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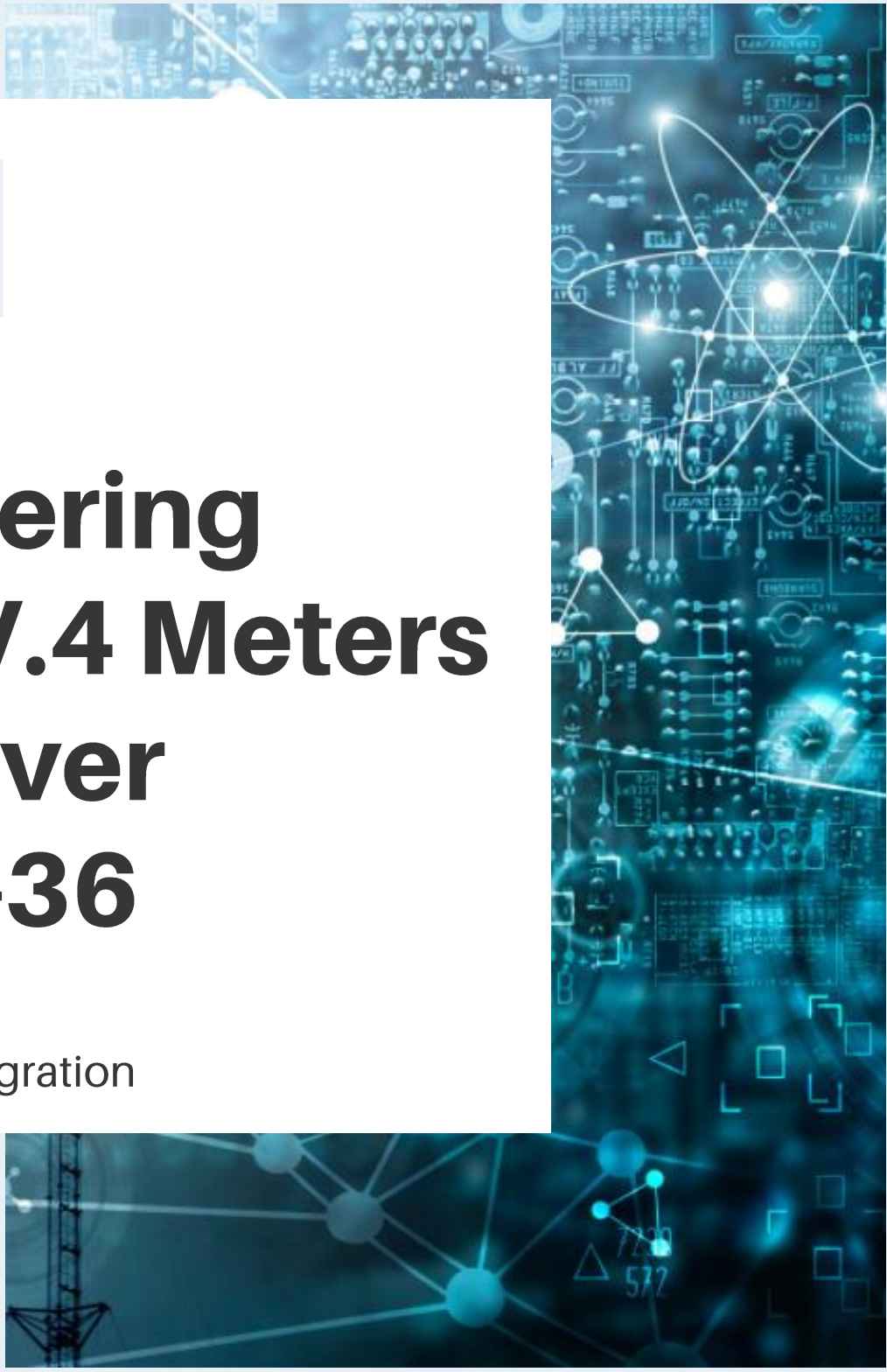

EKM Metering V.3 and V.4 Meters Serial Driver FS-8705-36

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1 EKM Metering V3 V4 Driver Description

This serial driver connects to a trunk of 1 or more (v3 and v4) EKM Meters using RS485. It is capable of reading operational and status data from each meter.

The 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. Other drivers can access the EKM Meter data and serve using other protocols such as BACnet and Modbus .

The driver is an active client driver in that it poll's for data – reading or writing data from meters. It cannot be used to simulate and EKM meter. Because only the client side of the protocol is implemented.

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.

Max Nodes Supported

FIELDSERVER MODE	NODES	COMMENTS
Client	Many	Number of Meters is determined by vendor and RS485 limitations. Trunks of dozens of devices supported.
Server	0	Not supported or documented.

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2 Driver Scope of Supply

2.1 Supplied with this driver

FIELDSERVER TECHNOLOGIES PART #	DESCRIPTION
Cables	No specific cables are shipped with this driver.
FS-8705-36	Driver Manual.

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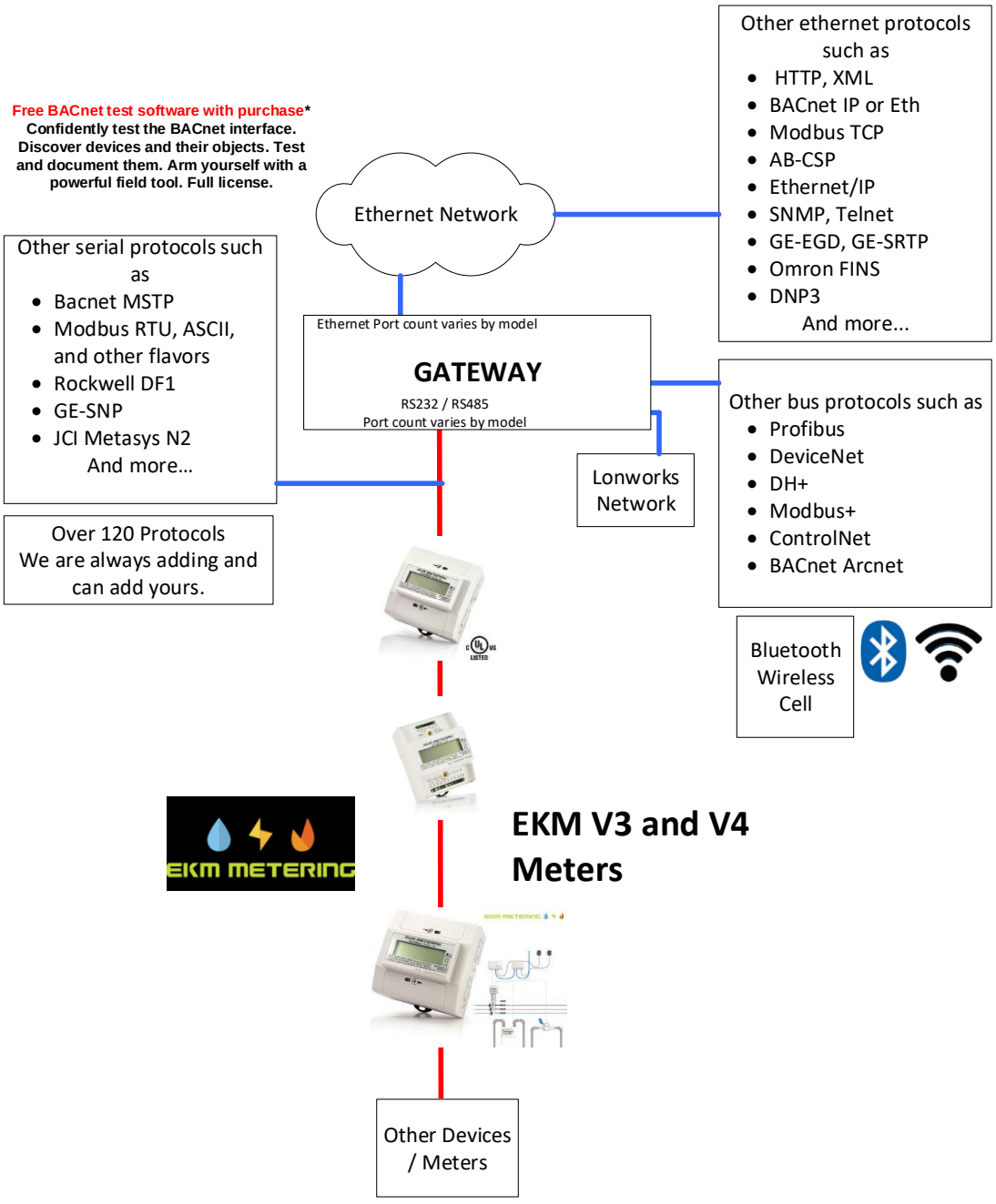
3 Hardware Connections

3.1 Block Diagram

Multiple WorkStation protocols and connection supported. See list of FieldServer Drivers



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3.2 Cable Connections

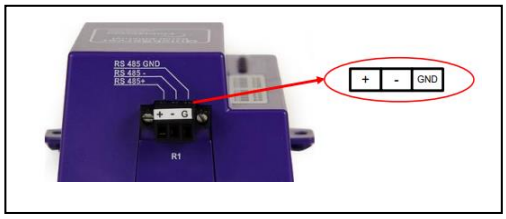
3.2.1 FS-1010 and FS-1210 Connections

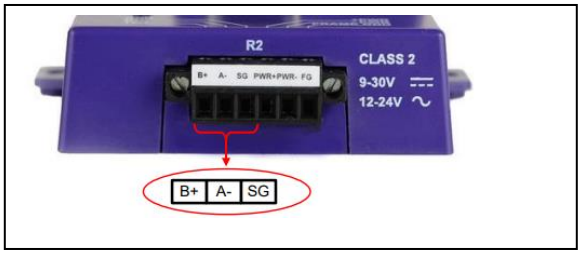
There are 2x RS485 Ports.

