



PassiveXPath Passive XML Path Language Ethernet Driver FS-8705-104

Chipkin - Enabling Integration

salesgroup1@chipkin.com

Tel: +1 866 383 1657

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Driver Version:
Document Revision: 2

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1 PassiveXPath Description

The PassiveXPath Driver allows the FieldServer to transfer XML data from devices over Ethernet. The PassiveXPath Driver uses TCP. The port is configurable and the driver supports opening multiple TCP ports to receive XML data.

The FieldServer emulates a passive Server, listening on the configured TCP port. When configured, the FieldServer listens for XML data. Upon receiving the data, the data is parsed based on the configured XPathS and the values are extracted. These values are stored on the FieldServer to be mapped to other protocols or simply to be viewed.

The information that follows describes how to expand upon the factory defaults provided in the configuration files included with the FieldServer.

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<?xml-stylesheet href="latest_ob.xml" type="text/xsl"?>
<current_observation version="1.0"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="http://www.weather.gov/view/current_observation.xsd"
  <credit>NOAA's National Weather Service</credit>
  <credit_URL>http://weather.gov/</credit_URL>
  <image>
    <url>http://weather.gov/images/xml_logo.gif</url>
    <title>NOAA's National Weather Service</title>
    <link>http://weather.gov/</link>
  </image>
  <suggested_pickup>15 minutes after the hour</suggested_pickup>
  <suggested_pickup_period>60</suggested_pickup_period>
  <location>Ak-Chin Regional Airport, AZ</location>
  <station_id>KA39</station_id>
  <latitude>32.99</latitude>
  <longitude>-111.91833</longitude>
  <observation_time>Last Updated on Feb 4 2021, 11:00 am MST</observation_time>
  <observation_time_rfc822>Thu, 04 Feb 2021 11:00:00 -0700</observation_time_rfc822>
  <weather>Mostly Cloudy</weather>
  <temperature_string>68.0 F (20.0 C)</temperature_string>
  <temp_f>68.0</temp_f>
  <temp_c>20.0</temp_c>
  <relative_humidity>26</relative_humidity>
  <wind_string>West at 9.2 MPH (8 KT)</wind_string>
  <wind_dir>West</wind_dir>
  <wind_degrees>270</wind_degrees>
  <wind_mph>9.2</wind_mph>
  <wind_kt>8</wind_kt>
  <pressure>30.06</pressure>
  <dewpoint_string>32.0 (0.0 C)</dewpoint_string>
  <dewpoint_f>32.0</dewpoint_f>
  <dewpoint_c>0.0</dewpoint_c>
  <visibility_mi>10.00</visibility_mi>
  <icon_url_base>http://forecast.weather.gov/images/wtf/small/</icon_url_base>
  <two_day_history_url>http://www.weather.gov/data/obhistory/KA39.html</two_day_history_url>
  <icon_url_name>bkn.png</icon_url_name>
