PW8001

HIOKI

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Modbus/TCP Communications
Instruction Manual

POWER ANALYZER

EN

Oct. 2024 Revised edition 1
PW8001A968-01

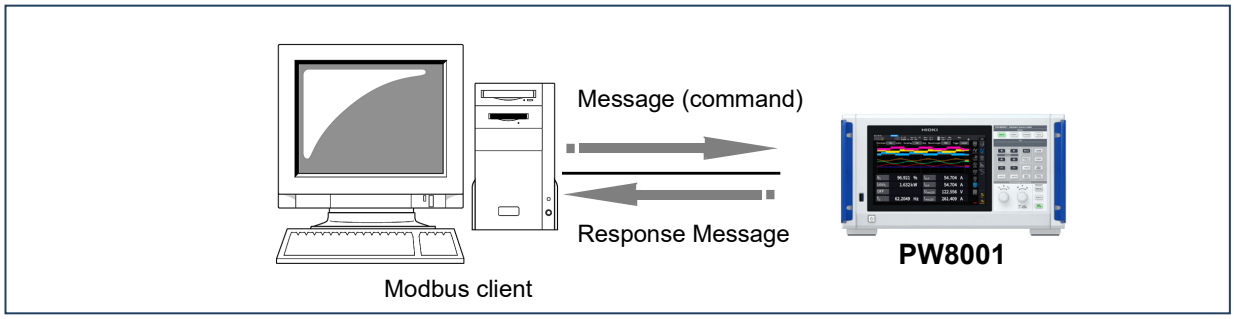
- ✓ This instruction manual explains only the Modbus/TCP communication.
- ✓ Before using PW8001, be sure to read the instruction manual of PW8001.
- ✓ For details regarding the PW8001 communication settings, please refer to “9 Connecting the Instrument to a PC” in the PW8001 Instruction Manual.
- ✓ Although all reasonable care has been taken in the production of this instruction manual, should you find any points which are unclear or in error, please contact your local distributor or the HIOKI International Sales Department.

Contents

1 Modbus/TCP Communication

1.1 Function Overview

In this manual, PW8001 is represented as the instrument.
This instrument functions as a Modbus/TCP server. You can control the instrument and acquire measurement data by sending messages from a Modbus client instrument to this instrument.



The instrument uses **TCP/IP port 502** as a listening port for the Modbus/TCP communication.
In addition, **the unit ID (server address)** for the Modbus/TCP server of this instrument is **1**. Any messages with a unit ID other than this value cannot be accepted.

1.2 Function Code

The function codes supported by the instrument are as follows.

Code No.	Functions	Description
0x03	Reading the holding register	Reads up to 125 sets of data continuously from the holding register.
0x04	Reading the input register	Reads up to 125 sets of data continuously from the input register.
0x06	Writing to the holding register	Writes data to one holding register.

1.3 Specifying a Register

You can specify a register from the Modbus client instrument as follows.

1.3.1 When using a commercially available SCADA system, etc.

Specify the Ref No. (reference number) listed in “3.1 Register Map” and “4.1 Register Map”.
Example: Specify Ref No. “30021” to acquire Urms1 Float lower 2 bytes “Input register:0020”.

1.3.2 When using a communication program created by the customer

Specify the Hex No. (relative number) listed in 3.1 Register Map” or “4.1 Register Map”.
Example: Specify Hex No. “0014” to acquire Urms1 Float lower 2 bytes “Input register:0020”.

2 Register

2.1 Register Overview

In this instrument, measurement data and settings data are assigned to the internal register for Modbus/TCP.

When the client instrument sends messages to the instrument via Modbus/TCP communication and the internal register of the instrument is read and written, measurement data can be acquired, integration can be started, etc.

2.2 Register Configuration (Overall Configuration)

	Register No.	Category		Description
Input register	0000 to 0019	Status		Status of each channel
	0020 to 0845	Basic measurement items	Power measurement items	Measurement data, such as voltage, current, and power
	1000 to 1205		Integration measurement items	Data regarding integration measurement
	2000 to 2087		Frequency and calculation measurement items	Frequency measurement data and user-defined formula (UDF) data
	3000 to 3047		Motor analysis measurement items	Motor analysis measurement data
	3500 to 3643		Flicker measurement items	IEC Flicker measurement data
	4000 to 4239	Harmonic measurement items		Harmonic measurement data
	4500 to 4563	Inter-harmonic measurement items		Inter-harmonic measurement data
	5000 to 5247	CUSTOM screen items		Measurement data linked to the CUSTOM screen display
	6000 to 7999	Optional output items		Measurement data specified using communication commands
	8000 to 8039	Measurement range setting items		Measurement range information
	10000 to 10019	[Secondary instrument] Status		Status of each channel
	10020 to 10845	[Secondary instrument] Basic measurement items	Power measurement items	Measurement data, such as voltage, current, and power
	11000 to 11205		Integration measurement items	Data regarding integration measurement
	12000 to 12087		Frequency and calculation	Frequency measurement data and user-defined formula

			measurement items	(UDF) data
	13000 to 13047		Motor analysis measurement items	Motor analysis measurement data
	14000 to 14239	[Secondary instrument] Harmonic measurement items		Harmonic measurement data
	18000 to 18039	[Secondary instrument] Measurement range setting items		Measurement range information
Holding register	0000 to 0007	Instrument control		Register value hold, integration control, etc.
Others		Prohibited area		Reading and writing are not supported.

Note
[Secondary instrument] is valid only when synchronous measurements are made using the optical link interface.
The register number is the primary device's register number plus 10000.

2.2.1 Input register non-assigned area

Any area with input register numbers skipped (register No. 0846 to 999, etc.) is an area to which data is not assigned. This area can be read with a Modbus message; however, the value is all NAN (0x7FC00000). Access to the address beyond the suffix of the input register (register No. 8040) generates an error.

3 Input Register

3.1 Register Map

3.1.1 Status

Reg No.	Ref No.	Hex No.	Register name	Register description	
0000	30001	0000	Status	Status	uint32 lower 2 bytes
0001	30002	0001			uint32 upper 2 bytes
0002	30003	0002	StatusCH1	CH1 status	uint32 lower 2 bytes
0003	30004	0003			uint32 upper 2 bytes
0004	30005	0004	StatusCH2	CH2 status	uint32 lower 2 bytes
0005	30006	0005			uint32 upper 2 bytes
0006	30007	0006	StatusCH3	CH3 status	uint32 lower 2 bytes
0007	30008	0007			uint32 upper 2 bytes
0008	30009	0008	StatusCH4	CH4 status	uint32 lower 2 bytes
0009	30010	0009			uint32 upper 2 bytes
0010	30011	000A	StatusCH5	CH5 status	uint32 lower 2 bytes
0011	30012	000B			uint32 upper 2 bytes
0012	30013	000C	StatusCH6	CH6 status	uint32 lower 2 bytes
0013	30014	000D			uint32 upper 2 bytes
0014	30015	000E	StatusCH7	CH7 status	uint32 lower 2 bytes
0015	30016	000F			uint32 upper 2 bytes
0016	30017	0010	StatusCH8	CH8 status	uint32 lower 2 bytes
0017	30018	0011			uint32 upper 2 bytes
0018	30019	0012	StatusMotor	Motor channel status	uint32 lower 2 bytes
0019	30020	0013			uint32 upper 2 bytes

