

# **ABB EQmatic Energy Analyzer QA/S 4.xx.1** Commissioning of a Terra AC Wallbox (Modbus RTU)

BUILDING AND HOME AUTOMATION SOLUTIONS							
DocType:	Step-by-Step Guide	DocNr.	9AKK108466A4349	Revision:	В		
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System:	i-bus® KNX	Product:	QA/S 4.16.1; QA/S 4.64.1 and 1	Terra AC Wallbo	x		
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# **Liability Disclaimer:**

This document serves the sole purpose of providing additional, technical information and possible application and use cases for the contained products and solutions. It **does not** replace the necessary technical documentation required for planning, installation and commissioning of the product. Technical details are subject to change without notice.

Despite checking that the contents of this document are consistent with the current versions of the related hard and software of the products mentioned within, deviations cannot be completely excluded. We therefore assume no liability for correctness. Necessary corrections will be introduced as and when new versions of the document are generated.

# Introduction

# ABB EQmatic Energy Analyzer QA/S

The ABB EQmatic Energy Analyzer QA/S devices are compact modular DIN rail components designed to monitor and display consumption and measured values. They are used in energy management applications. They log and store consumption data for electricity, gas, water or heat meters. This means that they can help those operating purpose-built premises or commercial enterprises to implement energy management systems such as ISO 50001. The devices have a plug and play commissioning system which automatically detects meters connected. Device access is via web browser. The user interface provides basic analysis functions such as a dashboard, historical data, instantaneous values, comparison functions, cost allocation by consumer group and much more. In this way energy flows and costs in the building become transparent.

Functions (extract)

- Collecting data from ABB i-bus® KNX meters, M-Bus meters or Modbus RTU meters
- Storage of meter data from up to 64 meters for up to 3 years
- Display and evaluation of historical consumption and measured data via configurable charts
- Customizable dashboard with predefined widgets
- Cost and consumption analysis for media such as electricity, water, heat and gas
- Manual data export, e.g., to xls, csv, pdf, etc.
- Cyclic (e.g. monthly) export of reports to FTP server or e-mail recipients
- Provision of the data to higher-level systems via Modbus TCP
- Automatic detection of ABB EQmatic meters from the A and B series



Fig. 1 ABB EQmatic Energy Analyzer Modbus QA/S 4.xx.1

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## Electric vehicle charging stations

ABB offers a total EV charging solution from compact, high quality AC Wallboxes, reliable DC fast charging stations with robust connectivity, to innovative on-demand electric bus charging systems, we deploy infrastructure that meet the needs of the next generation of smarter mobility.

The Terra AC Wallbox is a powerful yet cost-effective charging solution for electric vehicles, which is characterized by its range of functions, in particular through digital integration in the apps and portals or energy management systems supplied. Whether in a single/multi-family house, functional building or in the parking garage.

Technical features

- Load management (build-in energy meter, set up for external energy meter integration for dynamic load management and ready for integration with smart building energy systems)
- Built-in safety (overcurrent, overvoltage & undervoltage, ground fault, surge protection and PE continuity monitoring
- Design (IEC variants: Single phase up to 7.4 kW/32A and three phase up to 22 kW/32 A and UL variants up to 19 kW/80 A)
- Connectivity (Ethernet RJ45, Bluetooth, Wi-Fi, 4G variants, RS485 for connection to energy meter, and OCPP 1.6)



Fig. 2 ABB EV charging solution



Fig. 3 Terra AC Wallbox

### ABB EQmatic Energy Analyzer QA/S and a Terra AC Wallbox

A Terra AC Wallbox can communicate with the ABB EQmatic Energy Analyzer QA/S via the integrated RS485 interface using the Modbus protocol. The meter data measured by the wallbox can thus be displayed and further processed in the Energy Analyzer QA/S.



Fig. 4 System Overview ABB EQmatic Energy Analyzer QA/S

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# **Objectives of the document**

This document is intended to support you in the correct commissioning of an ABB EQmatic Energy Analyzer Modbus (QA/S4.16.1 or QA/S4.64.1) and a Terra AC Wallbox. We explain the necessary parameterization step by step.