R1 – Top of Unit

R2 = Bottom of Unit (This connection will only be used if you are connecting to 2 separate RS485 trunks)

2 Wire RS485 – often requires the 3rd wire – the signal common wire. We suggest providing a conductor for this purpose but in most cases it will not be required.





3.2.2 FS-1020 and FS-1220 Connections

There are 1x RS485 Ports identified as R1. See FS-1010 Connection info above for connection info.

R1 – Top of Unit

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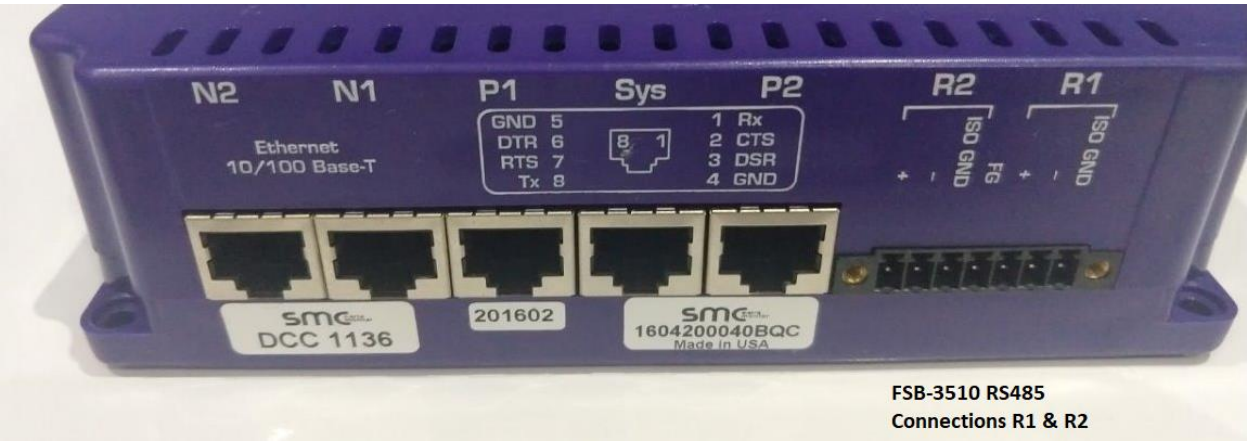
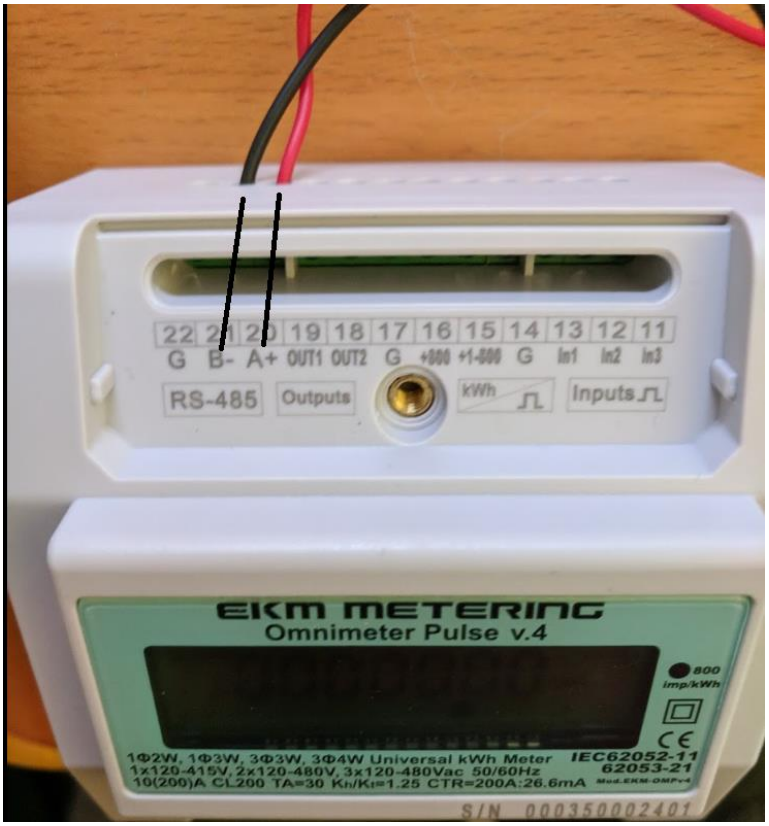
3.2.3 FSB-3510 Connections



FSB-3510 RS485
Connections R1 & R2

3.2.4 Meter Connections



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4 Configuring the FieldServer as a EKM Metering V3 V4 Client

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 EKM Metering V3 V4 system.

The configuration file tells the FieldServer about its interfaces, and the routing of data required. In order to enable the FieldServer for EKM Metering V3 V4 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.

4.1 Data Arrays

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.	**Recommended**: Bit, UInt16, Also Supported: Float, Uint32, SInt16, Packed_Bit, Byte, Packed_Byte, Swapped_Byte
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.	1-10,000

4.1.1 Data Arrays - Example

```
//    Data Arrays
Data_Arrays
Data_Array_Name,        Data_Format,    Data_Array_Length,
EKM-Stats,              UNT16,          200
000000028801,           FLOAT,          200
```

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4.2 Client Side Connections

Create one connection for each EKM Metering V3 V4 serial port. Each connection can only be used to connect to a single EKM Metering V3 V4 interface/port.

SECTION TITLE
Connections

COLUMN TITLE	FUNCTION	LEGAL VALUES
Port	Specify which port the device is connected to the FieldServer	P1-P8
Protocol	Specify protocol used	EKM
Baud*	Specify baud rate	Driver Supports : 110; 300; 600; 1200; 2400; 4800; **9600**; 19200; 28800; 38400; 57600 Baud EKM Default = 9600
Data_Bits *	Specify parity	Driver Supports : 7,**8** EKM Default = 7
Stop_Bits*	Specify data bits	Driver Supports : **1**,2 EKM Default = 1
Parity *	Specify stop bits	Driver Supports : Odd, Even, **None** EKM Default = Even

4.2.1 Client Side Connection Descriptions - Example

```
//      Client Side Connections


Connections

Port,           Baud    Parity,     Data_Bits,  Stop_Bits

R1,             9600    Even,       7,          1,
```

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4.3 Client Side Nodes

Create one Node per FACP in the network only.

SECTION TITLE
Nodes

COLUMN TITLE	FUNCTION	LEGAL VALUES
Node_Name	Provide name for node	Up 12 of the max of 32 alphanumeric characters possible to specify the Node name. **NB !** The name must be set to the Meter's 12 character address.
Node_ID	Not used directly by the driver	0-255 Commonly omitted. If you are using Node_Status bits then allocate a Node_ID. Give each meter a unique number.
Protocol	Specify protocol used	EKM

4.3.1 Client Side Nodes – Example

```
//  Client Side Nodes

Nodes
Node_Name,          Node_ID,    Protocol,    Connection
000000028016,       0,          EKM,         R1
```

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4.4 Client Side Map Descriptors

4.4.1 FieldServer Related 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 maximum specified in “Data Array” section above
Function	Function of Client Map Descriptor..	Rdbc,wrbc,wrbx

4.4.2 Driver Related Map Descriptor Parameters

COLUMN TITLE	FUNCTION	LEGAL VALUES
Node_Name	Name of Node to fetch data from	One of the node names specified in “Client Node Descriptor” above
Data_Type	This commonly used parameter is not used by this driver.	
Length	Length of Map Descriptor Reserves space in the Data Array.	V3 Read Length=36 V4 Read Length = 45 V4 ReadB Length = 27 6 Month Data Length = 30 Set the value to 1 when using services that write to the meters. Explanation is provided in section which describes the services.
Address	The Relay Number	1,2

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		Only required on Map Descriptors which use the service which operates the relays.

