Power Quality Controller – PQC
Blindleistungsregler

FRAKO

Regler Übersicht
cos φ0,968
U△ 347,2V   I 284,1 A
P   55,1kW Rückspeis. □
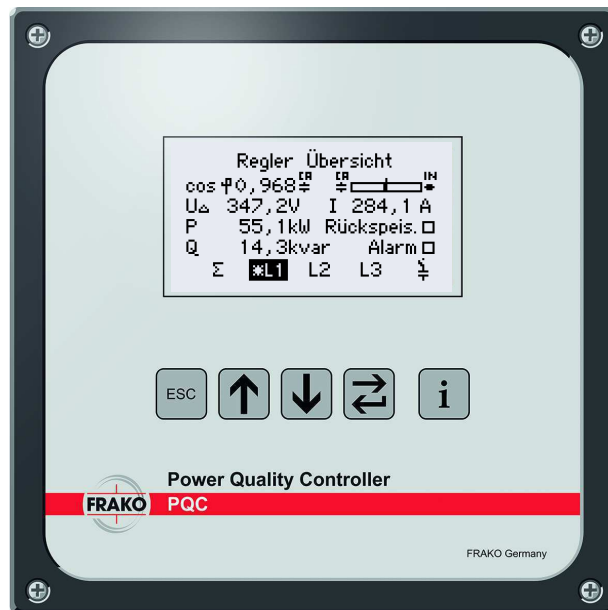Q   14,3kvar   Alarm □
Σ   L1 L2 L3

ESC ↑ ↓ ⇄ i

Power Quality Controller
PQC

FRAKO Germany

Modbus Specification V1.5

Frako Kondensatoren- und Anlagenbau GmbH

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Contents

1 Revision

Modified index	Version	date
xxxx	1.5	16.08.2016

2 General

This specification is based on the Modbus specification V1.1b3. See http://www.modbus.org/ for details.

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3 Supported PQC types

This Document is valid for PQC typs like PQC XXXXXXX-2X for example PQC 1202401-20. For more informations about the PQC types see: PQC User Manual from http://www.frako.com/service/downloads/.

4 Modbus

4.1 Available functions

The following functions are available:

function		Description
0x03	Read holding register	Read n registers
0x10	write multiple register	Write n registers

Simultaneously writing using Modbus and the user interface at the device itself leads to undefined behavior! Before entering any configuration screen at the device itself, ensure that all changes made through the Modbus interface have been stored in the EEPROM using the appropriate command.

4.2 Data Format

As specified by the Modbus specification, a register is

- 2 Byte long

- big endian (high byte first)

Float values are single precision (32 bit) as defined by IEE754.

5 Modbus Address List

Address	Format	Identifier	Unit	RW	Description
0	float	L1 cos phi	cos(phi)	R	$(0 \leq \cos\varphi < 1)$ system is inductive $(1 < \cos\varphi \leq 2)$ system is capacitive
4	float	L1 voltage	V	R	
8	float	L1 current	A	R	
12	float	L1 active power	kW	R	
16	float	L1 reactive power	kvar	R	
20	float	L1 apparent power	kVA	R	
36	float	L2 cos phi	cos(phi)	R	$(0 \leq \cos\varphi < 1)$ system is inductive $(1 < \cos\varphi \leq 2)$ system is capacitive
40	float	L2 voltage	V	R	
44	float	L2 current	A	R	
48	float	L2 active power	kW	R	
52	float	L2 reactive power	kvar	R	
56	float	L2 apparent power	kVA	R	
72	float	L3 cos phi	cos(phi)	R	$(0 \leq \cos\varphi < 1)$ system is inductive $(1 < \cos\varphi \leq 2)$ system is capacitive
76	float	L3 voltage	V	R	
80	float	L3 current	A	R	
84	float	L3 active power	kW	R	
88	float	L3 reactive power	kvar	R	
92	float	L3 apparent power	kVA	R	
128	uint16	L1 voltage harmonic 1 (fundamental)	%	R	
130	uint16	L1 voltage harmonic 02	%	R	
132	uint16	L1 voltage harmonic 03	%	R	
134	uint16	L1 voltage harmonic 04	%	R	
136	uint16	L1 voltage harmonic 05	%	R	
138	uint16	L1 voltage harmonic 06	%	R	
140	uint16	L1 voltage harmonic 07	%	R	
142	uint16	L1 voltage harmonic 08	%	R	
144	uint16	L1 voltage harmonic 09	%	R	