# Content

# <u>1. General</u>

This document is based on

- ABB EQmatic Energy Analyzer
  - QA/S4.16.1 or QA/S4.64.1 (Modbus)
  - Firmware version V 2.0.5
- Terra AC Wallbox
  - Terra AC W22-T-R-C-0 (three phase, 22kW, 32A, socket type 2, RFID, 4G)
  - Firmware version V 1.4.2

### 2. Prerequisites

- The ABB EQmatic Energy Analyzer was installed and commissioned in accordance with the product manual and is ready for operation
- The Terra Wallbox was installed and configured according to the installation manual and is ready for operation
- The Terra Wallbox was wired to the ABB EQmatic Energy Analyzer QA/S according to the Modbus guidelines
- The "TerraConfig" app was installed on the mobile phone and communicates with the Wallbox

### 3. Configuration of the Terra Wallbox

The Energy Analyzer is the only "Primary Device" and all meters – including the Terra Wallbox – are "Secondary Devices". A Modbus secondary device reads and writes from the Modbus local controller primary device (Energy Analyzer QA/S).

When delivered, the Terra Wallbox works as a primary device". When operated on an Energy Analyzer QA/S, however, it has to work as a secondary device.



Fig. 5 Topology with one local controller and multiple meters and chargers

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Setting the wallbox as a secondary device

- Open the "TerraConfig" app and connect to the wallbox •
  - Go to the menu "Configuration" and press "Load Balance"
    - Enable "Modbus"
    - o Select "Multiple chargers via local controller"
    - Select "Modbus RTU (RS485)"
    - o Set the Modbus address, baud rate, parity, stop bit and data bit (depending on the meters already configured) and press the "Save" button
- Close the "TerraConfig" app •



Fig. 6 TerraConfig



Fig. 7 Load Balance



Fig. 8 Load Balance - Modbus



.... \* 🏽 😤 🗐 21% 🗎 10:44 < Modbus RTU(RS485) Modbus address of secondary charger Baud Rate 9600 Parity None Stop bit 1 Data bit 8 Save

Fig. 10 Load Balance - Modbus RTU

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Fig. 9	Load	Balance	- Chargers
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# 4. Configuration of the ABB EQmatic Energy Analyzer QA/S

The wallbox must be added and configured as a new meter in the Energy Analyzer. The "Meter Management menu" is used to make all the settings for the Modbus devices connected. The wallbox is not available in the ABB EQmatic library by default (firmware version V 2.0.5). Therefore, a "Meter model" and then the "Register Mapping Data Points" must be added manually. After that, the wallbox can be added and configured as a meter.

Add a meter model and register mapping data points

- Log in to the QA/S with admin rights
- Go to the menu "Management" → "Meter Management"
  - All existing meters are displayed
  - Click on the "Add" button in the "Meter models" submenu

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← → C A No	t secure   192.168.1.44/app/management/modbu	us?tab=models			Q. (8. \$		e *	4
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	Configuration				Θ			
	Meters Meter models Registe	er mappings			-	/		
					+ Add			
	Search	٩						
	PRODUCT NAME	* MEDIUM	REGISTER MAPPING	VERSION	ACTION			
	A41112-100	Electricity	ABB EQ-Meters	512	/×			
	A41 112-100	Electricity	ABB EQ-Meters	1024	/×			

Fig. 11 Overview Meter models

- Enter a product name for the meter model (e.g. "Terra AC W22")
- Select the "Create new from template" option from the "Register mapping configuration" menu
- Select the "Blank register mapping" option from the "Register Mapping Template" menu
- Enter a name of the register mapping (e.g. "ABB Terra Wallbox")
- Select the "Electricity" option from the "Medium" menu
- Enter a name of the manufacturer (e.g. ABB)
- Enter the version (e.g. 1)

1eter model		6
* Product name	* Register mapping configuration	
Terra AC W22	Create new from template	•
Minimum readout interval [5]	* Register Mapping Template	
Type number	Blank register mapping	•
	*Name	
	ABB Terra Wallbox	
	* Medium	
	Electricity	•
	Manufacturer	
	ABB	
	Version	
	1	
	Invalid Value	
	Type hexadecimal value	
	Register Read Limit	
	Type number	

Fig. 12 Add a meter model for the wallbox

Click on the button "Save" and "Back"

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 $\circ~$  The added meter model is displayed in the "Meter model" overview

→ C A Nots	secure   192.168.1.44/app/management/modbus?t	tab=models			Q. (19	\$	*
BB EQmat	tic 🖽 Dashboard 🖬 Analytics 🔒	Management 위해 System			4/01/2022 13:22		0
er Management	Metering Structure User Management T	Fariffs and units Consumer Groups	Data sharing				
	Configuration				ø		
	Meters Meter models Register m	nappings			+ ast		
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Fig. 13 Overview meter models