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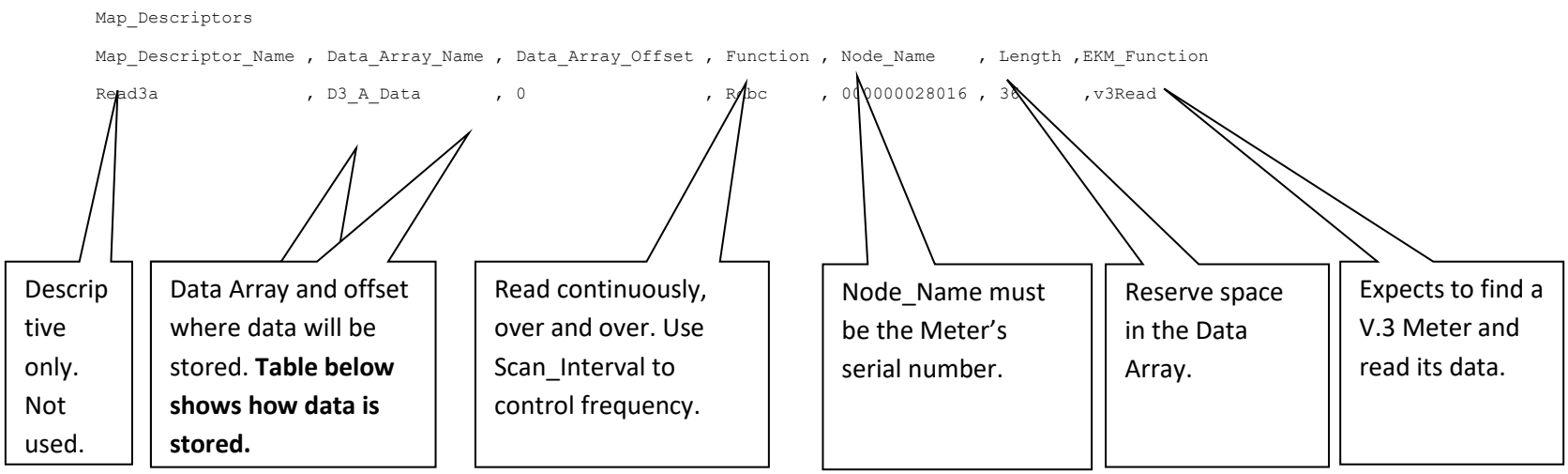
4.5 Examples

4.5.1 Map Descriptor Example 1 – Read V.3 Meter

This is the only function available to read energy data from a V3 Meter

```
Map_Descriptors
Map_Descriptor_Name , Data_Array_Name , Data_Array_Offset , Function , Node_Name    , Length ,EKM_Function
Read3a              , D3_A_Data       , 0                 , Rdbc     , 000000028016 , 38       ,v3Read
```



Label	Scaling	Offset
Model	None	0
Firmware	None	1
kWh_Tot	None	3
kWh_Tariff_1	None	4
kWh_Tariff_2	None	5
kWh_Tariff_3	None	6
kWh_Tariff_4	None	7
Rev_kWh_Tot	None	8
Rev_kWh_Tariff_1	None	9
Rev_kWh_Tariff_2	None	10
Rev_kWh_Tariff_3	None	11
Rev_kWh_Tariff_4	None	12
RMS_Volts_Ln_1	Divide By 10	13

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RMS_Volts_Ln_2	Divide By 10	14
RMS_Volts_Ln_3	Divide By 10	15
Amps_Ln_1	Divide By 10	16
Amps_Ln_2	Divide By 10	17
Amps_Ln_3	Divide By 10	18
RMS_Watts_Ln_1	None	19
RMS_Watts_Ln_2	None	20
RMS_Watts_Ln_3	None	21
RMS_Watts_Tot	None	22
Power_Factor_Adj_Ln_1	None	23
Power_Factor_Adj_Ln_2	None	24
Power_Factor_Adj_Ln_3	None	25
Max_Demand	None	26
Max_Demand_Period	None	27
CT_Ratio	None	28

Meter_Time	
Year	29
Month	30
Day of Month	31
Day of Week	32
Hour	33
Minute	34
Second	35

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4.5.2 Map Descriptor Example 2 – Read V.4

Read the basic data set available from a V.4 Meter.

```
Map_Descriptors
Map_Descriptor_Name , Data_Array_Name , Data_Array_Offset , Function , Node_Name    , Length ,EKM_Function
Read3a              , D4_A_Data       , 0                 , Rdbc     , 000000028016 , 46     ,v4Read
```

Descriptive only. Not used.

Data Array and offset where data will be stored. **Table below shows how data is stored**

Read continuously, over and over. Use Scan_Interval to control frequency.

Node_Name must be the Meter's serial number.

Reserve space in the Data Array.

Expects to find a V.4 Meter and read its PRIMARY data.

Label	Scale	Offset
Model	None	0
Firmware	None	1
kWh_Tot	kWh_Scale	3
Reactive_Energy_Tot	kWh_Scale	4
Rev_kWh_Tot	kWh_Scale	5
kWh_Ln_1	kWh_Scale	6
kWh_Ln_2	kWh_Scale	7
kWh_Ln_3	kWh_Scale	8
Rev_kWh_Ln_1	kWh_Scale	9
Rev_kWh_Ln_2	kWh_Scale	10
Rev_kWh_Ln_3	kWh_Scale	11
Resettable_kWh_Tot	kWh_Scale	12
Resettable_Rev_kWh_Tot	kWh_Scale	13
RMS_Volts_Ln_1	Divide By 10	14
RMS_Volts_Ln_2	Divide By 10	15

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RMS_Volts_Ln_3	Divide By 10	16
Amps_Ln_1	Divide By 10	17
Amps_Ln_2	Divide By 10	18
Amps_Ln_3	Divide By 10	19
RMS_Watts_Ln_1	None	20
RMS_Watts_Ln_2	None	21
RMS_Watts_Ln_3	None	22
RMS_Watts_Tot	None	23
Power_Factor_Ln_1	None	24
Power_Factor_Ln_2	None	25
Power_Factor_Ln_3	None	26
Reactive_Pwr_Ln_1	None	27
Reactive_Pwr_Ln_2	None	28
Reactive_Pwr_Ln_3	None	29
Reactive_Pwr_Tot	None	30
Line_Freq	Divide By 100	31
Pulse_Cnt_1	None	32
Pulse_Cnt_2	None	33
Pulse_Cnt_3	None	34
State_Inputs	None	35
State_Watts_Dir	None	36
State_Out	None	37
kWh_Scale	None	38
Meter_Time	None	
Year	None	39
Month	None	40
Day of Month	None	41
Day of Week	None	42
Hour	None	43
Minute	None	44
Second	None	45

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4.5.3 Map Descriptor Example 3 – Read V.4 DataB – 2ndary Data Set

Read the secondary data set available from a V.4 Meter.

```
Map_Descriptors
Map_Descriptor_Name , Data_Array_Name , Data_Array_Offset , Function , Node_Name    , Length ,EKM_Function
Read3a              , D4_B_Data       , 0                 , Rdbc     , 000000028016 , 38     ,v4ReadB
```

Descriptive only. Not used.

Data Array and offset where data will be stored. **Table below shows how data is stored**

Read continuously, over and over. Use Scan_Interval to control frequency.

Node_Name must be the Meter's serial number.

Reserve space in the Data Array.

Expects to find a V.4 Meter and read its SECONDARY data.

Label	**Scale**	**Offset**
Model	None	0
Firmware	None	1
kWh_Tariff_1	kWh_Scale	3
kWh_Tariff_2	kWh_Scale	4
kWh_Tariff_3	kWh_Scale	5
kWh_Tariff_4	kWh_Scale	6
Rev_kWh_Tariff_1	kWh_Scale	7
Rev_kWh_Tariff_2	kWh_Scale	8
Rev_kWh_Tariff_3	kWh_Scale	9
Rev_kWh_Tariff_4	kWh_Scale	10
RMS_Volts_Ln_1	Divide By 10	11
RMS_Volts_Ln_2	Divide By 10	12
RMS_Volts_Ln_3	Divide By 10	13
Amps_Ln_1	Divide By 10	14
Amps_Ln_2	Divide By 10	15
Amps_Ln_3	Divide By 10	16

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RMS_Watts_Ln_1	None	17
RMS_Watts_Ln_2	None	18
RMS_Watts_Ln_3	None	19
RMS_Watts_Tot	None	20
Power_Factor_Adj_Ln_1	None	21
Power_Factor_Adj_Ln_2	None	22
Power_Factor_Adj_Ln_3	None	23
RMS_Watts_Max_Demand	Divide By 10	24
Max_Demand_Period	None	25
Pulse_Ratio_1	None	26
Pulse_Ratio_2	None	27
Pulse_Ratio_3	None	28
CT_Ratio	None	29
Pulse_Output_Ratio	None	30
Meter_Time		
Year	None	31
Month	None	32
Day of Month	None	33
Day of Week	None	34
Hour	None	35
Minute	None	36
Second	None	37

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4.5.4 Map Descriptor Example 4 – Read V.4 6 Months of Data

Read the secondary data set available from a V.4 Meter.

```
Map_Descriptors
Map_Descriptor_Name , Data_Array_Name , Data_Array_Offset , Function , Node_Name    , Length ,EKM_Function
Read3a              , D4_B_Data       , 0                 , Rdbc     , 000000028016 , 38       , v3v4SixMonthFwd
```

Descriptive only. Not used.

Data Array and offset where data will be stored. **Table below shows how data is stored**

Read continuously, over and over. Use Scan_Interval to control frequency.