3.1.2 Power measurement items

Reg No.	Ref No.	Hex No.	Register name	Register description	
0020	30021	0014	Urms1	CH1 voltage RMS value	Float lower 2 bytes
0021	30022	0015			Float upper 2 bytes
0022	30023	0016	Urms2	CH2 voltage RMS value	Float lower 2 bytes
0023	30024	0017			Float upper 2 bytes
0024	30025	0018	Urms3	CH3 voltage RMS value	Float lower 2 bytes
0025	30026	0019			Float upper 2 bytes
0026	30027	001A	Urms4	CH4 voltage RMS value	Float lower 2 bytes
0027	30028	001B			Float upper 2 bytes
0028	30029	001C	Urms5	CH5 voltage RMS value	Float lower 2 bytes
0029	30030	001D			Float upper 2 bytes
0030	30031	001E	Urms6	CH6 voltage RMS value	Float lower 2 bytes
0031	30032	001F			Float upper 2 bytes
0032	30033	0020	Urms7	CH7 voltage RMS value	Float lower 2 bytes
0033	30034	0021			Float upper 2 bytes
0034	30035	0022	Urms8	CH8 voltage RMS value	Float lower 2 bytes
0035	30036	0023			Float upper 2 bytes
0036	30037	0024	Urms12	CH12 voltage RMS value	Float lower 2 bytes
0037	30038	0025			Float upper 2 bytes
0038	30039	0026	Urms23	CH23 voltage RMS value	Float lower 2 bytes
0039	30040	0027			Float upper 2 bytes
0040	30041	0028	Urms34	CH34 voltage RMS value	Float lower 2 bytes
0041	30042	0029			Float upper 2 bytes
0042	30043	002A	Urms45	CH45 voltage RMS value	Float lower 2 bytes
0043	30044	002B			Float upper 2 bytes
0044	30045	002C	Urms56	CH56 voltage RMS value	Float lower 2 bytes
0045	30046	002D			Float upper 2 bytes
0046	30047	002E	Urms67	CH67 voltage RMS value	Float lower 2 bytes
0047	30048	002F			Float upper 2 bytes
0048	30049	0030	Urms78	CH78 voltage RMS value	Float lower 2 bytes
0049	30050	0031			Float upper 2 bytes
0050	30051	0032	Urms123	CH123 voltage RMS value	Float lower 2 bytes
0051	30052	0033			Float upper 2 bytes
0052	30053	0034	Urms234	CH234 voltage RMS value	Float lower 2 bytes
0053	30054	0035			Float upper 2 bytes
0054	30055	0036	Urms345	CH345 voltage RMS value	Float lower 2 bytes
0055	30056	0037			Float upper 2 bytes
0056	30057	0038	Urms456	CH456 voltage RMS value	Float lower 2 bytes
0057	30058	0039			Float upper 2 bytes
0058	30059	003A	Urms567	CH567 voltage RMS value	Float lower 2 bytes
0059	30060	003B			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0060	30061	003C	Urms678	CH678 voltage RMS value	Float lower 2 bytes
0061	30062	003D			Float upper 2 bytes
0062	30063	003E	Umn1	CH1 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0063	30064	003F			Float upper 2 bytes
0064	30065	0040	Umn2	CH2 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0065	30066	0041			Float upper 2 bytes
0066	30067	0042	Umn3	CH3 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0067	30068	0043			Float upper 2 bytes
0068	30069	0044	Umn4	CH4 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0069	30070	0045			Float upper 2 bytes
0070	30071	0046	Umn5	CH5 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0071	30072	0047			Float upper 2 bytes
0072	30073	0048	Umn6	CH6 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0073	30074	0049			Float upper 2 bytes
0074	30075	004A	Umn7	CH7 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0075	30076	004B			Float upper 2 bytes
0076	30077	004C	Umn8	CH8 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0077	30078	004D			Float upper 2 bytes
0078	30079	004E	Umn12	CH12 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0079	30080	004F			Float upper 2 bytes
0080	30081	0050	Umn23	CH23 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0081	30082	0051			Float upper 2 bytes
0082	30083	0052	Umn34	CH34 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0083	30084	0053			Float upper 2 bytes
0084	30085	0054	Umn45	CH45 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0085	30086	0055			Float upper 2 bytes
0086	30087	0056	Umn56	CH56 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0087	30088	0057			Float upper 2 bytes
0088	30089	0058	Umn67	CH67 voltage mean value	Float lower 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0089	30090	0059		rectification RMS value equivalent	Float upper 2 bytes
0090	30091	005A	Umn78	CH78 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0091	30092	005B			Float upper 2 bytes
0092	30093	005C	Umn123	CH123 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0093	30094	005D			Float upper 2 bytes
0094	30095	005E	Umn234	CH234 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0095	30096	005F			Float upper 2 bytes
0096	30097	0060	Umn345	CH345 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0097	30098	0061			Float upper 2 bytes
0098	30099	0062	Umn456	CH456 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0199	30100	0063			Float upper 2 bytes
0100	30101	0064	Umn567	CH567 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0101	30102	0065			Float upper 2 bytes
0102	30103	0066	Umn678	CH678 voltage mean value rectification RMS value equivalent	Float lower 2 bytes
0103	30104	0067			Float upper 2 bytes
0104	30105	0068	Uac1	CH1 voltage AC component	Float lower 2 bytes
0105	30106	0069			Float upper 2 bytes
0106	30107	006A	Uac2	CH2 voltage AC component	Float lower 2 bytes
0107	30108	006B			Float upper 2 bytes
0108	30109	006C	Uac3	CH3 voltage AC component	Float lower 2 bytes
0109	30110	006D			Float upper 2 bytes
0110	30111	006E	Uac4	CH4 voltage AC component	Float lower 2 bytes
0111	30112	006F			Float upper 2 bytes
0112	30113	0070	Uac5	CH5 voltage AC component	Float lower 2 bytes
0113	30114	0071			Float upper 2 bytes
0114	30115	0072	Uac6	CH6 voltage AC component	Float lower 2 bytes
0115	30116	0073			Float upper 2 bytes
0116	30117	0074	Uac7	CH7 voltage AC component	Float lower 2 bytes
0117	30118	0075			Float upper 2 bytes
0118	30119	0076	Uac8	CH8 voltage AC component	Float lower 2 bytes
0119	30120	0077			Float upper 2 bytes
0120	30121	0078	Udc1	CH1 voltage simple average	Float lower 2 bytes
0121	30122	0079			Float upper 2 bytes
0122	30123	007A	Udc2	CH2 voltage simple	Float lower 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0123	30124	007B		average	Float upper 2 bytes
0124	30125	007C	Udc3	CH3 voltage simple	Float lower 2 bytes
0125	30126	007D		average	Float upper 2 bytes
0126	30127	007E	Udc4	CH4 voltage simple	Float lower 2 bytes
0127	30128	007F		average	Float upper 2 bytes
0128	30129	0080	Udc5	CH5 voltage simple	Float lower 2 bytes
0129	30130	0081		average	Float upper 2 bytes
0130	30131	0082	Udc6	CH6 voltage simple	Float lower 2 bytes
0131	30132	0083		average	Float upper 2 bytes
0132	30133	0084	Udc7	CH7 voltage simple	Float lower 2 bytes
0133	30134	0085		average	Float upper 2 bytes
0134	30135	0086	Udc8	CH8 voltage simple	Float lower 2 bytes
0135	30136	0087		average	Float upper 2 bytes
0136	30137	0088	Ufnd1	CH1 voltage fundamental	Float lower 2 bytes
0137	30138	0089		wave component	Float upper 2 bytes
0138	30139	008A	Ufnd2	CH2 voltage fundamental	Float lower 2 bytes
0139	30140	008B		wave component	Float upper 2 bytes
0140	30141	008C	Ufnd3	CH3 voltage fundamental	Float lower 2 bytes
0141	30142	008D		wave component	Float upper 2 bytes
0142	30143	008E	Ufnd4	CH4 voltage fundamental	Float lower 2 bytes
0143	30144	008F		wave component	Float upper 2 bytes
0144	30145	0090	Ufnd5	CH5 voltage fundamental	Float lower 2 bytes
0145	30146	0091		wave component	Float upper 2 bytes
0146	30147	0092	Ufnd6	CH6 voltage fundamental	Float lower 2 bytes
0147	30148	0093		wave component	Float upper 2 bytes
0148	30149	0094	Ufnd7	CH7 voltage fundamental	Float lower 2 bytes
0149	30150	0095		wave component	Float upper 2 bytes
0150	30151	0096	Ufnd8	CH8 voltage fundamental	Float lower 2 bytes
0151	30152	0097		wave component	Float upper 2 bytes
0152	30153	0098	Upk1+	CH1 voltage waveform	Float lower 2 bytes
0153	30154	0099		peak (+)	Float upper 2 bytes
0154	30155	009A	Upk2+	CH2 voltage waveform	Float lower 2 bytes
0155	30156	009B		peak (+)	Float upper 2 bytes
0156	30157	009C	Upk3+	CH3 voltage waveform	Float lower 2 bytes
0157	30158	009D		peak (+)	Float upper 2 bytes
0158	30159	009E	Upk4+	CH4 voltage waveform	Float lower 2 bytes
0159	30160	009F		peak (+)	Float upper 2 bytes
0160	30161	00A0	Upk5+	CH5 voltage waveform	Float lower 2 bytes
0161	30162	00A1		peak (+)	Float upper 2 bytes
0162	30163	00A2	Upk6+	CH6 voltage waveform	Float lower 2 bytes
0163	30164	00A3		peak (+)	Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0164	30165	00A4	Upk7+	CH7 voltage waveform	Float lower 2 bytes
0165	30166	00A5		peak (+)	Float upper 2 bytes
0166	30167	00A6	Upk8+	CH8 voltage waveform	Float lower 2 bytes
0167	30168	00A7		peak (+)	Float upper 2 bytes
0168	30169	00A8	Upk1−	CH1 voltage waveform	Float lower 2 bytes
0169	30170	00A9		peak (−)	Float upper 2 bytes
0170	30171	00AA	Upk2−	CH2 voltage waveform	Float lower 2 bytes
0171	30172	00AB		peak (−)	Float upper 2 bytes
0172	30173	00AC	Upk3−	CH3 voltage waveform	Float lower 2 bytes
0173	30174	00AD		peak (−)	Float upper 2 bytes
0174	30175	00AE	Upk4−	CH4 voltage waveform	Float lower 2 bytes
0175	30176	00AF		peak (−)	Float upper 2 bytes
0176	30177	00B0	Upk5−	CH5 voltage waveform	Float lower 2 bytes
0177	30178	00B1		peak (−)	Float upper 2 bytes
0178	30179	00B2	Upk6−	CH6 voltage waveform	Float lower 2 bytes
0179	30180	00B3		peak (−)	Float upper 2 bytes
0180	30181	00B4	Upk7−	CH7 voltage waveform	Float lower 2 bytes
0181	30182	00B5		peak (−)	Float upper 2 bytes
0182	30183	00B6	Upk8−	CH8 voltage waveform	Float lower 2 bytes
0183	30184	00B7		peak (−)	Float upper 2 bytes
0184	30185	00B8	Uthd1	CH1 total harmonic	Float lower 2 bytes
0185	30186	00B9		voltage distortion	Float upper 2 bytes
0186	30187	00BA	Uthd2	CH2 total harmonic	Float lower 2 bytes
0187	30188	00BB		voltage distortion	Float upper 2 bytes
0188	30189	00BC	Uthd3	CH3 total harmonic	Float lower 2 bytes
0189	30190	00BD		voltage distortion	Float upper 2 bytes
0190	30191	00BE	Uthd4	CH4 total harmonic	Float lower 2 bytes
0191	30192	00BF		voltage distortion	Float upper 2 bytes
0192	30193	00C0	Uthd5	CH5 total harmonic	Float lower 2 bytes
0193	30194	00C1		voltage distortion	Float upper 2 bytes
0194	30195	00C2	Uthd6	CH6 total harmonic	Float lower 2 bytes
0195	30196	00C3		voltage distortion	Float upper 2 bytes
0196	30197	00C4	Uthd7	CH7 total harmonic	Float lower 2 bytes
0197	30198	00C5		voltage distortion	Float upper 2 bytes
0198	30199	00C6	Uthd8	CH8 total harmonic	Float lower 2 bytes
0199	30200	00C7		voltage distortion	Float upper 2 bytes
0200	30201	00C8	Urf1	CH1 voltage ripple factor	Float lower 2 bytes
0201	30202	00C9			Float upper 2 bytes
0202	30203	00CA	Urf2	CH2 voltage ripple factor	Float lower 2 bytes
0203	30204	00CB			Float upper 2 bytes
0204	30205	00CC	Urf3	CH3 voltage ripple factor	Float lower 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0205	30206	00CD			Float upper 2 bytes
0206	30207	00CE	Urf4	CH4 voltage ripple factor	Float lower 2 bytes
0207	30208	00CF			Float upper 2 bytes
0208	30209	00D0	Urf5	CH5 voltage ripple factor	Float lower 2 bytes
0209	30210	00D1			Float upper 2 bytes
0210	30211	00D2	Urf6	CH6 voltage ripple factor	Float lower 2 bytes
0211	30212	00D3			Float upper 2 bytes
0212	30213	00D4	Urf7	CH7 voltage ripple factor	Float lower 2 bytes
0213	30214	00D5			Float upper 2 bytes
0214	30215	00D6	Urf8	CH8 voltage ripple factor	Float lower 2 bytes
0215	30216	00D7			Float upper 2 bytes
0216	30217	00D8	Uunb123	CH123 voltage unbalance rate	Float lower 2 bytes
0217	30218	00D9			Float upper 2 bytes
0218	30219	00DA	Uunb234	CH234 voltage unbalance rate	Float lower 2 bytes
0219	30220	00DB			Float upper 2 bytes
0220	30221	00DC	Uunb345	CH345 voltage unbalance rate	Float lower 2 bytes
0221	30222	00DD			Float upper 2 bytes
