Driver Manual
(Supplement to the FieldServer Instruction Manual)

FS-8705-34
Xprotect CCTV System Event Driver

APPLICABILITY & EFFECTIVITY
Effective for all systems manufactured after Aug 20, 2012
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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
  - Protocol Driver for XProtect
  - Protocol Driver (other eg Modbus) (More than 1 can be linked)
  - 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

<table>
<thead>
<tr>
<th>FieldServer Mode</th>
<th>Nodes</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTIVE CLIENT</td>
<td>LARGE NUMBER</td>
<td>PRACTICAL LIMITATION IS GATEWAY MEMORY AND RESOURCES. DESIGNED</td>
</tr>
<tr>
<td></td>
<td>OF NODE</td>
<td>TO OPERATE WITH A SINGLE SYSTEM</td>
</tr>
<tr>
<td>Active Server (Simulate a Panel)</td>
<td>0</td>
<td>Not supported or documented.</td>
</tr>
</tbody>
</table>
## 3 Driver Scope of Supply

### 3.1 Supplied with this driver

<table>
<thead>
<tr>
<th>FieldServer Technologies PART #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8915-10</td>
<td>No specific cables are shipped with this driver. A generic RJ45 Ethernet cable is shipped with the hardware.</td>
</tr>
</tbody>
</table>
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
4.3 Block Diagram #2 – Shows Autronica PLC as Modbus Master
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

<table>
<thead>
<tr>
<th>Section Title</th>
<th>Function</th>
<th>Legal Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data_Array_Name</strong></td>
<td>Provide name for Data Array</td>
<td>Up to 15 alphanumeric characters</td>
</tr>
<tr>
<td><strong>Data_Array_Format</strong></td>
<td>Provide data format. Each Data Array</td>
<td><strong>Recommended</strong>: Byte, UInt16,</td>
</tr>
<tr>
<td></td>
<td>can only take on one format.</td>
<td>Also Supported: Float, Uint32, SInt16, Packed_Bit, Byte,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Packed_BYTE, Swapped_Bit</td>
</tr>
<tr>
<td><strong>Data_Array_Length</strong></td>
<td>Number of Data Objects. Must be larger</td>
<td>1-10,000</td>
</tr>
<tr>
<td></td>
<td>than the data storage area required by</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the Map Descriptors for the data being</td>
<td></td>
</tr>
<tr>
<td></td>
<td>placed in this array.</td>
<td></td>
</tr>
</tbody>
</table>

#### 5.1.1 Data Arrays - Example

```c
// 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.

<table>
<thead>
<tr>
<th>Section Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adapters</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Column Title</th>
<th>Function</th>
<th>Legal Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adapter</td>
<td>Specify which Ethernet Port is used to connect to the Xprotect System</td>
<td>N1, N2</td>
</tr>
<tr>
<td>Protocol</td>
<td>Specify protocol used</td>
<td>XProtocect</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Section Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nodes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Column Title</th>
<th>Function</th>
<th>Legal Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node_Name</td>
<td>Provide name for node</td>
<td>Up to 32 alphanumeric characters</td>
</tr>
<tr>
<td>Node_ID</td>
<td>This commonly used gateway parameter does not have a use in this protocol driver.</td>
<td></td>
</tr>
<tr>
<td>Protocol</td>
<td>Specify protocol used</td>
<td>XProtect</td>
</tr>
<tr>
<td>Adapter</td>
<td>Which Adapter you are using at the connection level</td>
<td>N1, N2</td>
</tr>
<tr>
<td>IP_Address</td>
<td>The IP Address of the Xprotect CCTV System you want to send a message to.</td>
<td>Eg 192.168.1.168 (normal IP format)</td>
</tr>
</tbody>
</table>

5.3.1 Client Side Nodes - Example

```plaintext
// 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

<table>
<thead>
<tr>
<th>Column Title</th>
<th>Function</th>
<th>Legal Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Map_Descriptor_Name</td>
<td>Name of this Map Descriptor</td>
<td>Up to 32 alphanumeric characters</td>
</tr>
<tr>
<td>Data_Array_Name</td>
<td>Name of Data Array where data is to be stored in the FieldServer</td>
<td>One of the Data Array names from “Data Array” section above</td>
</tr>
<tr>
<td>Data_Array_Offset</td>
<td>Starting location in Data Array</td>
<td>0 to maximum specified in “Data Array” section above</td>
</tr>
<tr>
<td>Function</td>
<td>Function of Client Map Descriptor..</td>
<td>Wrbx,wrbc</td>
</tr>
</tbody>
</table>
### 5.4.2 Driver Related Map Descriptor Parameters