Address	Format	Identifier	Unit	RW	Description
146	uint16	L1 voltage harmonic 10	%	R	
148	uint16	L1 voltage harmonic 11	%	R	
150	uint16	L1 voltage harmonic 12	%	R	
152	uint16	L1 voltage harmonic 13	%	R	
154	uint16	L1 voltage harmonic 14	%	R	
156	uint16	L1 voltage harmonic 15	%	R	
158	uint16	L1 voltage harmonic 16	%	R	
160	uint16	L1 voltage harmonic 17	%	R	
162	uint16	L1 voltage harmonic 18	%	R	
164	uint16	L1 voltage harmonic 19	%	R	
166	float	L1 THDU	%	R	Total Harmonic Voltage Distortion
340	uint16	L2 voltage harmonic 1 (fundamental)	%	R	
342	uint16	L2 voltage harmonic 02	%	R	
344	uint16	L2 voltage harmonic 03	%	R	
346	uint16	L2 voltage harmonic 04	%	R	
348	uint16	L2 voltage harmonic 05	%	R	
350	uint16	L2 voltage harmonic 06	%	R	
352	uint16	L2 voltage harmonic 07	%	R	
354	uint16	L2 voltage harmonic 08	%	R	
356	uint16	L2 voltage harmonic 09	%	R	
358	uint16	L2 voltage harmonic 10	%	R	
360	uint16	L2 voltage harmonic 11	%	R	
362	uint16	L2 voltage harmonic 12	%	R	
364	uint16	L2 voltage harmonic 13	%	R	
366	uint16	L2 voltage harmonic 14	%	R	
368	uint16	L2 voltage harmonic 15	%	R	
370	uint16	L2 voltage harmonic 16	%	R	
372	uint16	L2 voltage harmonic 17	%	R	
374	uint16	L2 voltage harmonic 18	%	R	
376	uint16	L2 voltage harmonic 19	%	R	
378	float	L2 THDU	%	R	Total Harmonic Voltage Distortion
552	uint16	L3 voltage harmonic 1 (fundamental)	%	R	

Address	Format	Identifier	Unit	RW	Description
554	uint16	L3 voltage harmonic 02	%	R	
556	uint16	L3 voltage harmonic 03	%	R	
558	uint16	L3 voltage harmonic 04	%	R	
560	uint16	L3 voltage harmonic 05	%	R	
562	uint16	L3 voltage harmonic 06	%	R	
564	uint16	L3 voltage harmonic 07	%	R	
566	uint16	L3 voltage harmonic 08	%	R	
568	uint16	L3 voltage harmonic 09	%	R	
570	uint16	L3 voltage harmonic 10	%	R	
572	uint16	L3 voltage harmonic 11	%	R	
574	uint16	L3 voltage harmonic 12	%	R	
576	uint16	L3 voltage harmonic 13	%	R	
578	uint16	L3 voltage harmonic 14	%	R	
580	uint16	L3 voltage harmonic 15	%	R	
582	uint16	L3 voltage harmonic 16	%	R	
584	uint16	L3 voltage harmonic 17	%	R	
586	uint16	L3 voltage harmonic 18	%	R	
588	uint16	L3 voltage harmonic 19	%	R	
590	float	L3 THDU	%	R	Total Harmonic Voltage Distortion
764	uint16	L1 current harmonic 1 (fundamental)	%	R	
766	uint16	L1 current harmonic 02	%	R	
768	uint16	L1 current harmonic 03	%	R	
770	uint16	L1 current harmonic 04	%	R	
772	uint16	L1 current harmonic 05	%	R	
774	uint16	L1 current harmonic 06	%	R	
776	uint16	L1 current harmonic 07	%	R	
778	uint16	L1 current harmonic 08	%	R	
780	uint16	L1 current harmonic 09	%	R	
782	uint16	L1 current harmonic 10	%	R	
784	uint16	L1 current harmonic 11	%	R	
786	uint16	L1 current harmonic 12	%	R	
788	uint16	L1 current harmonic 13	%	R	