  <ob_url>http://www.weather.gov/data/METAR/KA39.1.txt</ob_url>
  <disclaimer_url>http://weather.gov/disclaimer.html</disclaimer_url>
  <copyright_url>http://weather.gov/disclaimer.html</copyright_url>
  <privacy_policy_url>http://weather.gov/notice.html</privacy_policy_url>
</current_observation>
```

XML Packet



eg. BACnet Ao(1)
Modbus 40001

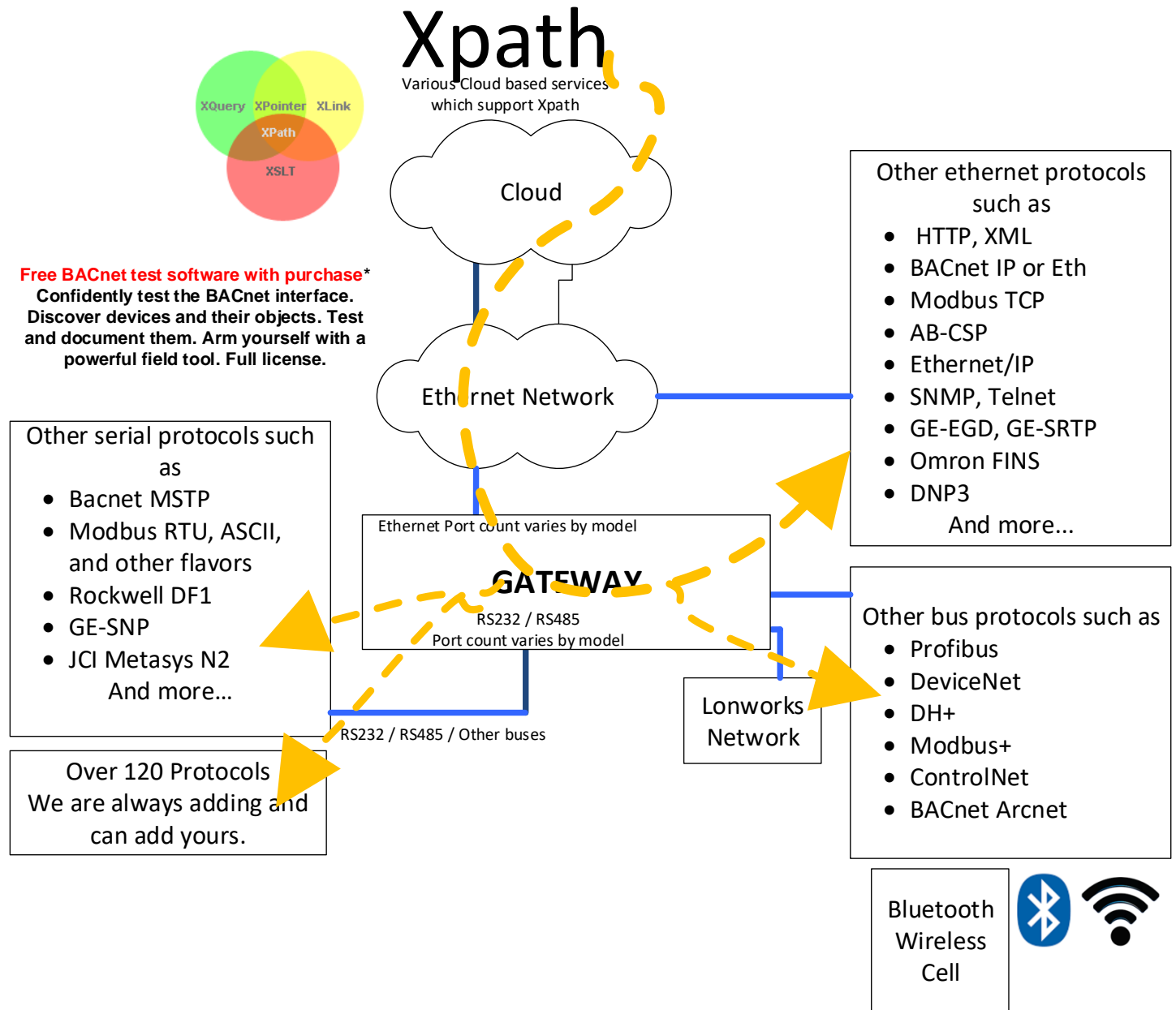
```
<temp_c>20.0</temp_c>
<relative_humidity>26</relative_humidity>
```

Xpath allows you to drill into a particular element

Driver maps element onto other protocol

2 Connection Description

This block diagram lists common network connections that can monitor XML data using other protocols like Modbus® RTU/TCP, BACnet® and HTTP.



3 PassiveXPath Configuration

To configure the PassiveXPath driver, from the home page, visit the following link:

http://{IP_ADDRESS}/passiveXPath/ui/

To configure the FieldServer, follow the instructions below to add a Connection (physical port), Nodes (TCP Ports to listen for data), and finally Tasks (the data to extract from the XML data).

3.1 Create Connection

To set up the FieldServer as a passive XPath server, first create a connection. The connection contains information about the physical port to use.

Connections

Configure the physical ethernet port for the Passive XPath Driver

Name	Type	Parameters	Actions
<div style="background-color: #4a86e8; color: white; padding: 5px 15px; display: inline-block; border-radius: 3px;">Create Connection</div>			

1. Click on the “Create Connection” button to open the Create Connection form.
2. Fill out the fields in the form. The fields are as follows:

COLUMN TITLE	FUNCTION	LEGAL VALUES
Name	Name of the server, used internally as an identifier	Text, must be unique
Type	The type of connection this is	ethernet
Parameters: Port	The physical port on the FieldServer to use	n1

* Bolded values are defaults

3. Click the “Save” button to add the connection.

If successful, the new entry will be populated in the Connections table:

Connections

Configure the physical ethernet port for the Passive XPath Driver

Name	Type	Parameters	Actions
Ethernet	Ethernet	{ "port": "n1" }	<input type="button" value="Edit"/> <input type="button" value="Delete"/>

***Note*:** Only one server connection can exist. If multiple connections are created, only the first one will be used.

3.2 Create Node

Follow the instructions below to configure the TCP ports to open for receiving XML data.

Nodes

Configure TCP ports to listen for XML Data

Name	Connection	Port	Type	Actions
------	------------	------	------	---------

1. Click on the “Create Node” button to open the Create Node form.
2. Fill out the fields in the form. The fields are as follows:

COLUMN TITLE	FUNCTION	LEGAL VALUES
Name	The name of the XML Data being received	Text, must be unique
Connection	The name of the physical port.	Text (Use the name of the Connection created in the previous section)
Port	The TCP port to use to receive the XML Data	Any valid TCP port not in use
Type	The type of data being received	xml

* Bolded values are defaults

3. Click on the “Save” button to add the node.

If successful, the new entry will be populated in the Nodes table:

Nodes

Configure TCP ports to listen for XML Data

Name	Connection	Port	Type	Actions
SampleXMLData	Ethernet	12345	Xml	Edit Delete

Create Node

Repeat the above steps to add additional ports to receive other XML data.

3.3 Create Task

Create tasks to add XPath patterns used to extract values from the XML data

Tasks

Configure XPath Tasks to extract values from the XML Data

Name	Node	Data Broker	Xpath	Actions
------	------	-------------	-------	---------

Create Task

1. Click on the “Create Task” button to open the Create Task form.
2. Fill out the fields in the form. The fields are as follows:

COLUMN TITLE	FUNCTION	LEGAL VALUES
Name	The name of the variable to add.	Text, must be unique
Node	The node that this variable belongs to.	Text (Use the name of a node created in the previous section)
DataBroker: Name	The data array in the protocol engine to retrieve the value.	One of the Data Array names
DataBroker: Start	The starting offset in the array to retrieve the value	0 to (“Data_Array_length” - 1)
XPath	The XPath pattern used to extract values from the received XML Data	Text, Valid XPath pattern

3. Click the “Save” button to add the task.

If successful, the new entry will be populated in the Tasks table:

Tasks

Configure XPath Tasks to extract values from the XML Data

Name	Node	Data Broker	Xpath	Actions
Temperature	SampleXMLData	PE:DA_AI:1	/Sensor/Temperature/Current/Text()	<input type="button" value="Edit"/> <input type="button" value="Delete"/>
Occupancy	SampleXMLData	PE:DA_AI:2	/Sensor/Occupancy/Count/Text()	<input type="button" value="Edit"/> <input type="button" value="Delete"/>

Repeat the above steps to add additional XPath values.

3.4 Saving the Server Configuration

When the configuration is complete, click on the “Save Configuration” button to save all of the updates and changes. For the configuration to take effect, reboot the system.



3.5 Resetting the Server Configuration

To clear the configuration and start over, click the “Reset Configuration” button. Then follow the instructions in the sections above to create new connections, nodes, and tasks.

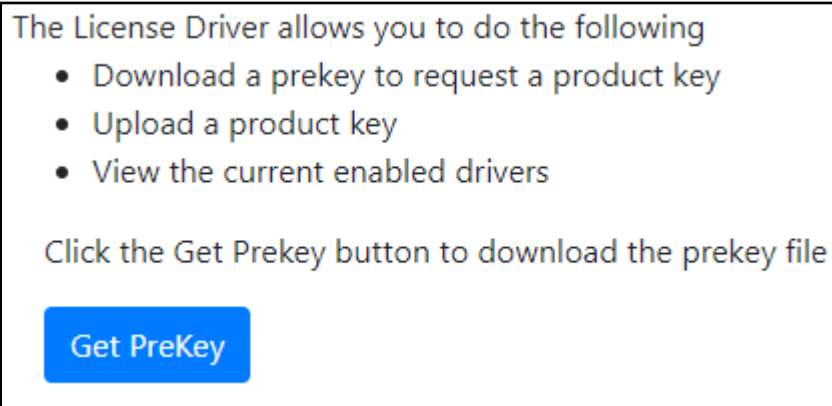


4 License

Some drivers such as PassiveXPath require a license product key. To generate this license product key a pre-key from the hardware is required.