Node_Name must be the Meter's serial number.

Reserve space in the Data Array.

Expects to find a V.4 . Valid Entries are:

v3v4SixMonthFwd

or

v3v4SixMonthREV

Label	Scale	Offset
Month_1_Ttl	kWh_Scale	0
Month_1_Tariff_1	kWh_Scale	1
Month_1_Tariff_2	kWh_Scale	2
Month_1_Tariff_3	kWh_Scale	3
Month_1_Tariff_4	kWh_Scale	4
Month_2_Ttl	kWh_Scale	5
Month_2_Tariff_1	kWh_Scale	6
Month_2_Tariff_2	kWh_Scale	7
Month_2_Tariff_3	kWh_Scale	8
Month_2_Tariff_4	kWh_Scale	9
Month_3_Ttl	kWh_Scale	10
Month_3_Tariff_1	kWh_Scale	11
Month_3_Tariff_2	kWh_Scale	12
Month_3_Tariff_3	kWh_Scale	13
Month_3_Tariff_4	kWh_Scale	14

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Month_4_Ttl	kWh_Scale	15
Month_4_Tariff_1	kWh_Scale	16
Month_4_Tariff_2	kWh_Scale	17
Month_4_Tariff_3	kWh_Scale	18
Month_4_Tariff_4	kWh_Scale	19
Month_5_Ttl	kWh_Scale	20
Month_5_Tariff_1	kWh_Scale	21
Month_5_Tariff_2	kWh_Scale	22
Month_5_Tariff_3	kWh_Scale	23
Month_5_Tariff_4	kWh_Scale	24
Month_6_Ttl	kWh_Scale	25
Month_6_Tariff_1	kWh_Scale	26
Month_6_Tariff_2	kWh_Scale	27
Month_6_Tariff_3	kWh_Scale	28
Month_6_Tariff_4	kWh_Scale	29

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4.5.5 Map Descriptor Example 5 – Control V.4 Relays

Turn Relay 1 or 2 On/Off and optionally set the duration. The Address param tells the driver which relay you want to act on. Two data items are sent with the message. At offset=0 set the required state (zero or 1). At offset=1 set the duration in seconds. Zero means latch. Max seconds are 9999. The wrbx (write on update) action is triggered when the data in offset zero is updated. The wrbx action is not triggered when you set the value at offset=1 – the reason is that the Map Descriptor length is set to 1. For these tasks to execute to completion, the meter must have a password of '00000000'. If the meter password is different then the password must be setup in the configuration file. (See Appendix) .

```
Map_Descriptors
Map_Descriptor_Name , Address ,Data_Array_Name , Data_Array_Offset , Function , Node_Name    , Length ,EKM_Function
Control Relay 1     , 1       ,D4_RELAY1       , 0                 , wrbx     , 000000028016 , 1      , v4SetRelay
Control Relay 2     , 2       ,D4_RELAY2       , 0                 , wrbx     , 000000028016 , 1      , v4SetRelay
```

Descriptive only. Not used.

Data Array and offset where data will be stored.

Write on Update.

Node_Name must be the Meter's serial number.

Reserve space in the Data Array.

Expects to find a V.4 Meter. Will set the relay. This action requires that the password is setup.

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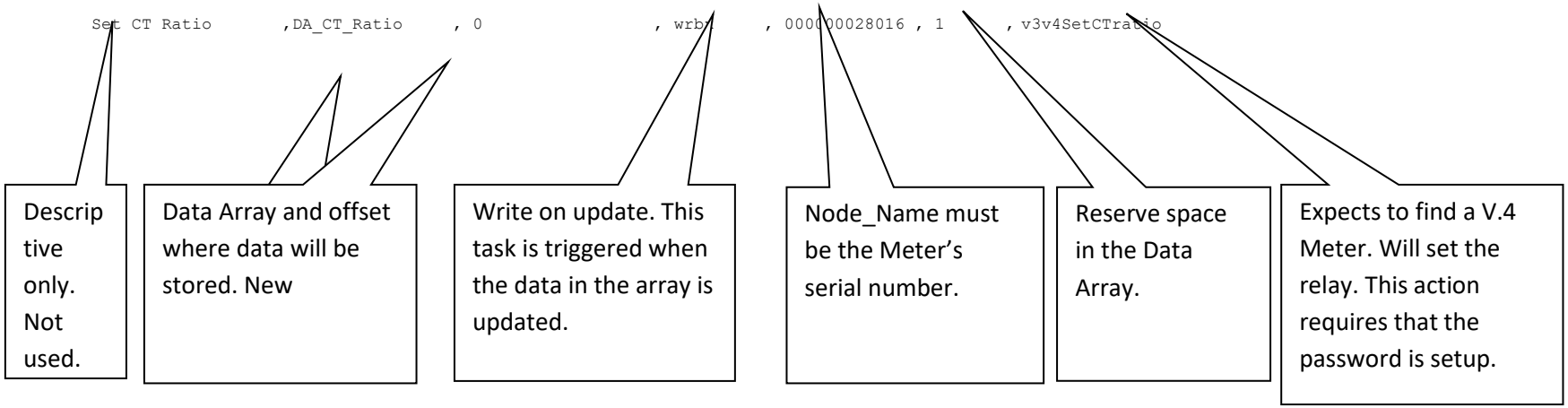
4.5.6 Map Descriptor Example 6 – Set CT Ratio

This task extracts the new CT ratio from offset=0 of the data array and sends it to the Meter. Works with V3 or V4 Meters. The meter must have a password of '00000000'. If the meter password is different then the password must be setup in the configuration file. (See Appendix).

```
Map_Descriptors
Map_Descriptor_Name ,Data_Array_Name , Data_Array_Offset , Function , Node_Name    , Length ,EKM_Function
Set CT Ratio       ,DA_CT_Ratio     , 0                , wrbt     , 000000028016 , 1      , v3v4SetCTratio
```



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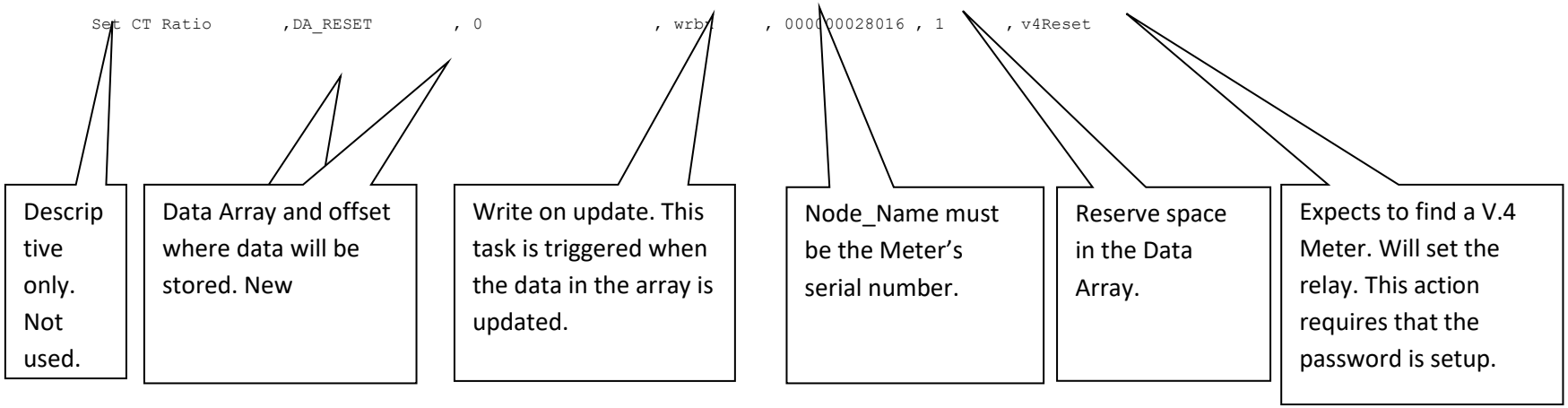
4.5.7 Map Descriptor Example 7 – Reset

Trigger this action by updating the value in the Data Array offset=0. The value is not sent to the Meter but is only used as a trigger. Works with V4 Meters. The meter must have a password of '00000000'. If the meter password is different then the password must be setup in the configuration file. (See Appendix).

```
Map_Descriptors
Map_Descriptor_Name ,Data_Array_Name , Data_Array_Offset , Function , Node_Name    , Length ,EKM_Function
Set CT Ratio       ,DA_RESET        , 0                 , wrbt     , 000000028016 , 1      , v4Reset
```



