



electrocom

ATK3

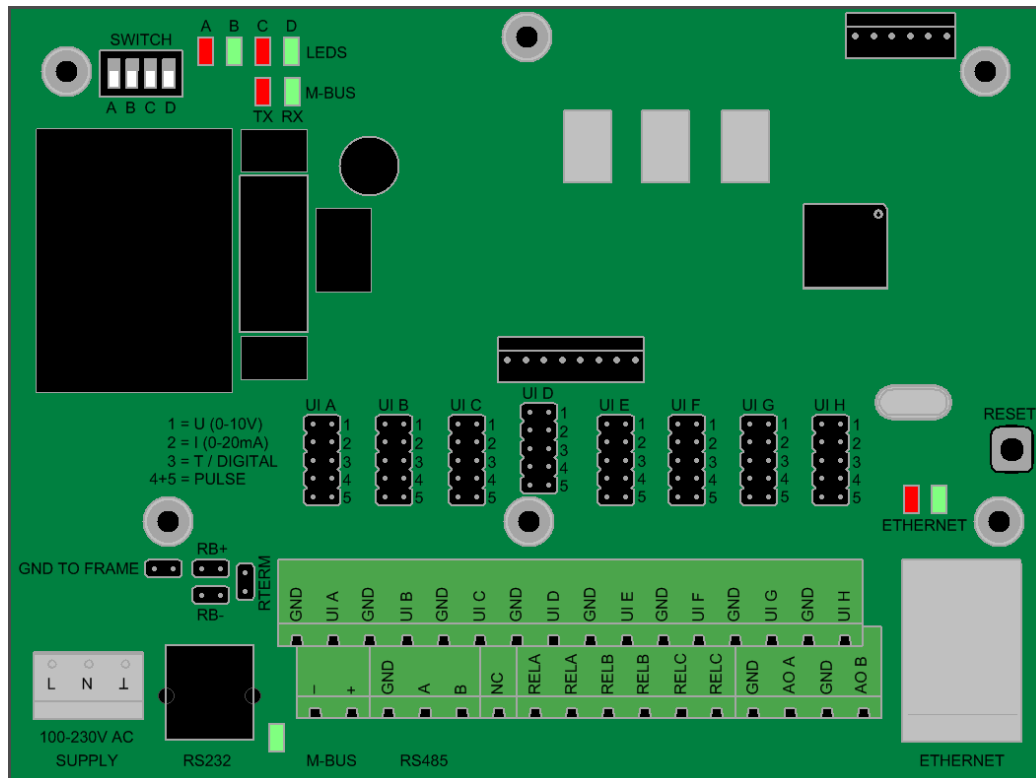
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1 Hardware

ATK3 is ElectroCom's newest hardware platform. One of the new features is ethernet which includes a webpage to setup the ATK3 application.



1.1 Inputs

There are 8 universal inputs on the ATK3 which are called UI A, UI B, UI C and so on. Each input can individually be setup to digital, pulse, voltage, current or NTC input.

The input type is setup on the ATK3 with 1 or 2 jumpers. The jumpers can be placed in 5 different positions as seen on the picture of ATK3 layout.

- 1 Voltage 0-10V
- 2 Current 4-20mA
- 3 Digital and NTC
- 4+5 Pulse

1.2 Outputs

The ATK3 has two different outputs - Relays and analog outputs.

Relay

There are 3 relay outputs on ATK3 which are called RELAY A, RELAY B and RELAY C.

Nominal switching capacity (resistive load):

1.0A 30V DC
0.3A 30V AC

Analog

There are 2 analog outputs available on the ATK3 which are called AO A and AO B.

The analog outputs range from 0 to 17.5V DC.

1.3 RS485

There is a RS485 3 wire connection on the ATK3 platform which consist of + (A), - (B) and GND connectors.

3 jumpers on the ATK3 are used to setup the RS485. 2 jumpers are called R-BIAS and should only be set for the master in RS485 network. The last jumper is called R-TERM and is used to enable the termination resistor on ATK3 board.

