CHIPKIN
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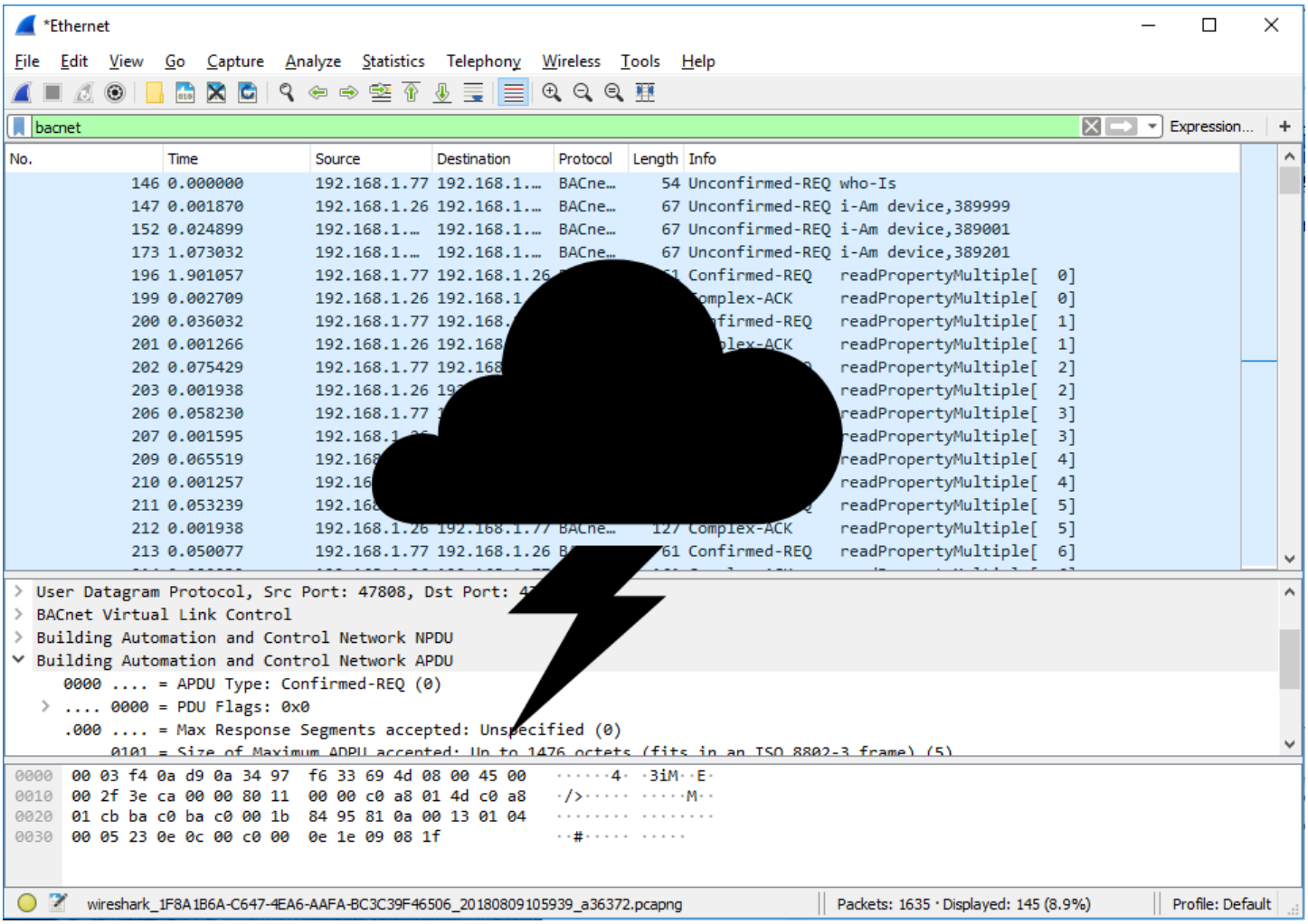
Chipkin™ BACnet Wireshark Storm
USER MANUAL



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PRODUCT NUMBER: CAS-1000-05
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DISCLAIMER

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rules of service repair.

