Driver Manual

FS-8704-23 EnergyWise Endpoint

APPLICABILITY & EFFECTIVITY
Effective for all systems manufactured after June 2023.

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1 Description

The EnergyWise Endpoint driver allows the FieldServer to participate on an EnergyWise domain as a Parent Node with multiple Child Nodes. The FieldServer gateway acts as a Parent node on the EnergyWise domain and a number of Child Nodes can be configured to read third party server devices such as Power Meters on Modbus or HVAC controllers on LonWorks.

Max Nodes Supported

FieldServer Mode	Nodes	Comments
Server	One Parent Node	Only a single Parent Node is supported
	Multiple Child Nodes	The number of Child Nodes is limited to the maximum points that the FieldServer con be configured for.

2 Driver Scope of Supply

2.1 Supplied by MSA Safety

Part #	Description
	Driver Manual

2.2 Provided by the Supplier of 3rd Party Equipment

2.2.1 Required 3rd Party Hardware

Part #	Description
	EnergyWise capable switch or Router (e.g. Catalyst 2960 switch)

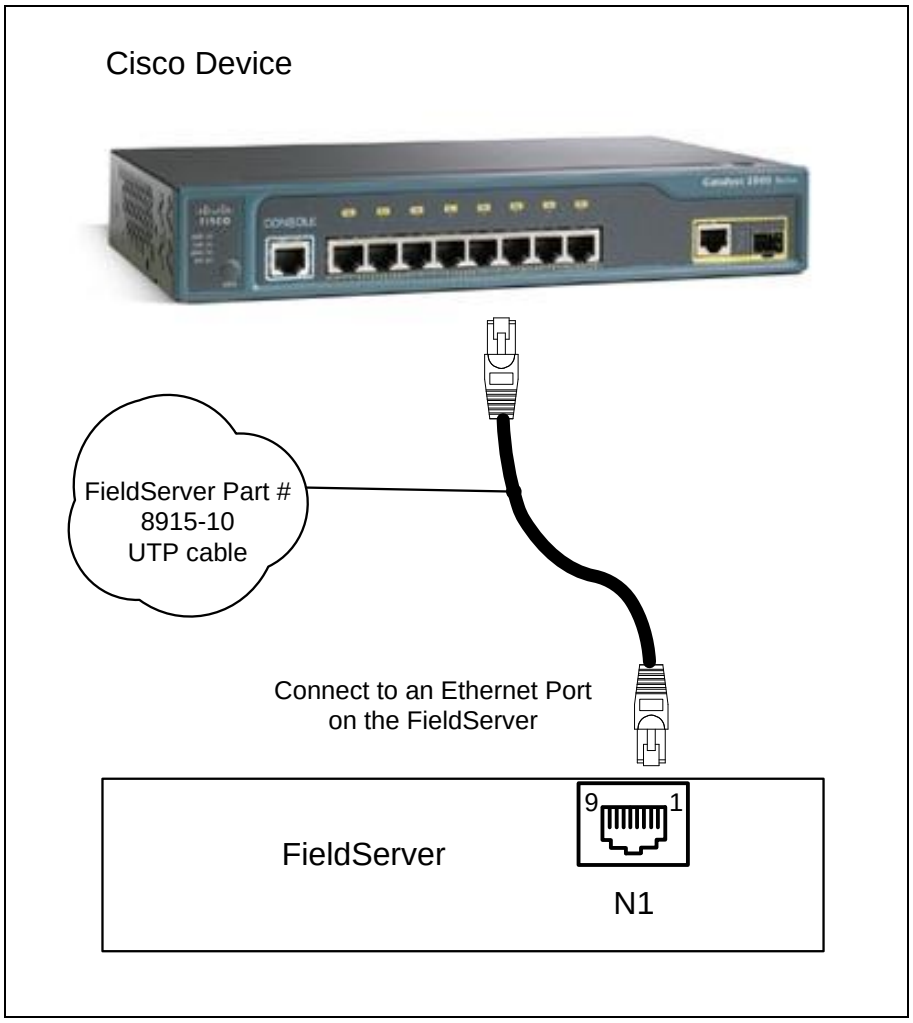
2.2.2 Required 3rd Party Configuration

EnergyWise Management tool e.g. JouleX Energy Management system, or directly on an EnergyWise router using the Cisco CLI.

3 Hardware Connections

The FieldServer is connected to an EnergyWise capable switch as shown in the connection drawing.

Configure the EnergyWise switch according to the manufacturer's instructions. Typically, this will involve enabling the EnergyWise domain and specifying a Shared Secret code. Refer to **Section** 7.1 for a typical CLI session on a Cisco EnergyWise switch.



