AC ELWA 2

Documentation of Controls

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Modbus TCP control

⚠ Control type of AC-THOR has to be set to Modbus TCP to accept power commands!

⚠ Mentioned register addresses are „real“ addresses. Depending on your data retrieval system it might be required to add 1 to the register addresses (e.g. 1001 instead of 1000)!

⚠ all registers are 16-bit unsigned integers, with the exceptions mentioned in footnotes 4 & 5

Address	R/W	Parameter	Value Unit Comment	
1000	R/W	Power 0-3.500 for Mode 1, 0-6.500 for Mode 3 In Multi-Mode this is the power sum of all devices, max 65.535	W	unlimited range of value
1001	R	Temp 1 (internal Sensor in AC ELWA 2)	1/10°C	
1002	R/W	Tmax (target temperature solar powered)	1/10°C	
1003	R	Status		see chapter Status codes
1004	R/W	Power timout	10-600 sec	
1005	R/W	Boost mode	0: off 1: on = ELWA (for Mode 1) 1: on = ELWA + AUX relay (for Mode 3) 4: SELV relay 5: AUX relay (only for Mode 3)	
1006	R/W	Tmin (Boost backup target temperature)	1/10°C	
1007	R/W	Boost time 1 start	0-23 hrs	
1008	R/W	Boost time 1 stop	0-24 hrs	
1009	R/W	Actual Time (Hour)	0-23	
1010	R/W	Actual Time (Minute)	0-59	
1011	R/W	Actual Time (Second)	0-59	
1012	R/W	Boost activate		Bit 0 = 0, Bit 1 = 0: off Bit 0 = 1: autoboost Bit 1 = 1: manual boost
1013	R/W	AC ELWA 2 Number		Standard is 1
1014	R/W	max Power	500-3500 W	
1015	R	tempchip	1/10°C	Controller temperature
1016	R	Controller firmware main version	u16	(e**xxxxx**yy)
1017	R	Powerstage firmware version	u16	(ep**xxx**)
1018	R	AC ELWA 2 serial number 1-2	2xCHAR	
1019	R	AC ELWA 2 serial number 3-4	2xCHAR	
1020	R	AC ELWA 2 serial number 5-6	2xCHAR	
1021	R	AC ELWA 2 serial number 7-8	2xCHAR	
1022	R	AC ELWA 2 serial number 9-10	2xCHAR	
1023	R	AC ELWA 2 serial number 11-12	2xCHAR	

1024	R	AC ELWA 2 serial number 13-14	2xCHAR	
1025	R	AC ELWA 2 serial number 15-16	2xCHAR	
1026	R/W	Boost time 2 start	0-23 hrs	
1027	R/W	Boost time 2 stop	0-24 hrs	
1028	R	Controller firmware sub version	u16	(exxxxx**yy**)
1029	R	Controller firmware update state	see Footnote 1	
1030	R	Temp 2 (external Sensor of AC ELWA 2)	1/10°C	
1053	R/W	Legionella interval	1-14 days	
1054	R/W	Legionella start	0-23 hrs	
1055	R/W	Legionella temp	°C	
1056	R/W	Legionella mode	0,1	
1058	R	Relay status	bit 0 AUX (0 off; 1 on) bit 1 SELV (0 off; 1 on)	
1061	R	U L1	V	power stage input voltage
1064	R	Freq	mHz	
1065	R/W	Operation mode	1, 3	
1067	R	U L2	V	AUX relay voltage
1068	R	I L2	100 mA	AUX relay current
1069	R	Meter Power	integer, negative is feed in	
1070	R/W	Control type	see Footnote 2	
1071	R	Pmax_abs; Max. power currently possible. Also includes power of slaves.	W	
1074	R	P out1	W	Power at ELWA immersion heater
1075	R	P out2	W	Power at AUX relay
1077	R	operation state	see Footnote 3	
1078	R/W	Power high word	W	see Footnote 4
1079	R/W	Power low word	W	see Footnote 4
1080	R/W	Power + AUX relay	W	bit 14: AUX relay bit 11 – 0: PS power 0 – 3.500
1081	R/W	Device state	0, 1	
1082	R	Power of the queried device	W	without slaves, 1082=1083+1084
1083	R	Solar part of device power	W	without slaves
1084	R	Grid part of device power	W	without slaves
1086	R	Co-Controller firmware version	u16	(ec**xxx**)
1087	R	Meter measurement value high word (negative = feed-in)	W	since version e0000300 see Footnote 5
1088	R	Meter measurement value low word (negative = feed-in)	W	since version e0000300 see Footnote 5

Registers can be read by Modbus command 0x03 (read holding registers) and written by Modbus commands 0x06 (write single register) or 0x10 (write multiple registers).

