EV Charging
ModBus Register Table
for External Energy Management
via ModBus

Version 1.1 (working)

Contents

Versions

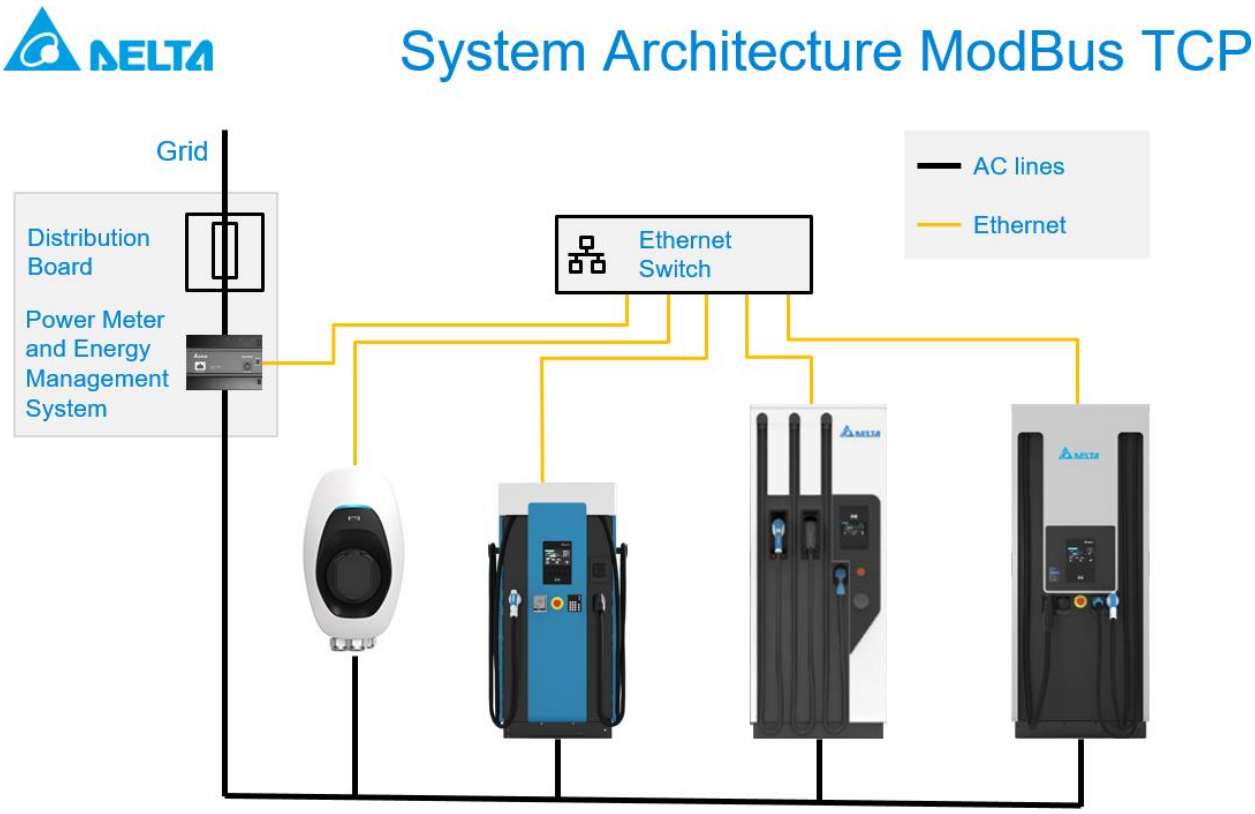
Date	Version	Changes	Released
3.4.2020	1.0	Initial Version	Stefan Walter
29.03.2021	1.1 (working)	• Document covers now multiple chargers and OCCP Converter • Document Title changed • Added new System Layouts • Extended Parameter List • Added Parameter / Product mapping • Changed data type of “Charging Power Limit” from UINT32 to INT32	Stefan Walter

System Setup

Dependent on the communication interface supported by the charger, the right system setup has to be used.

ModBus TCP

Chargers that support ModBus TCP have to be connected to the same local area network as the Energy Management System.



