

Generating Configuration File

The configuration file is currently being generated. This may take some time.

Status: Generate Config File has completed.
Elapsed Time: 3

Please download the configuration file from the following link: [Export Configuration](#)

Figure 4.6-6 - Export Configuration

5. COMMISSIONING, DIAGNOSTICS, AND TROUBLE-SHOOTING

5.1 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.

5.1.1 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/>
- **Wireshark** - 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>

5.1.2 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.

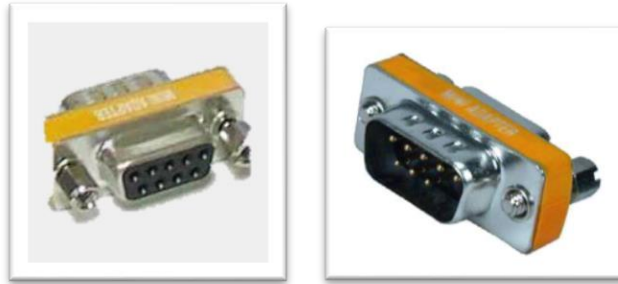


Figure 5.1-1 - DB9 Gender Changers

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



Figure 5.1-2 - 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

5.2 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.

5.2.1 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 5.2-1 - Setup reference card

5.2.2 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

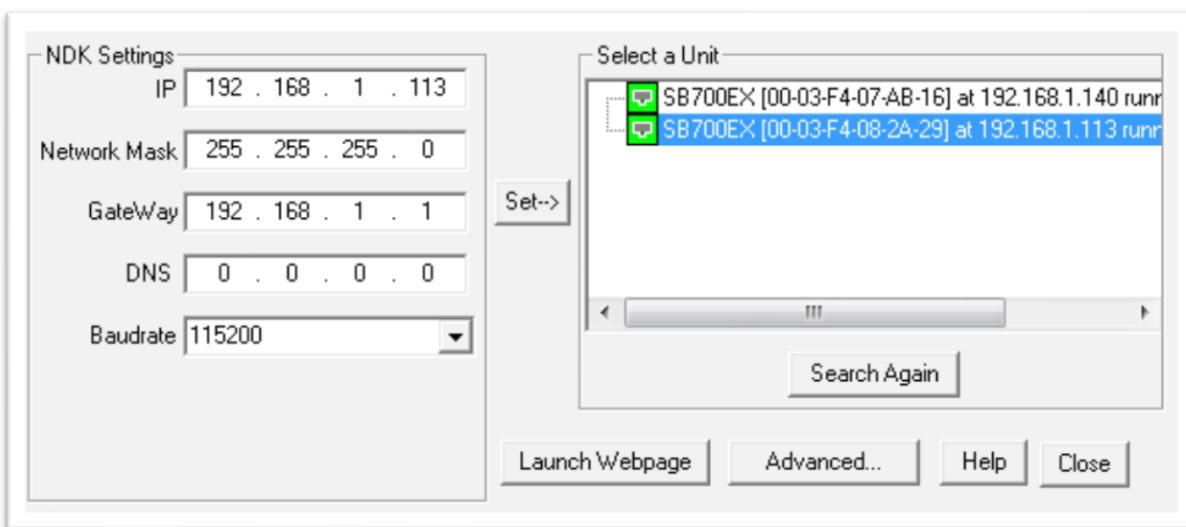


Figure 5.2-2 - IP Setup tool

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

5.3 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>

5.4 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.

5.4.1 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)