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DOCUMENT REVISION HISTORY

REVISION	DATE	AUTHOR	NOTE
0	2018-Aug-09	BDC	Created.

Table 1 - Document Revision History

1. PREFACE

1.1 WELCOME

As a new user of the Chipkin BACnet Storm, 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 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.

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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
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Vancouver, BC, Canada V5Z 4R3

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2. OVERVIEW

2.1 PRODUCT SUMMARY

The CAS BACnet Wireshark Storm application is a tool to help test BACnet server applications with problematic BACnet UDP messages. The tool loads a Wireshark PCap log file and resends the UDP messages to a destination IP address. The BACnet server at the destination IP address will then process the incoming UDP message and attempt to respond to them as if they were coming from an actual BACnet client.

2.2 USE CASES

- Testing specific problematic BACnet messages
- Testing denial of service (DOS), flood of BACnet messages
- Testing large sequences of messages from remote sites
- BACnet Pre-BTL testing
- Regression and unit testing

2.3 INSTALLATION SUMMARY

Download and install Wireshark (https://www.wireshark.org) if you have not already done so. The BACnet Wireshark Storm will not run otherwise.

To acquire the Chipkin BACnet Wireshark Storm, simply download the executable from https://store.chipkin.com/products/cas-bacnet-wireshark-storm.

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3. CONNECTIONS

3.1 **NETWORK DIAGRAM**

This block diagram consists of a Computer running the CAS BACnet Wireshark Storm tool that resends all the UDP messages from a given Wireshark PCap file to a BACnet IP Server device.

