

# Protec BACnet Interface Manual



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Protec Fire Detection PLC, Protec House, Churchill Way, Nelson, Lancashire, BB9 6RT.

Telephone: +44 (0) 1282 717171  
Fax: +44 (0) 1282 717273  
Web: [www.protec.co.uk](http://www.protec.co.uk)  
Email: [sales@protec.co.uk](mailto:sales@protec.co.uk)

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## Table of Contents

<b>1.0</b>	<b>OVERVIEW.....</b>	<b>4</b>
<b>2.0</b>	<b>BACNET AWARE EVENTS.....</b>	<b>5</b>
<b>3.0</b>	<b>SETTING UP THE INTERFACE .....</b>	<b>6</b>
3.1	Getting Started .....	6
3.2	Interface Application .....	7
3.2.1	GENERAL TAB.....	7
3.2.2	Common Controls .....	8
3.2.3	INPUTS TAB .....	10
3.2.3.1	Import and Export Data .....	11
<b>4.0</b>	<b>SUPPLIED PROGRAM .....</b>	<b>12</b>
<b>5.0</b>	<b>BACNET PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (PICS).....</b>	<b>13</b>
<b>6.0</b>	<b>EVENT TERMINOLOGY .....</b>	<b>14</b>

# Protec BACnet Interface

## 1.0 Overview

The BACnet interface supplied by Protec connects to the RS232 Graphics port on a Protec Fire Alarm Control Panel to get data from the fire alarm system. This data is adapted to the BACnet standard and is available from the interface as BACnet over Ethernet.

The graphics protocol from the fire alarm system provides change of state information for every device on the fire alarm network.

The BACnet interface has objects that are programmed for each required device to report the state of that device as a property of the object.

Objects (fire detection devices) take one of 4 mutually exclusive states:

- Quiet
- Fault
- Pre Alarm
- Alarm

The object can also be Blocked (disabled) at the panel, but when unblocked (normalised) revert to the current state.

The interface allows the BMS to subscribe to COV (change of value) for the objects; this will then send a COV message for any change of state. The subscription is for a timed period that is set up with the subscribe request.

The type of device is set up at commissioning.

This system is designed to work fully as described in this document with the 5400, 6400 and the 6600 systems, however, with the 5300 and 6300 systems the data is limited to Fire and Fault per fire alarm device.

## 2.0 BACnet Aware Events

BACnet objects are defined by their Node, Loop and Address numbers, the Zone, type and text description are also included but are optional.

The text can be entered manually but will be 'learnt' from the system as and when the device takes a state other than 'Quiet'.

Event Name	Panel Event Number	Allowed States	Object Defined By		
			Node	Loop	Address
Device Fire	Event 00	On & Off	Node	Loop	Address
Device Fault	Event 01	On & Off	Node	Loop	Address
Device Pre Alarm	Event 27	On & Off	Node	Loop	Address
Device Disable	Event 23	On	Node	Loop	Address
Device Normalise	Event 24	On	Node	Loop	Address
Loop Fault	Event 03	On & Off	Node	Loop	000
Node Events	Event FF	On & Off	Node	0	Event Code (3 ASCII Characters)

There are three types of events

### 1) Device Events

These events are specified by node loop and address. Fire, Fault or Pre Alarm is the device status and are mutually exclusive. Disabling keeps the status as per the device events even while disabled and reports either:

- the object current state;
- or the object disabled (Blocked - unless we find a better object property).

### 2) Loop Faults

See Event 3 above.

### 3) Node Events

See Event FF above.

As there are numerous different types of node fault, node fault events are all sent as event FF. By using the address number as the event code there is a unique Node Loop and Address information for any event sent.

This means any specific events required can be added with no effect the BACnet interface firmware.

A common Node Fault event is sent as address 255 for all non specified faults

Node Events Sent

Event Name	Panel Event Number	Allowed States	Node	Loop	Address
Node Faults	Event FF	On & Off	Node	0	255
Node Supply Fault	Event FF	On & Off	Node	0	005 (Event 05)

These are unique to the node. Node 00 is used for global versions of an event e.g. Walk Test, Alarm Outputs Disabled when these are specified.