5.4.2 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/>

5.5 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

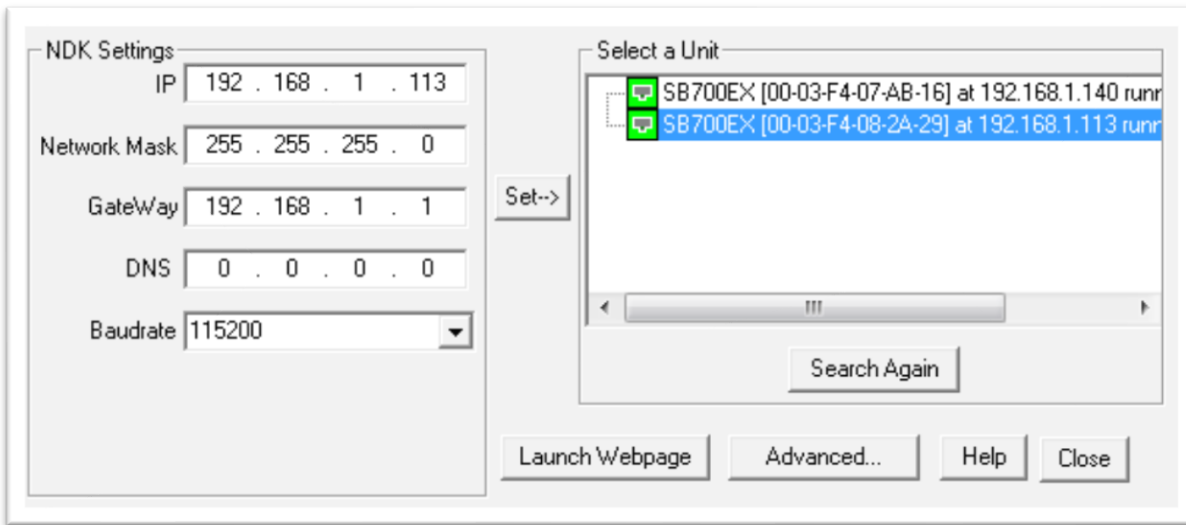


Figure 5.5-1 - IP Setup tool

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.

5.6 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 advises 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:

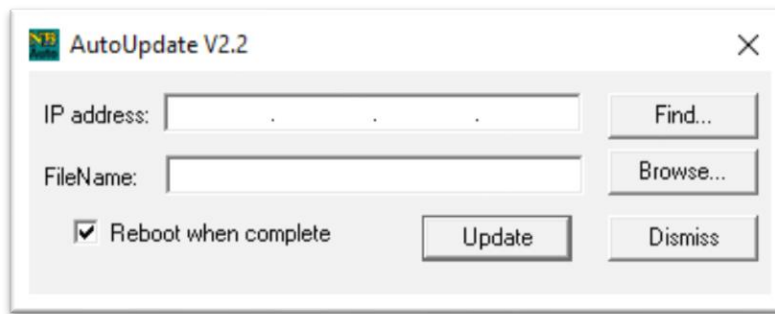


Figure 5.6-1 - AutoUpdate tool window

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.

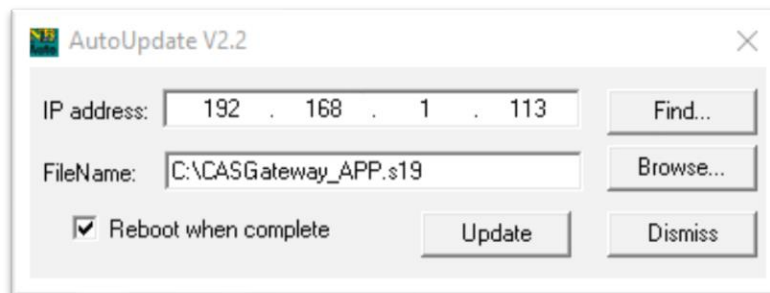


Figure 5.6-2 - AutoUpdate tool window

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:

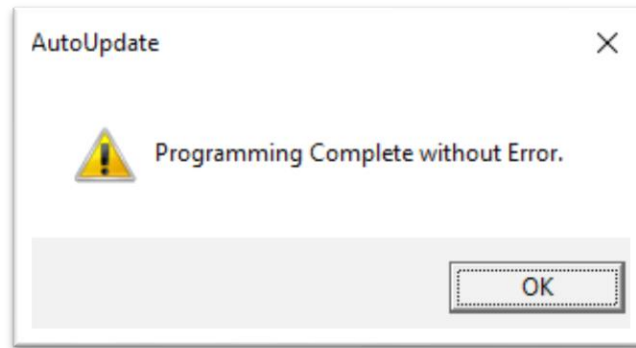


Figure 5.6-3 - Firmware update success

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.

