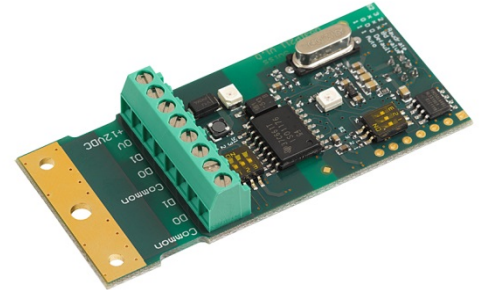


# Installation Instruction Modbus EIA-485 module for Supercal 531 and Superstatic 440/449

This manual describes the installation procedure of the Modbus module in the Supercal 531 integrator as standalone product or in combination with the Superstatic 440 or Superstatic 449 energy meter. The technical data and specifications of the Modbus module are described in this document.

The optional Modbus module comprises of an input +12 VDC for the supply of the module and also 2x3 screw terminals (D1/D0/Common terminals for the RS-485 connection).



## Delivery of the module

Before installing the Modbus module check the items delivered. Included in the delivery are the Modbus module, a fixing clamp for strain relief and this installation instruction.

The registers list is available at the end of this document.

These registers allow to access (or to read) to the values supported by the Supercal 531, Superstatic 440 and the Superstatic 449.

## Safety instructions

Avoid electrostatic discharges during installation or handling while manipulating the Modbus module. For this purpose, before touching the integrator or the Modbus module, you are advised to touch a grounded conductor (for example a water pipe or hot water pipe) to discharge electricity.

## Modbus module configuration

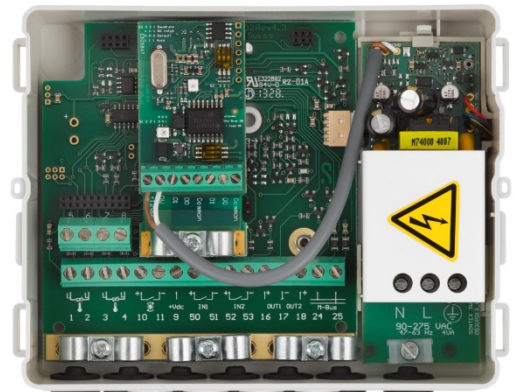
The device address, the serial transmission mode (RTU or ASCII) and the parity can be changed over the optical interface by the Prog531 and Prog449 configuration software supplied by Sontex. It is also possible to modify these parameters via Modbus command.

## Installing the Modbus Module

The Modbus module, as all other modules to retrofit to the Supercal integrator, is mounted in one of the two module slots on the mother board of the Supercal integrator.

- Disconnect the power supply of the integrator.
- Separate the cover (MET) from the housing (MIO).
- Place the Modbus module in one of the module slots of the integrator.
- Connect the mains power cable (external or internal) (12 VDC / 0 VDC) and the Modbus EIA-485 network (D0, D1 and common) with the Modbus module.
- Close the integrator carefully
- Reconnect the power supply cable.

**The Supercal integrator will automatically detect and recognize the new module. No other action is required. The Supercal 531 / Superstatic 440 / Superstatic 449 are now ready to communicate via the Modbus module.**



## Detection of the Modbus module with the Prog531 and Prog449 software

The software Prog531 and Prog449 allows detecting the Modbus module and to read:

- The firmware release of the Modbus module.
- The module type.
- Modbus revision.
- The device address.
- The parity.
- Stop bit number.

The software Prog531 and Prog449 allows changing the following parameters:

- The serial transmission mode (RTU or ASCII).
- The device address.
- The parity.

Setting the following parameters with DIP switch S1 and S2:

- The communication speed.
- The bias resistor and the terminating resistor.

## Procedure to use when changing parameters with Prog531 / 449 software or by Modbus command:

- Detect the module with Prog531 / 449 software.
- Select a free device address and/or the serial transmission mode (RTU or ASCII) and/or parity.
- Program the integrator with the Prog531 / 449. After programming the new parameters, **it's obligatory to open/separate the upper part with the lower of the integrator.** This operation will make a "reset" to the electronic board.
- Close the integrator, open part with lower part. After that, the new parameters programmed will be activated.

These operations are necessary even if the Modbus module is connected on the Bus. As soon that a new value is programmed with the Prog531 / 449 or by Modbus command, a "reset" hardware is necessary to activate the new parameters.

**Note: The Modbus module is compatible with Supercal / Superstatic integrators with firmware release FW 3.7 or higher (FW ≥ V3.7).**

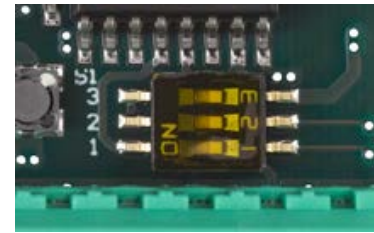


### Setting of the bias resistor and the terminating resistor with the DIP switch S1

When the Modbus module is at the end of the bus line, the terminating resistor 120 Ω + 1nF of the Modbus module can be used to close the line or with an external resistor.