Address	Format	Identifier	Unit	RW	Description
790	uint16	L1 current harmonic 14	%	R	
792	uint16	L1 current harmonic 15	%	R	
794	uint16	L1 current harmonic 16	%	R	
796	uint16	L1 current harmonic 17	%	R	
798	uint16	L1 current harmonic 18	%	R	
800	uint16	L1 current harmonic 19	%	R	
802	float	L1 THDI	%	R	Total Harmonic Current Distortion
806	float	L1 overcurrent factor	I_{eff}/I_{fu}	R	
976	uint16	L2 current harmonic 1 (fundamental)	%	R	
978	uint16	L2 current harmonic 02	%	R	
980	uint16	L2 current harmonic 03	%	R	
982	uint16	L2 current harmonic 04	%	R	
984	uint16	L2 current harmonic 05	%	R	
986	uint16	L2 current harmonic 06	%	R	
988	uint16	L2 current harmonic 07	%	R	
990	uint16	L2 current harmonic 08	%	R	
992	uint16	L2 current harmonic 09	%	R	
994	uint16	L2 current harmonic 10	%	R	
996	uint16	L2 current harmonic 11	%	R	
998	uint16	L2 current harmonic 12	%	R	
1000	uint16	L2 current harmonic 13	%	R	
1002	uint16	L2 current harmonic 14	%	R	
1004	uint16	L2 current harmonic 15	%	R	
1006	uint16	L2 current harmonic 16	%	R	
1008	uint16	L2 current harmonic 17	%	R	
1010	uint16	L2 current harmonic 18	%	R	
1012	uint16	L2 current harmonic 19	%	R	
1014	float	L2 THDI	%	R	Total Harmonic Current Distortion
1018	float	L2 overcurrent factor	I_{eff}/I_{fu}	R	
1188	uint16	L3 current harmonic 1 (fundamental)	%	R	
1190	uint16	L3 current harmonic 02	%	R	
1192	uint16	L3 current harmonic 03	%	R	

Address	Format	Identifier	Unit	RW	Description
1194	uint16	L3 current harmonic 04	%	R	
1196	uint16	L3 current harmonic 05	%	R	
1198	uint16	L3 current harmonic 06	%	R	
1200	uint16	L3 current harmonic 07	%	R	
1202	uint16	L3 current harmonic 08	%	R	
1204	uint16	L3 current harmonic 09	%	R	
1206	uint16	L3 current harmonic 10	%	R	
1208	uint16	L3 current harmonic 11	%	R	
1210	uint16	L3 current harmonic 12	%	R	
1212	uint16	L3 current harmonic 13	%	R	
1214	uint16	L3 current harmonic 14	%	R	
1216	uint16	L3 current harmonic 15	%	R	
1218	uint16	L3 current harmonic 16	%	R	
1220	uint16	L3 current harmonic 17	%	R	
1222	uint16	L3 current harmonic 18	%	R	
1224	uint16	L3 current harmonic 19	%	R	
1226	float	L3 THDI	%	R	Total Harmonic Current Distortion
1230	float	L3 overcurrent factor	I_{eff}/I_{fu}	R	
1344	float	total cos phi	cos(phi)	R	$(0 \leq \cos\varphi < 1)$ system is inductive $(1 < \cos\varphi \leq 2)$ system is capacitive
1348	float	total voltage	V	R	
1352	float	total current	A	R	
1356	float	total active power	kW	R	
1360	float	total reactive power	kvar	R	
1364	float	total apparent power	kVA	R	
1392	float	total C-Stages power	kvar	R	
1396	float	available C-Stages Power	kvar	R	
1400	float	missing reactive power (Based on control setPoint)	kvar	R	
1404	float	C-Stages power load rate	%	R	
1408	float	calculated cos phi setpoint	cos(phi)	R	$(0 \leq \cos\varphi < 1)$ system is inductive $(1 < \cos\varphi \leq 2)$ system is capacitive
1424	uint32	voltage sag count L1	events	R	