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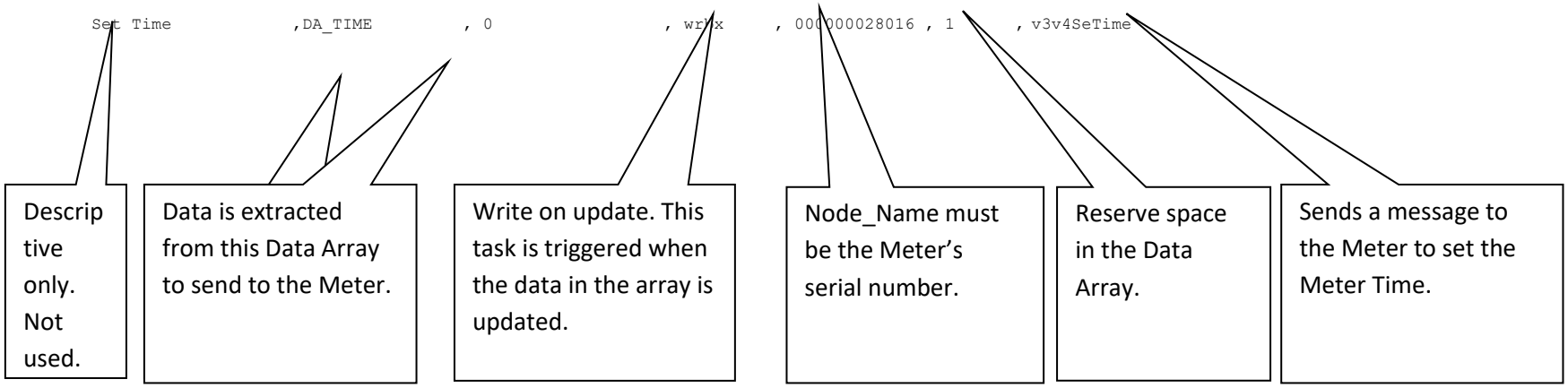
4.5.8 Map Descriptor Example 8 – Set Time

Trigger this action by updating the value in the Data Array offset=0. The value is not sent to the Meter but is only used as a trigger. When triggered, the driver extracts values from the Data array to send to the Meter to set the time. Preload offsets 1..7 then set the trigger.

```
Map_Descriptors
Map_Descriptor_Name ,Data_Array_Name , Data_Array_Offset , Function , Node_Name    , Length ,EKM_Function
Set Time            ,DA_TIME         , 0                 , write    , 000000028016 , 1      , v3v4SeTime
```



Trigger	Data_Array	Offset=0
year	Data_Array	Offset=1
month	Data_Array	Offset=2
day of month	Data_Array	Offset=3
day of week	Data_Array	Offset=4
hour	Data_Array	Offset=5
minute	Data_Array	Offset=6
second	Data_Array	Offset=7

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5 Configuring the FieldServer as a EKM Metering V3 V4 Server

This driver cannot be used to emulate an EKM Meter. If you want t o use another energy meter and you want it to appear like an EKM meter then you would need this emuation. Ask our sales department if you need this functionality.

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6 Revision History

DATE	RESP	FORMAT	DRIVER VER.	DOC. REV.	COMMENT
21 Jan 2019	PMC		1.0	1	Created
21 Feb 2019	PMC		8.0	2	Auto Config and other updates
28 Feb 2019	PMC		8.0	3	Updated auto config section.
30 Apr 2021	YC		8.0	4	Updated to new template

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Appendix A. Advanced Topics

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Appendix A.1 Notes on Operation of the Driver

In the configuration of a gateway, normally a single map descriptor represents a single task - for example read some data and store the data extracted from the response in the Data Array associated with the Map Descriptor.

This driver operates slightly differently. For example to read the 6 Month Data, one has to perform a Read of Data Set A prior. When one want s to send a command like the time or a reset, then the driver actually has to execute 3 tasks – Read Data Set A, Send the password and then finally send the command.

A consequence of this is that the Data SetA is read more often than necessary and in some cases its payload is discarded because the Data Array associated with the Map Descriptor is not intended for storing the Data Set A data.

Each time a response from the Meter contains data, the Data Array named with the Meter Number will also be updated. This data array will always have the most complete and up to date information. Read the section on Additional Data Storage method.

Appendix A.2 Additional Storage Method

If you create a Data Array whose name is identical to the Node_Name (The Meter Serial number) then when a read task is executed, besides storing the data in the Map Descriptor's Data array, the driver will additionally store data in the array named after the Meter.

Eg.

Data_Arrays

Data_Array_Name ,Data_Format ,Data_Array_Length

000350002401 ,FLOAT ,200

000000028016 ,FLOAT ,200

ReadV4		Offset	ReadV4DataB		Offset
Model	None	0	Model	None	50
Firmware	None	1	Firmware	None	51
Not used	None	2	Not used		52
kWh_Tot	kWh_Scale	3	kWh_Tariff_1	kWh_Scale	53
Reactive_Energy_Tot	kWh_Scale	4	kWh_Tariff_2	kWh_Scale	54
Rev_kWh_Tot	kWh_Scale	5	kWh_Tariff_3	kWh_Scale	55
kWh_Ln_1	kWh_Scale	6	kWh_Tariff_4	kWh_Scale	56
kWh_Ln_2	kWh_Scale	7	Rev_kWh_Tariff_1	kWh_Scale	57
kWh_Ln_3	kWh_Scale	8	Rev_kWh_Tariff_2	kWh_Scale	58
Rev_kWh_Ln_1	kWh_Scale	9	Rev_kWh_Tariff_3	kWh_Scale	59
Rev_kWh_Ln_2	kWh_Scale	10	Rev_kWh_Tariff_4	kWh_Scale	60
Rev_kWh_Ln_3	4Con	11	RMS_Volts_Ln_1	Divide By 10	61

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Resettable_kWh_Tot	kWh_Scale	12	RMS_Volts_Ln_2	Divide By 10	62
Resettable_Rev_kWh_Tot	kWh_Scale	13	RMS_Volts_Ln_3	Divide By 10	63
RMS_Volts_Ln_1	Divide By 10	14	Amps_Ln_1	Divide By 10	64
RMS_Volts_Ln_2	Divide By 10	15	Amps_Ln_2	Divide By 10	65
RMS_Volts_Ln_3	Divide By 10	16	Amps_Ln_3	Divide By 10	66
Amps_Ln_1	Divide By 10	17	RMS_Watts_Ln_1	None	67
Amps_Ln_2	Divide By 10	18	RMS_Watts_Ln_2	None	68
Amps_Ln_3	Divide By 10	19	RMS_Watts_Ln_3	None	69
RMS_Watts_Ln_1	None	20	RMS_Watts_Tot	None	70
RMS_Watts_Ln_2	None	21	Power_Factor_Adj_Ln_1	None	71
RMS_Watts_Ln_3	None	22	Power_Factor_Adj_Ln_2	None	72
RMS_Watts_Tot	None	23	Power_Factor_Adj_Ln_3	None	73
Power_Factor_Ln_1	None	24	RMS_Watts_Max_Demand	Divide By 10	74
Power_Factor_Ln_2	None	25	Max_Demand_Period	None	75
Power_Factor_Ln_3	None	26	Pulse_Ratio_1	None	76
Reactive_Pwr_Ln_1	None	27	Pulse_Ratio_2	None	77
Reactive_Pwr_Ln_2	None	28	Pulse_Ratio_3	None	78
Reactive_Pwr_Ln_3	None	29	CT_Ratio	None	79
Reactive_Pwr_Tot	None	30	Pulse_Output_Ratio	None	80
Line_Freq	Divide By 100	31	Year	None	81
Pulse_Cnt_1	None	32	Month	None	82
Pulse_Cnt_2	None	33	Day of Month	None	83
Pulse_Cnt_3	None	34	Day of Week	None	84
State_Inputs	None	35	Hour	None	85
State_Watts_Dir	None	36	Minute	None	86
State_Out	None	37	Second	None	87
kWh_Scale	None	38			
Year	None	39			
Month	None	40			
Day of Month	None	41			
Day of Week	None	42			
Hour	None	43			
Minute	None	44			
Second	None	45			