0222	30223	00DE	Uunb456	CH456 voltage unbalance rate	Float lower 2 bytes
0223	30224	00DF			Float upper 2 bytes
0224	30225	00E0	Uunb567	CH567 voltage unbalance rate	Float lower 2 bytes
0225	30226	00E1			Float upper 2 bytes
0226	30227	00E2	Uunb678	CH678 voltage unbalance rate	Float lower 2 bytes
0227	30228	00E3			Float upper 2 bytes
0228	30229	00E4	Irms1	CH1 current RMS value	Float lower 2 bytes
0229	30230	00E5			Float upper 2 bytes
0230	30231	00E6	Irms2	CH2 current RMS value	Float lower 2 bytes
0231	30232	00E7			Float upper 2 bytes
0232	30233	00E8	Irms3	CH3 current RMS value	Float lower 2 bytes
0233	30234	00E9			Float upper 2 bytes
0234	30235	00EA	Irms4	CH4 current RMS value	Float lower 2 bytes
0235	30236	00EB			Float upper 2 bytes
0236	30237	00EC	Irms5	CH5 current RMS value	Float lower 2 bytes
0237	30238	00ED			Float upper 2 bytes
0238	30239	00EE	Irms6	CH6 current RMS value	Float lower 2 bytes
0239	30240	00EF			Float upper 2 bytes
0240	30241	00F0	Irms7	CH7 current RMS value	Float lower 2 bytes
0241	30242	00F1			Float upper 2 bytes
0242	30243	00F2	Irms8	CH8 current RMS value	Float lower 2 bytes
0243	30244	00F3			Float upper 2 bytes
0244	30245	00F4	Irms12	CH12 current RMS value	Float lower 2 bytes
0245	30246	00F5			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0246	30247	00F6	Irms23	CH23 current RMS value	Float lower 2 bytes
0247	30248	00F7			Float upper 2 bytes
0248	30249	00F8	Irms34	CH34 current RMS value	Float lower 2 bytes
0249	30250	00F9			Float upper 2 bytes
0250	30251	00FA	Irms45	CH45 current RMS value	Float lower 2 bytes
0251	30252	00FB			Float upper 2 bytes
0252	30253	00FC	Irms56	CH56 current RMS value	Float lower 2 bytes
0253	30254	00FD			Float upper 2 bytes
0254	30255	00FE	Irms67	CH67 current RMS value	Float lower 2 bytes
0255	30256	00FF			Float upper 2 bytes
0256	30257	0100	Irms78	CH78 current RMS value	Float lower 2 bytes
0257	30258	0101			Float upper 2 bytes
0258	30259	0102	Irms123	CH123 current RMS value	Float lower 2 bytes
0259	30260	0103			Float upper 2 bytes
0260	30261	0104	Irms234	CH234 current RMS value	Float lower 2 bytes
0261	30262	0105			Float upper 2 bytes
0262	30263	0106	Irms345	CH345 current RMS value	Float lower 2 bytes
0263	30264	0107			Float upper 2 bytes
0264	30265	0108	Irms456	CH456 current RMS value	Float lower 2 bytes
0265	30266	0109			Float upper 2 bytes
0266	30267	010A	Irms567	CH567 current RMS value	Float lower 2 bytes
0267	30268	010B			Float upper 2 bytes
0268	30269	010C	Irms678	CH678 current RMS value	Float lower 2 bytes
0269	30270	010D			Float upper 2 bytes
0270	30271	010E	Imn1	CH1 current mean value rectification RMS value equivalent	Float lower 2 bytes
0271	30272	010F			Float upper 2 bytes
0272	30273	0110	Imn2	CH2 current mean value rectification RMS value equivalent	Float lower 2 bytes
0273	30274	0111			Float upper 2 bytes
0274	30275	0112	Imn3	CH3 current mean value rectification RMS value equivalent	Float lower 2 bytes
0275	30276	0113			Float upper 2 bytes
0276	30277	0114	Imn4	CH4 current mean value rectification RMS value equivalent	Float lower 2 bytes
0277	30278	0115			Float upper 2 bytes
0278	30279	0116	Imn5	CH5 current mean value rectification RMS value equivalent	Float lower 2 bytes
0279	30280	0117			Float upper 2 bytes
0280	30281	0118	Imn6	CH6 current mean value rectification RMS value equivalent	Float lower 2 bytes
0281	30282	0119			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0282	30283	011A	Imn7	CH7 current mean value rectification RMS value equivalent	Float lower 2 bytes
0283	30284	011B			Float upper 2 bytes
0284	30285	011C	Imn8	CH8 current mean value rectification RMS value equivalent	Float lower 2 bytes
0285	30286	011D			Float upper 2 bytes
0286	30287	011E	Imn12	CH12 current mean value rectification RMS value equivalent	Float lower 2 bytes
0287	30288	011F			Float upper 2 bytes
0288	30289	0120	Imn23	CH23 current mean value rectification RMS value equivalent	Float lower 2 bytes
0289	30290	0121			Float upper 2 bytes
0290	30291	0122	Imn34	CH34 current mean value rectification RMS value equivalent	Float lower 2 bytes
0291	30292	0123			Float upper 2 bytes
0292	30293	0124	Imn45	CH45 current mean value rectification RMS value equivalent	Float lower 2 bytes
0293	30294	0125			Float upper 2 bytes
0294	30295	0126	Imn56	CH56 current mean value rectification RMS value equivalent	Float lower 2 bytes
0295	30296	0127			Float upper 2 bytes
0296	30297	0128	Imn67	CH67 current mean value rectification RMS value equivalent	Float lower 2 bytes
0297	30298	0129			Float upper 2 bytes
0298	30299	012A	Imn78	CH78 current mean value rectification RMS value equivalent	Float lower 2 bytes
0299	30300	012B			Float upper 2 bytes
0300	30301	012C	Imn123	CH123 current mean value rectification RMS value equivalent	Float lower 2 bytes
0301	30302	012D			Float upper 2 bytes
0302	30303	012E	Imn234	CH234 current mean value rectification RMS value equivalent	Float lower 2 bytes
0303	30304	012F			Float upper 2 bytes
0304	30305	0130	Imn345	CH345 current mean value rectification RMS value equivalent	Float lower 2 bytes
0305	30306	0131			Float upper 2 bytes
0306	30307	0132	Imn456	CH456 current mean value rectification RMS value equivalent	Float lower 2 bytes
0307	30308	0133			Float upper 2 bytes
0308	30309	0134	Imn567	CH567 current mean value rectification RMS value equivalent	Float lower 2 bytes
0309	30310	0135			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0310	30311	0136	Imn678	CH678 current mean value rectification RMS value equivalent	Float lower 2 bytes
0311	30312	0137			Float upper 2 bytes
0312	30313	0138	Iac1	CH1 current AC component	Float lower 2 bytes
0313	30314	0139			Float upper 2 bytes
0314	30315	013A	Iac2	CH2 current AC component	Float lower 2 bytes
0315	30316	013B			Float upper 2 bytes
0316	30317	013C	Iac3	CH3 current AC component	Float lower 2 bytes
0317	30318	013D			Float upper 2 bytes
0318	30319	013E	Iac4	CH4 current AC component	Float lower 2 bytes
0319	30320	013F			Float upper 2 bytes
0320	30321	0140	Iac5	CH5 current AC component	Float lower 2 bytes
0321	30322	0141			Float upper 2 bytes
0322	30323	0142	Iac6	CH6 current AC component	Float lower 2 bytes
0323	30324	0143			Float upper 2 bytes
0324	30325	0144	Iac7	CH7current AC component	Float lower 2 bytes
0325	30326	0145			Float upper 2 bytes
0326	30327	0146	Iac8	CH8current AC component	Float lower 2 bytes
0327	30328	0147			Float upper 2 bytes
0328	30329	0148	Idc1	CH1 current simple average	Float lower 2 bytes
0329	30330	0149			Float upper 2 bytes
0330	30331	014A	Idc2	CH2 current simple average	Float lower 2 bytes
0331	30332	014B			Float upper 2 bytes
0332	30333	014C	Idc3	CH3 current simple average	Float lower 2 bytes
0333	30334	014D			Float upper 2 bytes
0334	30335	014E	Idc4	CH4 current simple average	Float lower 2 bytes
0335	30336	014F			Float upper 2 bytes
0336	30337	0150	Idc5	CH5 current simple average	Float lower 2 bytes
0337	30338	0151			Float upper 2 bytes
0338	30339	0152	Idc6	CH6 current simple average	Float lower 2 bytes
0339	30340	0153			Float upper 2 bytes
0340	30341	0154	Idc7	CH7 current simple average	Float lower 2 bytes
0341	30342	0155			Float upper 2 bytes
0342	30343	0156	Idc8	CH8 current simple average	Float lower 2 bytes
0343	30344	0157			Float upper 2 bytes
0344	30345	0158	Ifnd1	CH1 current fundamental wave component	Float lower 2 bytes
0345	30346	0159			Float upper 2 bytes
0346	30347	015A	Ifnd2	CH2 current fundamental wave component	Float lower 2 bytes
0347	30348	015B			Float upper 2 bytes
0348	30349	015C	Ifnd3	CH3 current fundamental wave component	Float lower 2 bytes
0349	30350	015D			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0350	30351	015E	Ifnd4	CH4 current fundamental wave component	Float lower 2 bytes
0351	30352	015F			Float upper 2 bytes
0352	30353	0160	Ifnd5	CH5 current fundamental wave component	Float lower 2 bytes
0353	30354	0161			Float upper 2 bytes
0354	30355	0162	Ifnd6	CH6 current fundamental wave component	Float lower 2 bytes
0355	30356	0163			Float upper 2 bytes
0356	30357	0164	Ifnd7	CH7 current fundamental wave component	Float lower 2 bytes
0357	30358	0165			Float upper 2 bytes
0358	30359	0166	Ifnd8	CH8 current fundamental wave component	Float lower 2 bytes
0359	30360	0167			Float upper 2 bytes
0360	30361	0168	Ipk1+	CH1 current waveform peak (+)	Float lower 2 bytes
0361	30362	0169			Float upper 2 bytes
0362	30363	016A	Ipk2+	CH2 current waveform peak (+)	Float lower 2 bytes
0363	30364	016B			Float upper 2 bytes
0364	30365	016C	Ipk3+	CH3 current waveform peak (+)	Float lower 2 bytes
0365	30366	016D			Float upper 2 bytes
0366	30367	016E	Ipk4+	CH4 current waveform peak (+)	Float lower 2 bytes
0367	30368	016F			Float upper 2 bytes
0368	30369	0170	Ipk5+	CH5 current waveform peak (+)	Float lower 2 bytes
0379	30370	0171			Float upper 2 bytes
0370	30371	0172	Ipk6+	CH6 current waveform peak (+)	Float lower 2 bytes
0371	30372	0173			Float upper 2 bytes
0372	30373	0174	Ipk7+	CH7 current waveform peak (+)	Float lower 2 bytes
0373	30374	0175			Float upper 2 bytes
0374	30375	0176	Ipk8+	CH8 current waveform peak (+)	Float lower 2 bytes
0375	30376	0177			Float upper 2 bytes
0376	30377	0178	Ipk1−	CH1 current waveform peak (−)	Float lower 2 bytes
0377	30378	0179			Float upper 2 bytes
0378	30379	017A	Ipk2−	CH2 current waveform peak (−)	Float lower 2 bytes
0379	30380	017B			Float upper 2 bytes
0380	30381	017C	Ipk3−	CH3 current waveform peak (−)	Float lower 2 bytes
0381	30382	017D			Float upper 2 bytes
0382	30383	017E	Ipk4−	CH4 current waveform peak (−)	Float lower 2 bytes
0383	30384	017F			Float upper 2 bytes
0384	30385	0180	Ipk5−	CH5 current waveform peak (−)	Float lower 2 bytes
0385	30386	0181			Float upper 2 bytes
0386	30387	0182	Ipk6−	CH6 current waveform peak (−)	Float lower 2 bytes
0387	30388	0183			Float upper 2 bytes
0388	30389	0184	Ipk7−	CH7 current waveform peak (−)	Float lower 2 bytes
0389	30390	0185			Float upper 2 bytes
0390	30391	0186	Ipk8−	CH8 current waveform	Float lower 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0391	30392	0187		peak (−)	Float upper 2 bytes
0392	30393	0188	Ithd1	CH1 total harmonic	Float lower 2 bytes
0393	30394	0189		current distortion	Float upper 2 bytes
0394	30395	018A	Ithd2	CH2 total harmonic	Float lower 2 bytes
0395	30396	018B		current distortion	Float upper 2 bytes
0396	30397	018C	Ithd3	CH3 total harmonic	Float lower 2 bytes
0397	30398	018D		current distortion	Float upper 2 bytes
0398	30399	018E	Ithd4	CH4 total harmonic	Float lower 2 bytes
0399	30400	018F		current distortion	Float upper 2 bytes
0400	30401	0190	Ithd5	CH5 total harmonic	Float lower 2 bytes
0401	30402	0191		current distortion	Float upper 2 bytes
0402	30403	0192	Ithd6	CH6 total harmonic	Float lower 2 bytes
0403	30404	0193		current distortion	Float upper 2 bytes
0404	30405	0194	Ithd7	CH7 total harmonic	Float lower 2 bytes
0405	30406	0195		current distortion	Float upper 2 bytes
0406	30407	0196	Ithd8	CH8 total harmonic	Float lower 2 bytes
0407	30408	0197		current distortion	Float upper 2 bytes
0408	30409	0198	Irf1	CH1 current ripple factor	Float lower 2 bytes
0409	30410	0199			Float upper 2 bytes
0410	30411	019A	Irf2	CH2 current ripple factor	Float lower 2 bytes
0411	30412	019B			Float upper 2 bytes
0412	30413	019C	Irf3	CH3 current ripple factor	Float lower 2 bytes
0413	30414	019D			Float upper 2 bytes
0414	30415	019E	Irf4	CH4 current ripple factor	Float lower 2 bytes
0415	30416	019F			Float upper 2 bytes
0416	30417	01A0	Irf5	CH5 current ripple factor	Float lower 2 bytes
0417	30418	01A1			Float upper 2 bytes
0418	30419	01A2	Irf6	CH6 current ripple factor	Float lower 2 bytes