Multiple devices can also be controlled via UDP broadcast.

⚠ **All writable registers ("W") must not be written more than once a day except register 1000, 1009, 1010, 1011, 1012, 1078, 1079, 1080. This is due to protect the lifespan of the non-volatile memory.**

Discover in Network

The devices can be found in the network by an UDP Broadcast command.
Data format UDP Discover (broadcast to 255.255.255.255):

Search-Algorithms my-PV Devices	AC•THOR 9s	AC•THOR	my-PV Meter	AC ELWA 2	AC ELWA-E
Protocol: UDP Broadcast					
Port Number:	16124	16124	16124	16124	16124
Block length:	32bytes	32bytes	32bytes	32bytes	32bytes
Data block:					
2bytes crc modbus type, high byte first, over following 30 bytes	0x84db	0xcb7a	0x401e	0xa4d9	0x86d9
2bytes identification	0x4f4c	0x4e84	0x4e8e	0x3f16	0x3efc
16bytes string, fill the rest with 0x00	AC-THOR 9s	AC-THOR	my-PV Meter	AC ELWA 2	AC ELWA-E
rest reserved 0x00					
reply:					
Block length	64 byte	64 byte	64 byte	64 byte	64 byte
Port Number	16124	16124	16124	16124	16124
Data block:					
0-1 2 bytes crc modbus type, high byte first, over 62 bytes					
2-3 2 bytes identification	0x4f4c	0x4e84	0x4e8e	0x3f16	0x3efc
4-7 4 bytes IP address					
8-23 16 bytes serial number string					
24-25 2 bytes firmware version comm high byte first					
26 byte ELWA number					
rest internally used					

Serial numbers of my-PV devices

⚠ **my-PV does not recommend using the serial number to identify the device type!**

If the control system identifies the my-PV device using the 16-digit serial number, the following variants must be considered:

200300xxxxxxxxxx	ACTHOR 9s
200100xxxxxxxxxx	ACTHOR
200103xxxxxxxxxx	ACTHOR i
200101xxxxxxxxxx	ACTHOR CH (Switzerland) This product is replaced by AC THOR i!
160150xxxxxxxxxx	AC ELWA 2
160151xxxxxxxxxx	AC ELWA 2 electronic unit without heating element for AC ELWA 2
160152xxxxxxxxxx	AC ELWA 2 electronic unit without heating element for AC ELWA-E
160124xxxxxxxxxx	AC ELWA-E This product is replaced by AC ELWA 2!
160140xxxxxxxxxx	AC ELWA-E (Switzerland) This product is replaced by AC ELWA 2!
160129xxxxxxxxxx	AC ELWA-E electronic unit without heating element This product is replaced by 160152xxxxxxxxxx!
160142xxxxxxxxxx	AC ELWA-E electronic unit without heating element (Switzerland) This product is replaced by 160152xxxxxxxxxx!

Status codes

1	no control
2	Heat
3	Standby
4	Boost heat
5	Heat finished
20	Legionella-Boost active
21	Device disabled (devmode = 0)
22	Device blocked
201	STL triggered
202	power stage overtemp
203	power stage PCB temp probe fault
204	Hardware fault
205	ELWA Temp Sensor fault (sensor in immersion heater)
209	Mainboard Error

Footnote 1:

0: no new fw available,
1: new fw available (download not started, fw-version in variable Fwup_actual_version)
3: download started
5: download interrupted
10: download finished, waiting for installation

Footnote 2:

Auto Detect	0
HTTP	1
Modbus TCP	2
Fronius Auto	3
Fronius Manual	4
SMA Home Manager	5
Steca Auto	6
Varta Auto	7
Varta Manual	8
my-PV Meter Auto	12
my-PV Meter Manual	13
my-PV Power Meter Direct	14
RCT Power Manual	10
SMA Direct meter communication Auto	15
SMA Direct meter communication Manual	16
Digital Meter P1	19
Frequency	20
Fronius Sunspec Manual	100
Kostal PIKO IQ Plenticore plus Manual	102
Kostal Smart Energy Meter Manual	103
MEC electronics Manual	104
SolarEdge Manual	105
Victron Energy 1ph Manual	106
Victron Energy 3ph Manual	107

Huawei (Modbus TCP) Manual	108
Carlo Gavazzi EM24 Manual	109
Sungrow Manual	111
Fronius Gen24 Manual	112
Huawei (Modbus RTU)	200
Growatt (Modbus RTU)	201
Solax (Modbus RTU)	202
Qcells (Modbus RTU)	203
IME Conto D4 Modbus MID (Modbus RTU)	204

Footnote 3: operation states (screen icon):

0 green tick flashes
1 yellow wave is on
2 yellow wave flashes
3 green tick and yellow wave is on
4 red cross is on
5 red cross flashes
6 Block active

Lights up = set temperature reached

Flashes = stand-by, waits for excess

Lights up = heats with PV excess. Flashes = boost backup mode

Lights up = no control signal

Lights up = physical connection to the RJ45 network connection is intact

Lights up = no intact physical connection to the RJ45 network connection

Block active

Footnote 4:

Only for large systems with several units (multi-mode) and output specifications greater than 65,535 watts. Power below this value is entered in register 1000.
1078 and 1079 form a 32-bit unsigned integer. Always write this registers consecutively.

Footnote 5:

For meter values below -32768 W and above 32767 W.
Power within this range can be read in register 1069.
1087 and 1088 form a 32-bit signed integer. Always read this registers consecutively.

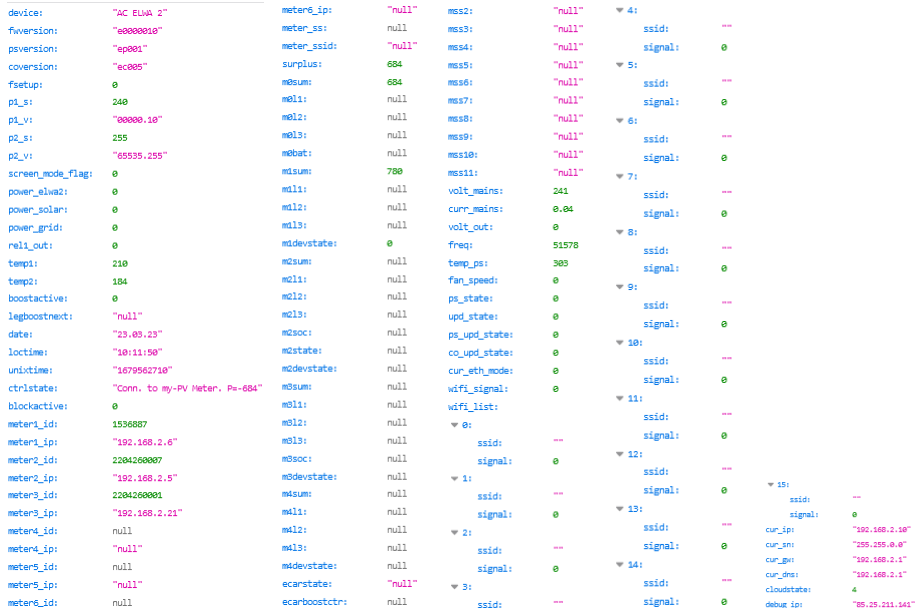
http control

In the Web interface the kind of control has to be set to http.

The control happens via the sub-page /control.html

/control.html?power=n	n ... Set power on the power stage, unlimited range of value The regulation is carried out by a higher-level control system.
/control.html?pid_power=n	The regulation is carried out by the pid-controller of AC ELWA 2
/control.html?boost=1	activate Boost-Backup manually

Status info is queried via [IP]/data.jsn



Compatibility mode: Behave as AC ELWA-E

Find documentation **here**

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Subject to change.