 Click on the "Edit" button of the meter model (e.g. "ABB Terra Wallbox") in the "Register mappings" submenu to add or edit the register mapping data points

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← → C ▲ No	t secure   192.168.1.44/app/management/modbus?tab=mapp	ings			Q. (P. s)	<b>1</b>	**
ABB EQm	atic 🖾 Dashboard 🖬 Analytics 🔒 Manager	ent 18 System			14/01/2022 13:28 🔺 🕈		
Meter Management	Metering Structure User Management Tariffs and	units Consumer Groups Data sharing					
	Configuration				0		
	Meters Meter models Register mappings				+ Add		
	Search	• MANUFACTURER	MEDIUM	VERSION	ACTION		
	ABB EQ-Meters	ABB	Electricity	769	/×		
	ABD EQ-Meters	A5B	Electricity	512	× /×		
	ABE MIMIS meters	АВН	Electricity	61	X×		
	ABB Terra Walloox	ABB	Electricity	1	/×		
	CMS-700	ADD	Electricity	1	/×		

Fig. 14 Meter model "ABB Terra Wallbox"

• There are no register mapping data points in the newly added meter model. Click on the "+" button to add them

xee CQ-matic X +			× - 9 ×
← → C A Not secure   192.168.1.44/app/management/modbu	/mapping-edit?proupHash=Z38tab=mappings		Q (C 🕁 📕 🖀 🗱 🖬 🖬 🖬
ABB EQmatic ED Dashboard Mt Analytics f	Management 18 System		• • • • • •
Meter Management Metering Structure User Management	Tariffs and units Consumer Groups Data sharing		
	Register Mapping Configuration	Θ	
	Invalid value		
	Typo hexadecimal value		
	Register Read Limit Type number		
		Rack Update Save as new	
	^ Assigned meter models	0	
	PRODUCT NAME MEDIUM REGISTER MAPPING	VERSION ACTION	
	Terra AC W22 Electricity ABB Terra Wallbox	1 /×	
	A Register Mapping Data Points	0	
	No Itams.		

Fig. 15 Add register mapping data points

- At least the register mapping data point for "Active Energy" or "Active Power" must be configured for basic operation
- Configure the register mapping data points according to Terra Wallbox manual (an extract from the manual: See chapter 6 "Modbus communication" for the available readable data)

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• Example of a configuration of the register mapping data points (energy, power, current and voltage)

* Modbus Function Code		
Read input registers (0x04)		-
* Start register address		
0x401E		
	Hexadecimal      Octal      Binary	Decimal
*Register data type		
Unsigned 32-bit (UINT32)		•
* Group		
Consumption		
* Data Point		
Active Imported Energy Total		-
*Unit:		
Wh		
* Multiplier		
Predefined      Custom		
1 (none)		
Description		
Energy delivered in charging session		
Most significant byte first (M5B)	C Least significant byte first (LSB)	
Most significant word first (MSW)	Least significant word first (LSW)	

Fig. 16 Energy delivered in charging session

Modbus Function Code			
Read input registers (0x04)			
Start register address			
0x4010			
	Hexadecimal	Octal OBin	ary 🔿 Decima
Register data type			
Unsigned 32-bit (UINT32)			
Group			
Instantaneous			
Data Point			
Current L1			
Unit			
A			
Multiplier			
Predefined      Custom			
0.001 (milli)			
Description			
Charging current phase L1			
Most significant byte first (MSB	) 🔘 Least significa	nt byte first (LSB)	
Most significant word first (MS)	N) () Least signific	ant word first (LSW	0

Fig. 18 Charging current phase 1

Data point configuration	1		
Modbus Function Code			
Read input registers (0x04)			•
Start register address			
0x401C			
	<ul> <li>Hexadecimal</li> </ul>	O Octal O E	Binary O Decimal
Register data type			
Unsigned 32-bit (UINT32)			-
Group			
Instantaneous			-
Data Point			
Active Imported Power Total			
Unit			
w			-
Multiplier			
Predefined     Custom			
1 (none)			~
escription			
Active power			
Most significant byte first (MSB)	O Least significan	t byte first (LSB	3)
Most significant word first (MSW)	Least significal	nt word first (L	SW)
			Cancel Save