0419	30420	01A3			Float upper 2 bytes
0420	30421	01A4	Irf7	CH7 current ripple factor	Float lower 2 bytes
0421	30422	01A5			Float upper 2 bytes
0422	30423	01A6	Irf8	CH8 current ripple factor	Float lower 2 bytes
0423	30424	01A7			Float upper 2 bytes
0424	30425	01A8	Iunb123	CH123 current unbalance	Float lower 2 bytes
0425	30426	01A9		rate	Float upper 2 bytes
0426	30427	01AA	Iunb234	CH234 current unbalance	Float lower 2 bytes
0427	30428	01AB		rate	Float upper 2 bytes
0428	30429	01AC	Iunb345	CH345 current unbalance	Float lower 2 bytes
0429	30430	01AD		rate	Float upper 2 bytes
0430	30431	01AE	Iunb456	CH456 current unbalance	Float lower 2 bytes
0431	30432	01AF		rate	Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0432	30433	01B0	Iunb567	CH567 current unbalance rate	Float lower 2 bytes
0433	30434	01B1			Float upper 2 bytes
0434	30435	01B2	Iunb678	CH678 current unbalance rate	Float lower 2 bytes
0435	30436	01B3			Float upper 2 bytes
0436	30437	01B4	P1	CH1 active power	Float lower 2 bytes
0437	30438	01B5			Float upper 2 bytes
0438	30439	01B6	P2	CH2 active power	Float lower 2 bytes
0439	30440	01B7			Float upper 2 bytes
0440	30441	01B8	P3	CH3 active power	Float lower 2 bytes
0441	30442	01B9			Float upper 2 bytes
0442	30443	01BA	P4	CH4 active power	Float lower 2 bytes
0443	30444	01BB			Float upper 2 bytes
0444	30445	01BC	P5	CH5 active power	Float lower 2 bytes
0445	30446	01BD			Float upper 2 bytes
0446	30447	01BE	P6	CH6 active power	Float lower 2 bytes
0447	30448	01BF			Float upper 2 bytes
0448	30449	01C0	P7	CH7 active power	Float lower 2 bytes
0449	30450	01C1			Float upper 2 bytes
0450	30451	01C2	P8	CH8 active power	Float lower 2 bytes
0451	30452	01C3			Float upper 2 bytes
0452	30453	01C4	P12	CH12 active power	Float lower 2 bytes
0453	30454	01C5			Float upper 2 bytes
0454	30455	01C6	P23	CH23 active power	Float lower 2 bytes
0455	30456	01C7			Float upper 2 bytes
0456	30457	01C8	P34	CH34 active power	Float lower 2 bytes
0457	30458	01C9			Float upper 2 bytes
0458	30459	01CA	P45	CH45 active power	Float lower 2 bytes
0459	30460	01CB			Float upper 2 bytes
0460	30461	01CC	P56	CH56 active power	Float lower 2 bytes
0461	30462	01CD			Float upper 2 bytes
0462	30463	01CE	P67	CH67 active power	Float lower 2 bytes
0463	30464	01CF			Float upper 2 bytes
0464	30465	01D0	P78	CH78 active power	Float lower 2 bytes
0465	30466	01D1			Float upper 2 bytes
0466	30467	01D2	P123	CH123 active power	Float lower 2 bytes
0467	30468	01D3			Float upper 2 bytes
0468	30469	01D4	P234	CH234 active power	Float lower 2 bytes
0469	30470	01D5			Float upper 2 bytes
0470	30471	01D6	P345	CH345 active power	Float lower 2 bytes
0471	30472	01D7			Float upper 2 bytes
0472	30473	01D8	P456	CH456 active power	Float lower 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0473	30474	01D9			Float upper 2 bytes
0474	30475	01DA	P567	CH567 active power	Float lower 2 bytes
0475	30476	01DB			Float upper 2 bytes
0476	30477	01DC	P678	CH678 active power	Float lower 2 bytes
0477	30478	01DD			Float upper 2 bytes
0478	30479	01DE	Pfnd1	CH1 fundamental wave	Float lower 2 bytes
0479	30480	01DF		active power	Float upper 2 bytes
0480	30481	01E0	Pfnd2	CH2 fundamental wave	Float lower 2 bytes
0481	30482	01E1		active power	Float upper 2 bytes
0482	30483	01E2	Pfnd3	CH3 fundamental wave	Float lower 2 bytes
0483	30484	01E3		active power	Float upper 2 bytes
0484	30485	01E4	Pfnd4	CH4 fundamental wave	Float lower 2 bytes
0485	30486	01E5		active power	Float upper 2 bytes
0486	30487	01E6	Pfnd5	CH5 fundamental wave	Float lower 2 bytes
0487	30488	01E7		active power	Float upper 2 bytes
0488	30489	01E8	Pfnd6	CH6 fundamental wave	Float lower 2 bytes
0489	30490	01E9		active power	Float upper 2 bytes
0490	30491	01EA	Pfnd7	CH7 fundamental wave	Float lower 2 bytes
0491	30492	01EB		active power	Float upper 2 bytes
0492	30493	01EC	Pfnd8	CH8 fundamental wave	Float lower 2 bytes
0493	30494	01ED		active power	Float upper 2 bytes
0494	30495	01EE	Pfnd12	CH12 fundamental wave	Float lower 2 bytes
0495	30496	01EF		active power	Float upper 2 bytes
0496	30497	01F0	Pfnd23	CH23 fundamental wave	Float lower 2 bytes
0497	30498	01F1		active power	Float upper 2 bytes
0498	30499	01F2	Pfnd34	CH34 fundamental wave	Float lower 2 bytes
0499	30500	01F3		active power	Float upper 2 bytes
0500	30501	01F4	Pfnd45	CH45 fundamental wave	Float lower 2 bytes
0501	30502	01F5		active power	Float upper 2 bytes
0502	30503	01F6	Pfnd56	CH56 fundamental wave	Float lower 2 bytes
0503	30504	01F7		active power	Float upper 2 bytes
0504	30505	01F8	Pfnd67	CH67 fundamental wave	Float lower 2 bytes
0505	30506	01F9		active power	Float upper 2 bytes
0506	30507	01FA	Pfnd78	CH78 fundamental wave	Float lower 2 bytes
0507	30508	01FB		active power	Float upper 2 bytes
0508	30509	01FC	Pfnd123	CH123 fundamental wave	Float lower 2 bytes
0509	30510	01FD		active power	Float upper 2 bytes
0510	30511	01FE	Pfnd234	CH234 fundamental wave	Float lower 2 bytes
0511	30512	01FF		active power	Float upper 2 bytes
0512	30513	0200	Pfnd345	CH345 fundamental wave	Float lower 2 bytes
0513	30514	0201		active power	Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0514	30515	0202	Pfnd456	CH456 fundamental wave active power	Float lower 2 bytes
0515	30516	0203			Float upper 2 bytes
0516	30517	0204	Pfnd567	CH567 fundamental wave active power	Float lower 2 bytes
0517	30518	0205			Float upper 2 bytes
0518	30519	0206	Pfnd678	CH678 fundamental wave active power	Float lower 2 bytes
0519	30520	0207			Float upper 2 bytes
0520	30521	0208	S1	CH1 apparent power	Float lower 2 bytes
0521	30522	0209			Float upper 2 bytes
0522	30523	020A	S2	CH2 apparent power	Float lower 2 bytes
0523	30524	020B			Float upper 2 bytes
0524	30525	020C	S3	CH3 apparent power	Float lower 2 bytes
0525	30526	020D			Float upper 2 bytes
0526	30527	020E	S4	CH4 apparent power	Float lower 2 bytes
0527	30528	020F			Float upper 2 bytes
0528	30529	0210	S5	CH5 apparent power	Float lower 2 bytes
0529	30530	0211			Float upper 2 bytes
0530	30531	0212	S6	CH6 apparent power	Float lower 2 bytes
0531	30532	0213			Float upper 2 bytes
0532	30533	0214	S7	CH7 apparent power	Float lower 2 bytes
0533	30534	0215			Float upper 2 bytes
0534	30535	0216	S8	CH8 apparent power	Float lower 2 bytes
0535	30536	0217			Float upper 2 bytes
0536	30537	0218	S12	CH12 apparent power	Float lower 2 bytes
0537	30538	0219			Float upper 2 bytes
0538	30539	021A	S23	CH23 apparent power	Float lower 2 bytes
0539	30540	021B			Float upper 2 bytes
0540	30541	021C	S34	CH34 apparent power	Float lower 2 bytes
0541	30542	021D			Float upper 2 bytes
0542	30543	021E	S45	CH45 apparent power	Float lower 2 bytes
0543	30544	021F			Float upper 2 bytes
0544	30545	0220	S56	CH56 apparent power	Float lower 2 bytes
0545	30546	0221			Float upper 2 bytes
0546	30547	0222	S67	CH67 apparent power	Float lower 2 bytes
0547	30548	0223			Float upper 2 bytes
0548	30549	0224	S78	CH78 apparent power	Float lower 2 bytes
0549	30550	0225			Float upper 2 bytes
0550	30551	0226	S123	CH123 apparent power	Float lower 2 bytes
0551	30552	0227			Float upper 2 bytes
0552	30553	0228	S234	CH234 apparent power	Float lower 2 bytes
0553	30554	0229			Float upper 2 bytes
0554	30555	022A	S345	CH345 apparent power	Float lower 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0555	30556	022B			Float upper 2 bytes
0556	30557	022C	S456	CH456 apparent power	Float lower 2 bytes
0557	30558	022D			Float upper 2 bytes
0558	30559	022E	S567	CH567 apparent power	Float lower 2 bytes
0559	30560	022F			Float upper 2 bytes
0560	30561	0230	S678	CH678 apparent power	Float lower 2 bytes
0561	30562	0231			Float upper 2 bytes
0562	30563	0232	Sfnd1	CH1 fundamental wave	Float lower 2 bytes
0563	30564	0233		apparent power	Float upper 2 bytes
0564	30565	0234	Sfnd2	CH2 fundamental wave	Float lower 2 bytes
0565	30566	0235		apparent power	Float upper 2 bytes
0566	30567	0236	Sfnd3	CH3 fundamental wave	Float lower 2 bytes
0567	30568	0237		apparent power	Float upper 2 bytes
0568	30569	0238	Sfnd4	CH4 fundamental wave	Float lower 2 bytes
0569	30570	0239		apparent power	Float upper 2 bytes
0570	30571	023A	Sfnd5	CH5 fundamental wave	Float lower 2 bytes
0571	30572	023B		apparent power	Float upper 2 bytes
0572	30573	023C	Sfnd6	CH6 fundamental wave	Float lower 2 bytes
0573	30574	023D		apparent power	Float upper 2 bytes
0574	30575	023E	Sfnd7	CH7 fundamental wave	Float lower 2 bytes
0575	30576	023F		apparent power	Float upper 2 bytes
0576	30577	0240	Sfnd8	CH8 fundamental wave	Float lower 2 bytes
0577	30578	0241		apparent power	Float upper 2 bytes
0578	30579	0242	Sfnd12	CH12 fundamental wave	Float lower 2 bytes
0579	30580	0243		apparent power	Float upper 2 bytes
0580	30581	0244	Sfnd23	CH23 fundamental wave	Float lower 2 bytes
0581	30582	0245		apparent power	Float upper 2 bytes
0582	30583	0246	Sfnd34	CH34 fundamental wave	Float lower 2 bytes
0583	30584	0247		apparent power	Float upper 2 bytes
0584	30585	0248	Sfnd45	CH45 fundamental wave	Float lower 2 bytes
0585	30586	0249		apparent power	Float upper 2 bytes
0586	30587	024A	Sfnd56	CH56 fundamental wave	Float lower 2 bytes
0587	30588	024B		apparent power	Float upper 2 bytes
0588	30589	024C	Sfnd67	CH67 fundamental wave	Float lower 2 bytes
0589	30590	024D		apparent power	Float upper 2 bytes
0590	30591	024E	Sfnd78	CH78 fundamental wave	Float lower 2 bytes
0591	30592	024F		apparent power	Float upper 2 bytes
0592	30593	0250	Sfnd123	CH123 fundamental wave	Float lower 2 bytes
0593	30594	0251		apparent power	Float upper 2 bytes
0594	30595	0252	Sfnd234	CH234 fundamental wave	Float lower 2 bytes
0595	30596	0253		apparent power	Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0596	30597	0254	Sfnd345	CH345 fundamental wave	Float lower 2 bytes
0597	30598	0255		apparent power	Float upper 2 bytes
0598	30599	0256	Sfnd456	CH456 fundamental wave	Float lower 2 bytes
0599	30600	0257		apparent power	Float upper 2 bytes
0600	30601	0258	Sfnd567	CH567 fundamental wave	Float lower 2 bytes
0601	30602	0259		apparent power	Float upper 2 bytes
0602	30603	025A	Sfnd678	CH678 fundamental wave	Float lower 2 bytes
0603	30604	025B		apparent power	Float upper 2 bytes
0604	30605	025C	Q1	CH1 reactive power	Float lower 2 bytes
0605	30606	025D			Float upper 2 bytes
0606	30607	025E	Q2	CH2 reactive power	Float lower 2 bytes
0607	30608	025F			Float upper 2 bytes
0608	30609	0260	Q3	CH3 reactive power	Float lower 2 bytes
0609	30610	0261			Float upper 2 bytes
0610	30611	0262	Q4	CH4 reactive power	Float lower 2 bytes
0611	30612	0263			Float upper 2 bytes
0612	30613	0264	Q5	CH5 reactive power	Float lower 2 bytes
0613	30614	0265			Float upper 2 bytes
0614	30615	0266	Q6	CH6 reactive power	Float lower 2 bytes
0615	30616	0267			Float upper 2 bytes
0616	30617	0268	Q7	CH7 reactive power	Float lower 2 bytes
0617	30618	0269			Float upper 2 bytes
0618	30619	026A	Q8	CH8 reactive power	Float lower 2 bytes
0619	30620	026B			Float upper 2 bytes
0620	30621	026C	Q12	CH12 reactive power	Float lower 2 bytes
0621	30622	026D			Float upper 2 bytes
0622	30623	026E	Q23	CH23 reactive power	Float lower 2 bytes
0623	30624	026F			Float upper 2 bytes
0624	30625	0270	Q34	CH34 reactive power	Float lower 2 bytes
0625	30626	0271			Float upper 2 bytes
0626	30627	0272	Q45	CH45 reactive power	Float lower 2 bytes
0627	30628	0273			Float upper 2 bytes
0628	30629	0274	Q56	CH56 reactive power	Float lower 2 bytes
0629	30630	0275			Float upper 2 bytes
0630	30631	0276	Q67	CH67 reactive power	Float lower 2 bytes
0631	30632	0277			Float upper 2 bytes
0632	30633	0278	Q78	CH78 reactive power	Float lower 2 bytes