For RS485 wiring guidelines check this application note by Maxim.

http://www.maxim-ic.com/appnotes.cfm/an_pk/763/

1.4 Ethernet

The ATK3 supports ethernet and have a RJ45 connector.

As default, DHCP is enabled and the ATK3 then gets the IP settings from the DHCP server. If there is no DHCP server on the network, then the default IP settings are:

```

IP address:      10.0.0.200
Subnet mask:     255.255.255.0
Gateway:        10.0.0.1
Primary DNS:     208.67.222.222
Secondary DNS:  208.67.220.220
    
```

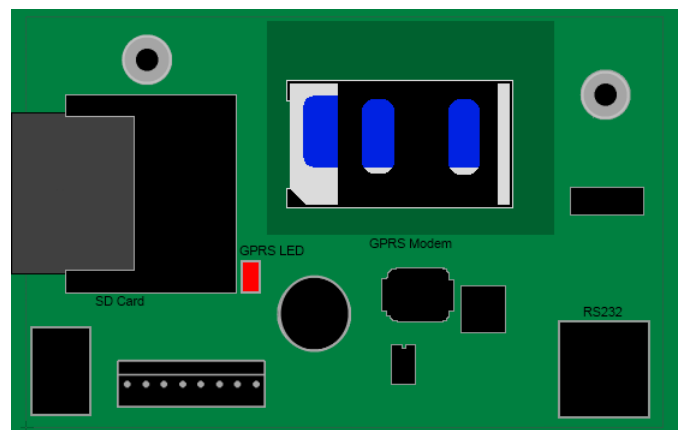
1.5 Switch

Only SWITCH D has a function on the ATK3. The other switches have no function.

Switch	State	Description
D	ON	Default settings restored at power up
D	OFF	Settings not overwritten at power up

1.6 Extension board

This is the extension board, which makes it possible to store the logs on a SD card and send them over GPRS instead of Ethernet.



The extension board comes with a SD Card already installed. This card cannot be removed. If removed, warranty will be lost.

The customer has the responsibility to install a SIM card before using the ATK3. It is very important to power off the ATK3 when installing or changing the SIM Card.

2 Webpage

A webpage is enabled on the ATK3 and can be accessed with the IP. All functions of ATK3 can also be setup and monitored via the webpage. There is a login and password for the webpage:

Login: admin
 Password: ATK3_pa\$\$

2.1 Inputs

The input values can be monitored on the webpage and the input types can be setup. It is also possible to edit the pulse values.

Inputs

This page allows the configuration of the board's Input settings.

CAUTION: For correct calculation, a 10kΩ NTC resistance is required when measuring temperature. 10kΩ ~ 25 °C.

Input A:	Pulse ▾	22 pulses
Input B:	Pulse ▾	16 pulses
Input C:	Digital ▾	ON
Input D:	Voltage ▾	9.60 V
Input E:	Voltage ▾	9.60 V
Input F:	Current ▾	20.00 mA
Input G:	NTC 10kΩ ▾	-39 °C
Input H:	NTC 10kΩ ▾	-39 °C

Volt limit: HIGH V

Volt limit: LOW V

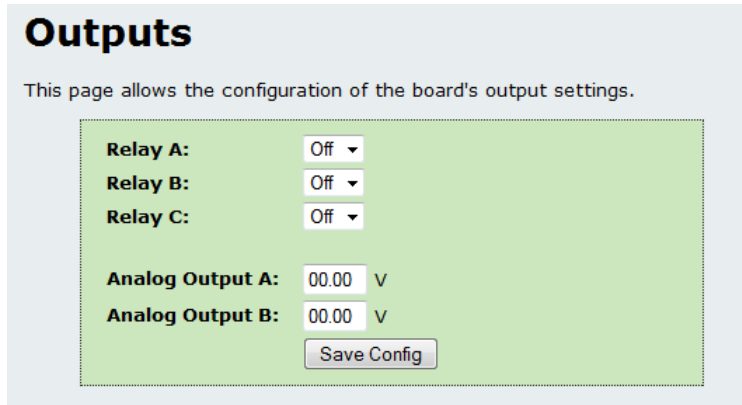
Edit pulse count

Pulse A counter: Add pulses (Ex. 8 or -8)

Pulse B counter: Add pulses (Ex. 8 or -8)

2.2 Outputs

The state of the 3 relays and 2 analog outputs can be changed on the webpage. The 2 analog outputs can be set from 0 to 17.5 V.