#### Settings with DIP switch S1:

Pos. 3	Pos. 2	Pos. 1	
0	0	0	Not used
0	0	1	Terminating resistor 120 Ω + 1nF
1	1	0	Bias resistance (510 Ω) without termination (120 Ω)
1	1	1	Bias resistance (510 Ω) with termination (120 Ω + 1 nF)



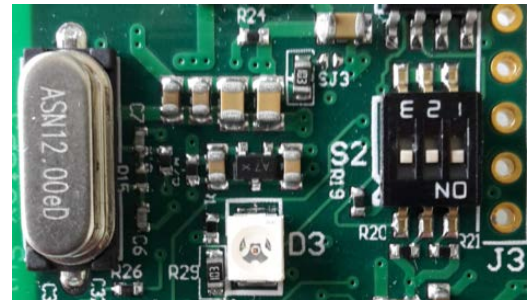
0 = OFF; 1 = ON

### Setting the communication speed with the DIP switch S2:

With the DIP switch S2 the communication speed is set. Default position is set to [1 1 1].

#### Settings with DIP switch S2:

Pos. 3	Pos. 2	Pos. 1	
0	0	0	1200 bit/s
0	0	1	2400 bit/s
0	1	0	9600 bit/s
0	1	1	38400 bit/s
1	0	0	57600 bit/s
1	0	1	115200 bit/s
1	1	0	Modbus OFF
1	1	1	19200 bit/s (default)



0 = OFF; 1 = ON

### Modbus module addressing

The Modbus module distinguishes the master devices and the slave peripherals.

The Modbus module can be addressed as slave in the range **1-247**.

The address **0** is used for broadcast.

**By default the Modbus module is 1 and the transmission mode is RTU.**

### Technical Data Modbus module

#### General

Operating temperature	5° to 55°C
Storage temperature	-10° to 55°C (dry environment)

#### Dimensions

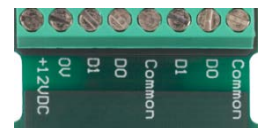
Dimensions	66 x 30 mm
Mounting	in one of the module slots of the Supercal 531/449 integrator

#### Power supply → please refer to the **Power Supply Precautions - Precautions Note** below

Internal power supply:	Mains switching power supply of 531 / 449 integrator 0531A030, 230 VAC with 2 outputs 0690A013, 24 VAC with 2 outputs
External power supply:	12 VDC / 150 mA

#### Network transmission and technical details

Bus communication	RS-485 twisted pair
RS-485 connection	Plug-screw terminal for D0, D1 and Common (2x3-pin) + 12 VDC / 0 VDC
Bus termination	Through DIP switch S1 or with an external resistor
Parity	Even, odd or none
Communication speed:	1200, 2400 9600, 19200, 38400, 57600 or 115200 bits/s



#### Firmware compatibility

Supercal 531 / Superstatic 449 firmware release FW 3.7 or higher (FW ≥ V3.7)

#### Precaution

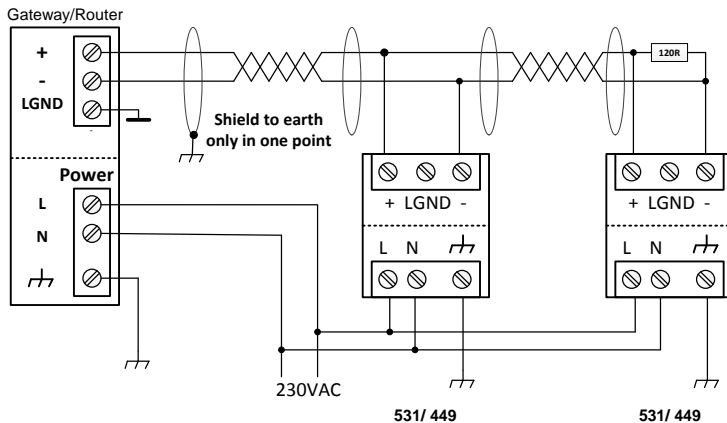
General notes: the Modbus module works with the specific characteristics described in this document. The manufacturer declines all liability if they are not respected. The manufacturer is not responsible if the Modbus module is incorrectly installed or used. The electrical connection must be established by an authorized person acting in compliance with the international and national standards in force and in conformity with local safety regulations. On the installation side, the main power supply must be protected by a 1A circuit-breaker device. The power supply cable for the Supercal 531 integrator must be installed in such a way that no hot parts (e.g. pipes, conduits at over 70°C) come into contact with the cable and no cable insulation will be damaged. The power supply connection terminals are designed for the connection of wires with a cross-section of between 0.75 mm<sup>2</sup> and 1.5 mm<sup>2</sup>.

### Power Supply Precautions - Precautions Note

- This main power supply 0690A013, 24 VAC with 2 outputs is built with a full-wave rectifier. Sharing AC power with half-wave rectified devices is not recommended.
- This main power supply 0531A030, 230 VAC with 2 outputs is completely electrically isolated. This power module can be used with a half-wave or a full-wave rectified device.
- With the external power supply +12VDC, it's necessary to use a completely isolated power supply.

