⊙CHIPKIN

Xprotect-CCTV System Event Driver FS-8705-16

Chipkin - Enabling Integration

Driver Version: 8
Document Revision: 3

TABLE OF CONTENTS

1   Xprotect Functional Summary

Sends text messages to the Xprotect CCTV system. These message drive actions.

Which actions ? – This is configured in the CCTV.

Messages are triggered by data from another protocol such as Modbus or BACnet.

Which data triggers what message ? – This is configured in the gateway.

The message format and payload is also configurable.

2   Xprotect Driver Description

The XProtect CCTV system can accept 'Generic Event' messages sent from remote systems.

In this document we describe the gateway interface developed to provide a gateway to XProtect CCTV products allowing for easy integration into Building and Industrial Automation Systems using protocols like BACnet and Modbus.

Gateway

The gateway consists of

- A Physical Device eg. FSB3510-Series or FS-QS-Series
- Firmware
  Firmware Consists of

     o   Protocol Driver for XProtect
     o   Protocol Driver (other eg Modbus) (More than 1 can be linked)
     o   Gateway Engine (connects the 2 protocols. Provides all the gateway functionality.)

Therefore complete documentation of the delivered product consists of

1. Manual for XProtect Driver – connections, settings, trouble shooting
2. Manual for Physical Gateway – Install, power, trouble shooting
3. Manual for Gateway Configuration and Software tools – How to configure the gateway
4. Manual for 'other' protocol. Such as Modbus

The XProtect protocol driver is capable of being linked with other FieldServer drivers to form regular FieldServer firmware that can be installed on QuickServer and other FieldServer gateways.

The driver is fully compatible with other FieldServer drivers and meets FieldServer's quality assurance standards. The driver was developed by Chipkin Automation Systems, an Approved FieldServer Integrator.

Only Client functionality have been implemented. Server functionality is not supported thus you cannot use it to emulate an Xprotect CCTV system.

Max Nodes Supported

FIELDSERVER MODE	NODES	COMMENTS
Active Client	Large NUMBER OF NODE	Practical limitation IS GATEWAY MEMORY AND RESOURCES. dESIGNED TO OPERATE WITH A SINGLE SYSTEM
Active Server (Simulate a Panel)	0	Not supported or documented.

2.1   Supplied by FieldServer Technologies for this driver

None known.