٦

#### Fig. 17 Active power

* Modbus Function Code	
Read input registers (0x04)	
* Start register address	
0x4016	
	Hexadecimal Octal OBinary ODecimal
* Register data type	
Unsigned 32-bit (UINT32)	-
* Group	
Instantaneous	-
* Data Point	
Voltage L1	
* Unit	
v	-
* Multiplier	
Predefined      Custom	
0.1 (deci)	~
Description	
Voltage L1	
Most significant byte first (MSB)	Least significant byte first (LSB)
Most significant word first (MSW)	Least significant word first (LSW)

Fig. 19 Voltage phase 1

# • All added data points are displayed for the selected meter model

COmatic	× +							v – Ø
→ C A Not se	cure   192.168.1.44/ap;	dbom/trienegenent/modb	us/mapping-edit?groupHash=23&ta	ib=mappings				Q (P 🕁 📴 🍘 🍁 (
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iter Management M	letering Structure	User Management	Tariffs and units Consumer	Groups Data	sharing			
			Assigned meter mo	odels			o	
			PRODUCT NAME	* MEDIUM	REGISTER MAPPING	VERSION	ACTION	
			Terra AC W22	Bectricit	y ABB Terra Wallbox	1	/×	
			^ Register Mapping D	Data Points	)		0	
			RTU REGISTER ADDRESS	UNIT	DESCRIPTION		ACTION	
			0x4010	A	Current L1		/×	
			0x4012	Ä	Current L2		/×	
			0x4014	A	Current L3		/ ×	
			0x4016	Y	Voltage L1		/×	
			0x4018	v	Voltage L2		/×	
			0x401A	v	Voltage L3		/×	
			0x401C	w	Active Imported Power Total		1×	
			0x401E	Wh	Active Imported Energy Total		/×	

#### Fig. 20 Overview register mapping data points

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In the "Meters" submenu, click on the "Add" button to add a meter manually.
 The scan function for the Wallbox is not yet supported with this firmware!

Am SQmatic	× +		Y	- 0	×
$\leftrightarrow$ $\rightarrow$ C A Nots	secure   192.168.1.44/app/management/modpus/tab=maters	Q (8 5	2 🖪 🛛	* 3	± 🕕
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Meter Management	Metering Structure User Management Tariffs and units Consumer Groups Data sharing				
	Configuration           Meter models         Septor mappings           primary address         • STATUS         • SPEED         MAIN/FACTURER         MEDIUM         VERSION         PLACE OF INSTALLATION         • METER NAME         • STERIAL NUMBER         BUILDING NO				

Fig. 21 Overview meters

- Select the meter model (e.g. "Terra AC W22) from the "Meter models" menu
- Set the address, baudrate, bytesize, parity and stop bits (matching the settings in the wall box)
- Enter an installation place, a name and serial number

Meter configuration	Θ	©⊕∎ … <	<b>\$ ₩</b> Soul 21% <b>0</b> 10:44
Meter models		Modbus RTU (RS485	5)
Terra AC W22	× *		
* Address	Installation	Modbus address of seco	ndary charger
1	Garage		
* Baudrate	Meter Name	Baud Rate	
9600 -	Terra Wallbox	9600	~
* Bytesize	Serial number	Parity	
8 *	4711	None	~
* Parity	Meter measures generated energy	Stop bit	~
None -			
* Stop bits		Data bit	
1 *			
	Cancel Save	Sau	/e

Fig. 22 Meter configuration

Fig. 23 Wallbox config.

- Click on the button "Save"
- The Energy Analyzer QA/S connects to the added wallbox.

The positive communication is displayed with the status "OK". In the event of communication problems (disconnected, not configured), the settings (address, baudrate, ...) in the Energy Analyzer and Wallbox and the wiring should be checked.

**Note:** Depending on the device variant, the polarity of the Modbus wiring on the device (e.g. Wallbox) must be reversed!

ement N	4etering Structure U	er Nanagement	Tariffs and unit	s Consumer Group	s Data	sharing									
	Configuration													0	
	Meters Meter	models Regist	er mappings									© Scennir	19 +1	udd	
	PRIMARY ADDRESS	• STATUS	SPEED :	MANUFACTURER	MEDIUM	VERSION	PLACE OF INSTALLATION	0	METER NAME	0	SERIAL NUMBER	BUILDING NODE		N	
	1	OK	9600	188	Electricity	1	Garage		Terra Wallbox		4711	NOT ASSIGNED	1×		