0633	30634	0279			Float upper 2 bytes
0634	30635	027A	Q123	CH123 reactive power	Float lower 2 bytes
0635	30636	027B			Float upper 2 bytes
0636	30637	027C	Q234	CH234 reactive power	Float lower 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0637	30638	027D			Float upper 2 bytes
0638	30639	027E	Q345	CH345 reactive power	Float lower 2 bytes
0639	30640	027F			Float upper 2 bytes
0640	30641	0280	Q456	CH456 reactive power	Float lower 2 bytes
0641	30642	0281			Float upper 2 bytes
0642	30643	0282	Q567	CH567 reactive power	Float lower 2 bytes
0643	30644	0283			Float upper 2 bytes
0644	30645	0284	Q678	CH678 reactive power	Float lower 2 bytes
0645	30646	0285			Float upper 2 bytes
0646	30647	0286	Qfnd1	CH1 fundamental wave	Float lower 2 bytes
0647	30648	0287		reactive power	Float upper 2 bytes
0648	30649	0288	Qfnd2	CH2 fundamental wave	Float lower 2 bytes
0649	30650	0289		reactive power	Float upper 2 bytes
0650	30651	028A	Qfnd3	CH3 fundamental wave	Float lower 2 bytes
0651	30652	028B		reactive power	Float upper 2 bytes
0652	30653	028C	Qfnd4	CH4 fundamental wave	Float lower 2 bytes
0653	30654	028D		reactive power	Float upper 2 bytes
0654	30655	028E	Qfnd5	CH5 fundamental wave	Float lower 2 bytes
0655	30656	028F		reactive power	Float upper 2 bytes
0656	30657	0290	Qfnd6	CH6 fundamental wave	Float lower 2 bytes
0657	30658	0291		reactive power	Float upper 2 bytes
0658	30659	0292	Qfnd7	CH7 fundamental wave	Float lower 2 bytes
0659	30660	0293		reactive power	Float upper 2 bytes
0660	30661	0294	Qfnd8	CH8 fundamental wave	Float lower 2 bytes
0661	30662	0295		reactive power	Float upper 2 bytes
0662	30663	0296	Qfnd12	CH12 fundamental wave	Float lower 2 bytes
0663	30664	0297		reactive power	Float upper 2 bytes
0664	30665	0298	Qfnd23	CH23 fundamental wave	Float lower 2 bytes
0665	30666	0299		reactive power	Float upper 2 bytes
0666	30667	029A	Qfnd34	CH34 fundamental wave	Float lower 2 bytes
0667	30668	029B		reactive power	Float upper 2 bytes
0668	30669	029C	Qfnd45	CH45 fundamental wave	Float lower 2 bytes
0669	30670	029D		reactive power	Float upper 2 bytes
0670	30671	029E	Qfnd56	CH56 fundamental wave	Float lower 2 bytes
0671	30672	029F		reactive power	Float upper 2 bytes
0672	30673	02A0	Qfnd67	CH67 fundamental wave	Float lower 2 bytes
0673	30674	02A1		reactive power	Float upper 2 bytes
0674	30675	02A2	Qfnd78	CH78 fundamental wave	Float lower 2 bytes
0675	30676	02A3		reactive power	Float upper 2 bytes
0676	30677	02A4	Qfnd123	CH123 fundamental wave	Float lower 2 bytes
0677	30678	02A5		reactive power	Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0678	30679	02A6	Qfnd234	CH234 fundamental wave reactive power	Float lower 2 bytes
0679	30680	02A7			Float upper 2 bytes
0680	30681	02A8	Qfnd345	CH345 fundamental wave reactive power	Float lower 2 bytes
0681	30682	02A9			Float upper 2 bytes
0682	30683	02AA	Qfnd456	CH456 fundamental wave reactive power	Float lower 2 bytes
0683	30684	02AB			Float upper 2 bytes
0684	30685	02AC	Qfnd567	CH567 fundamental wave reactive power	Float lower 2 bytes
0685	30686	02AD			Float upper 2 bytes
0686	30687	02AE	Qfnd678	CH678 fundamental wave reactive power	Float lower 2 bytes
0687	30688	02AF			Float upper 2 bytes
0688	30689	02B0	λ1	CH1 power factor	Float lower 2 bytes
0689	30690	02B1			Float upper 2 bytes
0690	30691	02B2	λ2	CH2 power factor	Float lower 2 bytes
0691	30692	02B3			Float upper 2 bytes
0692	30693	02B4	λ3	CH3 power factor	Float lower 2 bytes
0693	30694	02B5			Float upper 2 bytes
0694	30695	02B6	λ4	CH4 power factor	Float lower 2 bytes
0695	30696	02B7			Float upper 2 bytes
0696	30697	02B8	λ5	CH5 power factor	Float lower 2 bytes
0697	30698	02B9			Float upper 2 bytes
0698	30699	02BA	λ6	CH6 power factor	Float lower 2 bytes
0699	30700	02BB			Float upper 2 bytes
0700	30701	02BC	λ7	CH7 power factor	Float lower 2 bytes
0701	30702	02BD			Float upper 2 bytes
0702	30703	02BE	λ8	CH8 power factor	Float lower 2 bytes
0703	30704	02BF			Float upper 2 bytes
0704	30705	02C0	λ12	CH12 power factor	Float lower 2 bytes
0705	30706	02C1			Float upper 2 bytes
0706	30707	02C2	λ23	CH23 power factor	Float lower 2 bytes
0707	30708	02C3			Float upper 2 bytes
0708	30709	02C4	λ34	CH34 power factor	Float lower 2 bytes
0709	30710	02C5			Float upper 2 bytes
0710	30711	02C6	λ45	CH45 power factor	Float lower 2 bytes
0711	30712	02C7			Float upper 2 bytes
0712	30713	02C8	λ56	CH56 power factor	Float lower 2 bytes
0713	30714	02C9			Float upper 2 bytes
0714	30715	02CA	λ67	CH67 power factor	Float lower 2 bytes
0715	30716	02CB			Float upper 2 bytes
0716	30717	02CC	λ78	CH78 power factor	Float lower 2 bytes
0717	30718	02CD			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0718	30719	02CE	λ123	CH123 power factor	Float lower 2 bytes
0719	30720	02CF			Float upper 2 bytes
0720	30721	02D0	λ234	CH234 power factor	Float lower 2 bytes
0721	30722	02D1			Float upper 2 bytes
0722	30723	02D2	λ345	CH345 power factor	Float lower 2 bytes
0723	30724	02D3			Float upper 2 bytes
0724	30725	02D4	λ456	CH456 power factor	Float lower 2 bytes
0725	30726	02D5			Float upper 2 bytes
0726	30727	02D6	λ567	CH567 power factor	Float lower 2 bytes
0727	30728	02D7			Float upper 2 bytes
0728	30729	02D8	λ678	CH678 power factor	Float lower 2 bytes
0729	30730	02D9			Float upper 2 bytes
0730	30731	02DA	λfnd1	CH1 fundamental wave power factor	Float lower 2 bytes
0731	30732	02DB			Float upper 2 bytes
0732	30733	02DC	λfnd2	CH2 fundamental wave power factor	Float lower 2 bytes
0733	30734	02DD			Float upper 2 bytes
0734	30735	02DE	λfnd3	CH3 fundamental wave power factor	Float lower 2 bytes
0735	30736	02DF			Float upper 2 bytes
0736	30737	02E0	λfnd4	CH4 fundamental wave power factor	Float lower 2 bytes
0737	30738	02E1			Float upper 2 bytes
0738	30739	02E2	λfnd5	CH5 fundamental wave power factor	Float lower 2 bytes
0739	30740	02E3			Float upper 2 bytes
0740	30741	02E4	λfnd6	CH6 fundamental wave power factor	Float lower 2 bytes
0741	30742	02E5			Float upper 2 bytes
0742	30743	02E6	λfnd7	CH7 fundamental wave power factor	Float lower 2 bytes
0743	30744	02E7			Float upper 2 bytes
0744	30745	02E8	λfnd8	CH8 fundamental wave power factor	Float lower 2 bytes
0745	30746	02E9			Float upper 2 bytes
0746	30747	02EA	λfnd12	CH12 fundamental wave power factor	Float lower 2 bytes
0747	30748	02EB			Float upper 2 bytes
0748	30749	02EC	λfnd23	CH23 fundamental wave power factor	Float lower 2 bytes
0749	30750	02ED			Float upper 2 bytes
0750	30751	02EE	λfnd34	CH34 fundamental wave power factor	Float lower 2 bytes
0751	30752	02EF			Float upper 2 bytes
0752	30753	02F0	λfnd45	CH45 fundamental wave power factor	Float lower 2 bytes
0753	30754	02F1			Float upper 2 bytes
0754	30755	02F2	λfnd56	CH56 fundamental wave power factor	Float lower 2 bytes
0755	30756	02F3			Float upper 2 bytes
0756	30757	02F4	λfnd67	CH67 fundamental wave power factor	Float lower 2 bytes
0757	30758	02F5			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0758	30759	02F6	λfnd78	CH78 fundamental wave power factor	Float lower 2 bytes
0759	30760	02F7			Float upper 2 bytes
0760	30761	02F8	λfnd123	CH123 fundamental wave power factor	Float lower 2 bytes
0761	30762	02F9			Float upper 2 bytes
0762	30763	02FA	λfnd234	CH234 fundamental wave power factor	Float lower 2 bytes
0763	30764	02FB			Float upper 2 bytes
0764	30765	02FC	λfnd345	CH345 fundamental wave power factor	Float lower 2 bytes
0765	30766	02FD			Float upper 2 bytes
0766	30767	02FE	λfnd456	CH456 fundamental wave power factor	Float lower 2 bytes
0767	30768	02FF			Float upper 2 bytes
0768	30769	0300	λfnd567	CH567 fundamental wave power factor	Float lower 2 bytes
0769	30770	0301			Float upper 2 bytes
0770	30771	0302	λfnd678	CH678 fundamental wave power factor	Float lower 2 bytes
0771	30772	0303			Float upper 2 bytes
0772	30773	0304	ΘU1	CH1 voltage phase angle	Float lower 2 bytes
0773	30774	0305			Float upper 2 bytes
0774	30775	0306	ΘU2	CH2 voltage phase angle	Float lower 2 bytes
0775	30776	0307			Float upper 2 bytes
0776	30777	0308	ΘU3	CH3 voltage phase angle	Float lower 2 bytes
0777	30778	0309			Float upper 2 bytes
0778	30779	030A	ΘU4	CH4 voltage phase angle	Float lower 2 bytes
0779	30780	030B			Float upper 2 bytes
0780	30781	030C	ΘU5	CH5 voltage phase angle	Float lower 2 bytes
0781	30782	030D			Float upper 2 bytes
0782	30783	030E	ΘU6	CH6 voltage phase angle	Float lower 2 bytes
0783	30784	030F			Float upper 2 bytes
0784	30785	0310	ΘU7	CH7 voltage phase angle	Float lower 2 bytes
0785	30786	0311			Float upper 2 bytes
0786	30787	0312	ΘU8	CH8 voltage phase angle	Float lower 2 bytes
0787	30788	0313			Float upper 2 bytes
0788	30789	0314	ΘI1	CH1 current phase angle	Float lower 2 bytes
0789	30790	0315			Float upper 2 bytes
0790	30791	0316	ΘI2	CH2 current phase angle	Float lower 2 bytes
0791	30792	0317			Float upper 2 bytes
0792	30793	0318	ΘI3	CH3 current phase angle	Float lower 2 bytes
0793	30794	0319			Float upper 2 bytes
0794	30795	031A	ΘI4	CH4 current phase angle	Float lower 2 bytes
0795	30796	031B			Float upper 2 bytes
0796	30797	031C	ΘI5	CH5 current phase angle	Float lower 2 bytes
0797	30798	031D			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0798	30799	031E	ΘI6	CH6 current phase angle	Float lower 2 bytes
0799	30800	031F			Float upper 2 bytes
0800	30801	0320	ΘI7	CH7 current phase angle	Float lower 2 bytes
0801	30802	0321			Float upper 2 bytes
0802	30803	0322	ΘI8	CH8 current phase angle	Float lower 2 bytes
0803	30804	0323			Float upper 2 bytes
0804	30805	0324	Φ1	CH1 power phase angle	Float lower 2 bytes
0805	30806	0325			Float upper 2 bytes
0806	30807	0326	Φ2	CH2 power phase angle	Float lower 2 bytes
0807	30808	0327			Float upper 2 bytes
0808	30809	0328	Φ3	CH3 power phase angle	Float lower 2 bytes
0809	30810	0329			Float upper 2 bytes
0810	30811	032A	Φ4	CH4 power phase angle	Float lower 2 bytes
0811	30812	032B			Float upper 2 bytes
0812	30813	032C	Φ5	CH5 power phase angle	Float lower 2 bytes
0813	30814	032D			Float upper 2 bytes
0814	30815	032E	Φ6	CH6 power phase angle	Float lower 2 bytes
0815	30816	032F			Float upper 2 bytes
0816	30817	0330	Φ7	CH7 power phase angle	Float lower 2 bytes
0817	30818	0331			Float upper 2 bytes
0818	30819	0332	Φ8	CH8 power phase angle	Float lower 2 bytes
0819	30820	0333			Float upper 2 bytes
0820	30821	0334	Φ12	CH12 power phase angle	Float lower 2 bytes
0821	30822	0335			Float upper 2 bytes
0822	30823	0336	Φ23	CH23 power phase angle	Float lower 2 bytes
0823	30824	0337			Float upper 2 bytes
0824	30825	0338	Φ34	CH34 power phase angle	Float lower 2 bytes
0825	30826	0339			Float upper 2 bytes
0826	30827	033A	Φ45	CH45 power phase angle	Float lower 2 bytes
0827	30828	033B			Float upper 2 bytes
0828	30829	033C	Φ56	CH56 power phase angle	Float lower 2 bytes
0829	30830	033D			Float upper 2 bytes
0830	30831	033E	Φ67	CH67 power phase angle	Float lower 2 bytes
0831	30832	033F			Float upper 2 bytes
0832	30833	0340	Φ78	CH78 power phase angle	Float lower 2 bytes
0833	30834	0341			Float upper 2 bytes
0834	30835	0342	Φ123	CH123 power phase angle	Float lower 2 bytes
0835	30836	0343			Float upper 2 bytes
0836	30837	0344	Φ234	CH234 power phase angle	Float lower 2 bytes
0837	30838	0345			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
0838	30839	0346	Φ345	CH345 power phase angle	Float lower 2 bytes
0839	30840	0347			Float upper 2 bytes
0840	30841	0348	Φ456	CH456 power phase angle	Float lower 2 bytes
0841	30842	0349			Float upper 2 bytes
0842	30843	034A	Φ567	CH567 power phase angle	Float lower 2 bytes
0843	30844	034B			Float upper 2 bytes
0844	30845	034C	Φ678	CH678 power phase angle	Float lower 2 bytes
0845	30846	034D			Float upper 2 bytes