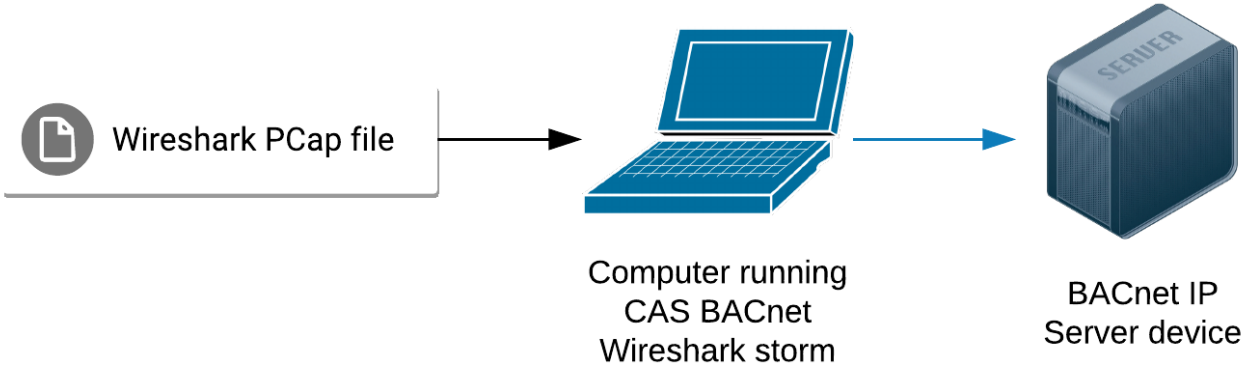

Figure 1 - Network Diagram

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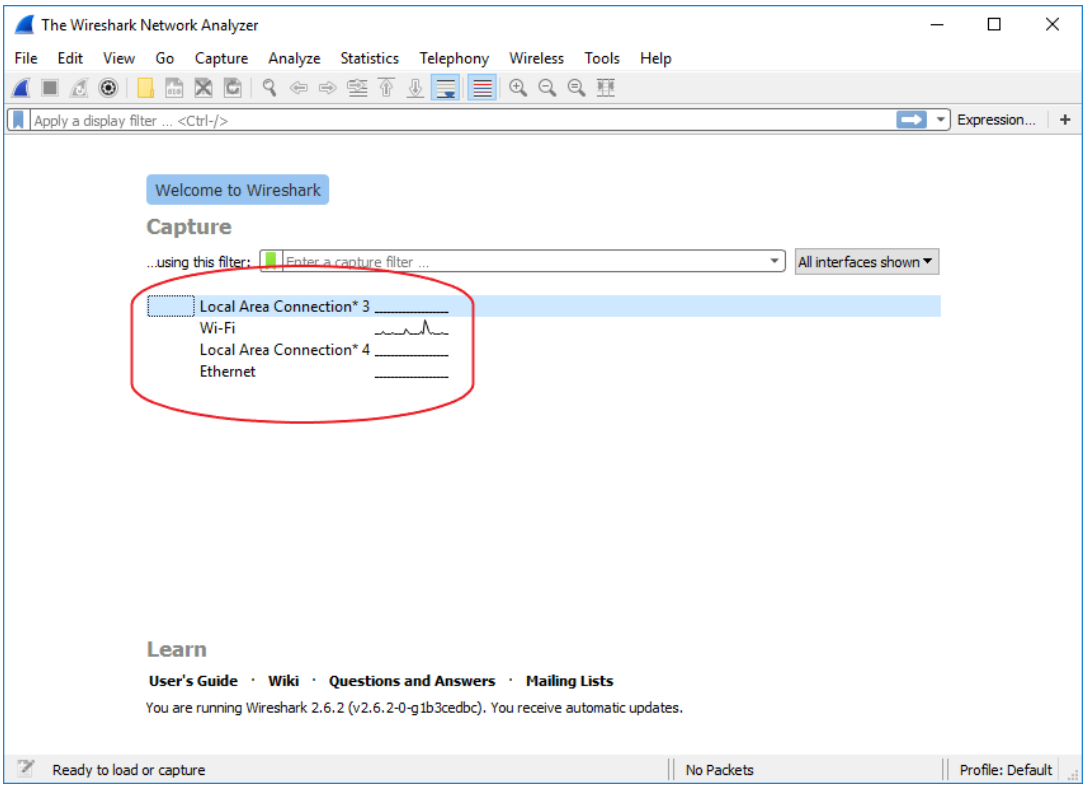
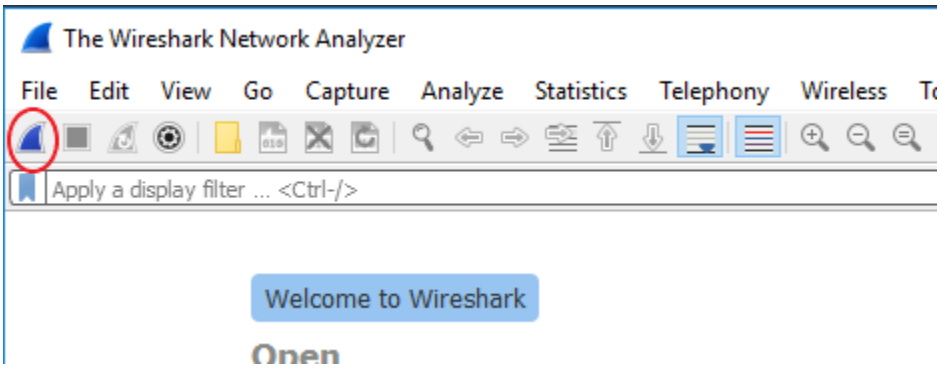
4. CREATING A WIRESHARK LOG

1) Download and install Wireshark if you have not already done so: https://www.wireshark.org.

2) Open Wireshark and click on the network you want to capture.



3) Click to start capturing packets.



