Description: access to AMTRON® with HCC3 via MODBUS-TCP

MENNEKES

MY POWER CONNECTION

Table of contents

1   Acronyms

Acronym	Description
IP	Internet Protocol
TCP	Transmission Control Protocol
UID	Unique Identifier of RFID-Tag
RFID	Radio Frequency Identification
WLAN	Wireless Local Area Network
EV	Electric Vehicle
CP	Control Pilot
PP	Proximity Pilot
HMI	Human Machine Interface

Table 1: Acronyms

2 Initiation

2.1 Identification

This document describes the access to AMTRON® via MODBUS-TCP.

2.2 Specification

Parameter	Value	Comment
Model	Server	The MODBUS-TCP server is enabled in Service-Interface. The MODBUS-TCP server is not active in AMTRON® Operation Mode 'Energy Manager' and 'SCU'
IP Address	Settings from Service-Interface	
Netmask	Settings from Service-Interface	
Gateway Address	Settings from Service-Interface	
Server-Port	502	
Numbers of TCP/IP connection	1	
KEEPALIVE option	Not supported	
TCP/IP max. connection time	30s	
Unit identifier	0xFF	
Supported Function Codes	0x01 – Read Coils 0x02 – Read Discrete Inputs 0x03 – Read Holding registers 0x04 – Read Input registers 0x05 – Write Single Coil 0x06 – Write Single register 0x0F – Write Multiple Coils	

Table 2: Specification

3 Register assignment

3.1 Coil register (Read/Write)

Data-Address (HEX)	Reg. (Modicon)	Typ	Function	Comment
0x0108	265	bool	Reboot AMTRON®	0: Disable 1: Enable (This value is read always as 0.)

Table 3: Coil register

3.2 Discrete Input register (Read)

Data-Address (HEX)	Reg. (Modicon)	Typ	Function	Comment
0x0200	10513	bool	Digital input: Error Input	0: Inactive 1: Active
0x0201	10514	bool	Digital input: Mirror Contact	0: Inactive 1: Active
0x0202	10515	bool	Digital input: Socket locking	0: Inactive 1: Active
0x0203	10516	bool	Digital output: Shunt trip	0: Inactive 1: Active
0x0204	10517	bool	Digital output: Contactor	0: Inactive (Contractor open) 1: Active (Contractor closed)
0x0205	10518	bool	Digital output: Socket locking	0: Inactive 1: Active
0x0206	10519	bool	Temperature Sensor Installed	0: Not installed 1: Installed
0x0207	10520	bool	Local Fuses Installed	0: Not installed 1: Installed
0x0208	10521	bool	Energy Manager Installed	0: Not installed 1: Installed
0x0209	10522	bool	External Tariff Switch Connected	0: Not connected 1: Connected
0x020A	10523	bool	Monitoring Relay Wired to 1 Phase Only	0: Monitoring relay like factory settings 1: Monitoring relay is wired to 1 phase
0x020B	10524	bool	RFID Authorization	0: RFID Authorization is disabled 1: RFID Authorization is enabled (Function depends on the AMTRON® version.)
0x020C	10525	bool	Power Fail Continue	0: Power Fail Continue is disabled 1: Power Fail Continue is enabled
0x020D	10526	bool	Autostart Charging	0: Autostart Charging is disabled 1: Autostart Charging is enabled
0x020E	10527	bool	Stop Button	0: Stop Button is disabled 1: Stop Button is enabled
0x020F	10528	bool	Color Schema	0: IDLE-blue; CHARGE-green; WAIT-white; ERROR-red 1: IDLE-green; CHARGE-blue; WAIT-white; ERROR-red
0x0210	10529	bool	RFID Beep	0: RFID Beep is disabled 1: RFID Beep is enabled (Function depends on the AMTRON® version.)
0x0211	10530	bool	WLAN Communication	0: WLAN is disabled 1: WLAN is enabled
0x0212	10531	bool	Currently Summer	0: Time offset is +0h 1: Time offset is +1h
0x0213	10532	bool	EV Wake-Up	0: EV Wake Up is disable 1: EV Wake Up is enable

Table 4: Discrete Input register

3.3 Input register (Read)

Data-Address (HEX)	Reg. (Modicon)	Typ	Function	Comment
0x0300	30769	SINT16	HMI Temperature Internal	Internal Panel temperature in °C Values: -55 ≤ x ≤ 125
0x0301	30770	SINT16	HMI Temperature External	External temperature in °C Values: -30 ≤ x ≤ 100
0x0302	30771	UINT16	CP State	0: illegal/bad 1: A1 2: A2 3: B1 4: B2 5: C1 6: C2 7: D1 8: D2
0x0303	30772	UINT16	PP State	0: illegal/bad 1: Open 2: 13A 3: 20A 4: 32A
0x0304	30773	UINT16	HCC3 Error Code	0: No error 10: Installation fault 11: Controller fault 12: Misconfiguration 13: Overtemperature 14: Mirror contactor error 15: Invalid device time 16: Energy Manager connection error 30: Device startup 31: Internal test not passed 32: HMI no connection 50: Badly plugged cable 51: Wrong cable 52: Defect cable 100: ACU communication error (SCU mode only) 101: Not polled by ACU (SCU mode only) 102: Maintenance (SCU mode only) 103: Disabled (SCU mode only) 255: Unknown error
0x0305	30774	UINT16	AMTRON® State	0: Idle 1: Standby Authorize 2: Standby Connect 3: Charging 4: Paused 5: Terminated 6: Error