3.1.3 Integration measurement items

Reg No.	Ref No.	Hex No.	Register name	Register description	
1000	31001	03E8	Ih1+	CH1 positive-direction current integrated value	Float lower 2 bytes
1001	31002	03E9			Float upper 2 bytes
1002	31003	03EA	Ih2+	CH2 positive-direction current integrated value	Float lower 2 bytes
1003	31004	03EB			Float upper 2 bytes
1004	31005	03EC	Ih3+	CH3 positive-direction current integrated value	Float lower 2 bytes
1005	31006	03ED			Float upper 2 bytes
1006	31007	03EE	Ih4+	CH4 positive-direction current integrated value	Float lower 2 bytes
1007	31008	03EF			Float upper 2 bytes
1008	31009	03F0	Ih5+	CH5 positive-direction current integrated value	Float lower 2 bytes
1009	31010	03F1			Float upper 2 bytes
1010	31011	03F2	Ih6+	CH6 positive-direction current integrated value	Float lower 2 bytes
1011	31012	03F3			Float upper 2 bytes
1012	31013	03F4	Ih7+	CH7 positive-direction current integrated value	Float lower 2 bytes
1013	31014	03F5			Float upper 2 bytes
1014	31015	03F6	Ih8+	CH8 positive-direction current integrated value	Float lower 2 bytes
1015	31016	03F7			Float upper 2 bytes
1016	31017	03F8	Ih1−	CH1 negative-direction current integrated value	Float lower 2 bytes
1017	31018	03F9			Float upper 2 bytes
1018	31019	03FA	Ih2−	CH2 negative-direction current integrated value	Float lower 2 bytes
1019	31020	03FB			Float upper 2 bytes
1020	31021	03FC	Ih3−	CH3 negative-direction current integrated value	Float lower 2 bytes
1021	31022	03FD			Float upper 2 bytes
1022	31023	03FE	Ih4−	CH4 negative-direction current integrated value	Float lower 2 bytes
1023	31024	03FF			Float upper 2 bytes
1024	31025	0400	Ih5−	CH5 negative-direction current integrated value	Float lower 2 bytes
1025	31026	0401			Float upper 2 bytes
1026	31027	0402	Ih6−	CH6 negative-direction current integrated value	Float lower 2 bytes
1027	31028	0403			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
1028	31029	0404	Ih7−	CH7 negative-direction current integrated value	Float lower 2 bytes
1029	31030	0405			Float upper 2 bytes
1030	31031	0406	Ih8−	CH8 negative-direction current integrated value	Float lower 2 bytes
1031	31032	0407			Float upper 2 bytes
1032	31033	0408	Ih1	CH1 positive- and negative-direction integrated current sum	Float lower 2 bytes
1033	31034	0409			Float upper 2 bytes
1034	31035	040A	Ih2	CH2 positive- and negative-direction integrated current sum	Float lower 2 bytes
1035	31036	040B			Float upper 2 bytes
1036	31037	040C	Ih3	CH3 positive- and negative-direction integrated current sum	Float lower 2 bytes
1037	31038	040D			Float upper 2 bytes
1038	31039	040E	Ih4	CH4 positive- and negative-direction integrated current sum	Float lower 2 bytes
1039	31040	040F			Float upper 2 bytes
1040	31041	0410	Ih5	CH5 positive- and negative-direction integrated current sum	Float lower 2 bytes
1041	31042	0411			Float upper 2 bytes
1042	31043	0412	Ih6	CH6 positive- and negative-direction integrated current sum	Float lower 2 bytes
1043	31044	0413			Float upper 2 bytes
1044	31045	0414	Ih7	CH7 positive- and negative-direction integrated current sum	Float lower 2 bytes
1045	31046	0415			Float upper 2 bytes
1046	31047	0416	Ih8	CH8 positive- and negative-direction integrated current sum	Float lower 2 bytes
1047	31048	0417			Float upper 2 bytes
1048	31049	0418	WP1+	CH1 positive-direction active power integrated value	Float lower 2 bytes
1049	31050	0419			Float upper 2 bytes
1050	31051	041A	WP2+	CH2 positive-direction active power integrated value	Float lower 2 bytes
1051	31052	041B			Float upper 2 bytes
1052	31053	041C	WP3+	CH3 positive-direction active power integrated value	Float lower 2 bytes
1053	31054	041D			Float upper 2 bytes
1054	31055	041E	WP4+	CH4 positive-direction active power integrated value	Float lower 2 bytes
1055	31056	041F			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
1056	31057	0420	WP5+	CH5 positive-direction active power integrated value	Float lower 2 bytes
1057	31058	0421			Float upper 2 bytes
1058	31059	0422	WP6+	CH6 positive-direction active power integrated value	Float lower 2 bytes
1059	31060	0423			Float upper 2 bytes
1060	31061	0424	WP7+	CH7 positive-direction active power integrated value	Float lower 2 bytes
1061	31062	0425			Float upper 2 bytes
1062	31063	0426	WP8+	CH8 positive-direction active power integrated value	Float lower 2 bytes
1063	31064	0427			Float upper 2 bytes
1064	31065	0428	WP12+	CH12 positive-direction active power integrated value	Float lower 2 bytes
1065	31066	0429			Float upper 2 bytes
1066	31067	042A	WP23+	CH23 positive-direction active power integrated value	Float lower 2 bytes
1067	31068	042B			Float upper 2 bytes
1068	31069	042C	WP34+	CH34 positive-direction active power integrated value	Float lower 2 bytes
1069	31070	042D			Float upper 2 bytes
1070	31071	042E	WP45+	CH45 positive-direction active power integrated value	Float lower 2 bytes
1071	31072	042F			Float upper 2 bytes
1072	31073	0430	WP56+	CH56 positive-direction active power integrated value	Float lower 2 bytes
1073	31074	0431			Float upper 2 bytes
1074	31075	0432	WP67+	CH67 positive-direction active power integrated value	Float lower 2 bytes
1075	31076	0433			Float upper 2 bytes
1076	31077	0434	WP78+	CH78 positive-direction active power integrated value	Float lower 2 bytes
1077	31078	0435			Float upper 2 bytes
1078	31079	0436	WP123+	CH123 positive-direction active power integrated value	Float lower 2 bytes
1079	31080	0437			Float upper 2 bytes
1080	31081	0438	WP234+	CH234 positive-direction active power integrated value	Float lower 2 bytes
1081	31082	0439			Float upper 2 bytes
1082	31083	043A	WP345+	CH345 positive-direction active power integrated value	Float lower 2 bytes
1083	31084	043B			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
1084	31085	043C	WP456+	CH456 positive-direction active power integrated value	Float lower 2 bytes
1085	31086	043D			Float upper 2 bytes
1086	31087	043E	WP567+	CH567 positive-direction active power integrated value	Float lower 2 bytes
1087	31088	043F			Float upper 2 bytes
1088	31089	0440	WP678+	CH678 positive-direction active power integrated value	Float lower 2 bytes
1089	31090	0441			Float upper 2 bytes
1090	31091	0442	WP1−	CH1 negative-direction active power integrated value	Float lower 2 bytes
1091	31092	0443			Float upper 2 bytes
1092	31093	0444	WP2−	CH2 negative-direction active power integrated value	Float lower 2 bytes
1093	31094	0445			Float upper 2 bytes
1094	31095	0446	WP3−	CH3 negative-direction active power integrated value	Float lower 2 bytes
1095	31096	0447			Float upper 2 bytes
1096	31097	0448	WP4−	CH4 negative-direction active power integrated value	Float lower 2 bytes
1097	31098	0449			Float upper 2 bytes
1098	31099	044A	WP5−	CH5 negative-direction active power integrated value	Float lower 2 bytes
1099	31100	044B			Float upper 2 bytes
1100	31101	044C	WP6−	CH6 negative-direction active power integrated value	Float lower 2 bytes
1101	31102	044D			Float upper 2 bytes
1102	31103	044E	WP7−	CH7 negative-direction active power integrated value	Float lower 2 bytes
1103	31104	044F			Float upper 2 bytes
1104	31105	0450	WP8−	CH8 negative-direction active power integrated value	Float lower 2 bytes
1105	31106	0451			Float upper 2 bytes
1106	31107	0452	WP12−	CH12 negative-direction active power integrated value	Float lower 2 bytes
1107	31108	0453			Float upper 2 bytes
1108	31109	0454	WP23−	CH23 negative-direction active power integrated value	Float lower 2 bytes
1109	31110	0455			Float upper 2 bytes
1110	31111	0456	WP34−	CH34 negative-direction active power integrated value	Float lower 2 bytes
1111	31112	0457			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
1112	31113	0458	WP45−	CH45 negative-direction active power integrated value	Float lower 2 bytes
1113	31114	0459			Float upper 2 bytes
1114	31115	045A	WP56−	CH56 negative-direction active power integrated value	Float lower 2 bytes
1115	31116	045B			Float upper 2 bytes
1116	31117	045C	WP67−	CH67 negative-direction active power integrated value	Float lower 2 bytes
1117	31118	045D			Float upper 2 bytes
1118	31119	045E	WP78−	CH78 negative-direction active power integrated value	Float lower 2 bytes
1119	31120	045F			Float upper 2 bytes
1120	31121	0460	WP123−	CH123 negative-direction active power integrated value	Float lower 2 bytes
1121	31122	0461			Float upper 2 bytes
1122	31123	0462	WP234−	CH234 negative-direction active power integrated value	Float lower 2 bytes
1123	31124	0463			Float upper 2 bytes
1124	31125	0464	WP345−	CH345 negative-direction active power integrated value	Float lower 2 bytes
1125	31126	0465			Float upper 2 bytes
1126	31127	0466	WP456−	CH456 negative-direction active power integrated value	Float lower 2 bytes
1127	31128	0467			Float upper 2 bytes
1128	31129	0468	WP567−	CH567 negative-direction active power integrated value	Float lower 2 bytes
1129	31130	0469			Float upper 2 bytes
1130	31131	046A	WP678−	CH678 negative-direction active power integrated value	Float lower 2 bytes
1131	31132	046B			Float upper 2 bytes
1132	31133	046C	WP1	CH1 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1133	31134	046D			Float upper 2 bytes
1134	31135	046E	WP2	CH2 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1135	31136	046F			Float upper 2 bytes
1136	31137	0470	WP3	CH3 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1137	31138	0471			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
1138	31139	0472	WP4	CH4 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1139	31140	0473			Float upper 2 bytes
1140	31141	0474	WP5	CH5 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1141	31142	0475			Float upper 2 bytes
1142	31143	0476	WP6	CH6 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1143	31144	0477			Float upper 2 bytes
1144	31145	0478	WP7	CH7 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1145	31146	0479			Float upper 2 bytes
1146	31147	047A	WP8	CH8 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1147	31148	047B			Float upper 2 bytes
1148	31149	047C	WP12	CH12 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1149	31150	047D			Float upper 2 bytes
1150	31151	047E	WP23	CH23 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1151	31152	047F			Float upper 2 bytes
1152	31153	0480	WP34	CH34 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1153	31154	0481			Float upper 2 bytes
1154	31155	0482	WP45	CH45 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1155	31156	0483			Float upper 2 bytes
1156	31157	0484	WP56	CH56 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1157	31158	0485			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
1158	31159	0486	WP67	CH67 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1159	31160	0487			Float upper 2 bytes
1160	31161	0488	WP78	CH78 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1161	31162	0489			Float upper 2 bytes
1162	31163	048A	WP123	CH123 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1163	31164	048B			Float upper 2 bytes
1164	31165	048C	WP234	CH234 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1165	31166	048D			Float upper 2 bytes
1166	31167	048E	WP345	CH345 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1167	31168	048F			Float upper 2 bytes
1168	31169	0490	WP456	CH456 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1169	31170	0491			Float upper 2 bytes
1170	31171	0492	WP567	CH567 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1171	31172	0493			Float upper 2 bytes
1172	31173	0494	WP678	CH678 positive- and negative-direction integrated active power sum	Float lower 2 bytes
1173	31174	0495			Float upper 2 bytes
1174	31175	0496	Etime1	CH1 integrated elapsed time (sec.)	uint32 lower 2 bytes
1175	31176	0497			uint32 upper 2 bytes
1176	31177	0498		CH1 integrated elapsed time (msec.)	uint32 lower 2 bytes
1177	31178	0499			uint32 upper 2 bytes
1178	31179	049A	Etime2	CH2 integrated elapsed time (sec.)	uint32 lower 2 bytes
1179	31180	049B			uint32 upper 2 bytes
1180	31181	049C		CH2 integrated elapsed time (msec.)	uint32 lower 2 bytes
1181	31182	049D			uint32 upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
1182	31183	049E	Etime3	CH3 integrated elapsed time (sec.)	uint32 lower 2 bytes
1183	31184	049F			uint32 upper 2 bytes
1184	31185	04A0		CH3 integrated elapsed time (msec.)	uint32 lower 2 bytes
1185	31186	04A1			uint32 upper 2 bytes
1186	31187	04A2	Etime4	CH4 integrated elapsed time (sec.)	uint32 lower 2 bytes
1187	31188	04A3			uint32 upper 2 bytes
1188	31189	04A4		CH4 integrated elapsed time (msec.)	uint32 lower 2 bytes
1189	31190	04A5			uint32 upper 2 bytes
1190	31191	04A6	Etime5	CH5 integrated elapsed time (sec.)	uint32 lower 2 bytes
1191	31192	04A7			uint32 upper 2 bytes
1192	31193	04A8		CH5 integrated elapsed time (msec.)	uint32 lower 2 bytes
1193	31194	04A9			uint32 upper 2 bytes
1194	31195	04AA	Etime6	CH6 integrated elapsed time (sec.)	uint32 lower 2 bytes
1195	31196	04AB			uint32 upper 2 bytes
1196	31197	04AC		CH6 integrated elapsed time (msec.)	uint32 lower 2 bytes
1197	31198	04AD			uint32 upper 2 bytes
1198	31199	04AE	Etime7	CH7 integrated elapsed time (sec.)	uint32 lower 2 bytes
1199	31200	04AF			uint32 upper 2 bytes
1200	31201	04B0		CH7 integrated elapsed time (msec.)	uint32 lower 2 bytes
1201	31202	04B1			uint32 upper 2 bytes
1202	31203	04B2	Etime8	CH8 integrated elapsed time (sec.)	uint32 lower 2 bytes
1203	31204	04B3			uint32 upper 2 bytes
1204	31205	04B4		CH8 integrated elapsed time (msec.)	uint32 lower 2 bytes
1205	31206	04B5			uint32 upper 2 bytes

3.1.4 Frequency and calculation measurement items

Reg No.	Ref No.	Hex No.	Register name	Register description	
2000	32001	07D0	fU1	CH1 voltage frequency	Float lower 2 bytes
2001	32002	07D1			Float upper 2 bytes
2002	32003	07D2	fU2	CH2 voltage frequency	Float lower 2 bytes
2003	32004	07D3			Float upper 2 bytes
2004	32005	07D4	fU3	CH3 voltage frequency	Float lower 2 bytes
2005	32006	07D5			Float upper 2 bytes
2006	32007	07D6	fU4	CH4 voltage frequency	Float lower 2 bytes
2007	32008	07D7			Float upper 2 bytes
2008	32009	07D8	fU5	CH5 voltage frequency	Float lower 2 bytes
2009	32010	07D9			Float upper 2 bytes
2010	32011	07DA	fU6	CH6 voltage frequency	Float lower 2 bytes
2011	32012	07DB			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
2012	32013	07DC	fU7	CH7 voltage frequency	Float lower 2 bytes
2013	32014	07DD			Float upper 2 bytes
2014	32015	07DE	fU8	CH8 voltage frequency	Float lower 2 bytes
2015	32016	07DF			Float upper 2 bytes
2016	32017	07E0	fI1	CH1 current frequency	Float lower 2 bytes
2017	32018	07E1			Float upper 2 bytes
2018	32019	07E2	fI2	CH2 current frequency	Float lower 2 bytes
2019	32020	07E3			Float upper 2 bytes
2020	32021	07E4	fI3	CH3 current frequency	Float lower 2 bytes
2021	32022	07E5			Float upper 2 bytes
2022	32023	07E6	fI4	CH4 current frequency	Float lower 2 bytes
2023	32024	07E7			Float upper 2 bytes
2024	32025	07E8	fI5	CH5 current frequency	Float lower 2 bytes
2025	32026	07E9			Float upper 2 bytes
2026	32027	07EA	fI6	CH6 current frequency	Float lower 2 bytes
2027	32028	07EB			Float upper 2 bytes
2028	32029	07EC	fI7	CH7 current frequency	Float lower 2 bytes
2029	32030	07ED			Float upper 2 bytes
2030	32031	07EE	fI8	CH8 current frequency	Float lower 2 bytes
2031	32032	07EF			Float upper 2 bytes
2032	32033	07F0	η1	Efficiency 1	Float lower 2 bytes
2033	32034	07F1			Float upper 2 bytes
2034	32035	07F2	η2	Efficiency 2	Float lower 2 bytes
2035	32036	07F3			Float upper 2 bytes
2036	32037	07F4	η3	Efficiency 3	Float lower 2 bytes
2037	32038	07F5			Float upper 2 bytes
2038	32039	07F6	η4	Efficiency 4	Float lower 2 bytes
2039	32040	07F7			Float upper 2 bytes
2040	32041	07F8	Loss1	Loss 1	Float lower 2 bytes
2041	32042	07F9			Float upper 2 bytes
2042	32043	07FA	Loss2	Loss 2	Float lower 2 bytes
2043	32044	07FB			Float upper 2 bytes
2044	32045	07FC	Loss3	Loss 3	Float lower 2 bytes
2045	32046	07FD			Float upper 2 bytes
2046	32047	07FE	Loss4	Loss 4	Float lower 2 bytes
2047	32048	07FF			Float upper 2 bytes
2048	32049	0800	UDF1	User-defined calculation 1	Float lower 2 bytes
2049	32050	0801			Float upper 2 bytes
2050	32051	0802	UDF2	User-defined calculation 2	Float lower 2 bytes
2051	32052	0803			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
2052	32053	0804	UDF3	User-defined calculation 3	Float lower 2 bytes
2053	32054	0805			Float upper 2 bytes
2054	32055	0806	UDF4	User-defined calculation 4	Float lower 2 bytes
2055	32056	0807			Float upper 2 bytes
2056	32057	0808	UDF5	User-defined calculation 5	Float lower 2 bytes
2057	32058	0809			Float upper 2 bytes
2058	32059	080A	UDF6	User-defined calculation 6	Float lower 2 bytes
2059	32060	080B			Float upper 2 bytes
2060	32061	080C	UDF7	User-defined calculation 7	Float lower 2 bytes
2061	32062	080D			Float upper 2 bytes
2062	32063	080E	UDF8	User-defined calculation 8	Float lower 2 bytes
2063	32064	080F			Float upper 2 bytes
2064	32065	0810	UDF9	User-defined calculation 9	Float lower 2 bytes
2065	32066	0811			Float upper 2 bytes
2066	32067	0812	UDF10	User-defined calculation 10	Float lower 2 bytes
2067	32068	0813			Float upper 2 bytes
2068	32069	0814	UDF11	User-defined calculation 11	Float lower 2 bytes
2069	32070	0815			Float upper 2 bytes
2070	32071	0816	UDF12	User-defined calculation 12	Float lower 2 bytes
2071	32072	0817			Float upper 2 bytes
2072	32073	0818	UDF13	User-defined calculation 13	Float lower 2 bytes
2073	32074	0819			Float upper 2 bytes
2074	32075	081A	UDF14	User-defined calculation 14	Float lower 2 bytes
2075	32076	081B			Float upper 2 bytes
2076	32077	081C	UDF15	User-defined calculation 15	Float lower 2 bytes
2077	32078	081D			Float upper 2 bytes
2078	32079	081E	UDF16	User-defined calculation 16	Float lower 2 bytes
2079	32080	081F			Float upper 2 bytes
2080	32081	0820	UDF17	User-defined calculation 17	Float lower 2 bytes
2081	32082	0821			Float upper 2 bytes
2082	32083	0822	UDF18	User-defined calculation 18	Float lower 2 bytes
2083	32084	0823			Float upper 2 bytes
2084	32085	0824	UDF19	User-defined calculation 19	Float lower 2 bytes
2085	32086	0825			Float upper 2 bytes
2086	32087	0826	UDF20	User-defined calculation 20	Float lower 2 bytes
2087	32088	0827			Float upper 2 bytes