4 Data Array Parameters

Data Arrays are “protocol neutral” data buffers for storage of data to be passed between protocols. It is necessary to declare the data format of each of the Data Arrays to facilitate correct storage of the relevant data.

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.	Float, Bit, Byte, Uint16, Uint32, Sint16, Sint32
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.	1-10000

Example

```
//    Data Arrays
Data_Arrays
Data_Array_Name    , Data_Array_Format    , Data_Array_Length
DA_Usage_01        , UInt16               , 200
DA_Level_01        , Byte                 , 200
```

5 Client Side Configuration

Client Configuration is not applicable for the EnergyWise Endpoint Driver. Refer to FS-8704-24 EnergyWise Management API Driver for Client operation.

6 Server Side Configuration

For detailed information on FieldServer configuration, 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 FieldServer).

This section documents and describes the parameters necessary for configuring the FieldServer to register and participate in the EnergyWise domain.

The configuration file tells the FieldServer about its interfaces, and the routing of data required. In order to enable the FieldServer for EnergyWise Endpoint communications, the driver independent FieldServer buffers need to be declared in the "Data Arrays" section, the FieldServer EnergyWise Parent Node needs to be declared in the "Server Side Nodes" section, and the data to be provided to the EnergyWise domain needs to be mapped in the "Server Side Map Descriptors" section. Details on how to do this can be found below.

NOTE: In the tables below, * indicates an optional parameter with the bold legal value as default.

6.1 Server Side Connection Parameters

Section Title		
Connections		
Column Title	**Function**	**Legal Values**
Adapter	Adapter Name.	N1-N2, WLAN[1]
Protocol	Specify protocol used.	EnergyWise_EP

Example

```
//    Server Side Connections
Adapters
Adapter      , Protocol
N1           , EnergyWise_EP
```

6.2 Server Side Node Parameters

Section Title		
Nodes		
Column Title	**Function**	**Legal Values**
Node_Name	Provide name for node.	Up to 32 alphanumeric characters
Protocol	Specify Protocol used.	EnergyWise_EP
Domain	EnergyWise Domain that this Endpoint will register on.	Any ASCII string – max 255 characters
Secret	Secret code (password) to gain access to the EnergyWise Domain. Note, password is case sensitive.	Any ASCII string – max 255 characters
Parent_Power*	Total Parent consumption of the Parent Node.	Typically 5-10, **6**
UDP_Port*	Configurable UDP port number.	Any valid UDP Port, **43440**
Discovery_Interval*	Configurable Discovery Interval.	Time in seconds, **30s**
Node_Device_Type	Device type connected to the Node.	
Node_Role	Role definition for the Node.	Any ASCII string – max 255 characters

[1] Not all ports shown are necessarily supported by the hardware. Consult the appropriate instruction manual for details of the ports available on specific hardware.

Node_Keywords	Specify one or more keywords which are used to identify the Node when the EnergyWise query command is executed. Keywords are a powerful feature of EnergyWise. EnergyWise managers can tag entities in the domain with arbitrary keywords and then search – and act on – them using the keyword.	Space separated set of keywords
Node_Importance*	Importance Value for Node with 100 the most important keyword. EnergyWise query results can be executed to operate on any Node with an importance less than the specified importance.	1-**100**

Example

```
//   Server Side Nodes

Nodes
Node_Name    , Protocol        , Domain   , Secret   , UDP_Port   , Discovery_Interval   , Node_Role
FST_Cisco    , EnergyWise_EP   , fst      , pass     , 43440      , 30s                  , FSB3510
```

```
, Node_Keywords     , Node_Device_Type   , Node_Importance   , Parent_Power
, demo fst gateway  , unknown            , 1                 , 6
```

6.3 Server Side Map Descriptor Parameters

6.3.1 FieldServer Specific 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 (Data_Array_Length-1) as specified in “Data_Array” section
Function	Function of Client Map Descriptor.	Passive

6.3.2 Driver Specific Map Descriptor Parameters

Column Title	Function	Legal Values
Node_Name	Name of Node to which data must be sent.	One of the Node names specified in the Server “Node” section above
Length*	Length of Map Descriptor.	**1**
DA_Byte_Name	Byte Name in Data Array where level data will be written.	
DA_Byte_Offset	Offset in Data Array where level data will be written.	
MD_Device_Type	Device type Description.	
MD_Category*	EnergyWise Category description of the device.	Producer, **Consumer**, Meter
MD_Units*	SI Units of power measurement.	**Watts**, MWatts
MD_Caliber*	Caliber associated with the platform's current power usage.	Max, Presumed, Unknown, **Actual**, Trusted
MD_Role	Role definition for the Map Descriptor.	Any ASCII string – max 255 characters

MD_Importance*	Importance Value for the Device, 100 most important, 1 least important. EnergyWise query results can be executed to operate on any Node with an importance less than the specified importance.	1 to **100**
MD_Keywords	Importance Value for Node with 100 the most important keyword. EnergyWise query results can be executed to operate on any Node with an importance less than the specified importance.	Space separated set of keywords.