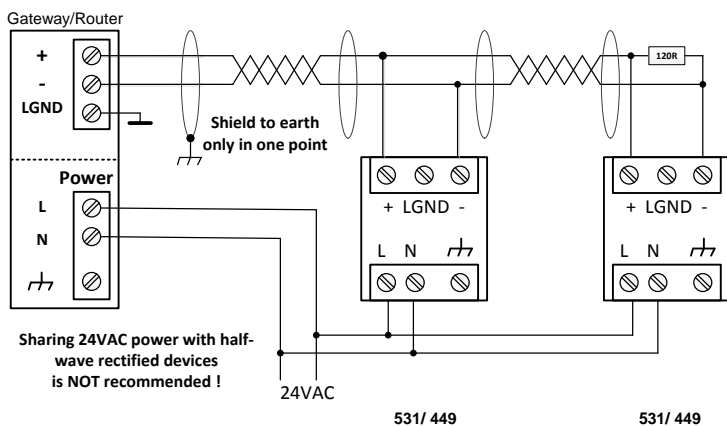
**Warning: Modbus devices powered from a common AC source could be damaged if a mix of half-wave and full-wave rectified devices exist.**

- Whole system is powered by 230VAC, gateway/router is built with an electrical isolation, 2-wire bus connections :



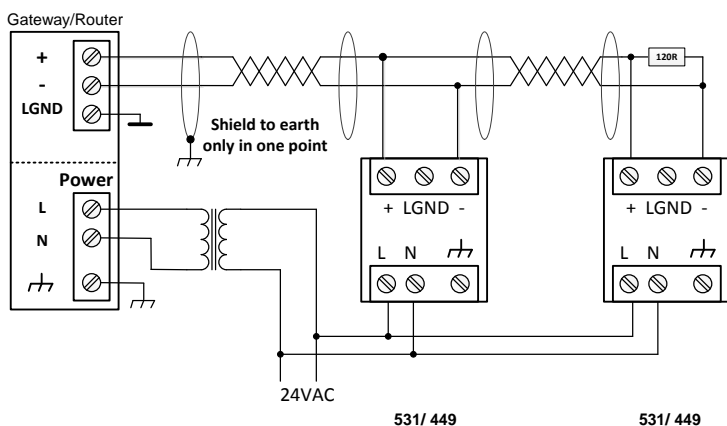
- Mains switching power supply module (Model 0531A030) used by 531 / 449 integrator.
- If gateway/router is built with an electrical isolation, there is no problem to use the main power supply module 0531A030.
- 2-wire bus connections. Connect the shield to earth at only one point.

- Whole system is powered by a 24VAC (no isolating transformer), gateway/router is built with a half-wave rectified (no electrical isolation), 2-wire bus connections :



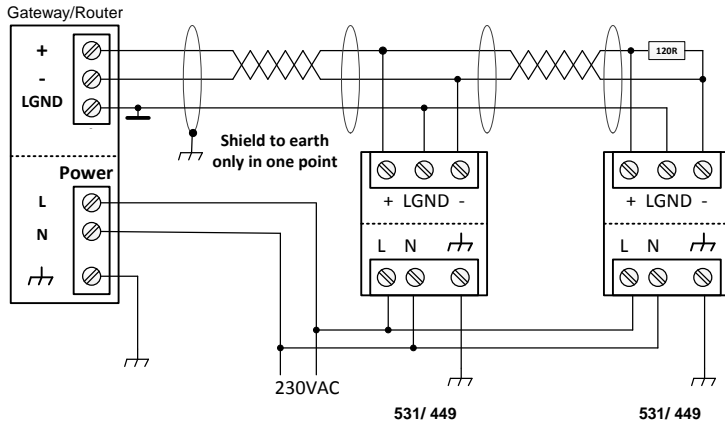
- Mains switching power supply module (Model 0690A013) used by 531 / 449 integrator.
- Does not connect the earth of the power supply module.
- 24VAC with no isolating transformer.
- If gateway/router is built with a half-wave rectified, this wiring is **NOT RECOMMENDED!**
- 2-wire bus connections. Connect the shield to earth at only one point.

- Whole system is powered by a 24VAC, gateway/router is built with an electric isolation and powered with isolating transformer, 2-wire bus connections :



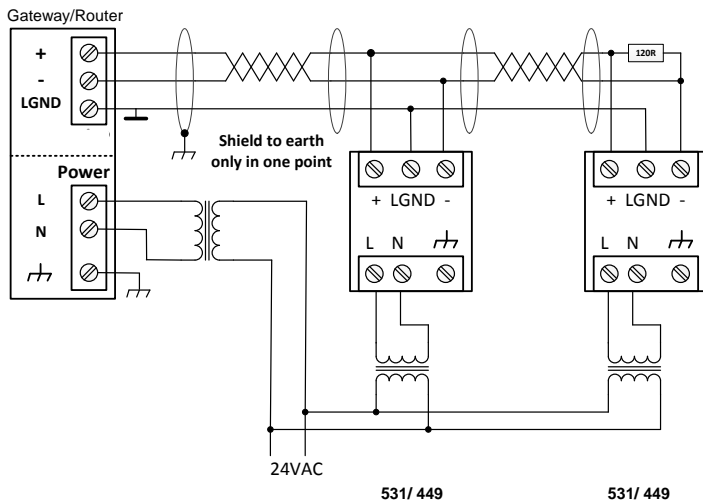
- Mains switching power supply module (Model 0690A013) used by 531 / 449 integrator.
- **Does not connect the earth of the power supply module.**
- Gateway/router is powered by 24VAC with isolating transformer. Even if gateway/router is built with an electrical isolation, this wiring can be used.
- 2-wire bus connections. Connect the shield to earth at only one point.