3.1.5 Motor analysis measurement items

Reg No.	Ref No.	Hex No.	Register name	Register description	
3000	33001	0BB8	Tq1	Torque 1	Float lower 2 bytes
3001	33002	0BB9			Float upper 2 bytes
3002	33003	0BBA	Tq2	Torque 2	Float lower 2 bytes
3003	33004	0BBB			Float upper 2 bytes
3004	33005	0BBC	Tq3	Torque 3	Float lower 2 bytes
3005	33006	0BBD			Float upper 2 bytes
3006	33007	0BBE	Tq4	Torque 4	Float lower 2 bytes
3007	33008	0BBF			Float upper 2 bytes
3008	33009	0BC0	Spd1	RPM 1	Float lower 2 bytes
3009	33010	0BC1			Float upper 2 bytes
3010	33011	0BC2	Spd2	RPM 2	Float lower 2 bytes
3011	33012	0BC3			Float upper 2 bytes
3012	33013	0BC4	Spd3	RPM 3	Float lower 2 bytes
3013	33014	0BC5			Float upper 2 bytes
3014	33015	0BC6	Spd4	RPM 4	Float lower 2 bytes
3015	33016	0BC7			Float upper 2 bytes
3016	33017	0BC8	Pm1	Motor power 1	Float lower 2 bytes
3017	33018	0BC9			Float upper 2 bytes
3018	33019	0BCA	Pm2	Motor power 2	Float lower 2 bytes
3019	33020	0BCB			Float upper 2 bytes
3020	33021	0BCC	Pm3	Motor power 3	Float lower 2 bytes
3021	33022	0BCD			Float upper 2 bytes
3022	33023	0BCE	Pm4	Motor power 4	Float lower 2 bytes
3023	33024	0BCF			Float upper 2 bytes
3024	33025	0BD0	Slip1	Slip 1	Float lower 2 bytes
3025	33026	0BD1			Float upper 2 bytes
3026	33027	0BD2	Slip2	Slip 2	Float lower 2 bytes
3027	33028	0BD3			Float upper 2 bytes
3028	33029	0BD4	Slip3	Slip 3	Float lower 2 bytes
3029	33030	0BD5			Float upper 2 bytes
3030	33031	0BD6	Slip4	Slip 4	Float lower 2 bytes
3031	33032	0BD7			Float upper 2 bytes
3032	33033	0BD8	CHA	CHA free input during independent input mode operation	Float lower 2 bytes
3033	33034	0BD9			Float upper 2 bytes
3034	33035	0BDA	CHB	CHB free input during independent input mode operation	Float lower 2 bytes
3035	33036	0BDB			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
3036	33037	0BDC	CHC	CHC free input during independent input mode operation	Float lower 2 bytes
3037	33038	0BDD			Float upper 2 bytes
3038	33039	0BDE	CHD	CHD free input during independent input mode operation	Float lower 2 bytes
3039	33040	0BDF			Float upper 2 bytes
3040	33041	0BE0	CHE	CHE free input during independent input mode operation	Float lower 2 bytes
3041	33042	0BE1			Float upper 2 bytes
3042	33043	0BE2	CHF	CHF free input during independent input mode operation	Float lower 2 bytes
3043	33044	0BE3			Float upper 2 bytes
3044	33045	0BE4	CHG	CHG free input during independent input mode operation	Float lower 2 bytes
3045	33046	0BE5			Float upper 2 bytes
3046	33047	0BE6	CHH	CHH free input during independent input mode operation	Float lower 2 bytes
3047	33048	0BE7			Float upper 2 bytes

3.1.6 Flicker measurement items

Reg No.	Ref No.	Hex No.	Register name	Register description	
3500	33501	0DAC	Pst1	CH1 short-term flicker	Float lower 2 bytes
3501	33502	0DAD			Float upper 2 bytes
3502	33503	0DAE	Pst2	CH2 short-term flicker	Float lower 2 bytes
3503	33504	0DAF			Float upper 2 bytes
3504	33505	0DB0	Pst3	CH3 short-term flicker	Float lower 2 bytes
3505	33506	0DB1			Float upper 2 bytes
3506	33507	0DB2	Pst4	CH4 short-term flicker	Float lower 2 bytes
3507	33508	0DB3			Float upper 2 bytes
3508	33509	0DB4	Pst5	CH5 short-term flicker	Float lower 2 bytes
3509	33510	0DB5			Float upper 2 bytes
3510	33511	0DB6	Pst6	CH6 short-term flicker	Float lower 2 bytes
3511	33512	0DB7			Float upper 2 bytes
3512	33513	0DB8	Pst7	CH7 short-term flicker	Float lower 2 bytes
3513	33514	0DB9			Float upper 2 bytes
3514	33515	0DBA	Pst8	CH8 short-term flicker	Float lower 2 bytes
3515	33516	0DBB			Float upper 2 bytes
3516	33517	0DBC	PstMax1	CH1 maximum short-term flicker value	Float lower 2 bytes
3517	33518	0DBD			Float upper 2 bytes
3518	33519	0DBE	PstMax2	CH2 maximum short-term	Float lower 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
3519	33520	0DBF		flicker value	Float upper 2 bytes
3520	33521	0DC0	PstMax3	CH3 maximum short-term	Float lower 2 bytes
3521	33522	0DC1		flicker value	Float upper 2 bytes
3522	33523	0DC2	PstMax4	CH4 maximum short-term	Float lower 2 bytes
3523	33524	0DC3		flicker value	Float upper 2 bytes
3524	33525	0DC4	PstMax5	CH5 maximum short-term	Float lower 2 bytes
3525	33526	0DC5		flicker value	Float upper 2 bytes
3526	33527	0DC6	PstMax6	CH6 maximum short-term	Float lower 2 bytes
3527	33528	0DC7		flicker value	Float upper 2 bytes
3528	33529	0DC8	PstMax7	CH7 maximum short-term	Float lower 2 bytes
3529	33530	0DC9		flicker value	Float upper 2 bytes
3530	33531	0DCA	PstMax8	CH8 maximum short-term	Float lower 2 bytes
3531	33532	0DCB		flicker value	Float upper 2 bytes
3532	33533	0DCC	Plt1	CH1 long-term flicker	Float lower 2 bytes
3533	33534	0DCD		value	Float upper 2 bytes
3534	33535	0DCE	Plt2	CH2 long-term flicker	Float lower 2 bytes
3535	33536	0DCF		value	Float upper 2 bytes
3536	33537	0DD0	Plt3	CH3 long-term flicker	Float lower 2 bytes
3537	33538	0DD1		value	Float upper 2 bytes
3538	33539	0DD2	Plt4	CH4 long-term flicker	Float lower 2 bytes
3539	33540	0DD3		value	Float upper 2 bytes
3540	33541	0DD4	Plt5	CH5 long-term flicker	Float lower 2 bytes
3541	33542	0DD5		value	Float upper 2 bytes
3542	33543	0DD6	Plt6	CH6 long-term flicker	Float lower 2 bytes
3543	33544	0DD7		value	Float upper 2 bytes
3544	33545	0DD8	Plt7	CH7 long-term flicker	Float lower 2 bytes
3545	33546	0DD9		value	Float upper 2 bytes
3546	33547	0DDA	Plt8	CH8 long-term flicker	Float lower 2 bytes
3547	33548	0DDB		value	Float upper 2 bytes
3548	33549	0DDC	PinstMax1	CH1 maximum	Float lower 2 bytes
3549	33550	0DDD		instantaneous flicker value	Float upper 2 bytes
3550	33551	0DDE	PinstMax2	CH2 maximum	Float lower 2 bytes
3551	33552	0DDF		instantaneous flicker value	Float upper 2 bytes
3552	33553	0DE0	PinstMax3	CH3 maximum	Float lower 2 bytes
3553	33554	0DE1		instantaneous flicker value	Float upper 2 bytes
3554	33555	0DE2	PinstMax4	CH4 maximum	Float lower 2 bytes
3555	33556	0DE3		instantaneous flicker value	Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
3556	33557	0DE4	PinstMax5	CH5 maximum instantaneous flicker value	Float lower 2 bytes
3557	33558	0DE5			Float upper 2 bytes
3558	33559	0DE6	PinstMax6	CH6 maximum instantaneous flicker value	Float lower 2 bytes
3559	33560	0DE7			Float upper 2 bytes
3560	33561	0DE8	PinstMax7	CH7 maximum instantaneous flicker value	Float lower 2 bytes
3561	33562	0DE9			Float upper 2 bytes
3562	33563	0DEA	PinstMax8	CH8 maximum instantaneous flicker value	Float lower 2 bytes
3563	33564	0DEB			Float upper 2 bytes
3564	33565	0DEC	PinstMin1	CH1 minimum instantaneous flicker value	Float lower 2 bytes
3565	33566	0DED			Float upper 2 bytes
3566	33567	0DEE	PinstMin2	CH2 minimum instantaneous flicker value	Float lower 2 bytes
3567	33568	0DEF			Float upper 2 bytes
3568	33569	0DF0	PinstMin3	CH3 minimum instantaneous flicker value	Float lower 2 bytes
3569	33570	0DF1			Float upper 2 bytes
3570	33571	0DF2	PinstMin4	CH4 minimum instantaneous flicker value	Float lower 2 bytes
3571	33572	0DF3			Float upper 2 bytes
3572	33573	0DF4	PinstMin5	CH5 minimum instantaneous flicker value	Float lower 2 bytes
3573	33574	0DF5			Float upper 2 bytes
3574	33575	0DF6	PinstMin6	CH6 minimum instantaneous flicker value	Float lower 2 bytes
3575	33576	0DF7			Float upper 2 bytes
3576	33577	0DF8	PinstMin7	CH7 minimum instantaneous flicker value	Float lower 2 bytes
3577	33578	0DF9			Float upper 2 bytes
3578	33579	0DFA	PinstMin8	CH8 minimum instantaneous flicker value	Float lower 2 bytes
3579	33580	0DFB			Float upper 2 bytes
3580	33581	0DFC	DC1	CH1 relative steady-state voltage change	Float lower 2 bytes
3581	33582	0DFD			Float upper 2 bytes
3582	33583	0DFE	DC2	CH2 relative steady-state voltage change	Float lower 2 bytes
3583	33584	0DFF			Float upper 2 bytes
3584	33585	0E00	DC3	CH3 relative steady-state voltage change	Float lower 2 bytes
3585	33586	0E01			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
3586	33587	0E02	DC4	CH4 relative steady-state voltage change	Float lower 2 bytes
3587	33588	0E03			Float upper 2 bytes
3588	33589	0E04	DC5	CH5 relative steady-state voltage change	Float lower 2 bytes
3589	33590	0E05			Float upper 2 bytes
3590	33591	0E06	DC6	CH6 relative steady-state voltage change	Float lower 2 bytes
3591	33592	0E07			Float upper 2 bytes
3592	33593	0E08	DC7	CH7 relative steady-state voltage change	Float lower 2 bytes
3593	33594	0E09			Float upper 2 bytes
3594	33595	0E0A	DC8	CH8 relative steady-state voltage change	Float lower 2 bytes
3595	33596	0E0B			Float upper 2 bytes
3596	33597	0E0C	DMax1	CH1 maximum relative voltage change	Float lower 2 bytes
3597	33598	0E0D			Float upper 2 bytes
3598	33599	0E0E	DMax2	CH2 maximum relative voltage change	Float lower 2 bytes
3599	33600	0E0F			Float upper 2 bytes
3600	33601	0E10	DMax3	CH3 maximum relative voltage change	Float lower 2 bytes
3601	33602	0E11			Float upper 2 bytes
3602	33603	0E12	DMax4	CH4 maximum relative voltage change	Float lower 2 bytes
3603	33604	0E13			Float upper 2 bytes
3604	33605	0E14	DMax5	CH5 maximum relative voltage change	Float lower 2 bytes
3605	33606	0E15			Float upper 2 bytes
3606	33607	0E16	DMax6	CH6 maximum relative voltage change	Float lower 2 bytes
3607	33608	0E17			Float upper 2 bytes
3608	33609	0E18	DMax7	CH7 maximum relative voltage change	Float lower 2 bytes
3609	33610	0E19			Float upper 2 bytes
3610	33611	0E1A	DMax8	CH8 maximum relative voltage change	Float lower 2 bytes
3611	33612	0E1B			Float upper 2 bytes
3612	33613	0E1C	TMax1	CH1 period while the relative voltage change exceeds the threshold	Float lower 2 bytes
3613	33614	0E1D			Float upper 2 bytes
3614	33615	0E1E	TMax2	CH2 period while the relative voltage change exceeds the threshold	Float lower 2 bytes
3615	33616	0E1F			Float upper 2 bytes
3616	33617	0E20	TMax3	CH3 period while the relative voltage change exceeds the threshold	Float lower 2 bytes
3617	33618	0E21			Float upper 2 bytes
3618	33619	0E22	TMax4	CH4 period while the relative voltage change exceeds the threshold	Float lower 2 bytes
3619	33620	0E23			Float upper 2 bytes
3620	33621	0E24	TMax5	CH5 period while the relative voltage change exceeds the threshold	Float lower 2 bytes
3621	33622	0E25			Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
3622	33623	0E26	TMax6	CH6 period while the relative voltage change exceeds the threshold	Float lower 2 bytes
3623	33624	0E27			Float upper 2 bytes
3624	33625	0E28	TMax7	CH7 period while the relative voltage change exceeds the threshold	Float lower 2 bytes
3625	33626	0E29			Float upper 2 bytes
3626	33627	0E2A	TMax8	CH8 period while the relative voltage change exceeds the threshold	Float lower 2 bytes
3627	33628	0E2B			Float upper 2 bytes
3628	33629	0E2C	T1	CH1 start time of the calculation (ms)	uint32 lower 2 bytes
3629	33630	0E2D			uint32 upper 2 bytes
3630	33631	0E2E	T2	CH2 start time of the calculation (ms)	uint32 lower 2 bytes
3631	33632	0E2F			uint32 upper 2 bytes
3632	33633	0E30	T3	CH3 start time of the calculation (ms)	uint32 lower 2 bytes
3633	33634	0E31			uint32 upper 2 bytes
3634	33635	0E32	T4	CH4 start time of the calculation (ms)	uint32 lower 2 bytes
3635	33636	0E33			uint32 upper 2 bytes
3636	33637	0E34	T5	CH5 start time of the calculation (ms)	uint32 lower 2 bytes
3637	33638	0E35			uint32 upper 2 bytes
3638	33639	0E36	T6	CH6 start time of the calculation (ms)	uint32 lower 2 bytes
3639	33640	0E37			uint32 upper 2 bytes
3640	33641	0E38	T7	CH7 start time of the calculation (ms)	uint32 lower 2 bytes
3641	33642	0E39			uint32 upper 2 bytes
3642	33643	0E3A	T8	CH8 start time of the calculation (ms)	uint32 lower 2 bytes
3643	33644	0E3B			uint32 upper 2 bytes