4.1 How to generate a pre-key

1. Goto the license page http://{IP_ADDRESS}/chipkinLicenseDriver/ui/
2. Click the Get Pre-Key button.



A pre-key.txt file will be created and downloaded to your system. Send this pre-key.txt and your Job number (FSE####) to Chipkin support.

4.2 How to activate a product key

Chipkin support can generate a license product key from the hardware pre-key. The product key will be sent as a text file via email.

1. Goto the license page http://{IP_ADDRESS}/chipkinLicenseDriver/ui/
2. Click “Browse” button and select the productkey-XXXXX.txt file provided to you by Chipkin Support.
3. Click the “Upload Product Key” button and wait for the product key to finish uploading.

Upload a product key. Select the product key to upload, then click the Upload Product Key button

Choose a productKey file or drop it here...

The list of enabled product codes can be viewed in the “Enabled Product Codes” list.

Enabled Product Codes

The list of product codes that have been enabled by uploaded product keys

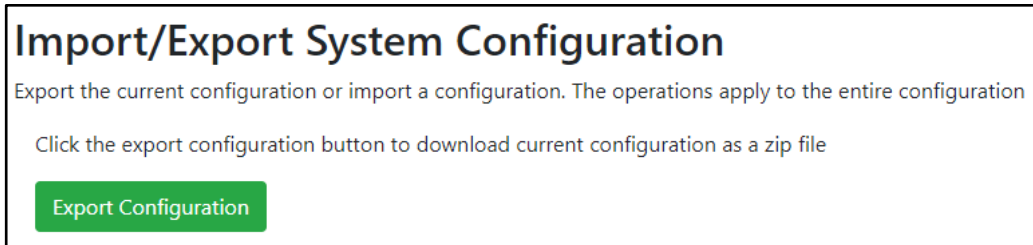
No product keys have been uploaded.

4.3 Importing and Exporting Configurations

It is possible to export the current configuration to back it up or simply to make some edits. Users can also import either the entire configuration via a zip file or a PE (Protocol Engine) configuration.

4.4 How to Export the Configuration

1. Goto the system configuration page http://{IP_ADDRESS}/chipkinConfiguration/ui/
2. Click the Export Configuration button.



4.5 How to Import the Configuration

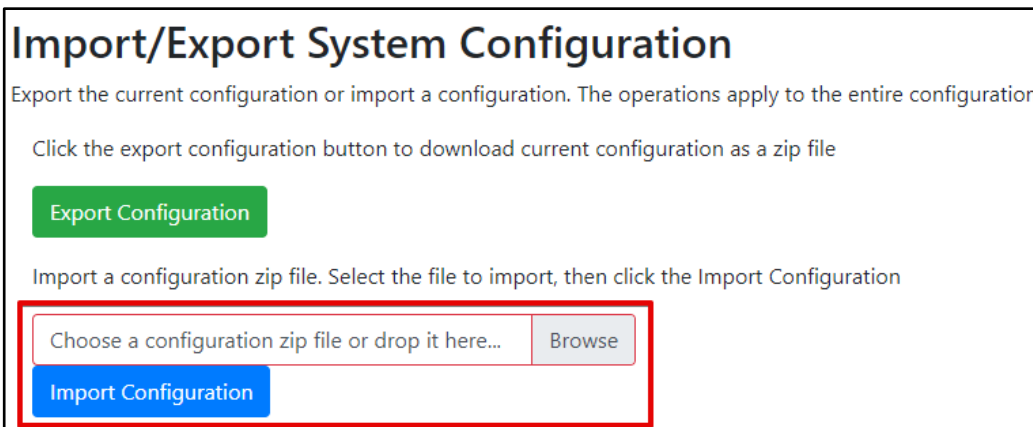
The file to import the configuration must be a zip file. The zip file should contain the following folders:

- ae - this folder contains any configuration files for the ae configuration
- documents - this folder contains any driver specific documents. For example, license product keys, etc.
- pe - this folder contains one config.csv file for the pe configuration.

To make sure the folder directory is correct, do an Export first, then extract the files, edit them, then zip them up again.

To import the configuration:

1. Goto the system configuration page http://{IP_ADDRESS}/chipkinConfiguration/ui/
2. Click the "Browse" button in the "Import/Export System Configuration" section and select the zip file containing the configuration to import.
3. Click the "Import Configuration" button and wait for the configuration to finish importing.
4. If successful, a success message will appear prompting a reboot of the Fieldserver for the changes to take effect.



4.6 How to Import a PE Configuration

It is possible to import a PE (Protocol Engine) configuration separately. To import a PE configuration:

1. Goto the system configuration page http://{IP_ADDRESS}/chipkinConfiguration/ui/
2. Click the “Browse” button in the “Import Specific Configuration” section and select the csv file containing the pe configuration to import.
3. Click the “Import PE Configuration” button and wait for the configuration to finish importing.
4. If successful, a success message will appear prompting a reboot of the Fieldserver for the changes to take effect.

Import Specific Configuration

Use the following control to import a specific portion of the configuration, this includes:

- Import PE Configuration

Import a pe configuration csv file. Select the file to import, then click the Import PE Configuration

5 Revision History

This table summarizes the update history for this document. Please contact Chipkin for an updated version of this document if required.

DATE	RESP	DOC. REV.	COMMENT
15 Dec 2020	ACF	1	Created initial document
2 June 2020	YC	2	Updated document format

Appendix A. Troubleshooting

Appendix A.1 Debugging the Passive XPath Server

- If the FieldServer is not receiving any XML data, verify in that the device sending the XML data is using the correct IP Address of the FieldServer and is using the configured TCP port.
- Check the Stats page to see if the server is listening and receiving data.
- If the FieldServer is not extracting values from the XML Data, check that the XPath pattern is valid. Use the following website: [Free Online XPath Tester / Evaluator - FreeFormatter.com](https://www.freeformatter.com/xpath-tester/) to test the XPath pattern against the XML Data being sent to verify that the pattern works to extract the required data.

Appendix B. Example Configuration

```
{
  "ae": {
    "passiveXPath": {
      "connections": [
        {
          "type": "ethernet",
          "name": "Ethernet",
          "parameters": { "port": "n1" }
        }
      ],
      "nodes": [
        {
          "connection": "Ethernet",
          "type": "xml",
          "name": "SampleXmlData",
          "port": 12345
        }
      ],
      "tasks": [
        {
          "node": "SampleXmlData",
          "xpath": "/Sensor/Temperature/Current/text()",
          "dataBroker": { "pe": { "Name": "DA_AI", "Start": "1" } },
          "name": "CurrentTemperature"
        }
      ]
    }
  }
}
```


Appendix C. Marketing

Appendix C.1 Case Study

A series of case studies for PassiveXPath can be found here

[ToDo] – Add Case Study or link to Case Studies...

Appendix C.2 Keyword

XML, XPath, Passive XML Server, XML-TCP

Appendix D. Glossary of Terms

- **XML** – Extensible Markup Language
- **XPath** – XML Path Language
- **TCP** – Transmission Control Protocol