<table>
<thead>
<tr>
<th>Column Title</th>
<th>Function</th>
<th>Legal Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node_Name</td>
<td>Name of Node to fetch data from</td>
<td>One of the node names specified in “Client Node Descriptor” above</td>
</tr>
<tr>
<td>Address</td>
<td>This commonly used parameter is not used by this driver.</td>
<td>0</td>
</tr>
<tr>
<td>Length</td>
<td>Length of Map Descriptor</td>
<td>Set the value to 1. One map descriptor is required for each point.</td>
</tr>
<tr>
<td>Da_Byte_Name</td>
<td>The name of the data array where the string to be transmitted to the Xprotect CCTV system is stored.</td>
<td>Any of the previously defined data arrays.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Suggestions, DA_STRING1,2,3..</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Please note – strings are expected</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1) to start at offset zero</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) to be &lt; 100 bytes long.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3) Potentially could contain control chars.</td>
</tr>
<tr>
<td>Xprotect_PortNo</td>
<td>UDP port the Xprotect system has been configured to listen on.</td>
<td>Eg. 1234</td>
</tr>
<tr>
<td>Xprotect_Option</td>
<td>If this parameters is</td>
<td>2</td>
</tr>
</tbody>
</table>
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.
5.5 Examples

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

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,DataByte_Name,Function,Node_Name,Address,Length,xprotect_PortNo,timeout

Channel1,DA_CONTROL,0,DA_STRING1,wrbx,Node01,0,1,1234,1
```

Wr bx means – write on update. Whenever the data in DA_CONTROL[0] is updated (value might not change) then the action is triggered.

The string found in this data array starting at offset zero is sent.

End of string is determined by the first null (zero) character
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
Title, Revision etc

Define Data Arrays

Preload them with the Xprotect Strings
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.
```plaintext
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     ,
```

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]

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

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

Let's say DA_STRING1 has been preloaded with “Fire Point 1 in state”.

Let's say the value written to 40001 is 99. Then string string that will be sent = “Fire Point 1 in state=999”.

#### Adapters

<table>
<thead>
<tr>
<th>Adapter</th>
<th>Protocol</th>
<th>Poll_Delay</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>xprotect</td>
<td>0.100s</td>
</tr>
</tbody>
</table>

#### Nodes

<table>
<thead>
<tr>
<th>Node_Name</th>
<th>Node_ID</th>
<th>Protocol</th>
<th>Adapter</th>
<th>IP_Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node01</td>
<td>1</td>
<td>xprotect</td>
<td>N1</td>
<td>192.168.1.17</td>
</tr>
</tbody>
</table>

#### Map Descriptors

<table>
<thead>
<tr>
<th>Map_Descriptor_Name</th>
<th>Data_Array_Name</th>
<th>Data_Array_Offset</th>
<th>Da_Byte_Name</th>
<th>Function</th>
<th>Node_Name</th>
<th>Address</th>
<th>Length</th>
<th>Scan_Interval</th>
<th>xprotect_PortNo</th>
<th>Xprotect_Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel1</td>
<td>DA_CONTROL</td>
<td>0</td>
<td>DA_STRING1</td>
<td>wrbx</td>
<td>Node01</td>
<td>0</td>
<td>1</td>
<td>10.0s</td>
<td>1234</td>
<td>2</td>
</tr>
<tr>
<td>Channel2</td>
<td>DA_CONTROL</td>
<td>1</td>
<td>DA_STRING2</td>
<td>wrbx</td>
<td>Node01</td>
<td>0</td>
<td>1</td>
<td>10.0s</td>
<td>1234</td>
<td>2</td>
</tr>
<tr>
<td>Channel3</td>
<td>DA_CONTROL</td>
<td>2</td>
<td>DA_STRING3</td>
<td>wrbx</td>
<td>Node01</td>
<td>0</td>
<td>1</td>
<td>10.0s</td>
<td>1234</td>
<td>2</td>
</tr>
</tbody>
</table>

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
6  Configuring the FieldServer as a Xprotect CCTV System Server

This driver cannot be used to emulate an Xprotect CCTV System Panel
Revision History

<table>
<thead>
<tr>
<th>Date</th>
<th>Resp</th>
<th>Format</th>
<th>Driver Ver.</th>
<th>Doc. Rev.</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018Seo04</td>
<td>PMC</td>
<td>1.0</td>
<td></td>
<td>1.0</td>
<td>Created</td>
</tr>
<tr>
<td>2019Jan</td>
<td>PMC</td>
<td>8</td>
<td></td>
<td>2.0</td>
<td>Added Xprotect_Option=2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>So that “=999” is added to end of string. Where 999 is the trigger value.</td>
</tr>
</tbody>
</table>