3 Driver Scope of Supply

3.1 Supplied with this driver

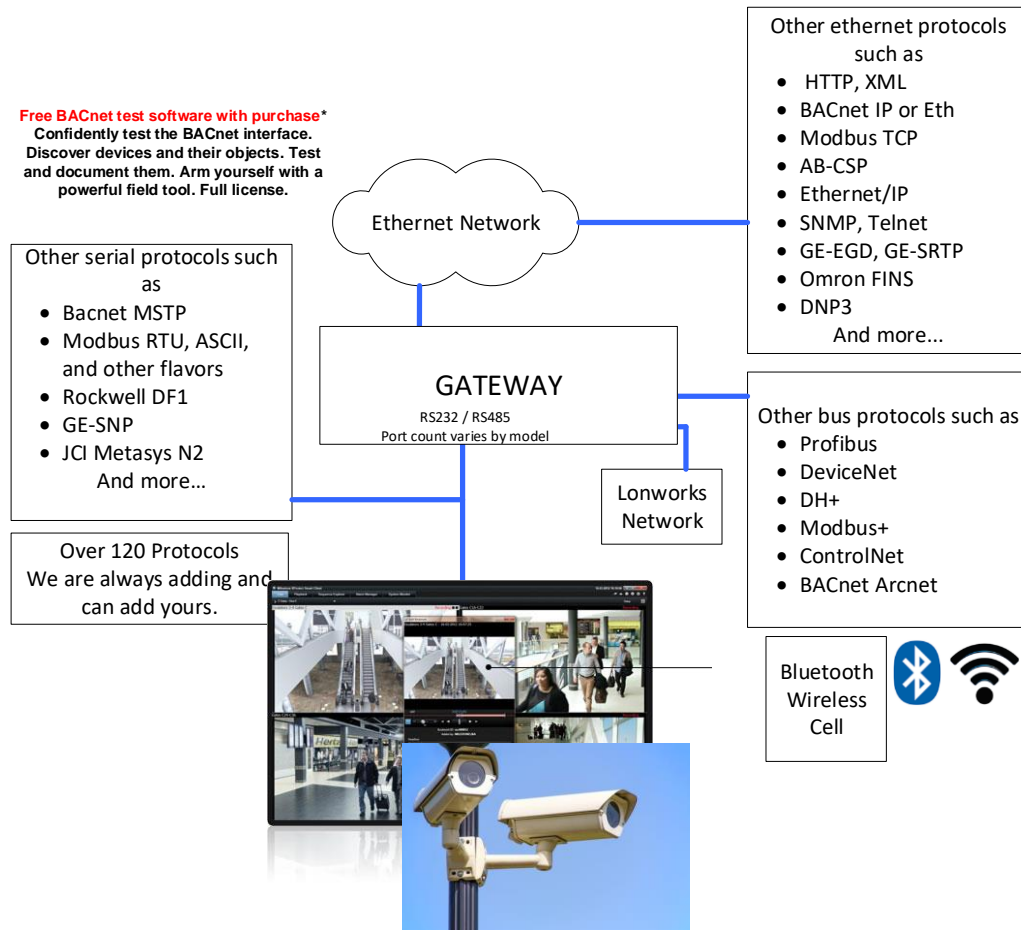| FIELDSERVER TECHNOLOGIES PART #	DESCRIPTION
8915-10	No specific cables are shipped with this driver. A generic RJ45 Ethernet cable is shipped with the hardware.
FS-8705-34	Driver Manual.

4   Hardware Connections

Multiple protocols and connection supported. See list of FieldServer Drivers.

4.1   Hardware Connections

This is an Ethernet Driver. Connections are via standard networking equipment such as hubs, switches, routers and patch cables.

4.2   Block Diagram #1 - Generic

Free BACnet test software with purchase*
Confidently test the BACnet interface. Discover devices and their objects. Test and document them. Arm yourself with a powerful field tool. Full license.

Other ethernet protocols such as
- HTTP, XML
- BACnet IP or Eth
- Modbus TCP
- AB-CSP
- Ethernet/IP
- SNMP, Telnet
- GE-EGD, GE-SRTP
- Omron FINS
- DNP3
    And more…

Ethernet Network

Other serial protocols such as
- Bacnet MSTP
- Modbus RTU, ASCII, and other flavors
- Rockwell DF1
- GE-SNP
- JCI Metasys N2
    And more…

GATEWAY

RS232 / RS485
Port count varies by model

Other bus protocols such as
- Profibus
- DeviceNet
- DH+
- Modbus+
- ControlNet
- BACnet Arcnet

Lonworks Network

Over 120 Protocols
We are always adding and can add yours.

Bluetooth Wireless Cell

milestone
Xprotect CCTV System
XProtect® Professional Series
The ideal video management software for mid-sized installations
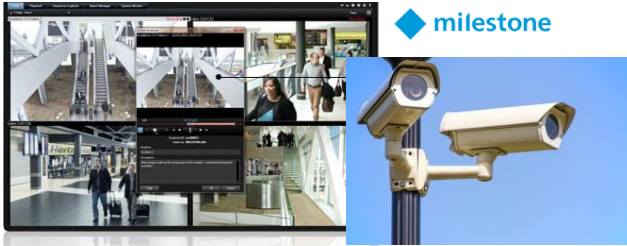
4.3   Block Diagram #2 – Shows Autronica PLC as Modbus Master

Create one connection for each FX2000 port. Each connection can only be used to connect to a single FX2000 interface/port.
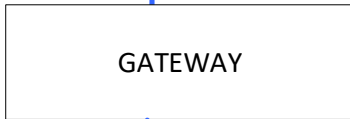
5   Configuring the FieldServer Gateway

For a detailed discussion on FieldServer configuration, please refer to the FieldServer Configuration Manual. The information that follows describes how to expand upon the factory defaults provided in the configuration files included with the FieldServer (See ".csv" sample files provided with the FS).