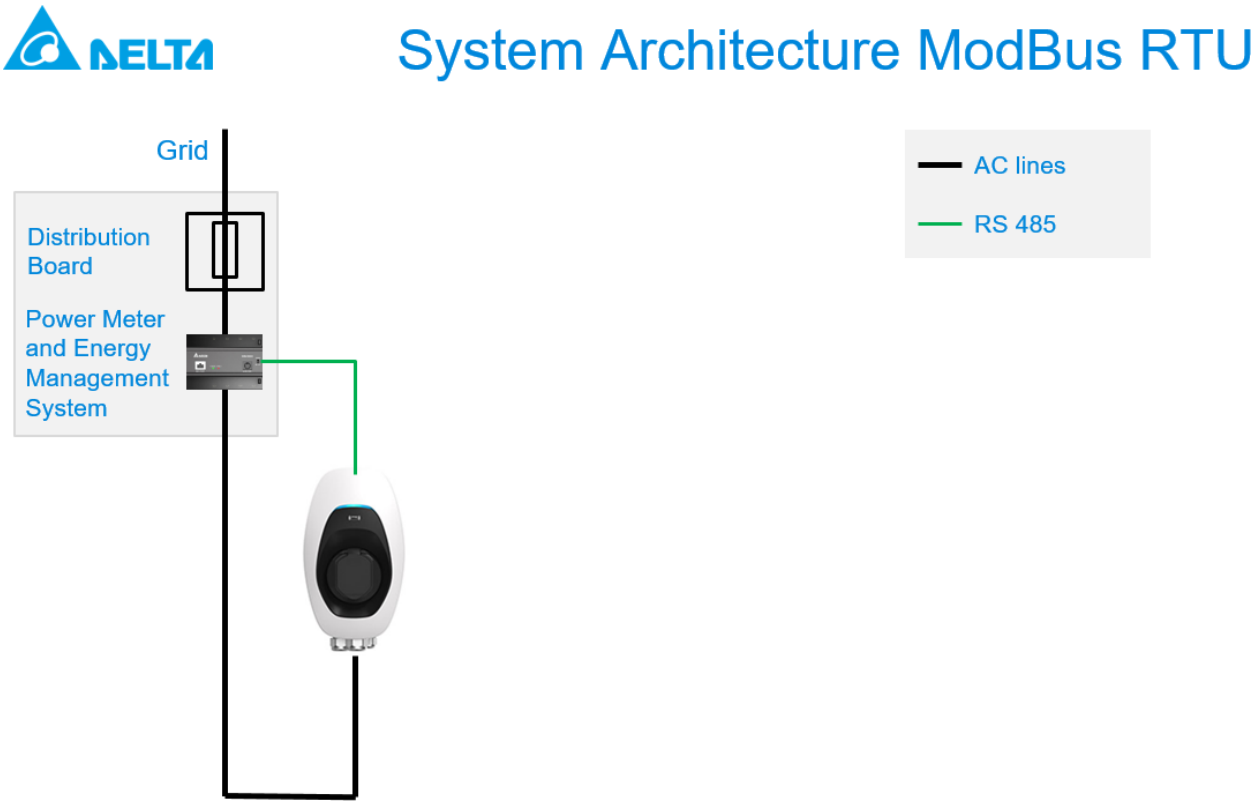
The default ModBus TCP Port is 502 on ACMAX and 5020 on UFC/SLIM.

Chargers that support ModBus TCP are:

- Delta Ultra Fast Charger 200 kW
- Delta Ultra Fast Charger 150 kW
- Delta SLIM Charger 75 kW
- AC MAX Smart

ModBus RTU

Chargers that support ModBus RTU have to be connected to the Energy Management System via RS485 interface.



