1 DESCRIPTION

The EtherNet/IP driver allows the FieldServer to transfer data to and from devices over Ethernet using the EtherNet/IP protocol. The FieldServer can emulate either a Server or Client. The EtherNet/IP driver uses port 44818 by default.

EtherNet/IP uses CIP (Control and Information Protocol), the common network, transport and application layers also shared by ControlNet and DeviceNet. EtherNet/IP then makes use of standard Ethernet and TCP/IP technology to transport CIP communications packets. The result is a common, open application layer on top of open and highly popular Ethernet and TCP/IP protocols.

The Driver is able to read/write using the Data Table structure employed by all Logix Series PLC’s.

PCCC support is also provided for legacy devices that do not fully support CIP encapsulation. EIP PCCC Encapsulation was tested at the FST factory using a PLC5 1785 ENET card. The following data types were tested:

- N
- F
- S

The Driver also supports PCCC communication on SLC and MicroLogix (tested on MicroLogix 1400 Device).

Fragmented Services (0x52) is supported for data_table read and write operations.

1.1 Connection Facts

<table>
<thead>
<tr>
<th>FieldServer Mode</th>
<th>Nodes</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client</td>
<td>1</td>
<td>Only 1 Client Node allowed.</td>
</tr>
<tr>
<td>Server</td>
<td>32</td>
<td>32 Server Nodes allowed.</td>
</tr>
</tbody>
</table>
6 SUPPORTED COMMUNICATION FUNCTIONS

EtherNet/IP is an object orientated protocol. The object oriented structure therefore allows for classes, instances, attributes and services. The ‘data types’ listed below are to be considered as the objects supported in the protocol. Each of these has attributes that have been supported to differing degrees.

6.1 Data Types Supported

<table>
<thead>
<tr>
<th>FieldServer Data Type</th>
<th>Description (or Device Data Type)</th>
</tr>
</thead>
</table>
| Identity – Class Code 0x01 | Attributes Supported:  
One instance supported (0x01)  
Attributes List:  
Vendor ID  
Device Type  
Product Code  
Device Revision  
Status  
Serial Number  
Device Description (text)  
Services Supported:  
Get_Attribute_All  
Get_Attribute_Single |
| Message Router – Class Code 0x02 | Attributes Supported:  
One instance supported (0x01)  
Attributes List:  
Max Connections  
Services Supported:  
Get_Attribute_Single |
| Assembly – Class Code 0x04 | Attributes Supported:  
Class Instance Support (0x00)  
Class Attributes:  
0x02 (Max Instance)  
Two instances supported (0x0100 and 0x0101)  
Attribute List:  
Member List  
Not Supported  
Data  
Services Supported:  
Get_Attribute_Single |
| Connection Manager – Class Code 0x06 | Forward Open Service  
Forward Close Service |
| Register – Class Code 0x07 | Attributes Supported:  
Class Instance Support (0x00)  
Class Attributes:  
0x02 (Max Instance)  
Two instances supported (0x01 and 0x02)  
Attribute List:  
Status Flag  
Direction (read/write)  
Size of Data (bits)  
Services Supported:  
Get_Attribute_Single |
| Discrete Input Point – Class Code 0x08 | No visible interface currently |
| Discrete Output Point – Class Code 0x09 | No visible interface currently |
| Analog Input Point – Class Code 0x0A | Attributes Supported:  
Class Instance Support (0x00)  
Class Attributes:  
0x02 (Max Instance)  
Two instances supported (0x01 and 0x02)  
Attribute List:  
Number of Attributes  
Not Supported  
Analog value (UINT16) not supported  
Vendor ID  
Services Supported:  
Get_Attribute_Single |
# FieldServer Protocol Driver Sheet

## EtherNet/IP Driver

<table>
<thead>
<tr>
<th>FieldServer Data Type</th>
<th>Description (or Device Data Type)</th>
</tr>
</thead>
</table>
| Analog Output Point – Class Code 0x0B | Attributes Supported:  
* Class Instance Support (0x00)  
* Class Attributes: 0x02 (Max Instance)  
* Two instances supported (0x01 and 0x02)  
* Attribute List:  
  * Number of Attributes Not Supported  
  * Analog value (UINT16) not supported  
* Vendor ID  
* Services Supported:  
  * Set_Attribute_Single  
  * Get_Attribute_Single |
| TCP/IP Interface Object – Class Code 0xF5 | Attributes Supported:  
* One instance supported (0x01)  
* Attribute List:  
  * Status  
  * Configuration Capability  
  * Configuration Control  
  * Physical Link Object  
  * Interface Configuration  
  * Host Name  
* Services Supported:  
  * Get_Attribute_Single |
| EtherNet Link Object – Class Code 0xF6 | Attributes Supported:  
* One instance supported (0x01)  
* Attribute List:  
  * Interface Speed  
  * Interface Flags  
  * Physical Address  
  * Interface Counters  
  * Media Counters  
* Services Supported:  
  * Get_Attribute_Single |
| Data Table Object – Private Object | Attributes Supported:  
* This object does not support instances or attributes but uses the data table structure, and associated tags, in Logix5000 PLC’s.  
* Services Supported:  
  * CIP Read Data |

## 6.2 Connection Types Supported

<table>
<thead>
<tr>
<th>Connection Type</th>
<th>Support Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unconnected Messages</td>
<td>Unconnected messages are supported to objects mentioned above.</td>
</tr>
<tr>
<td>Explicit Messages</td>
<td>Both client and server support Explicit Messages to all supported objects.</td>
</tr>
<tr>
<td>Implicit Messages</td>
<td>Implicit Messages are supported.</td>
</tr>
</tbody>
</table>

## 6.3 Read Operations Supported

The functions below are supported to varying degrees by the objects above. The exact support for functions is mentioned in the table above.

<table>
<thead>
<tr>
<th>FieldServer as a Client (Scanner)</th>
<th>FieldServer as a Server (Adapter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Get_Attribute_Single – Service Code 0x0E</td>
<td>Get_Attribute_Single – Service Code 0x0E</td>
</tr>
<tr>
<td>Data_Table_Read – Service Code 0x4C</td>
<td>Get_Attribute_All – Service Code 0x01</td>
</tr>
<tr>
<td>Data_Table_Read – Service Code 0x4C</td>
<td>Data_Table_Read – Service Code 0x4C</td>
</tr>
</tbody>
</table>

## 6.4 Write (Control) Options Supported

<table>
<thead>
<tr>
<th>FieldServer as a Client (Scanner)</th>
<th>FieldServer as a Server (Adapter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set_Attribute_Single – Service Code 0x10</td>
<td>Set_Attribute_Single – Service Code 0x10</td>
</tr>
<tr>
<td>Data_Table_Write – Service Code 0x4D</td>
<td>Data_Table_Write – service code 0x4D</td>
</tr>
</tbody>
</table>

1 Electronic Data Sheets (EDS) are simply ASCII files that describe how a device can be used on an EtherNet/IP network. It describes the objects, attributes and services available in the device.
### 6.5 Unsupported Functions and Data Types

<table>
<thead>
<tr>
<th>Function</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming messages</td>
<td>FieldServer is a data transfer device, and as such, programming messages are not required.</td>
</tr>
<tr>
<td>All Group Functions. (e.g. Analog Input Group Object)</td>
<td>Possibility of later support.</td>
</tr>
<tr>
<td>All Application Specific Data Objects (e.g. AC/DC Drive Object)</td>
<td>Possibility of later support.</td>
</tr>
</tbody>
</table>