This section documents and describes the parameters necessary for configuring the FieldServer to communicate with an Xprotect CCTV System.

The configuration file tells the FieldServer about its interfaces, and the routing of data required. In order to enable the FieldServer for Xprotect CCTV System monitoring, the driver independent FieldServer buffers need to be declared in the "Data Arrays" section, the destination device addresses need to be declared in the "Client Side Nodes" section, and the data required from the servers needs to be mapped in the "Client Side Map Descriptors" section. Details on how to do this can be found below.

Note that in the tables, * indicates an optional parameter, with the bold legal value being the default.

5.1   Data Arrays

SECTION TITLE		
Data_Arrays		

COLUMN TITLE	FUNCTION	LEGAL VALUES
Data_Array_Name	Provide name for Data Array	Up to 15 alphanumeric characters
Data_Array_Format	Provide data format. Each Data Array can only take on one format.	**Recommended**: Byte, UInt16, Also Supported: Float, Uint32, SInt16, Packed_Bit, Byte, Packed_Byte, Swapped_Byte
Data_Array_Length	Number of Data Objects. Must be larger than the data storage area required by the Map Descriptors for the data being placed in this array.	1-10,000

5.1.1   Data Arrays - Example

```
//   Data Arrays
Data_Arrays
Data_Array_Name,              Data_Format,              Data_Array_Length,
DA_STRING1,                   BYTE,                     200
```

5.2   Client Side Connections

Create one connection for each Xprotect CCTV System serial port. Each connection can only be used to connect to a single Xprotect CCTV System interface/port.

SECTION TITLE		
Adapters		

COLUMN TITLE	FUNCTION	LEGAL VALUES
Adapter	Specify which Ethernet Port is used to connect to the Xprotect System	N1, N2
Protocol	Specify protocol used	XProtocect

5.2.1   Client Side Connection Descriptions - Example

```
//      Client Side Connections



Adapters


Adapter,          Protocol,


N1,               Xprototect,
```

5.3   Client Side Nodes

Create one Node per Xprotect Panel. Create one of these for each CCTV system IP address you want to send messages to.

SECTION TITLE		
Nodes		

COLUMN TITLE	FUNCTION	LEGAL VALUES
Node_Name	Provide name for node	Up to 32 alphanumeric characters
Node_ID		This commonly used gateway parameter does not have a use in this protocol driver.
Protocol	Specify protocol used	XProtect
Adapter	Which Adapter you are using at the connection level	N1, N2
IP_Address	The IP Address of the Xprotect CCTV System you want to send a message to.	Eg 192.168.1.168 (normal IP format)

5.3.1   Client Side Nodes

```
//   Client Side Nodes


Nodes

Node_Name,            Node_ID,    Protocol,       Adapter      IP_Address

MainPanel,            1,          Xprotect ,      N1           192.168.1.168
```

5.4 Client Side Map Descriptors

5.4.1 FieldServer Related Map Descriptor Parameters

COLUMN TITLE	FUNCTION	LEGAL VALUES
Map_Descriptor_Name	Name of this Map Descriptor	Up to 32 alphanumeric characters
Data_Array_Name	Name of Data Array where data is to be stored in the FieldServer	One of the Data Array names from "Data Array" section above
Data_Array_Offset	Starting location in Data Array	0 to maximum specified in "Data Array" section above
Function	Function of Client Map Descriptor..	Wrbx,wrbc