- Whole system is powered by 230VAC, gateway/router is built with an electrical isolation, 3-wire bus connections :



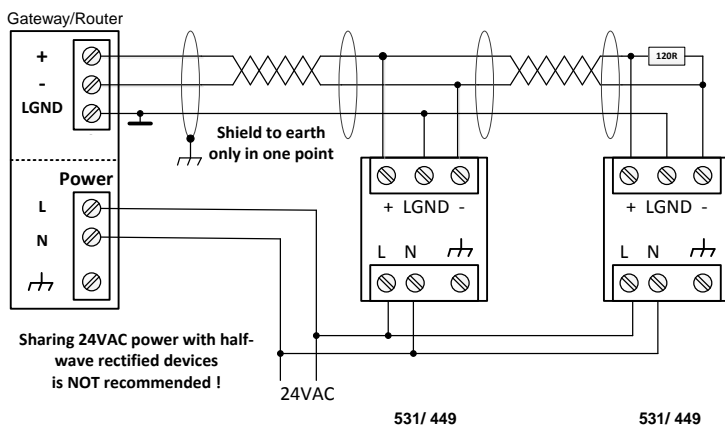
- Mains switching power supply module (Model 0531A030) used by 531 / 449 integrator.
- If gateway/router is built with an electrical isolation, there is no problem to use the main power supply module 0531A030
- 3-wire bus connections. Connect the shield to earth at only one point.

- Whole system is powered by 24VAC and full powered with isolating transformer, gateway/router is built with an electrical isolation, 3-wire bus connections :



- Mains switching power supply module (Model 0690A013) used by 531 / 449 integrator.
- Does not connect the earth of the power supply module.**
- If gateway/router is built with an electrical isolation, there is no problem to use the main power supply module 0690A013
- 3-wire bus connections. Connect the shield to earth at only one point.

- Whole system is powered by 24VAC, gateway/router is built with a half-wave rectified (no electrical isolation), 3-wire bus connections :



- Mains switching power supply module (Model 0690A013) used by 531 / 449 integrator.
- Does not connect the earth of the power supply module.**
- If gateway/router is built with a half-wave rectified, this wiring is **NOT RECOMMENDED!**
- 3-wire bus connections. Connect the shield to earth at only one point.

## Mapping registers for Supercal 531, Superstatic 440, Superstatic 449

### Product Description:

The thermal energy meter SUPERCAL 531/449 can be used in various commercial building and apartments, mainly for cooling and heating applications. The system based on signal inputs of two matched temperature sensors and any of e.g. Sontex flow meters.

Supercal 531/449 provide high accuracy e.g. energy, volume, power, flow, and temperature data via the local LCD display and various communication protocols, like Modbus, BACnet MS/TP, LON FFT-10A and M-Bus.

The Modbus uses a register start address of 1 (meaning physical address 0 in the telegram).

Both RTU and ASCII mode are supported. Byte length strictly follows V 1.1 specification with mode RTU using 8 bit data and ASCII mode 7 bit data.

If no parity is set, the number of stop bits is set to 2 automatically.

## Data model mapping

### Group (A) : settings

Holding Register	M-Bus data Individual description Group (A) : settings (read/write)	Data type	Read/Write	Remarks
<b>Managing actual date and time (IEEE745 single float values)</b>				
40011	Actual date: year	16 Bit Integer	R/W	
40012	Actual date: month	16 Bit Integer	R/W	
40013	Actual date: day	16 Bit Integer	R/W	
40014	Actual time: hour	16 Bit Integer	R/W	
40015	Actual time: minute	16 Bit Integer	R/W	
40016	Actual time: second	16 Bit Integer	R/W	
<b>Communication parameters</b>				
40017	Password „Communication“	16 Bit Integer	R/W	„1234“
40018	Modbus Address	16 Bit Integer	R/W	1-247
40019	Parity	16 Bit Integer	R/W	MB_PAR_NONE=0, MB_PAR_ODD=1, MB_PAR_EVEN=2
40020	Flow Control	16 Bit Integer	R/W	MB_RTU=0, MB_RTU=1
40021	Stop Bits	16 Bit Integer	R/W	1, 2
40022	Reserved	16 Bit Integer	R/W	
40023 - 40024	Custom ID	32 bits integer (h-l)	R/W	OEM serial number
<b>Setting date for next Set Day (IEEE745 single float values)</b>				
40025	Password „Set Day“	16 Bit Integer	R/W	
40026	Set-Day1: month	16 Bit Integer	R/W	
40027	Set-Day1: day	16 Bit Integer	R/W	
40028	Set-Day2: month	16 Bit Integer	R/W	
40029	Set-Day2: day	16 Bit Integer	R/W	