Outputs

This page allows the configuration of the board's output settings.

Relay A: Off ▾

Relay B: Off ▾

Relay C: Off ▾

Analog Output A: 00.00 V

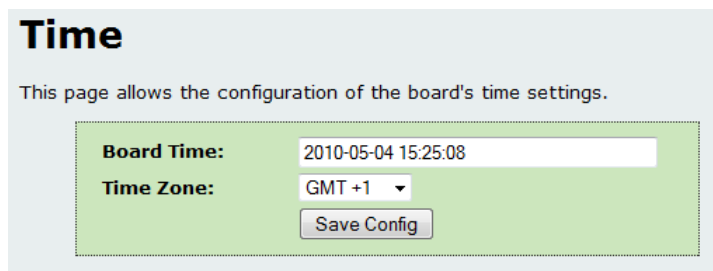
Analog Output B: 00.00 V

Save Config

2.3 Time

The ATK3 application has an internal clock. The time and time zone can be manually changed on the webpage.

The time is updated automatically if the ATK3 application has access to the internet.



Time

This page allows the configuration of the board's time settings.

Board Time: 2010-05-04 15:25:08

Time Zone: GMT +1 ▾

Save Config

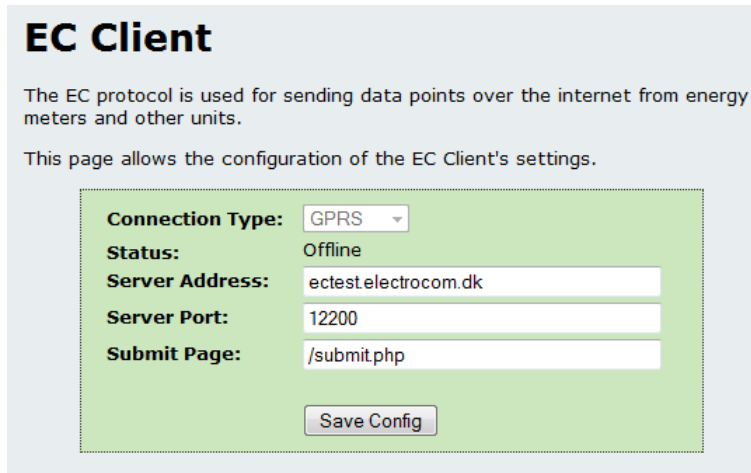
2.4 EC Client

The settings for the connection to an EC server can be changed. It is also possible to see the connection type and status for connection to the server.

Server Address

Server Port

Submit Page



EC Client

The EC protocol is used for sending data points over the internet from energy meters and other units.

This page allows the configuration of the EC Client's settings.

Connection Type:	GPRS
Status:	Offline
Server Address:	ectest.electrocom.dk
Server Port:	12200
Submit Page:	/submit.php

2.5 M-Bus Master

The M-Bus Master can be set to run on RS232 or the M-Bus hardware on the ATK3 board. It is also possible to change the baud rate.

A scan after M-Bus slaves can be started on the webpage, and it is possible to set start and stop range from 1 to 250. During the scan the found slaves will be listed. The ATK3 board will remember all the found slaves until a new scan is started.

M-Bus Master

This page allows the configuration of the board's M-Bus Master settings.

Connection Type:

Baud Rate:

Start Bit: 8

Stop Bit: 1

Parity: Even

Found M-Bus slaves

Scan Status:

M-Bus Slaves: None

Scan Range: Start: Stop:

2.6 Modbus Slave

The Modbus address can be setup on the webpage and default address is 1. The address can be changed to a value between 1 and 250. Each ATK3 unit must have a unique Modbus address.

Modbus Slave

This page allows the configuration of the board's Modbus Slave settings.