Address	Format	Identifier	Unit	RW	Description
1428	uint32	voltage sag count L2	events	R	
1432	uint32	voltage sag count L3	events	R	
1536	uint16	relay status 01		R	0: Turned off 1: Turned on 3: Not connected 5: Disabled 6: Zero stage 7: Fixed stage
1538	uint16	relay status 02		R	
1540	uint16	relay status 03		R	
1542	uint16	relay status 04		R	
1544	uint16	relay status 05		R	
1546	uint16	relay status 06		R	
1548	uint16	relay status 07		R	
1550	uint16	relay status 08		R	
1552	uint16	relay status 09		R	
1554	uint16	relay status 10		R	
1556	uint16	relay status 11		R	
1558	uint16	relay status 12		R	
1600	uint32	switch count relay 01	operations	R	
1604	uint32	switch count relay 02	operations	R	
1608	uint32	switch count relay 03	operations	R	
1612	uint32	switch count relay 04	operations	R	
1616	uint32	switch count relay 05	operations	R	
1620	uint32	switch count relay 06	operations	R	
1624	uint32	switch count relay 07	operations	R	
1628	uint32	switch count relay 08	operations	R	
1632	uint32	switch count relay 09	operations	R	
1636	uint32	switch count relay 10	operations	R	
1640	uint32	switch count relay 11	operations	R	
1644	uint32	switch count relay 12	operations	R	
1792	float	reactive power relay bank 01	kvar	R	

Address	Format	Identifier	Unit	RW	Description
1796	float	reactive power relay bank 02	kvar	R	
1800	float	reactive power relay bank 03	kvar	R	
1804	float	reactive power relay bank 04	kvar	R	
1808	float	reactive power relay bank 05	kvar	R	
1812	float	reactive power relay bank 06	kvar	R	
1816	float	reactive power relay bank 07	kvar	R	
1820	float	reactive power relay bank 08	kvar	R	
1824	float	reactive power relay bank 09	kvar	R	
1828	float	reactive power relay bank 10	kvar	R	
1832	float	reactive power relay bank 11	kvar	R	
1836	float	reactive power relay bank 12	kvar	R	
1856	uint16	reactive power left percent relay bank 01	%	R	Percent of left stage power since stage identification. This value is used for zero stage determination.
1858	uint16	reactive power left percent relay bank 02	%	R	
1860	uint16	reactive power left percent relay bank 03	%	R	
1862	uint16	reactive power left percent relay bank 04	%	R	
1864	uint16	reactive power left percent relay bank 05	%	R	
1866	uint16	reactive power left percent relay bank 06	%	R	
1868	uint16	reactive power left percent relay bank 07	%	R	
1870	uint16	reactive power left percent relay bank 08	%	R	
1872	uint16	reactive power left percent relay bank 09	%	R	
1874	uint16	reactive power left percent relay bank 10	%	R	
1876	uint16	reactive power left percent relay bank 11	%	R	
1878	uint16	reactive power left percent relay bank 12	%	R	

Address	Format	Identifier	Unit	RW	Description
2048	uint16	active control preset (1-5)		RW	0 = profil 1 1= profil 1 ... 4= profil 5 Range: $1 \leq x \leq 5$ Resolution: 1 Multiplier: 1
2054	uint16	Modbus lock status		R	If value is zero, write access is unlocked. Any value different from zero indicates a locked Modbus write access.
2056	uint16	save changes EEPROM		RW	Writing a nonzero value to this register flushes the written changes to the EEPROM, making them permanent. Range: $1 \leq x \leq 1$ Resolution: 1 Multiplier: 1
2058	uint16	EEPROM busy		R	A non-zero value indicates a still running write process. It is recommended to wait for the write process to complete before reading/writing any register.
2304	uint32	alarm register		R	Bit 0: Undervoltage (any phase) Bit 1: Undercurrent (any phase) Bit 2: THDI (controlled phase) Bit 5: cos(phi) (controlled phase) Bit 6: Zero stage (any stage) Bit 7: Stage counter (any stage) Bit 8: Impossible
2308	uint32	alarm details zero stage		R	Bit 0: Zerostage 1 detected Bit 1: Zerostage 2 detected ... Bit 11 : Zerostage 12 detected