5.4.2 Driver Related Map Descriptor Parameters

COLUMN TITLE	FUNCTION	LEGAL VALUES
Node_Name	Name of Node to fetch data from	One of the node names specified in "Client Node Descriptor" above
Address	This commonly used parameter is not used by this driver.	0
Length	Length of Map Descriptor	Set the value to 1. One map descriptor is required for each point.
Da_Byte_Name	The name of the data array where the string to be transmitted to the Xprotect CCTV system is stored.	Any of the previously defined data arrays. Suggestions, DA_STRING1,2,3.. Please note – strings are expected 1) to start at offset zero

		2) to be < 100 byes long. 3) Potentially could contain control chars.
Xprotect_PortNo	UDP port the Xprotect system has been configured to listen on.	Eg. 1234
Xprotect_Option	If this parameters is specified and its value=2 then the driver sends the string from the DA_BYTE_NAME but also appends the following string =value Where value is the value of found in the data array point which triggered the action.	2

5.5   Examples

5.5.1   **Example 1 – Define Data Arrays – Load the Xprotect action strings**

```
Data_Arrays

Data_Array_Name , Data_Format , Data_Array_Length

DA_STRING1       , BYTE         , 1000

DA_STRING2       , BYTE         , 1000

DA_STRING3       , BYTE         , 1000



Preloads

Data_Array_Name , Preload_Data_Index , Preload_Data_Format , Preload_Data_Value

DA_STRING1       , 0                  , String               , Detector Type

DA_STRING2       , 0                  , String               , String100

DA_STRING3       , 0                  , String               , String3333333333333333333333333
```

First we define and create the data arrays

Second, we preload them with the strings we want to send the Xprotect System

5.5.2 **Map Descriptor Example 2 – Send a String on Update**

In this example one point is written on update and another continuously.

```
Map_Descriptors

Map_Descriptor_Name ,Data_Array_Name ,Data_Array_Offset ,Da_Byte_Name   ,Function ,Node_Name ,Address ,Length ,xprotect_PortNo ,timeout

Action1             ,DA_CONTROL      ,0                 ,DA_STRING1     ,wrbx     ,Node01    ,0       ,1      ,1234            ,1

Action2             ,DA_CONTROL      ,1                 ,DA_STRING2     ,wrbx     ,Node01    ,0       ,1      ,1234            ,1

Action3             ,DA_CONTROL      ,2                 ,DA_STRING3     ,wrbx     ,Node01    ,0       ,1      ,1234            ,1
```

DA_CONTROL[x]