The default Settings for ModBus RTU are:

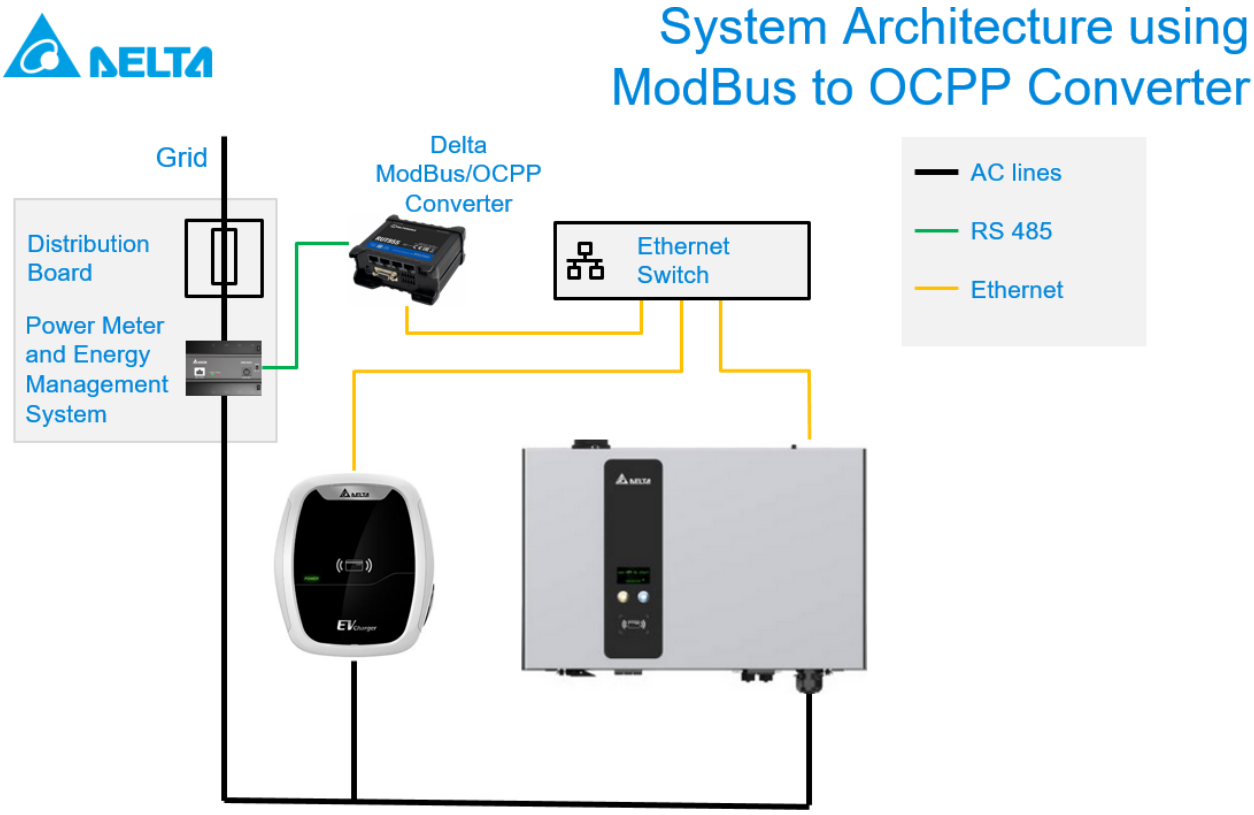
- 8N1 (Data bits: 8, Parity: none, Stop bits: 1)
- 115200 kBit/s

Chargers that support ModBus RTU are:

- Delta AC MAX Basic

OCPP

Chargers that support OCPP only have to be connected by using the Delta ModBus to OCPP Protocol Converter



In this setup, the ModBus to OCPP Protocol Converter acts as OCPP Proxy to the OCPP Back End (if applicable)

The default Settings for ModBus RTU are:

- 8N1 (Data bits: 8, Parity: none, Stop bits: 1)
- 19200 kBit/s

Chargers to be connected via Delta ModBus to OCPP Protocol Converter are:

- Delta AC Mini Plus
- Delta DC Wallbox 25 kW

Addressing

Each charger has its own ModBus ID. To address the EVSEs, following two methods are enabled:

1. Offset
    a. AC MAX
    b. OCPP Converter (Multiple ModBus/OCPP Protocol Converters connected to one Energy Management System are addressed by different IP addresses)
2. ModBus ID
    a. Delta Ultra Fast Charger 150 kW
    b. Delta Ultra Fast Charger 200 kW
    c. Delta SLIM Charger