(h-l) = high – low register

**Group (B) : informations**

Input Register	M-Bus data Individual description Group (B) : Informations (read)	Data type	Read/Write
<b>Device information</b>			
30001 - 30002	Fabrication number MET	32 Bit Integer (h-l)	R
30003	Firmware version	16 Bit Integer	R
30004 – 30005	Baudrate	32 Bit Integer (h-l)	R
30006 - 30007	Running hours	32 Bit Integer (h-l)	R
<b>Error flags</b>			
10001	Error status: temp. sensor 1	1 Bit	R
10002	Error status: temp. sensor 2	1 Bit	R
10003	Error status: flow	1 Bit	R
10004	Error status: MET access	1 Bit	R
10005	Error status: MIO access	1 Bit	R
10006	Error status: eep. Blank inv.	1 Bit	R
10007	Error status: AD Converter	1 Bit	R
10008	Error status: Hardware	1 Bit	R
10009	Error status: Supply power	1 Bit	R
10010	Error status: Option 1	1 Bit	R
10011	Error status: Option 2	1 Bit	R
10012	Error status: A1	1 Bit	R
10013	Error status: A2	1 Bit	R
10014	Error status: Internal HW	1 Bit	R
10015	Error status: CRC Err	1 Bit	R
10016	Error status: Conf Err	1 Bit	R

(h-l) = high – low register



Group (C) : actual values

Input Register	M-Bus data Individual description Group (C) : Actual values (read)	Data type	Read/Write	Remarks
<b>Energy data (IEEE754 single float values)</b>				
30101	Energy Unit	16 Bit Integer	R	Wh=18, kWh=19, MWh=146, MJ=126, GJ=226, BTU=20
30102	Reserved			
30103 - 30104	Energy totalizer heating	IEEE754 Single (h-l)	R	Actual value
30105 - 30106	Energy totalizer Tariff 1	IEEE754 Single (h-l)	R	Actual value
30107 - 30108	Energy totalizer Tariff 2	IEEE754 Single (h-l)	R	Actual value
30109 - 30110	Energy – stored ST1	IEEE754 Single (h-l)	R	
30111 - 30112	Energy Tariff 1 – stored ST1	IEEE754 Single (h-l)	R	
30113 - 30114	Energy Tariff 2 – stored ST1	IEEE754 Single (h-l)	R	
30115 - 30116	Energy – stored ST2	IEEE754 Single (h-l)	R	
30117 - 30118	Energy Tariff 1 – stored ST2	IEEE754 Single (h-l)	R	
30119 - 30120	Energy Tariff 2 – stored ST2	IEEE754 Single (h-l)	R	
<b>Energy data (long data points)</b>				
30201	Energy Unit	16 Bit Integer	R	Wh=18, kWh=19, MWh=146, MJ=126, GJ=226, BTU=20
30202	Energy Decimals	16 Bit Integer	R	Decimals: 0, 1 2 3
30203 - 30204	Energy totalizer heating	32 bits integer (h-l)	R	Actual value
30205 - 30206	Energy totalizer Tariff 1	32 bits integer (h-l)	R	Actual value
30207 - 30208	Energy totalizer Tariff 2	32 bits integer (h-l)	R	Actual value
30209 - 30210	Energy – stored ST1	32 bits integer (h-l)	R	
30211 - 30212	Energy Tariff 1 – stored ST1	32 bits integer (h-l)	R	
30213 - 30214	Energy Tariff 2 – stored ST1	32 bits integer (h-l)	R	
30215 - 30216	Energy – stored ST2	32 bits integer (h-l)	R	
30217 - 30218	Energy Tariff 1 – stored ST2	32 bits integer (h-l)	R	
30219 - 30220	Energy Tariff 2 – stored ST2	32 bits integer (h-l)	R	

(h-l) = high – low register

<b>Volume data (IEEE754 single float values)</b>				
30301	Volume Unit	16 Bit Integer	R	m3=80, USGallon=83
30302	Reserved			
30303 - 30304	Volume	IEEE754 Single (h-l)	R	Actual value
30305 - 30306	Volume Tariff 1	IEEE754 Single (h-l)	R	Actual value
30307 - 30308	Volume Tariff 2	IEEE754 Single (h-l)	R	Actual value
30309 - 30310	Volume – stored ST1	IEEE754 Single (h-l)	R	
30311 - 30312	Volume Tariff 1 – stored ST1	IEEE754 Single (h-l)	R	
30313 - 30314	Volume Tariff 2 – stored ST1	IEEE754 Single (h-l)	R	
30315 - 30316	Volume – stored ST2	IEEE754 Single (h-l)	R	
30317 - 30318	Volume Tariff 1 – stored ST2	IEEE754 Single (h-l)	R	
30319 - 30320	Volume Tariff 2 – stored ST2	IEEE754 Single (h-l)	R	
<b>Volume data (long data points)</b>				
30401	Volume Unit	16 Bit Integer	R	m3=80, USGallon=83
30402	Volume decimals	16 Bit Integer	R	Decimals: 0,1,2,3
30403 - 30404	Volume	32 bits integer (h-l)	R	Actual value
30405 - 30406	Volume Tariff 1	32 bits integer (h-l)	R	Actual value
30407 - 30408	Volume Tariff 2	32 bits integer (h-l)	R	Actual value
30409 - 30410	Volume – stored ST1	32 bits integer (h-l)	R	
30411 - 30412	Volume Tariff 1 – stored ST1	32 bits integer (h-l)	R	
30413 - 30414	Volume Tariff 2 – stored ST1	32 bits integer (h-l)	R	
30415 - 30416	Volume – stored ST2	32 bits integer (h-l)	R	
30417 - 30418	Volume Tariff 1 – stored ST2	32 bits integer (h-l)	R	
30419 - 30420	Volume Tariff 2 – stored ST2	32 bits integer (h-l)	R	