If x=0 then string1 data is sent

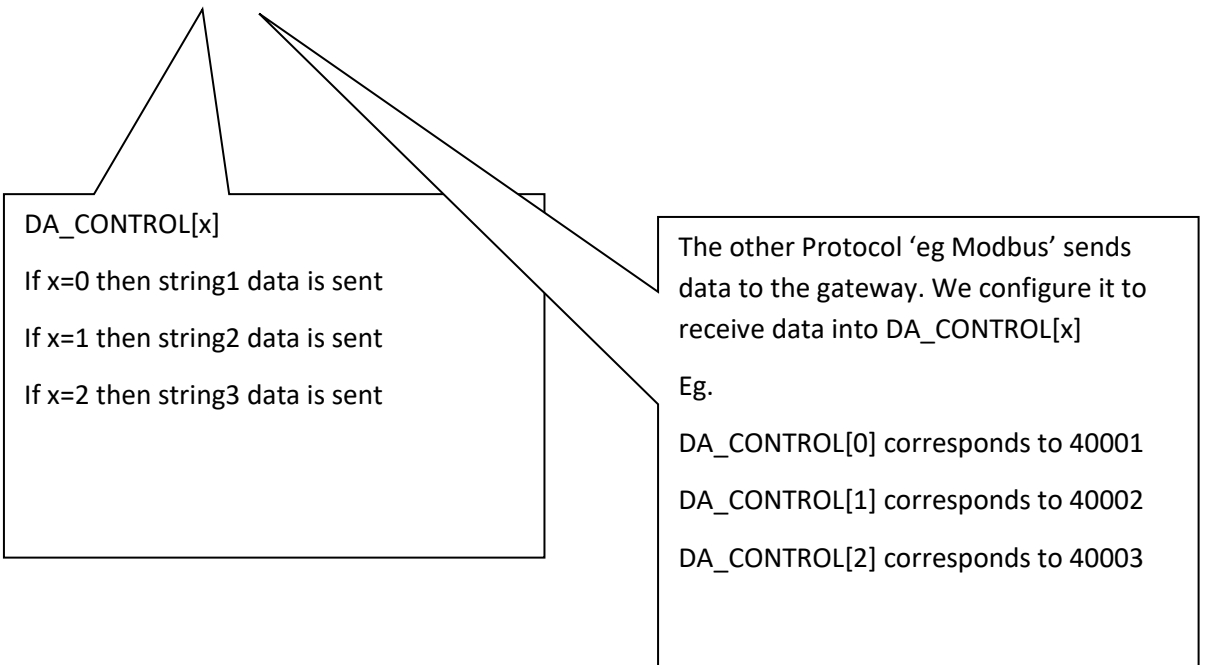If x=1 then string2 data is sent

If x=2 then string3 data is sent

The other Protocol 'eg Modbus' sends data to the gateway. We configure it to receive data into DA_CONTROL[x]

Eg.

DA_CONTROL[0] corresponds to 40001

DA_CONTROL[1] corresponds to 40002

DA_CONTROL[2] corresponds to 40003

5.5.3 **Map Descriptor Example 3 – Send a String on Update**

In this example one point is written on update and another continuously.

```
Map_Descriptors

Map_Descriptor_Name ,Data_Array_Name ,Data_Array_Offset ,Da_Byte_Name   ,Function ,Node_Name ,Address ,Length ,xprotect_PortNo ,timeout

Action1            ,DA_CONTROL      ,0                 ,DA_STRING1     ,wrbx     ,Node01    ,0       ,1      ,1234            ,1

Action2            ,DA_CONTROL      ,1                 ,DA_STRING2     ,wrbx     ,Node01    ,0       ,1      ,1234            ,1

Action3            ,DA_CONTROL      ,2                 ,DA_STRING3     ,wrbx     ,Node01    ,0       ,1      ,1234            ,1
```

DA_CONTROL[x]

If x=0 then string1 data is sent

If x=1 then string2 data is sent

If x=2 then string3 data is sent

The other Protocol 'eg Modbus' sends data to the gateway. We configure it to receive data into DA_CONTROL[x]

Eg.

DA_CONTROL[0] corresponds to 40001

DA_CONTROL[1] corresponds to 40002

DA_CONTROL[2] corresponds to 40003

```
//==============================================================================
//
//      Common Information
//
Bridge
Title
Xprotect Sample
//==============================================================================
//
//      Data Arrays
//
Data_Arrays
Data_Array_Name  ,Data_Format  ,Data_Array_Length
DA_CONTROL       ,UINT16       ,200
DA_STRING1       ,BYTE         ,1000
DA_STRING2       ,BYTE         ,1000
DA_STRING3       ,BYTE         ,1000

Preloads
Data_Array_Name  ,Preload_Data_Index  ,Preload_Data_Format  ,Preload_Data_Value
DA_STRING1       ,0                    ,String               ,Detector Type
DA_STRING2       ,0                    ,String               ,String100
DA_STRING3       ,0                    ,String               ,String3333333333333333333333333
```