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

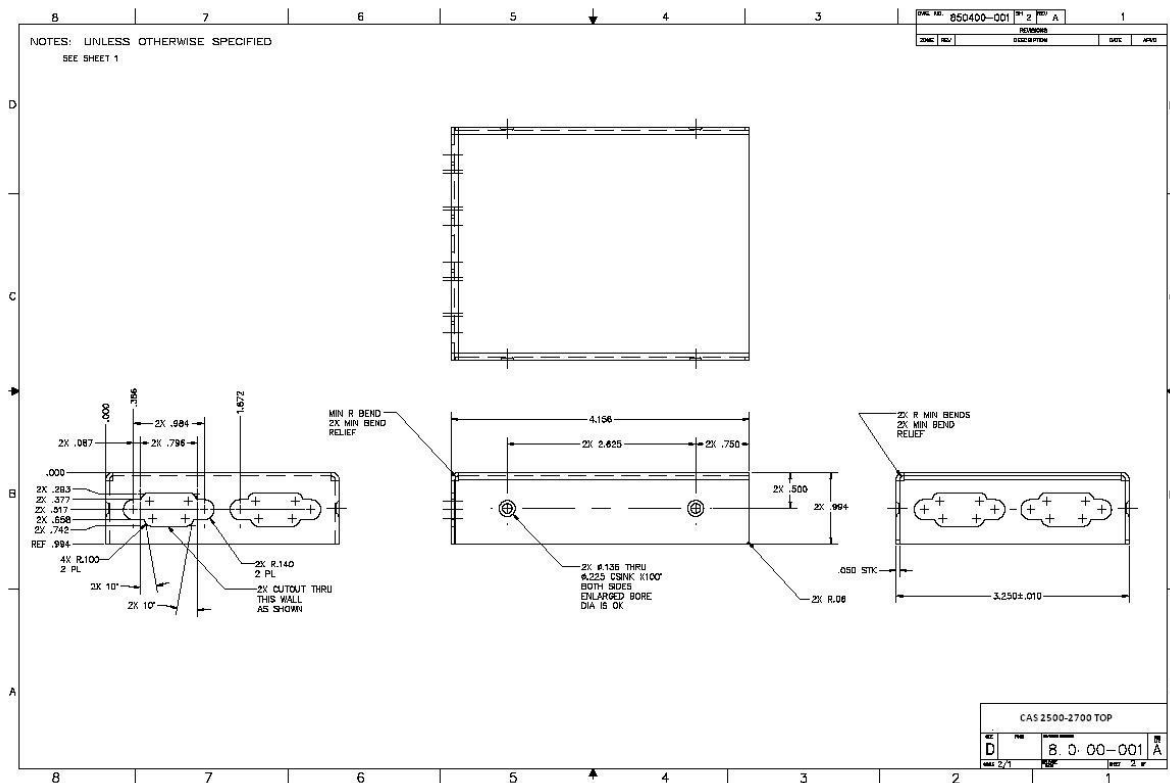
The following specifications for the CAS gateway are common to all Chipkin Gateways.