Offset

EVSE ID	OFFSET (decimal)
The Charger itself	0
1	1000
2	2000
3	3000
…	…

ModBus ID

EVSE ID	OFFSET (decimal)
The Charger itself	1
1	2
2	3
3	4
…	…

EV Charger

Read Registers

Readable via READ INPUT REGISTER – CODE 0x04

Register	Parameter	Description	Unit/Format	Data Type	UFC/SLIM	AC MAX	Converter
100	State	Condition of the EV Charger: 0: Not ready 1: Operational 10: Faulted 255: Charger not responding (only Converter)	enum	UINT16	Yes	Yes	Yes
101	Charger Version			UINT16	Yes		
102	EVSE Count	Number of EVSEs		UINT16	Yes	yes	yes
103	Charger Error	Error Code		UINT64	Yes	TBC.	
110	Serial Number	Serial Number of the EV Charger	ASCII	STRING20	yes	yes	yes
130	Model	Charge Point Model	ASCII	STRING20	yes	yes	yes

Write Registers

Writable via WRITE HOLDING REGISTER – CODE 0x10

Register	Parameter	Description	Unit/Format	Data Type	UFC/SLIM	AC MAX	Converter
200	Slave ID	ModBus ID – Default 1		UINT16		Yes	
201	Communication Timeout ENABLE	0: Disabled 1: Enabled	enum	UINT16	Yes	Yes	Yes
202	Communication Timeout	0: Deactivate Time Out 1..600 Timeout in seconds If the communication timeout is ENABLED and the charger receives no CHARGING POWER LIMIT for more	s	UINT16	Yes	Yes	Yes

		than COMMUNICATION TIMEOUT seconds, the charger will set CHARGING POWER LIMIT to FALLBACK POWER					
203	Fallback Power	Defines the default charging power in case of communication time out.	W	UINT32	Yes	Yes	Yes

EVSE

The following Register tables are defined as repeating blocks for each single EVSE.

Read Registers

Readable via READ INPUT REGISTER – CODE 0x04

Register	Parameter	Description	Unit/Format	Data Type	UFC/SLIM	AC MAX	Converter
000	State	Condition of the EVSE: 0: Unavailable 1: Available 2: Occupied 3: Preparing 4: Charging 5: Finishing 6: Suspended EV 7: Suspended EVSE 8: Not ready 9: Faulted	enum	UINT16	Yes	Yes	Yes
001	Charge State	0: Charging process not started (no vehicle connected) 1: Connected, waiting for release (by RFID or local) 2: Charging process starts 3: Charging 4: Suspended (loading paused) 5: Charging process successfully completed (vehicle still plugged in) 6: Charging process completed by user (vehicle still plugged in) 7: Charging ended with error (vehicle still connected)			Yes	TBC.	
003	Voltage	Actual Output Voltage	V	Float32	Yes	TBC.	

005	Charging Power	Actual Charging Power (unsigned)	W	UINT32	Yes	Yes	Yes
007	Current	Actual Output Current	A	Float32	Yes	TBC.	
009	Power	Actual Output Power	W	Float32	Yes		
011	SOC	State of Charge (not available for AC)	0.1% 10 = 1%	UINT16	Yes		Yes
013	Max. Charging Power	Maximum Charging Power (of EV) determined by the EVSE (0 if no car attached)	W	UINT32	Yes		Yes
015	Min. Charging Power	Minimum Charging Power (of EV) determined by the EVSE (0 if no car attached)	W	UINT32	Yes		Yes
017	Charging Time	Charging Time in Seconds	s	Float32	Yes	TBC.	
019	Charged Energy	Energy transferred to EV (at output)	Wh	Float32	Yes	TBC.	
021	Discharged Energy	Energy transferred from EV (at out-put)	Wh	Float32	Yes		
023	V2X Potential Total Power	Potential power the EV and charger can provide on AC side of charger Note: This value is used only for V2X systems (Bidirectional devices)	W	Float32			
025	V2X Potential Power Ph1	Potential power on phase 1 the EV and charger can provide on AC side of charger Note: see 023	W	Float32			
027	V2X Potential Power Ph2	Potential power on phase 2 the EV and charger can provide on AC side of charger Note: see 023	W	Float32			
029	V2X Potential Power Ph3	Potential power on phase 3 the EV and charger can provide on AC side of charger Note: see 023	W	Float32			