Title, Revision etc

Define Data Arrays

Preload them with the Xprotect Strings

```
Adapters
Adapter ,Protocol ,  Poll_Delay
N1      ,xprotect  ,0.100s


Nodes
Node_Name ,Node_ID ,Protocol ,Adapter ,IP_Address        ,
Node01    ,1       ,xprotect ,N1      ,192.168.1.17


Map_Descriptors
Map_Descriptor_Name ,Data_Array_Name ,Data_Array_Offset ,Da_Byte_Name    ,Function ,Node_Name ,Address ,Length ,Scan_Interval ,xprotect_PortNo ,timeout
Channel1            ,DA_CONTROL      ,0                 ,DA_STRING1      ,wrbx     ,Node01    ,0       ,1      ,10.0s         ,1234            ,2
Channel2            ,DA_CONTROL      ,1                 ,DA_STRING2      ,wrbx     ,Node01    ,0       ,1      ,10.0s         ,1234            ,2
Channel3            ,DA_CONTROL      ,2                 ,DA_STRING3      ,wrbx     ,Node01    ,0       ,1      ,10.0s         ,1234            ,2
```

Enable Xprotect protocol on Ethernet Port N1

The Address of the Xprotect CCTV System

Here are 3 possible strings to send. Each is controlled by a different offset of the data array called DA_CONTROL

```
/===============================================================================
//
//    ModbusTCP - Server
//

Adapters
Adapter  ,Protocol
N1       ,Modbus/TCP

Nodes
Node_Name  ,Node_ID  ,Protocol   ,
Mdbs_TCP   ,1        ,Modbus/TCP ,

Map_Descriptors
Map_Descriptor_Name  ,Data_Array_Name  ,Data_Array_Offset  ,Function  ,Node_Name  ,Address  ,Length  ,
Readtask TCP_1       ,DA_CONTROL       ,0                  ,Server    ,Mdbs_TCP   ,40001    ,100     ,
```

Modbus Server (Could have been BACnet or any other protocol)

Modbus writes to 40001 to trigger DA_STRING1 data to be sent ….

Here we see 40001 corresponds to DA_CONTROL[0]

Here we see 40002 corresponds to DA_CONTROL[1]

Here we see 40003 corresponds to DA_CONTROL[2]

5.5.4   A Variation of the Message String

If the remote PLC writes to 40001 it triggers the message found in DA_STRING1 to be sent. This time it is sent using Style=2

Lets say DA_STRING1 has been preloaded with "Fire Point 1 in state"

Lets say the value written to 40001 is 99. Then string string that will be sent =

"Fire Point 1 in state=999

> In this variation of the configuration Style 2 has been specified.

> The other Protocol 'eg Modbus' sends data to the gateway. We configure it to receive data into DA_CONTROL[x]
>
> Eg.
>
> DA_CONTROL[0] corresponds to 40001
>
> DA_CONTROL[1] corresponds to 40002
>
> DA_CONTROL[2] corresponds to 40003

```
Adapters

Adapter ,Protocol ,  Poll_Delay

N1      ,xprotect  ,0.100s


Nodes

Node_Name ,Node_ID ,Protocol ,Adapter ,IP_Address

Node01    ,1       ,xprotect ,N1      ,192.168.1.17


Map_Descriptors

Map_Descriptor_Name ,Data_Array_Name ,Data_Array_Offset ,Da_Byte_Name   ,Function ,Node_Name ,Address ,Length ,Scan_Interval ,xprotect_PortNo , Xprotect_Option

Channel1            ,DA_CONTROL      ,0                 ,DA_STRING1     ,wrbx     ,Node01    ,0       ,1      ,10.0s         ,1234            ,2

Channel2            ,DA_CONTROL      ,1                 ,DA_STRING2     ,wrbx     ,Node01    ,0       ,1      ,10.0s         ,1234            ,2

Channel3            ,DA_CONTROL      ,2                 ,DA_STRING3     ,wrbx     ,Node01    ,0       ,1      ,10.0s         ,1234            ,2
```

6   Configuring the FieldServer as a Xprotect CCTV System Server

This driver cannot be used to emulate an Xprotect CCTV System.

7 Revision History

DATE	RESP	FORMAT	DRIVER VER.	DOC. REV.	COMMENT
04 Sep 2018	PMC		1.0	1	Created
Jan 2019	PMC		8	2	Added Xprotect_Option=2 So that "=999" is added to end of string. Where 999 is the trigger value.
10 May 2021	YC		8	3	Updated to latest template