### 3.0 Setting Up the Interface

This application is a general purpose BACnet interface using the BACnet IP (Annex J) data link layer.

The interface can be set up with up to 10000 points for any combination of addresses on the fire alarm network.

COV reporting is supported as either confirmed or unconfirmed reporting.

#### 3.1 Getting Started

The interface is supplied with the BACnet firmware installed and set up in the test configuration.

Install the supplied program 'Protec BACNet Interface.msi' on to the PC that will be used to program the interface.

The interface is supplied boxed and already connected to the Ethernet Module and the RS232 Module.

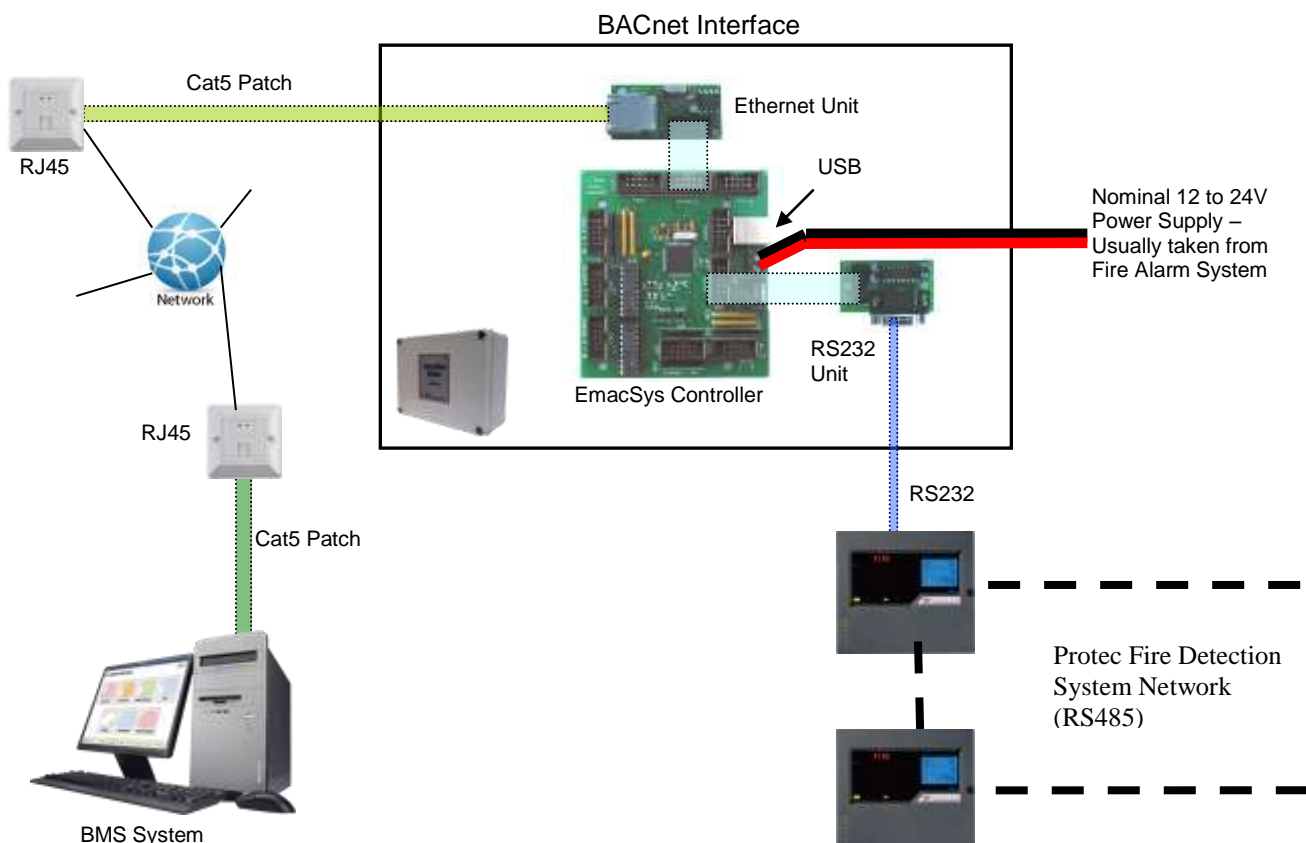
Connect the power and ensure the green run LED is illuminated. (12 to 30V DC).