031	Max. Charging Power	Maximal Charging Power required on AC side of charger Note: This register is estimated by maximal potential charging power communicated from EV or historical data from the last 2 minutes of charging.	W	Float32	Yes		
033	Max. Charging Power Ph1	Maximal charging power phase 1 required on AC side of charger. Note: see 031	W	Float32	Yes		
035	Max. Charging Power Ph2	Maximal charging power phase 2 required on AC side of charger. Note: see 031	W	Float32	Yes		
037	Max. Charging Power Ph3	Maximal charging power phase 3 required on AC side of charger. Note: see 031	W	Float32	Yes		
039	Min. Charging Power	Minimum Charging Power required on AC side of charger. Note: This register is indicating the minimal charging power to keep charging process ongoing. If set point is smaller, the charging process is suspended.	W	Float32	Yes		
041	Min. Charging Power Ph1	Minimal charging power phase 1 required on AC side of charger. Note: see 039	W	Float32	Yes		
043	Min. Charging Power Ph2	Minimal charging power phase 2 required on AC side of charger. Note: see 039	W	Float32	Yes		
045	Min. Charging Power Ph3	Minimal charging power phase 3 required on AC side of charger. Note: see 039	W	Float32	Yes		
047	Current Power Consumption Total	Current Total Power Consumption of complete charger (grid connection)	W	Float32	Yes	TBC.	

049	Current Power Consumption L1	Current Power Consumption of complete charger at L1 (grid connection)	W	Float32	Yes	TBC.	
051	Current Power Consumption L2	Current Power Consumption of complete charger at L2 (grid connection)	W	Float32	Yes	TBC.	
053	Current Power Consumption L3	Current Power Consumption of complete charger at L3 (grid connection)	W	Float32	Yes	TBC.	
055	Error Code			UINT64	Yes		
059	Total Battery Capacity	Capacity of battery (if available from EV)	Wh	Float32	Yes		
061	Remaining Battery Capacity	Capacity value at current SOC (if available from EV)	Wh	Float32	Yes		
063	Minimal Battery Capacity	Minimal capacity for discharge (if available from EV)	Wh	Float32	Yes		
065	Bulk Charge Capacity	Maximal capacity for fast charger (if available from EV)	Wh	Float32	Yes		
067	EVSE Total Current	The total current consumed by the EVSE	A	Float32		TBC.	
069	EVSE L1 Current	Line 1 current consumed by the EVSE	A	Float32		TBC.	
071	EVSE L2 Current	Line 2 current consumed by the EVSE	A	Float32		TBC.	
073	EVSE L3 Current	Line 3 current consumed by the EVSE	A	Float32		TBC.	
075	ISO62196 State	Condition of the EVSE 0: EVSE not available - state F 1: EVSE available - state A 2: Plug detected - state A+ 3: reserved 4: EV connected – state B 5: EV connected – state C- 6: EV connected, ventilation required – state D- 7: EVSE ready - state B+ 8: EV ready - state C 9: Charging EV - state C+ 10: EV ready, ventilation required - state D 11: Charging EV, ventilation required - state D+	enum	UNIT16		TBC.	

		12: Stop charging 13: Alarm 14: Shortcut – state E 15: Digital Com by EVSE state					
100	RFID	Used Authentication ID	ASCII	STRING20	Yes	TBC.	

Write Registers

Writable via WRITE HOLDING REGISTER – CODE 0x10

Register	Parameter	Description	Unit/Format	Data Type	UFC/SLIM	AC MAX	Converter
600	Charging Power Limit	Charging Power Limit Control Register	W	INT32	Yes	Yes (UNIT32)	Yes
602	Suspend Charging	0: no pause 1: Charging pause (leave locking etc. on)		UNIT16	Yes	TBC.	