(h-l) = high – low register



<b>Auxiliary A1 data or complementary counter A1 totalizer (IEEE754 single float values)</b>				
30501	Auxiliary-A1 Unit	16 Bit Integer	R	no unit=0, Wh=18, kWh=19, MWh=146, MJ=126, GJ=226, BTU=20, m3=80, USGallon=83
30502	Reserved			
30503 - 30504	Auxiliary-A1	IEEE754 Single (h-l)	R	Actual value
30505 - 30506	Auxiliary-A1 – stored ST1	IEEE754 Single (h-l)	R	
30507 - 30508	Auxiliary-A1 – stored ST2	IEEE754 Single (h-l)	R	
<b>Auxiliary A1 data or complementary counter A1 totalizer (long data points)</b>				
30601	Auxiliary-A1 Unit	16 Bit Integer	R	no unit=0, Wh=18, kWh=19, MWh=146, MJ=126, GJ=226, BTU=20, m3=80, USGallon=83
30602	Decimals	16 Bit Integer	R	Decimals: 0,1,2,3
30603 - 30604	Auxiliary-A1	32 bits integer (h-l)	R	Actual value
30605 - 30606	Auxiliary-A1 – stored ST1	32 bits integer (h-l)	R	
30607 - 30608	Auxiliary-A1 – stored ST2	32 bits integer (h-l)	R	
<b>Auxiliary A2 data or complementary counter A2 totalizer (IEEE754 single float values)</b>				
30511	Auxiliary-A2 Unit	16 Bit Integer	R	no unit=0, Wh=18, kWh=19, MWh=146, MJ=126, GJ=226, BTU=20, m3=80, USGallon=83
30512	Reserved			
30513 - 30514	Auxiliary-A2	IEEE754 Single (h-l)	R	Actual value
30515 - 30516	Auxiliary-A2 – stored ST1	IEEE754 Single (h-l)	R	
30517 - 30518	Auxiliary-A2 – stored ST2	IEEE754 Single (h-l)	R	
<b>Auxiliary A2 data or complementary counter A2 totalizer (long data points)</b>				
30611	Auxiliary-A2 Unit	16 Bit Integer	R	no unit=0, Wh=18, kWh=19, MWh=146, MJ=126, GJ=226, BTU=20, m3=80, USGallon=83
30612	Decimals	16 Bit Integer	R	Decimals: 0,1,2,3
30613 - 30614	Auxiliary-A2	32 bits integer (h-l)	R	Actual value
30615 - 30616	Auxiliary-A2 – stored ST1	32 bits integer (h-l)	R	
30617 - 30618	Auxiliary-A2 – stored ST2	32 bits integer (h-l)	R	
<b>Power (IEEE754 single float values)</b>				
30701	Power Unit	16 Bit Integer	R	W=47, kW=48
30702	Reserved			
30703 - 30704	Power	IEEE754 Single (h-l)	R	Actual value
<b>Power (long data points)</b>				
30801	Power Unit	16 Bit Integer	R	W=47, kW=48
30802	Decimals	16 Bit Integer	R	Decimals: 0,1,2,3
30803 - 30804	Power	32 bits integer (h-l)	R	Actual value, signed