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ReadV4SixMonthsFwd		Offset	ReadV4SixMonthsRev		Offset
Month_1_Ttl	kWh_Scale	90	Month_1_Ttl	kWh_Scale	130
Month_1_Tariff_1	kWh_Scale	91	Month_1_Tariff_1	kWh_Scale	131
Month_1_Tariff_2	kWh_Scale	92	Month_1_Tariff_2	kWh_Scale	132
Month_1_Tariff_3	kWh_Scale	93	Month_1_Tariff_3	kWh_Scale	133
Month_1_Tariff_4	kWh_Scale	94	Month_1_Tariff_4	kWh_Scale	134
Month_2_Ttl	kWh_Scale	95	Month_2_Ttl	kWh_Scale	135
Month_2_Tariff_1	kWh_Scale	96	Month_2_Tariff_1	kWh_Scale	136
Month_2_Tariff_2	kWh_Scale	97	Month_2_Tariff_2	kWh_Scale	137
Month_2_Tariff_3	kWh_Scale	98	Month_2_Tariff_3	kWh_Scale	138
Month_2_Tariff_4	kWh_Scale	99	Month_2_Tariff_4	kWh_Scale	139
Month_3_Ttl	kWh_Scale	100	Month_3_Ttl	kWh_Scale	140
Month_3_Tariff_1	kWh_Scale	101	Month_3_Tariff_1	kWh_Scale	141
Month_3_Tariff_2	kWh_Scale	102	Month_3_Tariff_2	kWh_Scale	142
Month_3_Tariff_3	kWh_Scale	103	Month_3_Tariff_3	kWh_Scale	143
Month_3_Tariff_4	kWh_Scale	104	Month_3_Tariff_4	kWh_Scale	144
Month_4_Ttl	kWh_Scale	105	Month_4_Ttl	kWh_Scale	145
Month_4_Tariff_1	kWh_Scale	106	Month_4_Tariff_1	kWh_Scale	146
Month_4_Tariff_2	kWh_Scale	107	Month_4_Tariff_2	kWh_Scale	147
Month_4_Tariff_3	kWh_Scale	108	Month_4_Tariff_3	kWh_Scale	148
Month_4_Tariff_4	kWh_Scale	109	Month_4_Tariff_4	kWh_Scale	149
Month_5_Ttl	kWh_Scale	110	Month_5_Ttl	kWh_Scale	150
Month_5_Tariff_1	kWh_Scale	111	Month_5_Tariff_1	kWh_Scale	151
Month_5_Tariff_2	kWh_Scale	112	Month_5_Tariff_2	kWh_Scale	152
Month_5_Tariff_3	kWh_Scale	113	Month_5_Tariff_3	kWh_Scale	153
Month_5_Tariff_4	kWh_Scale	114	Month_5_Tariff_4	kWh_Scale	154
Month_6_Ttl	kWh_Scale	115	Month_6_Ttl	kWh_Scale	155
Month_6_Tariff_1	kWh_Scale	116	Month_6_Tariff_1	kWh_Scale	156
Month_6_Tariff_2	kWh_Scale	117	Month_6_Tariff_2	kWh_Scale	157
Month_6_Tariff_3	kWh_Scale	118	Month_6_Tariff_3	kWh_Scale	158
Month_6_Tariff_4	kWh_Scale	119	Month_6_Tariff_4	kWh_Scale	159

Appendix A.3 Supported Communications functions

Always check the Data Sheet for an accurate and up to date list.

PROTOCOL SERVICE	SUPPORTED
V3 Read Meter Data/Connect	Yes
V4 Read Meter Data A/Connect	Yes
V4 Read Meter Data B	Yes

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V4 Set Relay	Yes
V4 Set Pulse Input Ratio	No. See Note 1
V4 Set Pulse Output Ratio	No. See Note 1
V4 Reset Resettable kWh Reverse	Yes
V4 Auto Reset Max Demand	No. See Note 1
V4 Set LCD	No.
v3/v4 Send Password	Yes
v3/v4 Change Password	No. See Note 1
v3/v4 Set Max Demand Period	No. See Note 1
v3/v4 Set Max Demand Reset Value	No. See Note 1
v3/v4 Set Time	Yes
v3/v4 Set CT Ratio	Yes
v3/v4 Set Schedule Tariffs	No. See Note 1
v3/v4 Read Schedule Tariffs	No. See Note 1
v3/v4 Set Seasons	No. See Note 1
v3/v4 Set Holidays	No. See Note 1
v3/v4 Read Holiday Dates	No. See Note 1
v3/v4 Set Schedule for Weekend and Holiday	No. See Note 1
v3/v4 Read 6 Months	Yes

Note 1 : These are configuration services. The data does not change during normal operation once installation and setup has been completed	If you require these services for as project please contact our sales department to get special firmware.

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Appendix A.4 Password Protected Meters

Support for max 6 digit password. Use the 'Route' parameter on the node as illustrated in the example below. If not specified as password of zero's is assumed.

Nodes

Node_Name , Node_ID , Protocol , Port ,Route

000350002401 , 1 , EKM , R1 ,1.2.3.4.5.6

Appendix A.5 Auto / Simplified Configuration

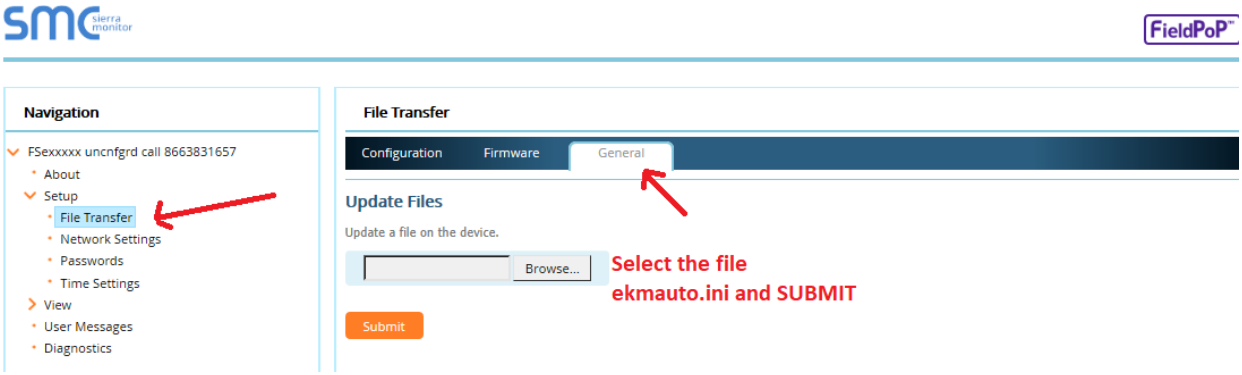
This driver supports a simplified configuration method. It is intended to simplify the configuration by requiring that you specify the minimum amount of data required. A sample ini file is show below.

Auto config will generate one ModbusTCP and one BACnetIPnode for each meter. Under each node will be a set of (server) data objects that remote systems can read (and write). Each node will have identical objects numbered the same way. The objects for a V3 or V4 meter are different.

1. STEP 0 - Load basic Driver config file (Shipped with this file already loaded)
2. **STEP 1 - Prepare** and send file ekmauto.ini to gateway

   Watch the Youtube video on how to do this.

   Structure and contents of file are explained in more detail on following pages.
   (Browse to gateway, From the menu: SETUP, File Transfer, General, Select the file ekmauto.ini, send to device).



3. **Step 2** - Trigger the Autoconfig.

   Trigger AutoConfig by Browsing to the data array called "EKM_autoConfig" and poking the value 99 into offset 0. At that time the driver will generate a new config.csv and reboot itself. Do not power down during this process.

   (Browse to device, From the Menu: VIEW, Arrays, View the Array called "EKM_AutoConfig", Enable Edits – button near bottom center of screen, Poke the value 99 into offset 0 - Youtube video shows this)

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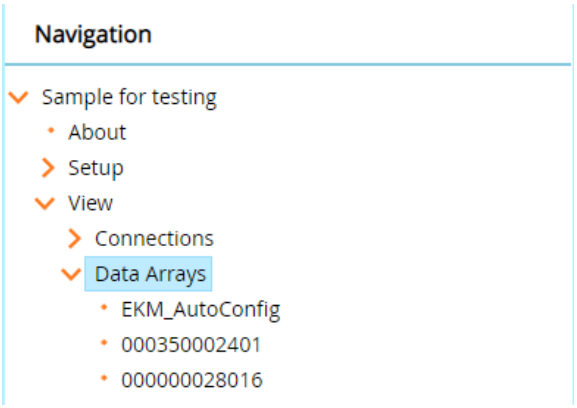
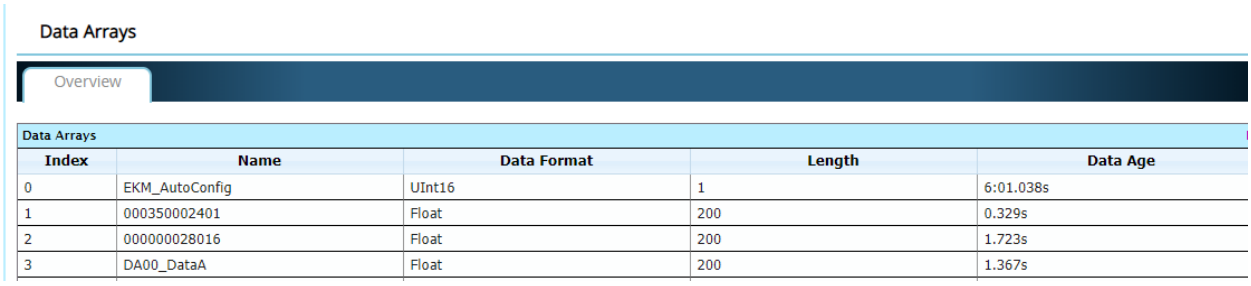
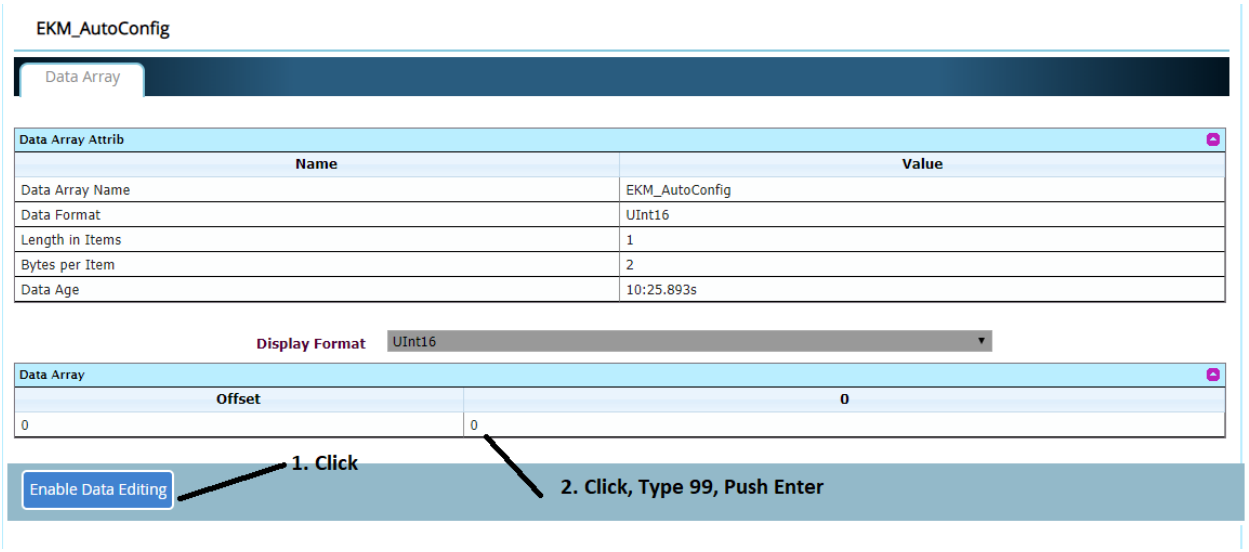
A few seconds later the device will restart and start polling the meters.