The Ethernet module green LED indicates that it is correctly attached to the Control Module. The red LED indicates that the Ethernet module is not attached.

Note: Do not disconnect or connect the Ethernet module while the Control Module is powered as this may cause damage to either module.

Connect the RS232 into the fire alarm system 'graphics' port. (see relevant fire system manual).

Connect the local Ethernet cable into the Ethernet module.



## 3.2 Interface Application

The interface application allows the setting of various Ethernet and BACnet options via the USB port. General Connect a USB lead between the interface and a PC and run the application in the Program Files – Protec Folder – ProtecBACNetInterface.exe. This can be found from the start menu All Programs in the section entitled Protec.

A window similar to the one shown will be displayed.

### 3.2.1 GENERAL TAB

#### IP Information

**Get Address Automatically:** If this box is checked the IP address of the device will be obtained by DHCP. Any information in the IP Address boxes will be ignored.

**IP Address:** This is the IP address of the device. (ignored if DHCP is used).

**Gateway Address:** IP address of the gateway if this is used.

**Submask:** Used in conjunction with the gateway if this is used.

**Port:** This is the port used to communicate with other BACnet devices. The default is 47808 and should not normally need to be changed.

**Object Name:** This is the object\_name property of the device object. It should be unique internetwork-wide and has a maximum length of 24 characters.

**Object Identifier Number:** This is the object\_identifier property of the device object. It should be unique internetwork-wide.

**Location:** This is the location property of the device object. It has a maximum length of 24 characters.

Description: This is the description property of the device object. It has a maximum length of 24 characters.

Password: Used with the Reinitialise command.

Serial Baud Rate – This must be set to 2400 Baud

Use 3 Digit Node Number must not be checked

Serial Timeout should be set to 10 seconds or longer.

The Text window on the right hand side shows all the actions between the interface and the PC.

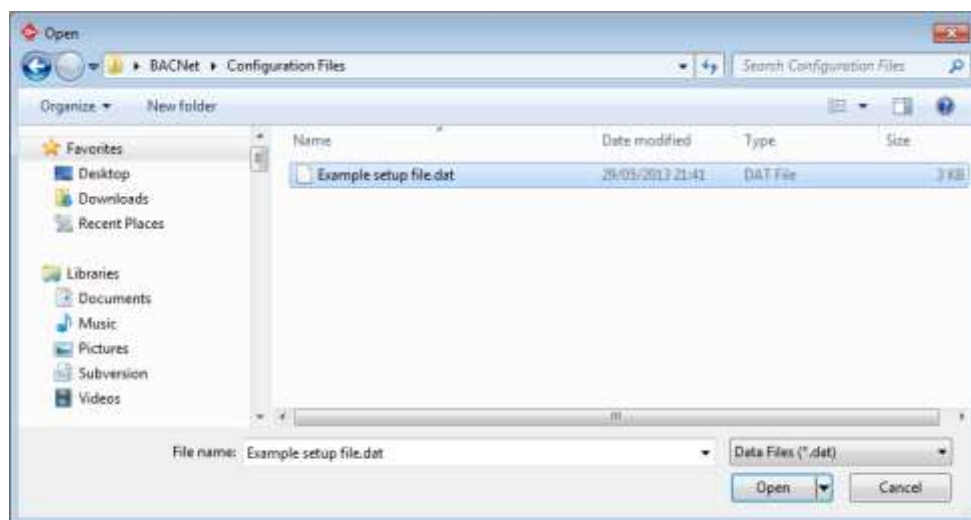
```
Appware Version:1.00.00  
Serial Number: 10379  
Data read  
File Saved:  
C:\Users\hart\Desktop\BACNet\Example setup file.dat  
File Saved:  
C:\Users\hart\Desktop\BACNet\Configuration Files\Updated setup  
file.dat  
Appware Version:1.00.00  
Serial Number: 10379  
Data read  
Appware Version:1.00.00  
Serial Number: 10379  
Data downloaded
```

The Connect button copies all data from the fire alarm panel to the text window. This should only be used for fault finding purposes.