6.4 Map Descriptor Example

```
// Server Side Map Descriptors

Map_Descriptor_Name   , Data_Array_Name   , Data_Array_Offset   , DA_Byte_Name   , DA_Byte_Offset   Function   Node_Name   MD_Role
Lutron_Lighting_Level , DA_Usage_01       , 0                  , DA_Level_01     , 0               , Passive    , FST_Cisco   , Child
Lutron_Sunscreen      , DA_Usage_01       , 1                  , DA_Level_01     , 1               , Passive    , FST_Cisco   , Child
Lutron_Total_Power    , DA_Usage_01       , 2                  , DA_Level_01     , 2               , Passive    , FST_Cisco   , Child
Lutron_Max_Power      , DA_Usage_01       , 3                  , DA_Level_01     , 3               , Passive    , FST_Cisco   , Child
Circon_VAV            , DA_Usage_01       , 4                  , DA_Level_01     , 4               , Passive    , FST_Cisco   , Child
Schneider1_Power_A    , DA_Usage_01       , 5                  , DA_Level_01     , 5               , Passive    , FST_Cisco   , Child
Schneider1_Power_B    , DA_Usage_01       , 6                  , DA_Level_01     , 6               , Passive    , FST_Cisco   , Child
Schneider1_Power_C    , DA_Usage_01       , 7                  , DA_Level_01     , 7               , Passive    , FST_Cisco   , Child
Schneider2_Power_A    , DA_Usage_01       , 8                  , DA_Level_01     , 8               , Passive    , FST_Cisco   , Child
Schneider2_Power_B    , DA_Usage_01       , 9                  , DA_Level_01     , 9               , Passive    , FST_Cisco   , Child
Schneider2_Power_C    , DA_Usage_01       , 10                 , DA_Level_01     , 10              , Passive    , FST_Cisco   , Child
```

```
MD_Keywords      , MD_Device_Type , MD_Importance , MD_Category , MD_Units , MD_Caliber , Length
, fstlutron      , Unknown        , 10            , 1           , 0        , 1          , 1
, fstlutron      , Unknown        , 20            , 1           , 0        , 1          , 1
, fstlutron      , Unknown        , 30            , 1           , 0        , 1          , 1
, fstlutron      , Unknown        , 40            , 1           , 0        , 1          , 1
, fstlutron      , Unknown        , 50            , 1           , 0        , 1          , 1
, fstschneider1  , Unknown        , 60            , 1           , 0        , 1          , 1
, fstschneider1  , Unknown        , 70            , 1           , 0        , 1          , 1
, fstschneider1  , Unknown        , 80            , 1           , 0        , 1          , 1
, fstschneider2  , Unknown        , 90            , 1           , 0        , 1          , 1
, fstschneider2  , Unknown        , 90            , 1           , 0        , 1          , 1
, fstschneider2  , Unknown        , 90            , 1           , 0        , 1          , 1
```

7 Reference

7.1 EnergyWise Endpoint Setup on Cisco Router

The commands can be used to set up the domain and secret (using domain = fst and secret = pass) as per the Server Side Node Parameters.

- Switch>enable
- Password: <enter password>
- Switch#config terminal
- Switch(config)#energywise domain fst secret pass
- Switch(config)#energywise endpoint security shared-secret pass
- Switch(config)#energywise management security shared-secret pass
- Switch(config)# end

7.2 Data Manipulation Using Queries and Filters

7.2.1 Query Types Supported by EnergyWise

- Collect—Receive power-usage information in Watts from the domain members and end points.
- Save—Save the running configuration of a domain member. Use the EnergyWise allow query to save global configuration command.
- Set—Change the power level of a domain member or end point in the running configuration.
- Sum—Summarize the information from domain members and end points.

7.2.2 Filtering the Results

You can filter the results with the following attributes:

- Importance—Rate the devices based on the business or deployment context. The range is from 1 (least important) to 100 (most important).
- Role—Device function based on the business or deployment context.
- Name—Device identity.
- Keywords—Device descriptions (other than the name or role).

The query results show entities with importance values less than or equal to the specified value and that match the different filter attributes specified.

7.3 Unsupported Functions

Delta command to run "what if "calculations.