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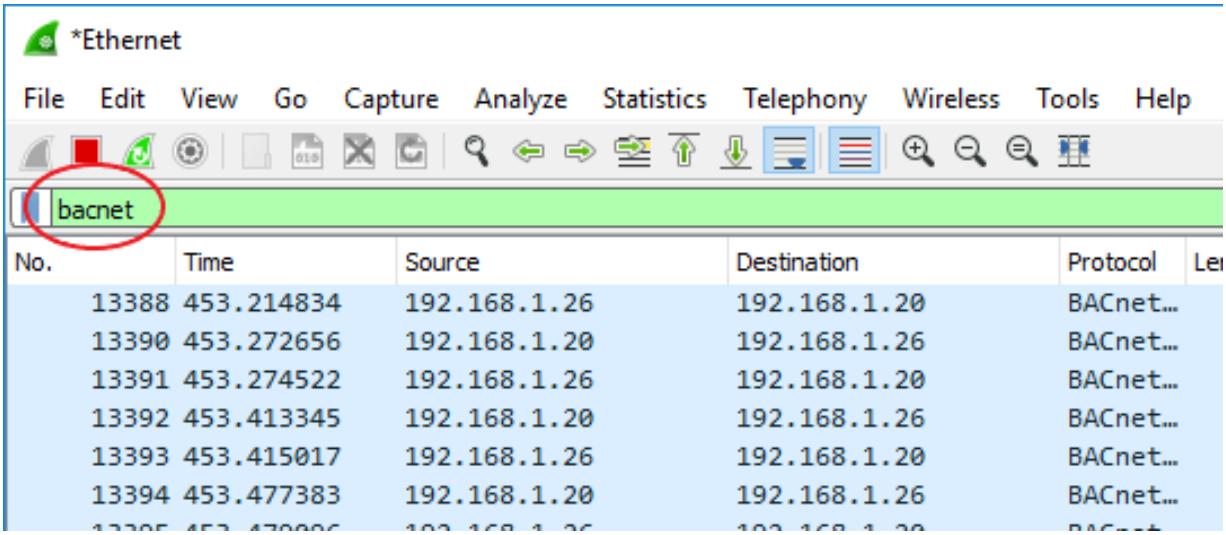
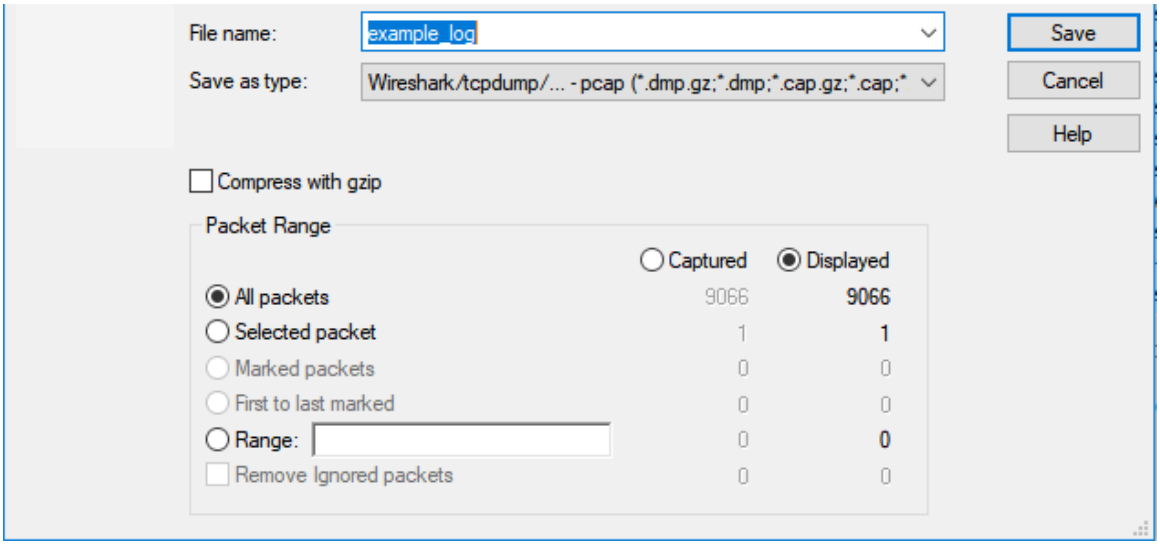
4) Enter **bacnet** as the display filter.



5) If you are debugging an issue, reproduce the problematic issue on the BACnet network.

6) Once you are confident you have all the messages you want captured, click to stop capturing the communication.

7) Click **File->Export Specified Packets…**, change the log file format to ***.pcap**, ensure **Displayed** is selected, and save.