(h-l) = high – low register

<b>Flow (IEEE745 single float values)</b>				
30711	Flow Unit	16 Bit Integer	R	m <sup>3</sup> /h=135
30712	Reserved			
30713 - 30714	Flow	IEEE754 Single (h-l)	R	Actual value
<b>Flow (long data points)</b>				
30811	Flow Unit	16 Bit Integer	R	m <sup>3</sup> /h=135
30812	Decimals	16 Bit Integer	R	Decimals: 0,1,2,3
30813 - 30814	Flow	32 bits integer (h-l)	R	Actual value
<b>High temperature (IEEE745 single float values)</b>				
30721	Temperature Unit	16 Bit Integer	R	°C=62
30722	Reserved			
30723 - 30724	High temperature	IEEE754 Single (h-l)	R	Actual value
<b>High temperature (long data points)</b>				
30821	Temperature Unit	16 Bit Integer	R	°C=62
30822	Decimals	16 Bit Integer	R	Decimals: 0,1,2,3
30823 - 30824	High temperature	32 bits integer (h-l)	R	Actual value, signed
<b>Low temperature (IEEE745 single float values)</b>				
30721	Temperature Unit	16 Bit Integer	R	°C=62
30722	Reserved			
30725 - 30726	Low temperature	IEEE754 Single (h-l)	R	Actual value
<b>Low temperature (long data points)</b>				
30821	Temperature Unit	16 Bit Integer	R	°C=62
30822	Decimals	16 Bit Integer	R	Decimals: 0,1,2,3
30825 - 30826	Low temperature	32 bits integer (h-l)	R	Actual value, signed
<b>Temperature difference (IEEE745 single float values)</b>				
30731	Delta Temperature Unit	16 Bit Integer	R	K=63
30732	Reserved		R	
30733 - 30734	Delta Temperature	IEEE754 Single (h-l)	R	
<b>Temperature difference (long data points)</b>				
30831	Delta Temperature Unit	16 Bit Integer	R	K=63
30832	Decimals	16 Bit Integer	R	Decimals: 0,1,2,3
30833 - 30834	Delta Temperature	32 bits integer (h-l)	R	Signed

(h-l) = high – low register

**Group (D) : ST1 values**

Input Register	M-Bus data Individual description Group (D) : ST1 values (read)	Data type	Read/Write	Remarks
<b>ST1 values (IEEE754 single float values)</b>				
30008	Last Set-Day1: month	16 Bit Integer	R	
30009	Last Set-Day1: day	16 Bit Integer	R	
30109 - 30110	Energy – stored ST1	IEEE754 Single (h-l)	R	
30111 - 30112	Energy Tariff 1 – stored ST1	IEEE754 Single (h-l)	R	
30113 - 30114	Energy Tariff 2 – stored ST1	IEEE754 Single (h-l)	R	
30309 - 30310	Volume – stored ST1	IEEE754 Single (h-l)	R	
30311 - 30312	Volume Tariff 1 – stored ST1	IEEE754 Single (h-l)	R	
30313 - 30314	Volume Tariff 2 – stored ST1	IEEE754 Single (h-l)	R	
30505 - 30506	Auxiliary-A1 – stored ST1	IEEE754 Single (h-l)	R	
30515 - 30516	Auxiliary-A2 – stored ST1	IEEE754 Single (h-l)	R	
<b>ST1 values (long data points)</b>				
30008	Last Set-Day1: month	16 Bit Integer	R	
30009	Last Set-Day1: day	16 Bit Integer	R	
30209 - 30210	Energy – stored ST1	32 bits integer (h-l)	R	
30211 - 30212	Energy Tariff 1 – stored ST1	32 bits integer (h-l)	R	
30213 - 30214	Energy Tariff 2 – stored ST1	32 bits integer (h-l)	R	
30409 - 30410	Volume – stored ST1	32 bits integer (h-l)	R	
30411 - 30412	Volume Tariff 1 – stored ST1	32 bits integer (h-l)	R	
30413 - 30414	Volume Tariff 2 – stored ST1	32 bits integer (h-l)	R	
30605 - 30606	Auxiliary-A1 – stored ST1	32 bits integer (h-l)	R	
30615 - 30616	Auxiliary-A2 – stored ST1	32 bits integer (h-l)	R	

(h-l) = high – low register

**Group (E) : ST2 values**

Input Register	M-Bus data Individual description Group (E) : ST2 values (read)	Data type	Read/Write	Remarks
<b>ST2 values (IEEE754 single float values)</b>				
30010	Last Set-Day2: month	16 Bit Integer	R	
30011	Last Set-Day2: day	16 Bit Integer	R	
30115 - 30116	Energy – stored ST2	IEEE754 Single (h-l)	R	
30117 - 30118	Energy Tariff 1 – stored ST2	IEEE754 Single (h-l)	R	
30119 - 30120	Energy Tariff 2 – stored ST2	IEEE754 Single (h-l)	R	
30315 - 30316	Volume – stored ST2	IEEE754 Single (h-l)	R	
30317 - 30318	Volume Tariff 1 – stored ST2	IEEE754 Single (h-l)	R	
30319 - 30320	Volume Tariff 2 – stored ST2	IEEE754 Single (h-l)	R	
30507 - 30508	Auxiliary-A1 – stored ST2	IEEE754 Single (h-l)	R	
30517 - 30518	Auxiliary-A2 – stored ST2	IEEE754 Single (h-l)	R	
<b>ST2 values (long data points)</b>				
30010	Last Set-Day2: month	16 Bit Integer	R	
30011	Last Set-Day2: day	16 Bit Integer	R	
30215 - 30216	Energy – stored ST2	32 bits integer (h-l)	R	
30217 - 30218	Energy Tariff 1 – stored ST2	32 bits integer (h-l)	R	
30219 - 30220	Energy Tariff 2 – stored ST2	32 bits integer (h-l)	R	
30415 - 30416	Volume – stored ST2	32 bits integer (h-l)	R	
30417 - 30418	Volume Tariff 1 – stored ST2	32 bits integer (h-l)	R	
30419 - 30420	Volume Tariff 2 – stored ST2	32 bits integer (h-l)	R	
30607 - 30608	Auxiliary-A1 – stored ST2	32 bits integer (h-l)	R	
30617 - 30618	Auxiliary-A2 – stored ST2	32 bits integer (h-l)	R	