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- Go to the menu "Management"  $\rightarrow$  "Metering Structure"
  - The metering structure is displayed
  - $\circ~$  Create a new metering structure or add a new sub node for the wallbox

🚥 Qmatic 🗙 🛨		× - 0 ×
← → C A Not secure   192.158.1.44/app/management/buildings	Q. (8	x 🖪 🖻 🖈 🏦 🗄
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Meter Management Metering Structure User Management Tariffs and units Consumer Groups Data sharing		
Metering structure configuration	0	
Famual     Create automatically flat metering of ucture	Legend	
	III Virtual meter	
	⑦ Metering point	
	F&AIII1 Mestum	
	E: Difference	

Fig. 25 Metering Structure

- Select the "Metering point" option from the "Node type" menu
- Enter a node name (e.g. "Terra Wallbox")
- Select the "Electriciy" option from the "Medium" menu
- Select the "Terra Wallbox" option from the "Meter" menu

Creat	e node		
* Node typ	De		
Meterin	g point		-
Node na	me		
Terra W	allbox		
Medium			
Electric	ity		
Meter			
∮ Elect	ricity, ABB, Terra Wallbox, Garage, #0	0004711	× -
Consumer	group		
Select			÷
Meter dat	a points		
TARIFF	METER TARIFF DATA POINT	ASSIGNED TARIFF	
0	Active Imported Energy Total	default tariff	•
		c	Cancel Save

Fig. 26 Create a sub node

- Click on the button "Save"
- → This completes the configuration of the Wallbox and the ABB EQmatic Energy Analyzer QA/S
- → The widgets can still be added in the "Dashboard" menu
- → The historical data, instantaneous values, ... are available in the "Analytics" menu
- → All other functions in the QA/S are available for the Terra Wallbox
  - Storage of metering data for at least 3 years
  - Sent reports via E-Mail and uploaded via FTP
  - Share data with other systems via Modbus TCP/IP
  - Alarms ....

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## 5. Menu "Dashboard" and "Analytics" of the ABB EQmatic Energy Analyzer QA/S

# Example: Charging an electric car

All EQmatic x +     ← → C 192.168.1.44/app		<ul> <li>、     </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、      </li> <li>、       </li> <li>、       </li> <li>、       </li> <li>、      </li> <li>、      </li> <li>、       </li> <li>、      </li> <li>、      </li> <li>、       </li> <li>、        </li> <li>、        </li> <li>、        </li> <li>、        </li> <li>、        </li> <li>、         </li> <!--</th--><th></th></ul>	
	lint Analytics 📾 Management 입부 Sys	tem 14/01/2022 15:59 🜲 ★ 👗 (	• G
Today All			\$
Energy delivered in ch 0	Active power 0	* Active power	0
0	OW JW	U-HE [94]	-
Voltage L1 0	Voltage L2 0	*         Voltage L3         •         *         Charging current L1         •         *         Charging current L2         •         *         Charging current L3	0
236.6 CV 5489	235.6 , 044V	224,5         0 <td></td>	

Fig. 27 Dashboard: Idle - no charging



Fig. 28 Dashboard: A car is connected to the wallbox and is charging

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ABB EQmatic 🖾 Dashboard	La Analytics 🛍 Management 🛛 System 117/01/2022 09:58	* * ±	• B
Search	Historical Data Usage Split Instantaneous Values Benchmark - Period Benchmark - Consumer Reports Alarms		
	Medium First axis settings Second axis settings	Resolution	Actions
III Familly Home	Load profile • Line • None • Line •	5 minutes <del>*</del>	Export •
🗇 Terra Wallbox 🖸	Average Load profile		
	1.53 (kw)		
	Historical Data 📃 Load profile (Electricity)		
	35k		
	34		
	25%		
<	al a		
	3		
	154		
	24		
	500		
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	K Jan 14 06:00 12:00 18:00 Jan 15 06:00 Junit 00 Jan 16 06:00 12:00 18:00 Jan 17 06:00 12:00	18:00	>
	2022/01/15 2022/01/15 20	Day Week All	
			-

Fig. 29 Analytics - Historical data: A car was connected to the wallbox and charged