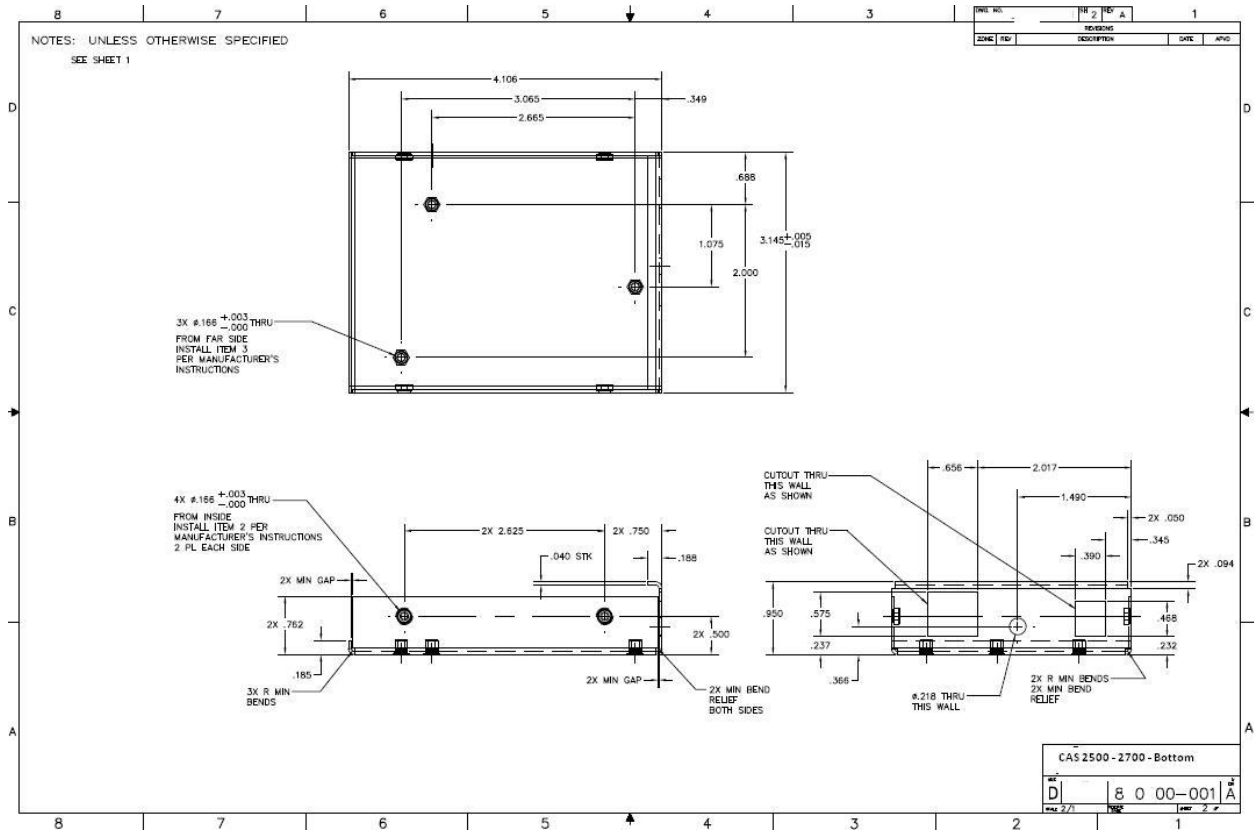
- UL, C/UL, CE, FCC approved
- 10/100BASE-T with RJ-45 connector
- 1x RS232 port
- 1x RS485 port (different models have additional ports)
- Power: 7 – 24 VDC @90 mA
- Operating temperature: 0 – 70 °C (32 – 158 °F)
- LEDs: link, speed/data, power
- Dimensions (LxWxH): 107 x 83 x 25 mm (4.2 x 3.25 x 1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

MECHANICAL DRAWINGS

Applies to all CAS2500 and CAS2700 products.

Top View





Front Panel



Back Panel

Serial Protocols Supported

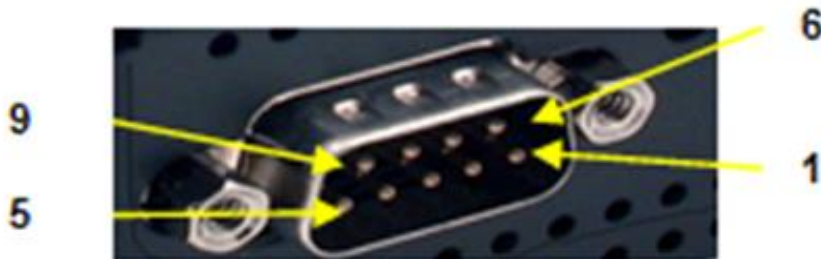
RS-232, RS-422, and RS-485

Serial Configurations

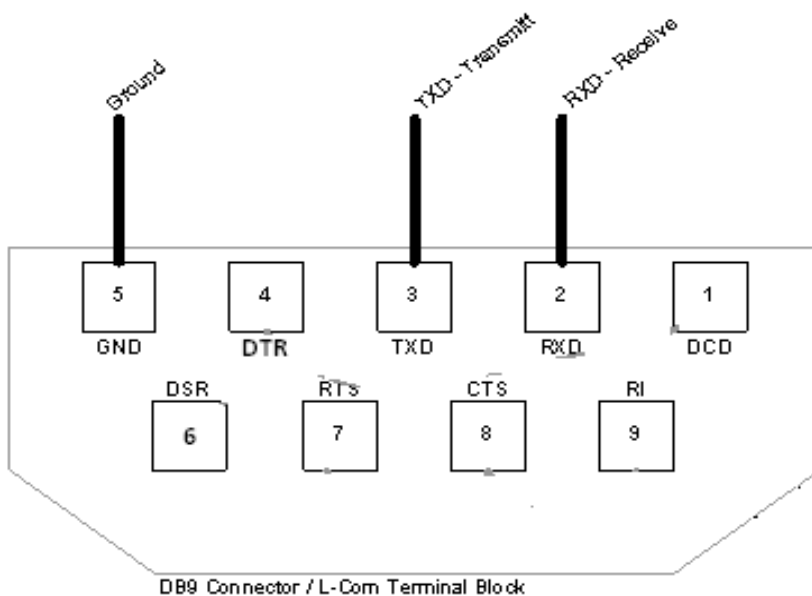
The two UARTs can be configured in the following ways:

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

DB9 Pinout

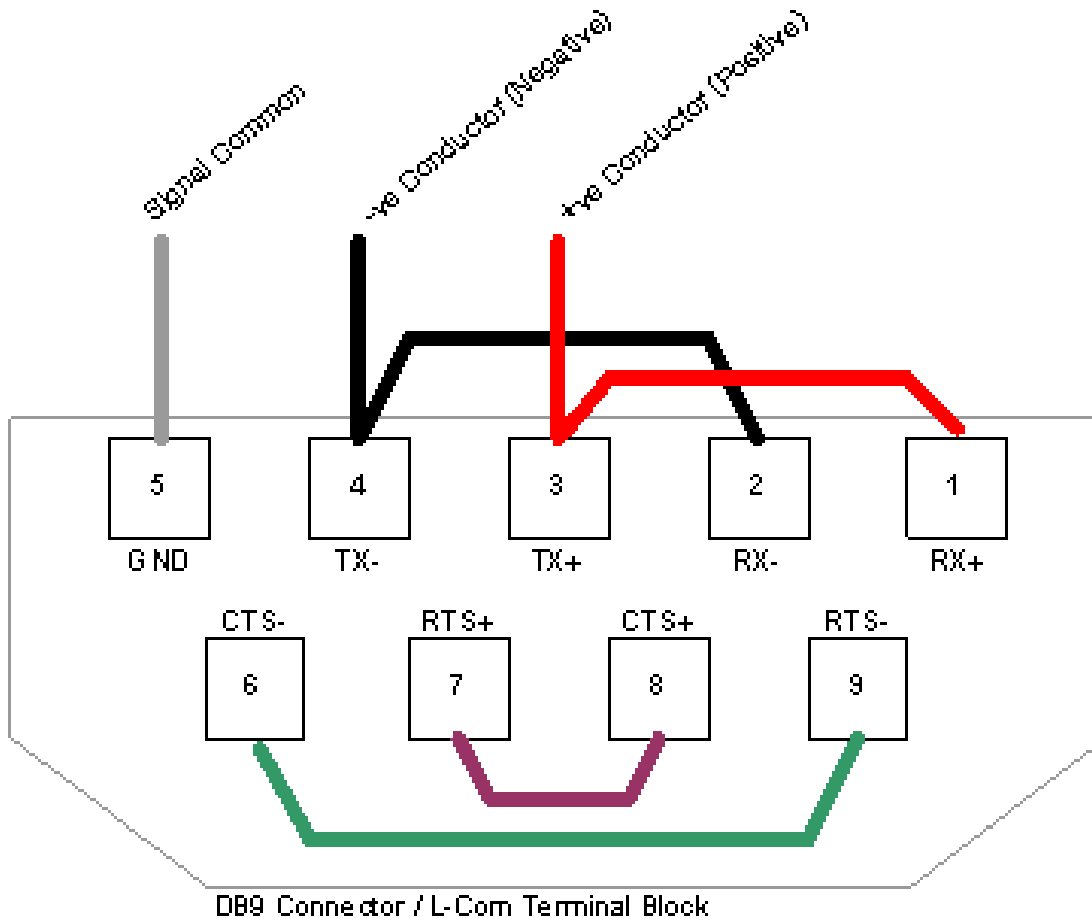


RS232- 3 Wire [No Handshaking]



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: SUPPORTED BACNET SERVICES

The following BACnet services are supported by the CAS 2500-04.

BACNET SERVICE
Read Property
Read Property Multiple
Write Property Multiple
Subscribe COV

APPENDIX D: 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

Toll free: 1-866-383-1657

Email: salesgroup1@chipkin.com