Modbus Slave Address:

2.7 GPRS

The GPRS status and signal strength can be seen on the webpage. The modem will power up every time a log has to be send, and then power down afterwards. APN, Username, Password and DNS are set up to the Danish GPRS net as default.

GPRS

This page allows the configuration of the GPRS settings.

Status: Modem powered and responding

Signal Strength:

APN:

Username:

Password:

DNS:

2.8 TCP/IP

The ATK3 comes with DHCP enabled, so it will automatically get an IP from the DHCP server. If the ATK3 is on a network without a DHCP server, it will get the IP 10.0.0.200. The TCP/IP configurations can also be set up manually on this webpage.

- MAC address (cannot be changed)
- IP address
- Gateway
- Subnet Mask
- Primary DNS
- Secondary DNS

Board Configuration

This page allows the configuration of the board's network settings.

CAUTION: Incorrect settings may cause the board to lose network connectivity.

Enter the new settings for the board below:

MAC Address:	00:50:C2:B4:C0:00
Host Name:	<input type="text" value="ATK3-11845632"/>
	<input checked="" type="checkbox"/> Enable DHCP
IP Address:	<input type="text" value="10.0.0.26"/>
Gateway:	<input type="text" value="10.0.0.1"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Primary DNS:	<input type="text" value="212.242.40.3"/>
Secondary DNS:	<input type="text" value="212.242.40.51"/>
	<input type="button" value="Save Config"/>

3 Energy Client M-Bus

The Energy Client M-Bus application supports the EC protocol. The EC protocol is used for transferring data points over the internet from energy meters and other units. The application has the following features:

- 8 Universal inputs
- M-Bus Master to read data from energy meters
- M-Bus via ATK3 board or RS232
- Support up to 25 M-Bus slaves
 - Can be extended with adding a M-Bus power level converter

3.1 Application flow

1. Sends own input and found M-Bus slaves data to EC server
2. Waits for the minute count to be 00, 15, 30 or 45. Then continues to number 1.

3.2 LEDs

- LED A: Indicates M-Bus Master transmitting
- LED B: Indicates M-Bus Master receiving
- LED C: Constantly ON connection to EC server is OK.
Blinking when connection to EC server failed.
- LED D: Constantly ON when a M-Bus scan is active

4 Energy Client Modbus

The Energy Client Modbus application supports the EC protocol. The EC protocol is used for transferring data points over the internet from energy meters and other units. The application has the following features:

- 8 Universal inputs
- Modbus Master to read inputs from ATK3 Modbus Server
- Modbus RS485
- Modbus RTU format

4.1 Application flow

1. Scans the RS485 network for Modbus slaves 1 to 25.
2. Sends own input and found slaves input data to EC server
3. Waits for the minute count to be 00, 15, 30 or 45. Then continues to number 2.

4.2 LEDs

- LED A: Indicates Modbus Master transmitting
- LED B: Indicates Modbus Master receiving
- LED C: Constantly ON connection to EC server is OK.
Blinking when connection to EC server failed.
- LED D: Blinks when a Modbus slave is found.
Constantly ON after Modbus scan ended.

5 Modbus Server

The Modbus Server application is working as a Modbus Slave. It has the following features:

- 8 Universal inputs
- 3 Relays
- 2 Analog outputs
- Modbus RS485
- Modbus RTU format

5.1 Modbus Settings

The default Modbus slave address is 1 and the Modbus RS485 settings are:

Baudrate	9600
Databits	8
Stopbits	1
Parity	EVEN
Format	RTU

5.2 LEDs

- LED A: Indicates Modbus Slave receiving
- LED B: Indicates Modbus Slave transmitting
- LED C:
- LED D: Constantly ON Modbus Slave is OK. Blinking Modbus Slave error.

5.3 Registers

There are 4 different types of Modbus registers - Coils, Discretes Inputs, Holding Registers and Input Registers.

The following table shows which Modbus functions can be used for a specific register type.