Address	Format	Identifier	Unit	RW	Description
2312	uint32	alarm details stagecounter		R	Bit 0: Stagecounter 1 reached Bit 1: Stagecounter 2 reached ... Bit 11 : Stagecounter 12 reached
2316	uint32	alarm details harmonic current		R	Bit 0: harmonic 1 detected Bit 1: harmonic 2 detected ... Bit 18 : harmonic 19 detected
2320	uint32	alarm details harmonic voltage		R	Bit 0: harmonic 1 detected Bit 1: harmonic 2 detected ... Bit 18 : harmonic 19 detected
2324	uint32	alarm details measured Data		R	Bit 0: Undervoltage (L1) Bit 1: Undercurrent (L1) Bit 2: THDI (L1) Bit 3: Underfrequency detected (L1) Bit 4: Overfrequency detected (L1) Bit 5: Overcurrent detected (L1) Bit 10: Undervoltage (L2) Bit 11: Undercurrent (L2) Bit 12: THDI (L2) Bit 13: Underfrequency detected (L2) Bit 14: Overfrequency detected (L2) Bit 15: Overcurrent detected (L2) Bit 20: Undervoltage (L3) Bit 21: Undercurrent (L3) Bit 22: THDI (L3) Bit 23: Underfrequency detected (L3) Bit 24: Overfrequency detected (L3) Bit 25: Overcurrent detected (L3)
2384	uint16	Software Version Major		R	
2386	uint16	Software Version Minor		R	
2388	uint32	Software Version Revision		R	First 32 Bit of git commit hash

Address	Format	Identifier	Unit	RW	Description
2392	uint32	Hardware Serial Number		R	
2396	uint32	Hardware Relay Voltage		R	
2400	uint32	Hardware Date Code		R	
2404	uint16	Hardware Phase Count		R	
2406	uint16	Hardware Stage Count		R	
2560	float	Profile 1 cos phi target	cos(phi)	RW	Range: $0.8 \leq x \leq 1.1$ Resolution: 0.01 Multiplier: 1
2564	float	Profile 1 Limitation T		RW	T = -2.5 means OFF Range: $-7.5 \leq x \leq 2$ Resolution: 0.5 Multiplier: 1
2568	float	Profile 1 Parallel Shift PS		RW	Range: $-2 \leq x \leq 5$ Resolution: 0.5 Multiplier: 1
2572	float	Profile 1 Switching delay time	s	RW	Range: $5 \leq x \leq 500$ Resolution: 1 Multiplier: 1
2576	uint16	Profile 1 controlled Phase		RW	0: L1 1: L2 2: L3 Range: $1 \leq x \leq 3$ Resolution: 1 Multiplier: 1
2578	float	Profile 2 cos phi target	cos(phi)	RW	Range: $0.8 \leq x \leq 1.1$ Resolution: 0.01 Multiplier: 1
2582	float	Profile 2 Limitation T		RW	T = -2.5 means OFF Range: $-7.5 \leq x \leq 2$ Resolution: 0.5 Multiplier: 1

Address	Format	Identifier	Unit	RW	Description
2586	float	Profile 3 Parallel Shift		RW	Range: $-2 \leq x \leq 5$ Resolution: 0.5 Multiplier: 1
2590	float	Profile 4 Switching delay time	s	RW	Range: $5 \leq x \leq 500$ Resolution: 1 Multiplier: 1
2594	uint16	Profile 5 controlled Phase		RW	0: L1 1: L2 2: L3 Range: $1 \leq x \leq 3$ Resolution: 1 Multiplier: 1
2596	float	Profile 3 cos phi target		RW	Range: $0.8 \leq x \leq 1.1$ Resolution: 0.01 Multiplier: 1
2600	float	Profile 3 Limitation T		RW	T = -2.5 means OFF Range: $-7.5 \leq x \leq 2$ Resolution: 0.5 Multiplier: 1
2604	float	Profile 3 Parallel Shift		RW	Range: $-2 \leq x \leq 5$ Resolution: 0.5 Multiplier: 1
2608	float	Profile 3 Switching delay time	s	RW	Range: $5 \leq x \leq 500$ Resolution: 1 Multiplier: 1
2612	uint16	Profile 3 controlled Phase		RW	0: L1 1: L2 2: L3 Range: $1 \leq x \leq 3$ Resolution: 1 Multiplier: 1

Address	Format	Identifier	Unit	RW	Description
2614	float	Profile 4 cos phi target	cos(phi)	RW	Range: $0.8 \leq x \leq 1.1$ Resolution: 0.01 Multiplier: 1
2618	float	Profile 4 Limitation T		RW	T = -2.5 means OFF Range: $-7.5 \leq x \leq 2$ Resolution: 0.5 Multiplier: 1
2622	float	Profile 4 Parallel Shift		RW	Range: $-2 \leq x \leq 5$ Resolution: 0.5 Multiplier: 1
2626	float	Profile 4 Switching delay time	s	RW	Range: $5 \leq x \leq 500$ Resolution: 1 Multiplier: 1
2630	uint16	Profile 4 controlled Phase		RW	0: L1 1: L2 2: L3 Range: $1 \leq x \leq 3$ Resolution: 1 Multiplier: 1
2632	float	Profile 5 cos phi target	cos(phi)	RW	Range: $0.8 \leq x \leq 1.1$ Resolution: 0.01 Multiplier: 1
2636	float	Profile 5 Limitation T		RW	T = -2.5 means OFF Range: $-7.5 \leq x \leq 2$ Resolution: 0.5 Multiplier: 1
2640	float	Profile 5 Parallel Shift		RW	Range: $-2 \leq x \leq 5$ Resolution: 0.5 Multiplier: 1
2644	float	Profile 5 Switching delay time	s	RW	Range: $5 \leq x \leq 500$ Resolution: 1 Multiplier: 1