The Clear button clears the text window.

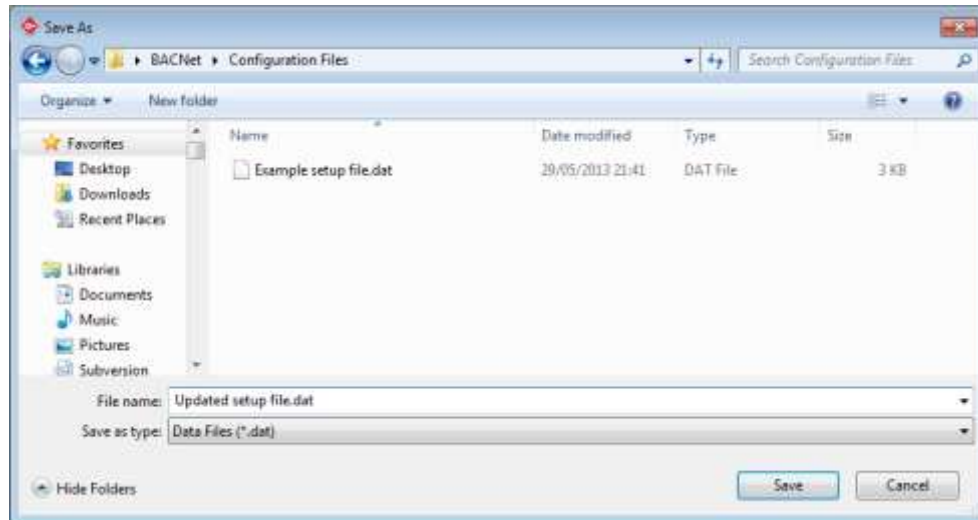
### 3.2.2 Common Controls

Load File – loads a BACnet configuration file previously saved on the PC

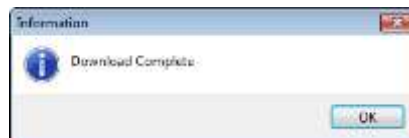




Save File – Saves the current configuration data.



Write To EMACSYS – Writes the current configuration data to the EMACSYS and displays the following message when the download has successfully completed.



Read From EMACSYS – Writes the current configuration data from the EMACSYS and displays the following message when the read has successfully completed.



Exit – Terminates the application, if any data has changed there will be a prompt to save these changes.

Send New MAC if displayed, does not function in this application.

### 3.2.3 INPUTS TAB

Object	Node	Loop	Address	Zone	Type	Description
2	2	1	1	0	15WIO input	Node 2 Loop 1 Address 1
3	2	1	2	0		Node 2 Loop 1 Address 2
4	2	1	3	0		Node 2 Loop 1 Address 3
5	2	1	4	0		Node 2 Loop 1 Address 4
6	2	1	5	0		Node 2 Loop 1 Address 5
7	2	1	6	0		Node 2 Loop 1 Address 6
8	2	1	7	0		Node 2 Loop 1 Address 7
9	2	1	8	0		Node 2 Loop 1 Address 8
10	2	1	9	0		Node 2 Loop 1 Address 009
11	2	1	10	0		Node 2 Loop 1 Address 010
12	2	1	11	0		Node 2 Loop 1 Address 011
13	2	1	12	0		Node 2 Loop 1 Address 012
14	2	1	13	0		Node 2 Loop 1 Address 013
15	2	1	14	0		Node 2 Loop 1 Address 014
16	2	1	15	0		Node 2 Loop 1 Address 015

Objects are numbered 2 to 10001, object 1 is reserved by the interface.

To add an object click Add. This find the next object in the list and open the window:

It is now necessary to define the object.

Enter the Node, Loop and Address of the fire alarm device to define the point. The Zone, Description and Type are optional fields that can be filled if required. Note that the Description will be overwritten by data received from the fire system when the device changes state and that change is communicated to the BACnet interface.