Register Type	Size	Read	Write
Coils	1bit	1	5, 15
Discretes Inputs	1bit	2	–
Holding Registers	16bit	3	6, 16
Input Registers	16bit	4	–

5.3.1 Coils

Reg	Description	Range	Unit
0	Relay A	ON (1) / OFF (0)	
1	Relay B	ON (1) / OFF (0)	
2	Relay C	ON (1) / OFF (0)	

5.3.2 Holding Registers

Reg	Description	Range	Unit
0	Relays <ul style="list-style-type: none"> • Bit 0 - Relay A • Bit 1 - Relay B • Bit 2 - Relay C 	ON (1) / OFF (0) ON (1) / OFF (0) ON (1) / OFF (0)	
1	Analog Output A	0 – 1000	V / 100
2	Analog Output B	0 – 1000	V / 100
4	Input A – Type <ul style="list-style-type: none"> • 0 = Digital, 1 = Volt, • 2 = Current, 3 = NTC • 4 = Pulse 	0 – 4	
5	Input B – Type <ul style="list-style-type: none"> • 0 = Digital, 1 = Volt, • 2 = Current, 3 = NTC • 4 = Pulse • 4 = Pulse 	0 – 4	
6	Input C – Type <ul style="list-style-type: none"> • 0 = Digital, 1 = Volt, • 2 = Current, 3 = NTC • 4 = Pulse 	0 – 4	
7	Input D – Type <ul style="list-style-type: none"> • 0 = Digital, 1 = Volt, • 2 = Current, 3 = NTC • 4 = Pulse 	0 – 4	
8	Input E – Type <ul style="list-style-type: none"> • 0 = Digital, 1 = Volt, • 2 = Current, 3 = NTC • 4 = Pulse 	0 – 4	

9	Input F – Type • 0 = Digital, 1 = Volt, • 2 = Current, 3 = NTC • 4 = Pulse	0 – 4	
10	Input G – Type • 0 = Digital, 1 = Volt, • 2 = Current, 3 = NTC • 4 = Pulse	0 – 4	
11	Input H – Type • 0 = Digital, 1 = Volt, • 2 = Current, 3 = NTC • 4 = Pulse	0 – 4	
12	Pulse voltage limit HIGH	100 – 250	V / 100
13	Pulse voltage limit LOW	50 – 200	V / 100

5.3.3 Input Registers

Reg	Description	Range	Unit
100	Serial Number	0 – 99999999	
101	32bit unsigned value		
102	Input A	ON (1) / OFF (0)	
103	• Digital • Voltage • Current • NTC 32bit unsigned value	0 – 1000 0 – 2000 0 – 100000	V / 100 mA / 100 Ω
104	Input B	ON (1) / OFF (0)	
105	• Digital • Voltage • Current • NTC 32bit unsigned value	0 – 1000 0 – 2000 0 – 100000	V / 100 mA / 100 Ω
106	Input C	ON (1) / OFF (0)	
107	• Digital • Voltage • Current • NTC 32bit unsigned value	0 – 1000 0 – 2000 0 – 100000	V / 100 mA / 100 Ω

108	Input D		
109	<ul style="list-style-type: none"> • Digital • Voltage • Current • NTC 32bit unsigned value	ON (1) / OFF (0) 0 – 1000 0 – 2000 0 – 100000	V / 100 mA / 100 Ω
110	Input E		
111	<ul style="list-style-type: none"> • Digital • Voltage • Current • NTC 32bit unsigned value	ON (1) / OFF (0) 0 – 1000 0 – 2000 0 – 100000	V / 100 mA / 100 Ω
112	Input F		
113	<ul style="list-style-type: none"> • Digital • Voltage • Current • NTC 32bit unsigned value	ON (1) / OFF (0) 0 – 1000 0 – 2000 0 – 100000	V / 100 mA / 100 Ω
114	Input G		
115	<ul style="list-style-type: none"> • Digital • Voltage • Current • NTC 32bit unsigned value	ON (1) / OFF (0) 0 – 1000 0 – 2000 0 – 100000	V / 100 mA / 100 Ω
116	Input H		
117	<ul style="list-style-type: none"> • Digital • Voltage • Current • NTC 32bit unsigned value	ON (1) / OFF (0) 0 – 1000 0 – 2000 0 – 100000	V / 100 mA / 100 Ω
150	M-Bus 1: Slave Address	0 - 250	
151	M-Bus 1: Serial number	0 - 999999999	kWh
152	32bit unsigned value		MJ
153	M-Bus 1: Energy	0 - 999999999	kWh
154	32bit unsigned value		MJ
155	M-Bus 1: Energy (U1)	0 - 999999999	kWh
156	32bit unsigned value		MJ
157	M-Bus 1: Energy (U2)	0 - 999999999	kWh
158	32bit unsigned value		MJ
159	M-Bus 1: Energy (U3)	0 - 999999999	kWh
160	32bit unsigned value		MJ
161	M-Bus 1: Power	0 - 999999999	W
162	32bit unsigned value		kJ/h