Address	Format	Identifier	Unit	RW	Description
2648	uint16	Profile 5 controlled Phase		RW	0: L1 1: L2 2: L3 Range: $1 \leq x \leq 3$ Resolution: 1 Multiplier: 1
2650	float	Profile active cos phi target	cos(phi)	RW	Range: $0.8 \leq x \leq 1.1$ Resolution: 0.01 Multiplier: 1
2654	float	Profile active Limitation T		RW	T = -2.5 means OFF Range: $-7.5 \leq x \leq 2$ Resolution: 0.5 Multiplier: 1
2658	float	Profile active Parallel Shift		RW	Range: $-2 \leq x \leq 5$ Resolution: 0.5 Multiplier: 1
2662	float	Profile active Switching delay time	s	RW	Range: $5 \leq x \leq 500$ Resolution: 1 Multiplier: 1
2666	uint16	Profile active controlled Phase		RW	0: L1 1: L2 2: L3 Range: $1 \leq x \leq 3$ Resolution: 1 Multiplier: 1
3840	float	THDI Trip Value	%	RW	Range: $5 \leq x \leq 500$ Resolution: 1 Multiplier: 1
3848	uint16	Uharmonic trip value 02	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100

Address	Format	Identifier	Unit	RW	Description
3850	uint16	Uharmonic trip value 03	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3852	uint16	Uharmonic trip value 04	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3854	uint16	Uharmonic trip value 05	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3856	uint16	Uharmonic trip value 06	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3858	uint16	Uharmonic trip value 07	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3860	uint16	Uharmonic trip value 08	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3862	uint16	Uharmonic trip value 09	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3864	uint16	Uharmonic trip value 10	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3866	uint16	Uharmonic trip value 11	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3868	uint16	Uharmonic trip value 12	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3870	uint16	Uharmonic trip value 13	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100

Address	Format	Identifier	Unit	RW	Description
3872	uint16	Uharmonic trip value 14	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3874	uint16	Uharmonic trip value 15	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3876	uint16	Uharmonic trip value 16	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3878	uint16	Uharmonic trip value 17	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3880	uint16	Uharmonic trip value 18	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3882	uint16	Uharmonic trip value 19	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3952	uint16	Iharmonic trip value 02	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3954	uint16	Iharmonic trip value 03	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3956	uint16	Iharmonic trip value 04	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3958	uint16	Iharmonic trip value 05	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3960	uint16	Iharmonic trip value 06	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100

Address	Format	Identifier	Unit	RW	Description
3962	uint16	Iharmonic trip value 07	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3964	uint16	Iharmonic trip value 08	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3966	uint16	Iharmonic trip value 09	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3968	uint16	Iharmonic trip value 10	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3970	uint16	Iharmonic trip value 11	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3972	uint16	Iharmonic trip value 12	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3974	uint16	Iharmonic trip value 13	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3976	uint16	Iharmonic trip value 14	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3978	uint16	Iharmonic trip value 15	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3980	uint16	Iharmonic trip value 16	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3982	uint16	Iharmonic trip value 17	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100