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5. EXECUTION

5.1 ADDING WIRESHARK FILES

The BACnet Wireshark Storm will send the UDP messages found in PCap Wireshark logs contained in the same directory as the application (CASBACnetStorm.exe). In the case that multiple logs have been added to the same directory as the executable, the BACnet Wireshark Storm will send the UDP messages from each log in succession.

5.2 COMMAND LINE SYNTAX

```
CASBACnetStorm [destination IP address] [packet delay] [source port]
```

5.3 COMMAND LINE ARGUMENTS

- ***Destination IP Address*** (optional) – The IP address that the stream of UDP messages will be sent to. *Default: 192.168.1.113*
- ***Packet Delay*** (optional) – The amount of time in milliseconds between sending each packet. A value of zero will send the packets as fast as possible. This can be useful for DOS testing. *Default: 10 ms*
- ***Source Port*** (Optional) – The source UDP port that the messages will be sent from. *Default: 47808*

5.4 COMMAND LINE EXAMPLES

1) The following example will rebroadcast all the UDP packets found in the Wireshark logs (located in the same directory as CASBACnetStorm.exe) to *192.168.1.113* as fast as possible:

```
CASBACnetStorm 192.168.1.113 0
```

2) The following example will rebroadcast all the UDP packets found in the Wireshark logs (located in the same directory as CASBACnetStorm.exe) to *192.168.1.113* with a 25 millisecond wait time between sending each packet:

```
CASBACnetStorm 192.168.1.113 25
```


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6. EXAMPLE COMMAND LINE OUTPUT

```
CAS BACnet Wireshark Storm v1.0.0.0
Written by: Steven Smethurst (chipkin.com)
Last updated: Aug 9 2018 12:27:59
More information: chipkin.com

arg1 = Outgoing IP Address (default: 192.168.1.113)
  Outgoing IP Address set to 192.168.1.113
arg2 = Delay between sending packets (default: 10)
  packetDelay set to 10
arg3 = Source port (default: 47808)
  sourcePort set to 47808
Connected to port=[47808]
FYI: Process Wireshark file [wscap_00094_20180427120738_00006_20180626220000.pcap]
FYI: Wireshark packet version [2.4]
FYI: processed packet #100
FYI: processed packet #200
FYI: processed packet #300
FYI: processed packet #400
FYI: processed packet #500
FYI: processed packet #600
FYI: processed packet #700
...
FYI: processed packet #43000
FYI: processed packet #43100
FYI: processed packet #43200
FYI: processed packet #43300
FYI: processed packet #43400
FYI: processed packet #43500
Done with file=[wscap_00094_20180427120738_00006_20180626220000.pcap]

Waiting 10 seconds before looping...
CAS BACnet Wireshark Storm v1.0.0.0

Input options:
 q - Quit application
 or press any key to continue
```


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7. DIAGNOSTICS AND SUPPORT

7.1 REPORTING BUGS AND REQUESTING FEATURES

Chipkin always strives to provide the highest quality of products and services to customers. Please contact us (https://store.chipkin.com/contact-us) to report bugs or suggest features so that we can improve BACnet Wireshark Storm for you.

7.2 ERROR MESSAGES

7.2.1 **"Nothing to send. bufferSize=0"**

The system could not send this message since the packet was invalid.

7.2.2 **"Failed to send message. bufferSize=<size of packet in bytes>"**

The system could not send the message.

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BEST PRACTICES

The Chipkin BACnet Storm (CAS-1000-05) best practices:

Tip: We recommend filtering any non-BACnet IP messages out of Wireshark logs before they are processed by the BACnet Wireshark Storm. To do so, open the Wireshark logs and then follow steps 4 and 7 (skip 5/6) in the [Creating a Wireshark Log] section above.

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APPENDIX A: SAFETY WARNINGS

This Appendix is left intentionally blank.

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APPENDIX B: HARDWARE SPECIFICATIONS

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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.

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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.

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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

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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.

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GLOSSARY

- **BACnet** – The communication protocol for Building Automation and Control (BAC) networks.
- **UDP** – User Datagram Protocol
- **PCap (Packet Capture)** – Data files containing the packet data of a network.

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THANK YOU

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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

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