163	M-Bus 1: Volume	0 - 999999999	L
164	32bit unsigned value		
165	M-Bus 1: Volume (U1)	0 - 999999999	L
166	32bit unsigned value		
167	M-Bus 1: Energy (U2)	0 - 999999999	kWh
168	32bit unsigned value		MJ
169	M-Bus 1: Flow	0 - 999999999	L/h
170	32bit unsigned value		L/m L/s
171	M-Bus 1: Flow Temperature	0 - 1000	°C/10
172	M-Bus 1: Return Temperature	0 - 1000	°C/10
173	M-Bus 1: HCA (U1)	0 - 999999999	Pulses
174	32bit unsigned value		
175	M-Bus 1: HCA (U2)	0 - 999999999	Pulses
176	32bit unsigned value		
180	M-Bus 2: Slave Address	0 - 250	
181	M-Bus 2: Serial number	0 - 999999999	
182	32bit unsigned value		
183	M-Bus 2: Energy	0 - 999999999	kWh
184	32bit unsigned value		MJ
185	M-Bus 2: Energy (U1)	0 - 999999999	kWh
186	32bit unsigned value		MJ
187	M-Bus 2: Energy (U2)	0 - 999999999	kWh
188	32bit unsigned value		MJ
189	M-Bus 2: Energy (U3)	0 - 999999999	kWh
190	32bit unsigned value		MJ
191	M-Bus 2: Power	0 - 999999999	W
192	32bit unsigned value		kJ/h
193	M-Bus 2: Volume	0 - 999999999	L
194	32bit unsigned value		
195	M-Bus 2: Volume (U1)	0 - 999999999	L
196	32bit unsigned value		
197	M-Bus 2: Volume (U2)	0 - 999999999	L
198	32bit unsigned value		
199	M-Bus 2: Flow	0 - 999999999	L/h
200	32bit unsigned value		L/m L/s
201	M-Bus 2: Flow Temperature	0 - 1000	°C/10
202	M-Bus 2: Return Temperature	0 - 1000	°C/10
203	M-Bus 2: HCA (U1)	0 - 999999999	Pulses
204	32bit unsigned value		
205	M-Bus 2: HCA (U2)	0 - 999999999	Pulses
206	32bit unsigned value		

210	M-Bus 3: Slave Address	0 - 250	
211	M-Bus 3: Serial number	0 - 999999999	
212	32bit unsigned value		
213	M-Bus 3: Energy	0 - 999999999	kWh
214	32bit unsigned value		MJ
215	M-Bus 3: Energy (U1)	0 - 999999999	kWh
216	32bit unsigned value		MJ
217	M-Bus 3: Energy (U2)	0 - 999999999	kWh
218	32bit unsigned value		MJ
219	M-Bus 3: Energy (U3)	0 - 999999999	kWh
220	32bit unsigned value		MJ
221	M-Bus 3: Power	0 - 999999999	W
222	32bit unsigned value		kJ/h
223	M-Bus 3: Volume	0 - 999999999	L
224	32bit unsigned value		
225	M-Bus 3: Volume (U1)	0 - 999999999	L
226	32bit unsigned value		
227	M-Bus 3: Volume (U2)	0 - 999999999	L
228	32bit unsigned value		
229	M-Bus 3: Flow	0 - 999999999	L/h
230	32bit unsigned value		L/m L/s
231	M-Bus 3: Flow Temperature	0 - 1000	°C/10
232	M-Bus 3: Return Temperature	0 - 1000	°C/10
233	M-Bus 3: HCA (U1)	0 - 999999999	Pulses
234	32bit unsigned value		
235	M-Bus 3: HCA (U2)	0 - 999999999	Pulses
236	32bit unsigned value		
240	M-Bus 4: Slave Address	0 - 250	
241	M-Bus 4: Serial number	0 - 999999999	
242	32bit unsigned value		
243	M-Bus 4: Energy	0 - 999999999	kWh
244	32bit unsigned value		MJ
245	M-Bus 4: Energy (U1)	0 - 999999999	kWh
246	32bit unsigned value		MJ
247	M-Bus 4: Energy (U2)	0 - 999999999	kWh
248	32bit unsigned value		MJ
249	M-Bus 4: Energy (U3)	0 - 999999999	kWh
250	32bit unsigned value		MJ
251	M-Bus 4: Power	0 - 999999999	W
252	32bit unsigned value		kJ/h
253	M-Bus 4: Volume	0 - 999999999	L
254	32bit unsigned value		