You could then use the CAS BACnet Explorer to do discovery.







ekmauto.ini File Contents Explained

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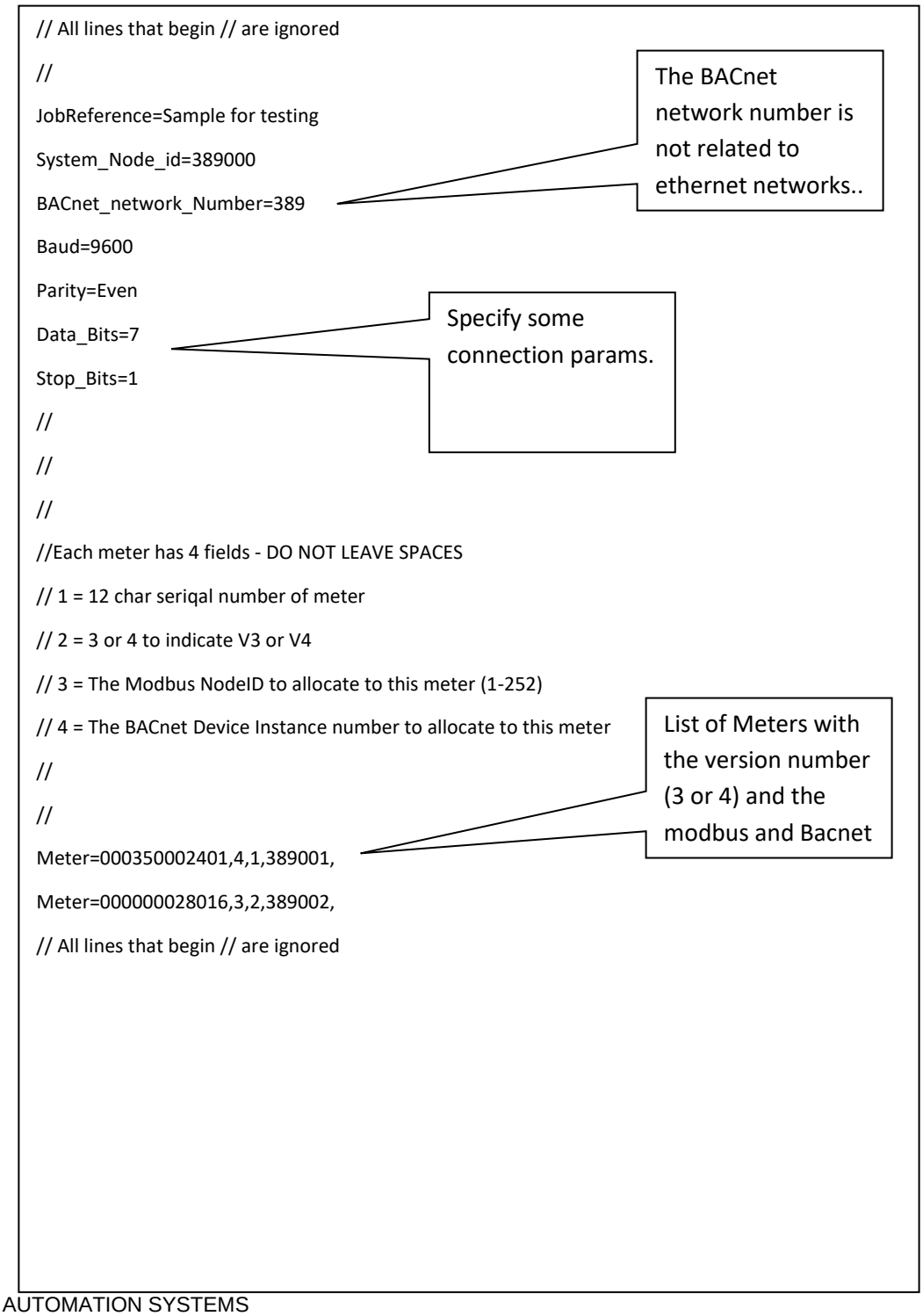

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Appendix A.6 V4 Meter Data Objects

Data variable	BACnet Object Number Modbus Register		Object Type
Model	30001	No_Units	AI
Firmware	30002	No_Units	AI
Not used	30003	No_Units	AI
kWh_Tot	30004	kwh	AI
Reactive_Energy_Tot	30005	volt-ampere-hours-reactive	AI
Rev_kWh_Tot	30006	volt-ampere-hours-reactive	AI
kWh_Ln_1	30007	kwh	AI
kWh_Ln_2	30008	kwh	AI
kWh_Ln_3	30009	kwh	AI
Rev_kWh_Ln_1	30010	kwh	AI
Rev_kWh_Ln_2	30011	kwh	AI
Rev_kWh_Ln_3	30012	kwh	AI
Resettable_kWh_Tot	30013	kwh	AI
Resettable_Rev_kWh_Tot	30014	kwh	AI
RMS_Volts_Ln_1	30015	Volts	AI
RMS_Volts_Ln_2	30016	Volts	AI
RMS_Volts_Ln_3	30017	Volts	AI
Amps_Ln_1	30018	Amps	AI
Amps_Ln_2	30019	Amps	AI
Amps_Ln_3	30020	Amps	AI
RMS_Watts_Ln_1	30021	Watts	AI
RMS_Watts_Ln_2	30022	Watts	AI
RMS_Watts_Ln_3	30023	Watts	AI
RMS_Watts_Tot	30024	Watts	AI
Power_Factor_Ln_1	30025	PF	AI
Power_Factor_Ln_2	30026	PF	AI
Power_Factor_Ln_3	30027	PF	AI
Reactive_Pwr_Ln_1	30028	VAR	AI
Reactive_Pwr_Ln_2	30029	VAR	AI
Reactive_Pwr_Ln_3	30030	VAR	AI
Reactive_Pwr_Tot	30031	VAR	AI
Line_Freq	30032	HZ	AI
Pulse_Cnt_1	30033	No_Units	AI
Pulse_Cnt_2	30034	No_Units	AI
Pulse_Cnt_3	30035	No_Units	AI
State_Inputs	30036	No_Units	AI
State_Watts_Dir	30037	No_Units	AI
State_Out	30038	No_Units	AI
kWh_Scale	30039	No_Units	AI
Year	30040	Years	AI

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Month	30041	Months	AI
Day of Month	30042	Days	AI
Day of Week	30043	No_Units	AI
Hour	30044	Hours	AI
Minute	30045	Minutes	AI
Second	30050	Seconds	AI
Model	30051	No_Units	AI
Firmware	30052	No_Units	AI
Not used	30053	No_Units	AI
kWh_Tariff_1	30054	kwh	AI
kWh_Tariff_2	30055	kwh	AI
kWh_Tariff_3	30056	kwh	AI
kWh_Tariff_4	30057	kwh	AI
Rev_kWh_Tariff_1	30058	kwh	AI
Rev_kWh_Tariff_2	30059	kwh	AI
Rev_kWh_Tariff_3	30060	kwh	AI
Rev_kWh_Tariff_4	30061	kwh	AI
RMS_Volts_Ln_1	30062	Volts	AI
RMS_Volts_Ln_2	30063	Volts	AI
RMS_Volts_Ln_3	30064	Volts	AI
Amps_Ln_1	30065	Amps	AI
Amps_Ln_2	30066	Amps	AI
Amps_Ln_3	30067	Amps	AI
RMS_Watts_Ln_1	30068	Watts	AI
RMS_Watts_Ln_2	30069	Watts	AI
RMS_Watts_Ln_3	30070	Watts	AI
RMS_Watts_Tot	30071	Watts	AI
Power_Factor_Adj_Ln_1	30072	PF	AI
Power_Factor_Adj_Ln_2	30073	PF	AI
Power_Factor_Adj_Ln_3	30074	PF	AI
RMS_Watts_Max_Demand	30075	Watts	AI
Max_Demand_Period	30076	No_Units	AI
Pulse_Ratio_1	30077	No_Units	AI
Pulse_Ratio_2	30078	No_Units	AI
Pulse_Ratio_3	30079	No_Units	AI
CT_Ratio	30080	No_Units	AI
Pulse_Output_Ratio	30081	No_Units	AI
Year	30082	Years	AI
Month	30083	Months	AI
Day of Month	30084	Days	AI
Day of Week	30085	No_Units	AI
Hour	30086	Hours	AI
Minute	30087	Minutes	AI
Second	30088	Seconds	AI
Month_1_Ttl Fwd	30091	kwh	AI