0x0306	30775	UINT16	AMTRON® Operation Mode	1: Remote 2: Time-Managed 3: External Switch Note: In AMTRON® Operation Mode 'Energy Manager' and 'SCU' MODBUS server is disabled.
0x0307	30776	UINT16	Connector Type	0: Unknown 1: Cable Type 1 2: Cable Type 2 3: Socket with Shutter 4: Socket with Flip-Top
0x0308	30777	UINT16	AMTRON® No. of Phases	0: Unknown 1: 1 Phase 3: 3 Phases
0x0309	30778	UINT16	AMTRON® Rated Current	Rated Current in A Values: 0 or $6 \leq x \leq 32$
0x030A	30779	UINT16	AMTRON® Installation Current	Installation Current in A Values: 0 or $6 \leq x \leq 32$
0x030B - 0x030C	30780	UINT32	Serial number	AMTRON® serial number, 1-9 digits (Reg_Low–0x030B, Reg_High-0x030C)
0x030D - 0x030E	30782	UINT32	Charging session meter count	Charging session meter count in Wh Values: $0 \leq x \leq 2^{32}\text{-}1$ (Function depends on the AMTRON® version.) (Reg_Low–0x030D, Reg_High-0x030E)
0x030F - 0x0310	30784	UINT32	Actual power con-sumption	Actual power consumption (average) in W Values: $0 \leq x \leq 2^{32}\text{-}1$ The value of the Actual Power is derived from the value of delivered energy. It is intendent for visualiza-tion purposes only. It should be considered, that this value tends to show heavy overshoots and poor dam-ping. This value is available only if the AMTRON® has an energy meter installed. (Reg_Low–0x030F, Reg_High-0x0310)
0x0311 - 0x031C	30786	ASCII	AMTRON® Wallbox Name	String with length of max. 22 characters and termina-ted with a null character (0x00). Restriction: The string must fit into 22 bytes (not cha-racters!)
0x031D	30788	UINT16	Max Current T1	Maximal current of tariff 1 in A Values: 0 or $6 \leq x \leq 32$
0x031E	30789	UINT16	Start hour T1	Start hour for tariff 1 in h Values: $0 \leq x \leq 23$
0x031F	30790	UINT16	Start minute T1	Start minute for tariff 1 in minute Values: $0 \leq x \leq 59$
0x0320	30791	UINT16	Price T1	Price per kWh for tariff 1 in 1/10 Eurocent Values: $0 \leq x \leq 9990$
0x0321	30792	UINT16 UINT16	Max Current T2	Maximal current of tariff 2 in A Values: 0 or $6 \leq x \leq 32$

0x0322	30793	UINT16	Start hour T2	Start hour for tariff 2 in h Values: 0 ≤ x ≤ 23
0x0323	30794	UINT16	Start minute T2	Start minute for tariff 2 in minute Values: 0 ≤ x ≤ 59
0x0324	30795	UINT16	Price T2	Price per kWh for tariff 2 in 1/10 Eurocent Values: 0 ≤ x ≤ 9990
0x0325	30796	UINT16	Planned min current	Planned minimum current in A per phase Values: 0 or 6 ≤ x ≤ 32
0x0326	30797	UINT16	Planned max current	Planned maximum current in A per phase Values: 0 or 6 ≤ x ≤ 32
0x0327	30798	UINT16	Planned min power	Planned minimum power consumption in W Values: 0 or 1380 ≤ x ≤ 8970
0x0328	30799	UINT16	Planned max power	Planned maximum power consumption in W Values: 0 or 1380 ≤ x ≤ 22080

Table 5: Input register

3.3.1 Calculation of planned current and power consumption

Following parameters are used for the planning calculation:

- No. of Vehicle Phases
- Minimum Current per Phase
- Maximum Current per Phase

In case of an AMTRON® without RFID-Reader or if the RFID function is deactivated, the values from the menu Electro Vehicle Data are used. Otherwise the values from the corresponding entry of the AMTRON® Whitelist are be used.

The values for 'Minimum Current per Phase' and 'Maximum Current per Phase' are aligned with the current limits 'AMTRON® Rated Current' and 'AMTRON® Installation Current'.

The values for the 'Planned minimum power consumption' respectively 'Planned maximum power consumption' are computed by multiplying the 230 VAC with the currently used 'Minimum Current per Phase' respectively 'Maximum Current per Phase' values and the 'No. of Vehicle Phases'.

3.4 Holding register (Read/Write)

Data-Address (HEX)	Reg. (Modicon)	Typ	Function	Comment
0x0400	41025	UINT16	Customer Current Limitation	Current limitation in A Values: 0 or 6 ≤ x ≤ 32 (Value depends on AMTRON® Rated Current and AMTRON® Installation Current.)
0x0401	41026	UINT16	Change charge state	1: "Pause" – Pause charging 2: "Continue" – Continue charging after pause 3: "Terminate" – Terminate charging 4: "Start" – Start charging without UID (This value is read always as 0.)

Table 6: Holding register

NOTE for system integrator or programmer of the MODBUS client:

Some values can also be changed by the user via the MENNEKES Charge App. The MODBUS client is responsible for timing the read/write command. AMTRON® always accepts the last written values (MODBUS client or app) as valid.