255	M-Bus 4: Volume (U1)	0 - 999999999	L
256	32bit unsigned value		
257	M-Bus 4: Volume (U2)	0 - 999999999	L
258	32bit unsigned value		
259	M-Bus 4: Flow	0 - 999999999	L/h
260	32bit unsigned value		L/m L/s
261	M-Bus 4: Flow Temperature	0 - 1000	°C/10
262	M-Bus 4: Return Temperature	0 - 1000	°C/10
263	M-Bus 4: HCA (U1)	0 - 999999999	Pulses
264	32bit unsigned value		
265	M-Bus 4: HCA (U2)	0 - 999999999	Pulses
266	32bit unsigned value		
270	M-Bus 3: Slave Address	0 - 250	
271	M-Bus 3: Serial number	0 - 999999999	
272	32bit unsigned value		
273	M-Bus 3: Energy	0 - 999999999	kWh
274	32bit unsigned value		MJ
275	M-Bus 3: Energy (U1)	0 - 999999999	kWh
276	32bit unsigned value		MJ
277	M-Bus 3: Energy (U2)	0 - 999999999	kWh
278	32bit unsigned value		MJ
279	M-Bus 3: Energy (U3)	0 - 999999999	kWh
280	32bit unsigned value		MJ
281	M-Bus 3: Power	0 - 999999999	W
282	32bit unsigned value		kJ/h
283	M-Bus 3: Volume	0 - 999999999	L
284	32bit unsigned value		
285	M-Bus 3: Volume (U1)	0 - 999999999	L
286	32bit unsigned value		
287	M-Bus 3: Volume (U2)	0 - 999999999	L
288	32bit unsigned value		
289	M-Bus 3: Flow	0 - 999999999	L/h
290	32bit unsigned value		L/m L/s
291	M-Bus 3: Flow Temperature	0 - 1000	°C/10
292	M-Bus 3: Return Temperature	0 - 1000	°C/10
293	M-Bus 3: HCA (U1)	0 - 999999999	Pulses
294	32bit unsigned value		
295	M-Bus 3: HCA (U2)	0 - 999999999	Pulses
296	32bit unsigned value		

5.4 XNC Modbus Master examples

Here are some examples of using the XNC Modbus Master with the Modbus Server unit.

5.4.1 Communication

The communication setting:
RS485 2 wire;9600;8;1;2;RTU;1;

5.4.2 Serial number

Read the serial number and set it as XNC output 1:
1;4;100;1;2;U32L;

5.4.3 Inputs

Set the input types with XNC input 1 to 8:
1;16;4;1;8;

Read the input values to XNC output 2 to 9:
1;4;102;2;16;U32L;

5.4.4 Outputs

Set the 3 relays with XNC input 9 to 11:
1;15;16;9;3;

Set the 2 analog outputs with XNC input 12 to 13:
1;16;1;12;2;

For further information about the XNC Modbus Master check the documentation on ElectroCom's webpage.

<http://www.electrocom.dk/?download=XNC%20Modbus%20Master.pdf>