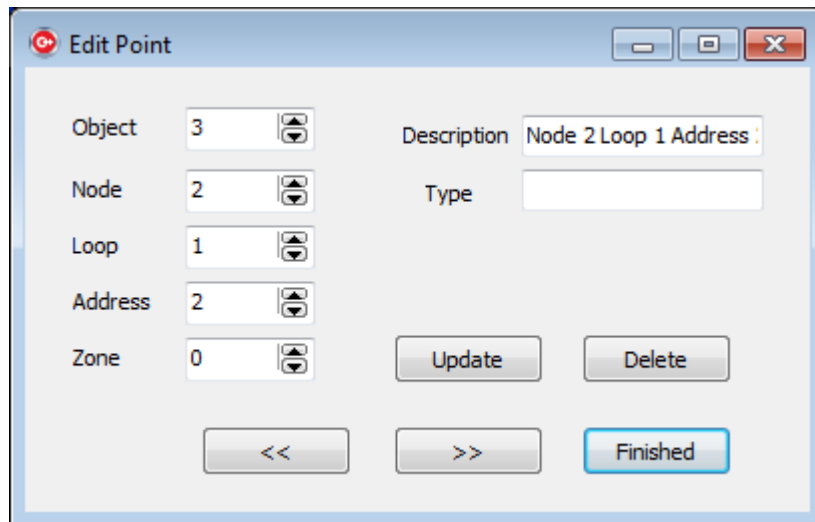
Note that the text is limited to 60 characters and the Type is limited to 15 characters.

Click 'Add' to place the data into the Object list.

To add further points click 'Find Next Free'

Repeat until all the objects have been defined then click 'Finished'

Click on any object in the list to open the Edit Point window:



The 'Edit Point' dialog box contains the following fields and buttons:

- Object:** 3 (with up/down arrow buttons)
- Node:** 2 (with up/down arrow buttons)
- Loop:** 1 (with up/down arrow buttons)
- Address:** 2 (with up/down arrow buttons)
- Zone:** 0 (with up/down arrow buttons)
- Description:** Node 2 Loop 1 Address
- Type:** (empty text box)
- Buttons:** Update, Delete, <<, >>, and Finished.

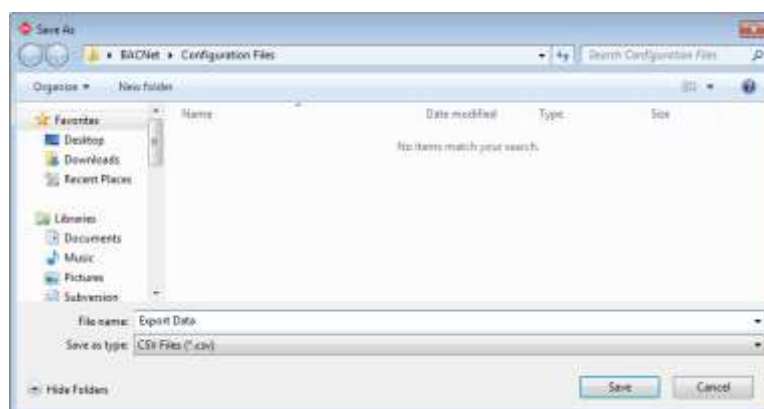
Edit the data as required and click 'Update' to write the data to the list or click 'Delete' to remove the object.

Use the Arrow buttons to move up and down the object list and click 'Finished' when editing is complete.

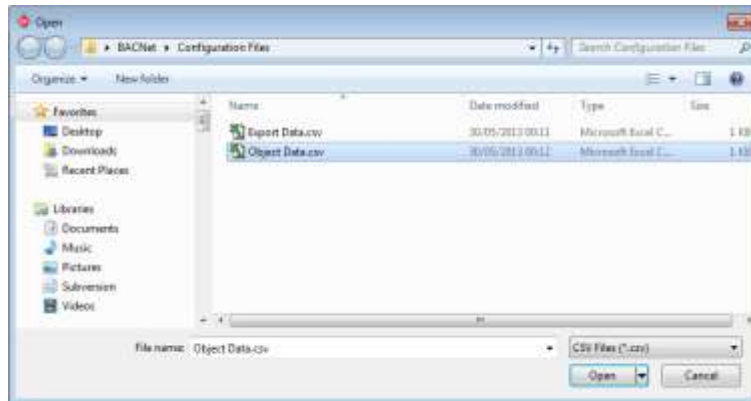
Remember to click 'Update' when the data has been edited, to write the new data to the object list.

