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.

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 I785 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   ODVA Status

ODVA is an international association comprised of members from the world's leading automation companies. Collectively, ODVA and its members support network technologies based on the Common Industrial Protocol (CIP™). These currently include DeviceNet™, EtherNet/IP™, CIP Safety™ and CIP Sync™. ODVA manages the development of these open technologies, and assists manufacturers and users of CIP-based networks through tools, training and marketing activities.

FieldServer Technologies is an ODVA member and our device is ODVA tested to be Ethernet/IP Compliant.

Vendor Code	875
Product Type Code	12 or "Communications Adapter"

Notes:

- It is possible for the FieldServer to act as a scanner and an adapter at the same time so long as they are configured on different ports. Consequently this functionality is not possible on an FS-X20 platform.

Fieldserver Mode	Nodes	Comments
Client	1	Only 1 Client Node allowed.
Server	32	32 Server Nodes allowed.

2   FORMAL DRIVER TYPE

Ethernet
Client or Server

3   COMPATIBILITY MATRIX

FieldServer Model	Compatible with this driver
FS-x2010	Yes
FS-x2011	Yes
FS-x25	Yes
FS-x30	Yes
FS-x40	Yes
SlotServer	Yes
ProtoNode	Yes
QuickServer FS-QS-10xx	No
QuickServer FS-QS-12xx	Yes
ProtoCessor FPC-FO2	No
ProtoCessor FPC-FD2	Yes

4   CONNECTION INFORMATION

Connection type: Ethernet
Ethernet Speeds Supported   10Base-T, 100Base-T[1]

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[1] Not all FieldServer models support 100BaseT. Consult the appropriate instruction manual for details of the Ethernet speed supported by specific hardware.

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5   DEVICES TESTED

Device	Tested (FACTORY, SITE)
ODVA Conformance Tool (ENetCT Ver A3.5)	Factory
FlexLogix PLC/ 1788 - Enet Ethernet Card	Factory
Wago 750-841 Programmable Fieldbus Coupler	Factory
ControlLogix 5561 with 1756-ENBT A Ethernet card	Factory
Micrologix 1400	Site

6   COMMUNICATIONS FUNCTIONS - SUPPORTED FUNCTIONS AT A GLANCE:

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

FieldServer Data Type	Description (or Device Data Type)
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)* Attribute List: Max Connections

FieldServer Data Type	Description (or Device Data Type)
	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

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FieldServer Data Type	Description (or Device Data Type)
	Vendor ID
	Services Supported:
	Get_Attribute_Single
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.

FieldServer Data Type	Description (or Device Data Type)
	Services Supported:
	CIP Read Data

6.2   Connection Types Supported

Connection Type	Support Details
Unconnected Messages	Unconnected messages are supported to objects mentioned above.
Explicit Messages	Both client and server support Explicit Messages to all supported objects.
Implicit Messages	Implicit Messages are not currently supported.

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.

FieldServer as a Client (Scanner)	FieldServer as a Server (Adapter)
Get_Attribute_Single – Service Code 0x0E	Get_Attribute_Single – Service Code 0x0E
Data_Table_Read – Service Code 0x4C	Get_Attribute_All – Service Code 0x01
	Data_Table_Read – Service Code 0x4C

6.4   Write (Control) Operations supported

FieldServer as a Client (Scanner)	FieldServer as a Server (Adapter)
Set_Attribute_Single – Service Code 0x10	Set_Attribute_Single – Service Code 0x10
Data_Table_Write – Service Code 0x4D	Data_Table_Write – service code 0x4D

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6.5   Unsupported Functions and Data Types

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

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