Address	Format	Identifier	Unit	RW	Description
3984	uint16	Iharmonic trip value 18	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3986	uint16	Iharmonic trip value 19	%	RW	Range: $0 \leq x \leq 10000$ Resolution: 1 Multiplier: 100
3988	uint16	overcurrent factor trip value	I_{eff}/I_{fu}	RW	Range: $100 \leq x \leq 200$ Resolution: 1 Multiplier: 100
3990	uint16	blackout voltage percent of nominal voltage	%	RW	Range: $50 \leq x \leq 93$ Resolution: 1 Multiplier: 1
3992	uint16	voltage blackout no of quarter periods		RW	Range: $1 \leq x \leq 4$ Resolution: 1 Multiplier: 1
3994	uint16	voltage sag phase		RW	0: L1 1: L2 2: L3 Range: $0 \leq x \leq 2$ Resolution: 1 Multiplier: 1
4096	uint16	automatic c/k identification		R	
4098	uint16	c/k value	mA	R	
4100	uint16	switching sequence value relay 01		R	
4102	uint16	switching sequence value relay 02		R	
4104	uint16	switching sequence value relay 03		R	
4106	uint16	switching sequence value relay 04		R	
4108	uint16	switching sequence value relay 05		R	
4110	uint16	switching sequence value relay 06		R	
4112	uint16	switching sequence value relay 07		R	
4114	uint16	switching sequence value relay 08		R	
4116	uint16	switching sequence value relay 09		R	
4118	uint16	switching sequence value relay 10		R	

Address	Format	Identifier	Unit	RW	Description
4120	uint16	switching sequence value relay 11		R	
4122	uint16	switching sequence value relay 12		R	
4192	uint16	determination of fixed stages	fix Stage	R	0: Fix stage 1: Stage 1 is a fixed stage 2: Stage 1 and stage 2 are fixed stages 3: Stages 1, 2 and 3 are fixed stages , ...
4194	uint16	number of contactors used	Stages	R	
4196	uint16	automatic identification of voltage and current source		R	
4198	uint16	enter or read mode of connection		R	
4200	uint16	discharge time	s	R	
4202	uint16	setting cyclic/non-cyclic switching rotation		R	
4204	uint16	threshold for number of switching alarm	operations	R	
4206	uint16	current transformer ratio		RW	Range: $1 \leq x \leq 6000$ Resolution: 1 Multiplier: 1
4212	uint16	voltage transformer ratio		RW	Range: $1 \leq x \leq 300$ Resolution: 1 Multiplier: 1
4218	uint16	cos phi alarm tripping signal		R	
4220	uint16	language		R	
4222	uint16	choke factor	%	R	
4224	uint16	zero Stage detection limit	%	R	
4226	uint16	nominal voltage	V	R	
8192	uint16	Temp-IO config: PT Sensor active/inactive		R	
8194	uint16	Temp-IO config: NTC 1 Sensor active/inactive		R	
8196	uint16	Temp-IO config: NTC 2 Sensor active/inactive		R	

Address	Format	Identifier	Unit	RW	Description
8198	uint16	Temp-IO config: I/O configuration		R	0: Input 1: Output 2: Unconfigured Bit 0-1: I/O 1 Bit 2-3: I/O 2 Bit 4-5: I/O 3 Bit 6-7: I/O 4 Bit 8-9: I/O 5 Bit 10-12: Profile switching pin (0 means deactivated)
8200	uint16	Temp-IO config: temperature unit		R	0: °C 1: °F 2: Kelvin
8202	uint16	Temp-IO config: PT Sensor alarm threshold	K/ °C/ °F	R	
8204	uint16	Temp-IO config: NTC 1 Sensor alarm threshold	K/ °C/ °F	R	
8206	uint16	Temp-IO config: NTC 2 Sensor alarm threshold	K/ °C/ °F	R	
12288	uint16	Temp-IO I/O IO Status		R	0: OFF 1: ON Bit 0: IO1 Bit 1: IO2 Bit 2: IO3 Bit 3: IO4 Bit 4: IO5
12290	uint16	Temp-IO PT Sensor Detection		R	0: PT 1000 1: PT 100 2: No Sensor detected
12292	uint16	Temp-IO temperature PT	°C	R	Special values: 32765: inactive 32766: no Sensor 32767: out of range Multiplier: 0.1
12294	uint16	Temp-IO temperature PT	°F	R	
12296	uint16	Temp-IO temperature PT	K	R	

Address	Format	Identifier	Unit	RW	Description
12298	uint16	Temp-IO temperature NTC 1	°C	R	
12300	uint16	Temp-IO temperature NTC 1	°F	R	
12302	uint16	Temp-IO temperature NTC 1	K	R	
12304	uint16	Temp-IO temperature NTC 2	°C	R	
12306	uint16	Temp-IO temperature NTC 2	°F	R	
12308	uint16	Temp-IO temperature NTC 2	K	R	