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Month_1_Tariff_1 Fwd	30092	kwh	AI
Month_1_Tariff_2 Fwd	30093	kwh	AI
Month_1_Tariff_3 Fwd	30094	kwh	AI
Month_1_Tariff_4 Fwd	30095	kwh	AI
Month_2_Ttl Fwd	30096	kwh	AI
Month_2_Tariff_1 Fwd	30097	kwh	AI
Month_2_Tariff_2 Fwd	30098	kwh	AI
Month_2_Tariff_3 Fwd	30099	kwh	AI
Month_2_Tariff_4 Fwd	30100	kwh	AI
Month_3_Ttl Fwd	30101	kwh	AI
Month_3_Tariff_1 Fwd	30102	kwh	AI
Month_3_Tariff_2 Fwd	30103	kwh	AI
Month_3_Tariff_3 Fwd	30104	kwh	AI
Month_3_Tariff_4 Fwd	30105	kwh	AI
Month_4_Ttl Fwd	30106	kwh	AI
Month_4_Tariff_1 Fwd	30107	kwh	AI
Month_4_Tariff_2 Fwd	30108	kwh	AI
Month_4_Tariff_3 Fwd	30109	kwh	AI
Month_4_Tariff_4 Fwd	30110	kwh	AI
Month_5_Ttl Fwd	30111	kwh	AI
Month_5_Tariff_1 Fwd	30112	kwh	AI
Month_5_Tariff_2 Fwd	30113	kwh	AI
Month_5_Tariff_3 Fwd	30114	kwh	AI
Month_5_Tariff_4 Fwd	30115	kwh	AI
Month_6_Ttl Fwd	30116	kwh	AI
Month_6_Tariff_1 Fwd	30117	kwh	AI
Month_6_Tariff_2 Fwd	30118	kwh	AI
Month_6_Tariff_3 Fwd	30119	kwh	AI
Month_6_Tariff_4 Fwd	30120	kwh	AI
Month_1_Ttl Rev	30131	kwh	AI
Month_1_Tariff_1 Rev	30132	kwh	AI
Month_1_Tariff_2 Rev	30133	kwh	AI
Month_1_Tariff_3 Rev	30134	kwh	AI
Month_1_Tariff_4 Rev	30135	kwh	AI
Month_2_Ttl Rev	30136	kwh	AI
Month_2_Tariff_1 Rev	30137	kwh	AI
Month_2_Tariff_2 Rev	30138	kwh	AI
Month_2_Tariff_3 Rev	30139	kwh	AI
Month_2_Tariff_4 Rev	30140	kwh	AI
Month_3_Ttl Rev	30141	kwh	AI
Month_3_Tariff_1 Rev	30142	kwh	AI
Month_3_Tariff_2 Rev	30143	kwh	AI
Month_3_Tariff_3 Rev	30144	kwh	AI
Month_3_Tariff_4 Rev	30145	kwh	AI
Month_4_Ttl Rev	30146	kwh	AI

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Month_4_Tariff_1 Rev	30147	kwh	AI
Month_4_Tariff_2 Rev	30148	kwh	AI
Month_4_Tariff_3 Rev	30149	kwh	AI
Month_4_Tariff_4 Rev	30150	kwh	AI
Month_5_Ttl Rev	30151	kwh	AI
Month_5_Tariff_1 Rev	30152	kwh	AI
Month_5_Tariff_2 Rev	30153	kwh	AI
Month_5_Tariff_3 Rev	30154	kwh	AI
Month_5_Tariff_4 Rev	30155	kwh	AI
Month_6_Ttl Rev	30156	kwh	AI
Month_6_Tariff_1 Rev	30157	kwh	AI
Month_6_Tariff_2 Rev	30158	kwh	AI
Month_6_Tariff_3 Rev	30159	kwh	AI
Month_6_Tariff_4 Rev	30160	kwh	AI
CT Ratio to be set	0	No_Units	AV
Reset KwH	0	No_Units	BV
Operate Relay1	1	No_Units	BV
Relay1 Cmd Duration	1	No_Units	AV
Operate Relay2	2	No_Units	BV
Relay2 Cmd Duration	2	No_Units	AV
Set Time - Send Cmd	10	No_Units	AV
Set Time Years	11	No_Units	AV
Set Time Months	12	No_Units	AV
Set Time Day of Month	13	No_Units	AV
Set Time Day of Week	14	No_Units	AV
Set Time Hours	15	No_Units	AV
Set Time Minutes	16	No_Units	AV
Set Time Seconds	17	No_Units	AV

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Appendix A.7 V3 Meter Data Objects

Data variable	BACnet Object Number Modbus Register		Object Type
Model	30001	No_Units	AI
Firmware	30002	No_Units	AI
kWh_Tot	30004	kwh	AI
kWh_Tariff_1	30005	kwh	AI
kWh_Tariff_2	30006	kwh	AI
kWh_Tariff_3	30007	kwh	AI
kWh_Tariff_4	30008	kwh	AI
Rev_kWh_Tot	30009	kwh	AI
Rev_kWh_Tariff_1	30010	kwh	AI
Rev_kWh_Tariff_2	30011	kwh	AI
Rev_kWh_Tariff_3	30012	kwh	AI
Rev_kWh_Tariff_4	30013	kwh	AI
RMS_Volts_Ln_1	30014	Volts	AI
RMS_Volts_Ln_2	30015	Volts	AI
RMS_Volts_Ln_3	30016	Volts	AI
Amps_Ln_1	30017	Amps	AI
Amps_Ln_2	30018	Amps	AI
Amps_Ln_3	30019	Amps	AI
RMS_Watts_Ln_1	30020	Watts	AI
RMS_Watts_Ln_2	30021	Watts	AI
RMS_Watts_Ln_3	30022	Watts	AI
RMS_Watts_Tot	30023	Watts	AI
Power_Factor_Adj_Ln_1	30024	PF	AI
Power_Factor_Adj_Ln_2	30025	PF	AI
Power_Factor_Adj_Ln_3	30026	PF	AI
Max_Demand	30027	Watts	AI
Max_Demand_Period	30028	No_Units	AI
CT_Ratio	30029	years	AI
Year	30030	months	AI
Month	30031	Days	AI
Day of Month	30032	No_Units	AI
Day of Week	30033	No_Units	AI
Hour	30034	Hours	AI
Minute	30035	Minutes	AI
Second	30036	Seconds	AI
Model	30001	No_Units	AI
Firmware	30002	No_Units	AI
kWh_Tot	30004	kwh	AI
kWh_Tariff_1	30005	kwh	AI
kWh_Tariff_2	30006	kwh	AI
kWh_Tariff_3	30007	kwh	AI

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kWh_Tariff_4	30008	kwh	AI
Rev_kWh_Tot	30009	kwh	AI
Rev_kWh_Tariff_1	30010	kwh	AI
Rev_kWh_Tariff_2	30011	kwh	AI
Rev_kWh_Tariff_3	30012	kwh	AI
Rev_kWh_Tariff_4	30013	kwh	AI
RMS_Volts_Ln_1	30014	Volts	AI
RMS_Volts_Ln_2	30015	Volts	AI
RMS_Volts_Ln_3	30016	Volts	AI
Amps_Ln_1	30017	Amps	AI
Amps_Ln_2	30018	Amps	AI
Amps_Ln_3	30019	Amps	AI
RMS_Watts_Ln_1	30020	Watts	AI
RMS_Watts_Ln_2	30021	Watts	AI
RMS_Watts_Ln_3	30022	Watts	AI
RMS_Watts_Tot	30023	Watts	AI
Power_Factor_Adj_Ln_1	30024	PF	AI
Power_Factor_Adj_Ln_2	30025	PF	AI
Power_Factor_Adj_Ln_3	30026	PF	AI
Max_Demand	30027	Watts	AI
Max_Demand_Period	30028	No_Units	AI
CT_Ratio	30029	years	AI
Year	30030	months	AI
Month	30031	Days	AI
Day of Month	30032	No_Units	AI
Day of Week	30033	No_Units	AI
Hour	30034	Hours	AI
Minute	30035	Minutes	AI
Second	30036	Seconds	AI

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