### 3.2.3.1 Import and Export Data

The object list can be saved as 'comma separated variables' (CSV) by clicking 'Export'.



Or imported by clicking the 'Import' button.



The file can be viewed, edited or created using a spreadsheet program such as Microsoft Excel as shown. This must always be saved as a '.csv' file.

	A	B	C	D	E	F	G
1	2	2	1	1	0	16WIO input	Node 2 Loop 1 Address 1
2	3	2	1	2	0		Node 2 Loop 1 Address 2
3	4	2	1	3	0		Node 2 Loop 1 Address 3
4	5	2	1	4	0		Node 2 Loop 1 Address 4
5	6	2	1	5	0		Node 2 Loop 1 Address 5
6	7	2	1	6	0		Node 2 Loop 1 Address 6
7	8	2	1	7	0		Node 2 Loop 1 Address 7
8	9	2	1	8	0		Node 2 Loop 1 Address 8
9	10	2	1	9	0		Node 2 Loop 1 Address 9
10	11	2	1	10	0		Node 2 Loop 1 Address 010
11	12	2	1	11	0		Node 2 Loop 1 Address 011
12	13	2	1	12	0		Node 2 Loop 1 Address 012
13	14	2	1	13	0		Node 2 Loop 1 Address 013
14	15	2	1	14	0		Node 2 Loop 1 Address 014
15	16	2	1	15	0		Node 2 Loop 1 Address 015
16	17	2	1	16	0		Node 2 Loop 1 Address 016
17	18	2	1	17	0		
18	19	2	1	18	0		
19	20	2	1	19	0		
20							
21							

Columns A to G match the object list columns – Object, Node, Loop, Address, Zone, Type, and Description.

Note, again, that the text is limited to 60 characters and the Type is limited to 15 characters.

## 4.0 Supplied Program

Protec BACNet Interface.msi

## 5.0 BACnet Protocol Implementation Conformance Statement (PICS)

**Date:** 17<sup>th</sup> January 2012

**Vendor Name:** Protec Fire Detection PLC

**Product Name:** Protec BACnet Interface

**Product Model Number:** n/a

**Application Software Version:** n/a

**Firmware Revision:** 1.00

**BACnet Protocol Revision:** 4

**Product Description:**

The Protec BACnet Interface provides an interface to the Protec range of fire panels.

**BACnet Standardized Device Profile (Annex L):**

BACnet Application Specific Controller (B-ASC).

**BACnet Interoperability Building Blocks Supported (Annex K):**

DS-RP-B

DS-RPM-B

DS-WP-B

DS-COV-B

DM-DDB-B

DM-DOB-B

**Segmentation Capability:**

Able to transmit segmented messages: No.

Able to receive segmented messages: No.

**Standard Object Types Supported:**

Dynamically Creatable Objects: None

Dynamically Deletable Objects: None

**Device**

object-identifier

object-name

object-type

vendor-name

vendor-id

model-name

firmware-revision

application-software-revision

protocol-version

protocol-revision

protocol-services-supported

protocol-object-types-supported

object-list

max-apdu-length

segmentation-supported

apdu-timeout

number-of-apdu-retries

device-address-binding

database-revision

description

location

## Life Safety Point

object-identifier  
object-name  
object-type  
present-value  
tracking-value  
description  
device type  
status-flags  
event-state  
reliability  
out-of-service  
mode  
accepted mode  
silenced  
operation expected

### **Data Link Layer Options:**

BACnet IP (Annex J)

### **Device Address Binding:**

Static device binding supported: No.

### **Character Sets Supported:**

ANSI X3.4

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## 6.0 Event Terminology

Fire System Event	BACnet State
Normal	Quiet
Fault	Fault
Pre-alarm	Pre-alarm
Fire	Alarm
Disabled	Blocked

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