All EQmatic X +		v e e +	- 0	×
ABB EQmatic I Dashboard	🔒 Management 👭 System 15/01/2022 16:24	<ul><li>▲ ★</li></ul>	± 0	G
Search Q	Historikal Data Usage Split Instantaneous Values Benchmark - Period Benchmark - Consumer Reports Alarms			
III Familiy Home	Medum			
Terra Wallbox 9	∮ Electricity		9	¢
	Current L1 14,90 A			26
	Current L2 14.86 A			×
	Current L3 14.60 A			×
	Voltage L1 233.60 V			26
	Voltage L2 234.80 V			20
	Voltage L3 234.50 V			×
	Active Imported Power Total 13,305 W			8
	Active Imported Energy Total 18,322 Wh			8
<				

Fig. 30 Analytics - Instantaneous values: A car is connected to the wallbox and is charging

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## 6. Modbus communication

The Terra Wallbox is in secondary mode, connected to a local controller (e.g. ABB EQmatic Energy Analyzer QA/S) and provides this readable data:

Start F	Register	Name	Reg. size	Res.	Unit	Data Type	Attr.
4000h	16384d	Serial Number	4			Unsign.	RO
4004h	16388d	Firmware version	2			Unsign.	RO
4006h	16390d	Max rated/settable current	2	0.001	А	Unsign.	RO
4008h	16392d	Error Code	2			Unsign.	RO
400Ah	16394d	Socket lock state	2			Unsign.	RO
400Ch	16396d	Charging state	2			Unsign.	RO
400Eh	16398d	Current charging current limit	2	0.001	А	Unsign.	RO
4010h	16400d	Charging current phase 1	2	0.001	А	Unsign.	RO
4012h	16402d	Charging current phase 2	2	0.001	А	Unsign.	RO
4014h	16404d	Charging current phase 3	2	0.001	А	Unsign.	RO
4016h	16406d	Voltage phase 1	2	0.1	V	Unsign.	RO
4018h	16408d	Voltage phase 2	2	0.1	V	Unsign.	RO
401Ah	16410	Voltage phase 3	2	0.1	V	Unsign.	RO
401Ch	16412d	Active power	2	1	W	Unsign.	RO
401Eh	16414d	Energy delivered in charging session	2	1	Wh	Unsign.	RO

Modbus uses 16-bit registers for data exchange. The smallest unit here is 16 bits or 2 bytes.

The register size of 2 thus corresponds to 32 bits or 4 bytes.

Order of bytes:

- Register size of 2 (Unsigned 32 bit, UINT32): AB CD
- Register size of 4 (Unsigned 64 bit, UINT64): AB CD EF GH

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#### 7. More information and training material

#### Competence Center Europe – Smart Buildings: Training & Qualification Database

- The database contains extensive training content
  - o Webinar, Learning Sessions, ... slides and videos
  - Presentations
  - Video tutorials
  - o and more ...
  - o https://go.abb/ba-training
  - www.abb.com/knx (→ Services & Tools → Training and Qualification → Training Database) YouTube
  - Channel "ABB Home and Building Automation"
  - www.youtube.com/user/ABBibusKNX
- Training Presentation "ABB EQmatic Energy Analyzer QA/S M-Bus, Modbus and KNX"
  - http://search.abb.com/library/Download.aspx?DocumentID=9AKK107046A7077&LanguageCode=en&DocumentPartId=PDF&Action=Launch
- Webinar Presentation "ABB EQmatic Energy Analyzer QA/S M-Bus and Modbus"
  - http://search.abb.com/library/Download.aspx?DocumentID=9AKK107046A7071&LanguageCode=en&DocumentPartId=PDF&Action=Launch
- Webinar Recording "ABB EQmatic Energy Analyzer QA/S M-Bus and Modbus"
  - http://search.abb.com/library/Download.aspx?DocumentID=9AKK107046A7259&LanguageCode=en&DocumentPartId=&Action=Launch

#### ABB EQmatic Energy Analyzer QA/S 4.xx.1

- Product and downloads
  - https://new.abb.com/low-voltage/products/building-automation/product-range/abb-ibus-knx/products/energy-management

#### ABB Terra AC wallbox

- Microsite "Terra AC wallbox" (overview, introduction, manuals, ...)
  - o https://new.abb.com/ev-charging/terra-ac-wallbox
- Terra AC Quick Start Guide
  - https://abb-quickstartguide.s3-eu-west-1.amazonaws.com/tac\_quickstart\_EN/index.html#/

### **References to other documents**

- FAQ Home and Building Automation
- Engineering Guide Database
- News-Ticker
- Software Repository
- Follow us... **P YouTube**

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