(h-l) = high – low register

**Group (F) : monthly values**

Input Register	M-Bus data Individual description Group (F) : Monthly values (read)	Data type	Read/Write	Remarks
<b>Day for monthly storage</b>				
30012	Last Monthly Data: day	16 Bit Integer	R	
<b>Energy Monthly value (IEEE754 single float values)</b>				
31001	Energy Unit	16 Bit Integer	R	Wh=18, kWh=19, MWh=146, MJ=126(not a BACnet unit), GJ=226, BTU=20
31002	Reserved			
31003 - 31066	Energy Monthly Value - Stored [0..31]	IEEE754 Single	R	32 x 2 Input registers
31067 - 31130	Energy Monthly Value Tariff 1 – Stored [0..31]	IEEE754 Single	R	32 x 2 Input registers
31131 - 31194	Energy Monthly Value Tariff 2 – Stored [0..31]	IEEE754 Single	R	32 x 2 Input registers
<b>Energy Monthly value (long data points)</b>				
31201	Energy Unit	16 Bit Integer	R	Wh=18, kWh=19, MWh=146, MJ=126(not a BACnet unit), GJ=226, BTU=20
31202	Decimals	16 Bit Integer	R	Decimals: 0,1,2,3
31203 - 31266	Energy Monthly Value - Stored [0..31]	32 bits integer	R	32 x 2 Input registers
31267 - 31330	Energy Monthly Value Tariff 1 – Stored [0..31]	32 bits integer	R	32 x 2 Input registers
31331 - 31394	Energy Monthly Value Tariff 2 – Stored [0..31]	32 bits integer	R	32 x 2 Input registers
<b>Volume Monthly value (IEEE754 single float values)</b>				
31401	Volume Unit	16 Bit Integer	R	m3=80, USGallon=83
31402	Reserved			
31403 - 31466	Volume Monthly Value - Stored [0..31]	IEEE754 Single	R	32 x 2 Input registers
31467 - 31530	Volume Monthly Value Tariff 1 – Stored [0..31]	IEEE754 Single	R	32 x 2 Input registers
31531 - 31594	Volume Monthly Value Tariff 2 – Stored [0..31]	IEEE754 Single	R	32 x 2 Input registers
<b>Volume Monthly value (long data points)</b>				
31601	Volume Unit	16 Bit Integer	R	m3=80, USGallon=83
31602	Decimals	16 Bit Integer	R	Decimals: 0,1,2,3
31603 - 31666	Volume Monthly Value - Stored [0..31]	32 bits integer	R	32 x 2 Input registers
31667 - 31730	Volume Monthly Value Tariff 1 – Stored [0..31]	32 bits integer	R	32 x 2 Input registers
31731 - 31794	Volume Monthly Value Tariff 2 – Stored [0..31]	32 bits integer	R	32 x 2 Input registers

<b>Auxiliary A1 monthly value or complementary counter (IEEE745 single float values)</b>				
32001	Auxiliary-A1 Unit	16 Bit Integer	R	no unit=0 , Wh=18, kWh=19, MWh=146, MJ=126, GJ=226, BTU=20, m3=80, USGallon=83
32002	Reserved			
32003 - 32066	Auxiliary-A1 Monthly Value - Stored [0..31]	IEEE754 Single	R	32 x 2 Input registers
<b>Auxiliary A1 monthly value or complementary counter (long data points)</b>				
33001	Auxiliary-A1 Unit	16 Bit Integer	R	no unit=0 , Wh=18, kWh=19, MWh=146, MJ=126, GJ=226, BTU=20, m3=80, USGallon=83
33002	Decimals	16 Bit Integer	R	Decimals: 0,1,2,3
33003 - 33066	Auxiliary-A1 Monthly Value - Stored [0..31]	32 bits integer	R	32 x 2 Input registers
<b>Auxiliary A2 monthly value or complementary counter (IEEE745 single float values)</b>				
32201	Auxiliary-A2 Unit	16 Bit Integer	R	no unit=0 , Wh=18, kWh=19, MWh=146, MJ=126, GJ=226, BTU=20, m3=80, USGallon=83
32202	Reserved			
32203 - 32266	Auxiliary-A2 Monthly Value - Stored [0..31]	IEEE754 Single	R	32 x 2 Input registers
<b>Auxiliary A2 monthly value or complementary counter (long data points)</b>				
33201	Auxiliary-A2 Unit	16 Bit Integer	R	no unit=0 , Wh=18, kWh=19, MWh=146, MJ=126, GJ=226, BTU=20, m3=80, USGallon=83
33202	Decimals	16 Bit Integer	R	Decimals: 0,1,2,3
33203 - 33266	Auxiliary-A2 Monthly Value - Stored [0..31]	32 bits integer	R	32 x 2 Input registers