3.1.7 Harmonic measurement items

The following items are all primary measurement data in the initial settings

Reference: 3.3 Harmonic Measurement Items

Reg No.	Ref No.	Hex No.	Register name	Register description	
4000	34001	0FA0	HARMStatus	Status	uint32 lower 2 bytes
4001	34002	0FA1			uint32 upper 2 bytes
4002	34003	0FA2	Uk1	CH1 harmonic voltage	Float lower 2 bytes
4003	34004	0FA3		RMS value	Float upper 2 bytes
4004	34005	0FA4	Uk2	CH2 harmonic voltage	Float lower 2 bytes
4005	34006	0FA5		RMS value	Float upper 2 bytes
4006	34007	0FA6	Uk3	CH3 harmonic voltage	Float lower 2 bytes
4007	34008	0FA7		RMS value	Float upper 2 bytes
4008	34009	0FA8	Uk4	CH4 harmonic voltage	Float lower 2 bytes
4009	34010	0FA9		RMS value	Float upper 2 bytes
4010	34011	0FAA	Uk5	CH5 harmonic voltage	Float lower 2 bytes
4011	34012	0FAB		RMS value	Float upper 2 bytes
4012	34013	0FAC	Uk6	CH6 harmonic voltage	Float lower 2 bytes
4013	34014	0FAD		RMS value	Float upper 2 bytes
4014	34015	0FAE	Uk7	CH7 harmonic voltage	Float lower 2 bytes
4015	34016	0FAF		RMS value	Float upper 2 bytes
4016	34017	0FB0	Uk8	CH8 harmonic voltage	Float lower 2 bytes
4017	34018	0FB1		RMS value	Float upper 2 bytes
4018	34019	0FB2	ΘUk1	CH1 harmonic voltage	Float lower 2 bytes
4019	34020	0FB3		phase angle	Float upper 2 bytes
4020	34021	0FB4	ΘUk2	CH2 harmonic voltage	Float lower 2 bytes
4021	34022	0FB5		phase angle	Float upper 2 bytes
4022	34023	0FB6	ΘUk3	CH3 harmonic voltage	Float lower 2 bytes
4023	34024	0FB7		phase angle	Float upper 2 bytes
4024	34025	0FB8	ΘUk4	CH4 harmonic voltage	Float lower 2 bytes
4025	34026	0FB9		phase angle	Float upper 2 bytes
4026	34027	0FBA	ΘUk5	CH5 harmonic voltage	Float lower 2 bytes
4027	34028	0FBB		phase angle	Float upper 2 bytes
4028	34029	0FBC	ΘUk6	CH6 harmonic voltage	Float lower 2 bytes
4029	34030	0FBD		phase angle	Float upper 2 bytes
4030	34031	0FBE	ΘUk7	CH7 harmonic voltage	Float lower 2 bytes
4031	34032	0FBF		phase angle	Float upper 2 bytes
4032	34033	0FC0	ΘUk8	CH8 harmonic voltage	Float lower 2 bytes
4033	34034	0FC1		phase angle	Float upper 2 bytes
4034	34035	0FC2	Ik1	CH1 harmonic current	Float lower 2 bytes
4035	34036	0FC3		RMS value	Float upper 2 bytes
4036	34037	0FC4	Ik2	CH2 harmonic current	Float lower 2 bytes
4037	34038	0FC5		RMS value	Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
4038	34039	0FC6	Ik3	CH3 harmonic current	Float lower 2 bytes
4039	34040	0FC7		RMS value	Float upper 2 bytes
4040	34041	0FC8	Ik4	CH4 harmonic current	Float lower 2 bytes
4041	34042	0FC9		RMS value	Float upper 2 bytes
4042	34043	0FCA	Ik5	CH5 harmonic current	Float lower 2 bytes
4043	34044	0FCB		RMS value	Float upper 2 bytes
4044	34045	0FCC	Ik6	CH6 harmonic current	Float lower 2 bytes
4045	34046	0FCD		RMS value	Float upper 2 bytes
4046	34047	0FCE	Ik7	CH7 harmonic current	Float lower 2 bytes
4047	34048	0FCF		RMS value	Float upper 2 bytes
4048	34049	0FD0	Ik8	CH8 harmonic current	Float lower 2 bytes
4049	34050	0FD1		RMS value	Float upper 2 bytes
4050	34051	0FD2	ΘIk1	CH1 harmonic current	Float lower 2 bytes
4051	34052	0FD3		phase angle	Float upper 2 bytes
4052	34053	0FD4	ΘIk2	CH2 harmonic current	Float lower 2 bytes
4053	34054	0FD5		phase angle	Float upper 2 bytes
4054	34055	0FD6	ΘIk3	CH3 harmonic current	Float lower 2 bytes
4055	34056	0FD7		phase angle	Float upper 2 bytes
4056	34057	0FD8	ΘIk4	CH4 harmonic current	Float lower 2 bytes
4057	34058	0FD9		phase angle	Float upper 2 bytes
4058	34059	0FDA	ΘIk5	CH5 harmonic current	Float lower 2 bytes
4059	34060	0FDB		phase angle	Float upper 2 bytes
4060	34061	0FDC	ΘIk6	CH6 harmonic current	Float lower 2 bytes
4061	34062	0FDD		phase angle	Float upper 2 bytes
4062	34063	0FDE	ΘIk7	CH7 harmonic current	Float lower 2 bytes
4063	34064	0FDF		phase angle	Float upper 2 bytes
4064	34065	0FE0	ΘIk8	CH8 harmonic current	Float lower 2 bytes
4065	34066	0FE1		phase angle	Float upper 2 bytes
4066	34067	0FE2	Pk1	CH1 harmonic active	Float lower 2 bytes
4067	34068	0FE3		power	Float upper 2 bytes
4068	34069	0FE4	Pk2	CH2 harmonic active	Float lower 2 bytes
4069	34070	0FE5		power	Float upper 2 bytes
4070	34071	0FE6	Pk3	CH3 harmonic active	Float lower 2 bytes
4071	34072	0FE7		power	Float upper 2 bytes
4072	34073	0FE8	Pk4	CH4 harmonic active	Float lower 2 bytes
4073	34074	0FE9		power	Float upper 2 bytes
4074	34075	0FEA	Pk5	CH5 harmonic active	Float lower 2 bytes
4075	34076	0FEB		power	Float upper 2 bytes
4076	34077	0FEC	Pk6	CH6 harmonic active	Float lower 2 bytes
4077	34078	0FED		power	Float upper 2 bytes
4078	34079	0FEE	Pk7	CH7 harmonic active	Float lower 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
4079	34080	0FEF		power	Float upper 2 bytes
4080	34081	0FF0	Pk8	CH8 harmonic active	Float lower 2 bytes
4081	34082	0FF1		power	Float upper 2 bytes
4082	34083	0FF2	Pk12	CH12 harmonic active	Float lower 2 bytes
4083	34084	0FF3		power	Float upper 2 bytes
4084	34085	0FF4	Pk23	CH23 harmonic active	Float lower 2 bytes
4085	34086	0FF5		power	Float upper 2 bytes
4086	34087	0FF6	Pk34	CH34 harmonic active	Float lower 2 bytes
4087	34088	0FF7		power	Float upper 2 bytes
4088	34089	0FF8	Pk45	CH45 harmonic active	Float lower 2 bytes
4089	34090	0FF9		power	Float upper 2 bytes
4090	34091	0FFA	Pk56	CH56 harmonic active	Float lower 2 bytes
4091	34092	0FFB		power	Float upper 2 bytes
4092	34093	0FFC	Pk67	CH67 harmonic active	Float lower 2 bytes
4093	34094	0FFD		power	Float upper 2 bytes
4094	34095	0FFE	Pk78	CH78 harmonic active	Float lower 2 bytes
4095	34096	0FFF		power	Float upper 2 bytes
4096	34097	1000	Pk123	CH123 harmonic active	Float lower 2 bytes
4097	34098	1001		power	Float upper 2 bytes
4098	34099	1002	Pk234	CH234 harmonic active	Float lower 2 bytes
4099	34100	1003		power	Float upper 2 bytes
4100	34101	1004	Pk345	CH345 harmonic active	Float lower 2 bytes
4101	34102	1005		power	Float upper 2 bytes
4102	34103	1006	Pk456	CH456 harmonic active	Float lower 2 bytes
4103	34104	1007		power	Float upper 2 bytes
4104	34105	1008	Pk567	CH567 harmonic active	Float lower 2 bytes
4105	34106	1009		power	Float upper 2 bytes
4106	34107	100A	Pk678	CH678 harmonic active	Float lower 2 bytes
4107	34108	100B		power	Float upper 2 bytes
4108	34109	100C	Θk1	CH1 harmonic voltage/	Float lower 2 bytes
4109	34110	100D		current phase difference	Float upper 2 bytes
4110	34111	100E	Θk2	CH2 harmonic voltage/	Float lower 2 bytes
4111	34112	100F		current phase difference	Float upper 2 bytes
4112	34113	1010	Θk3	CH3 harmonic voltage/	Float lower 2 bytes
4113	34114	1011		current phase difference	Float upper 2 bytes
4114	34115	1012	Θk4	CH4 harmonic voltage/	Float lower 2 bytes
4115	34116	1013		current phase difference	Float upper 2 bytes
4116	34117	1014	Θk5	CH5 harmonic voltage/	Float lower 2 bytes
4117	34118	1015		current phase difference	Float upper 2 bytes
4118	34119	1016	Θk6	CH6 harmonic voltage/	Float lower 2 bytes
4119	34120	1017		current phase difference	Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
4120	34121	1018	Θk7	CH7 harmonic voltage/	Float lower 2 bytes
4121	34122	1019		current phase difference	Float upper 2 bytes
4122	34123	101A	Θk8	CH8 harmonic voltage/	Float lower 2 bytes
4123	34124	101B		current phase difference	Float upper 2 bytes
4124	34125	101C	Θ12	CH12 harmonic voltage/	Float lower 2 bytes
4125	34126	101D		current phase difference	Float upper 2 bytes
4126	34127	101E	Θ23	CH23 harmonic voltage/	Float lower 2 bytes
4127	34128	101F		current phase difference	Float upper 2 bytes
4128	34129	1020	Θ34	CH34 harmonic voltage/	Float lower 2 bytes
4129	34130	1021		current phase difference	Float upper 2 bytes
4130	34131	1022	Θ45	CH45 harmonic voltage/	Float lower 2 bytes
4131	34132	1023		current phase difference	Float upper 2 bytes
4132	34133	1024	Θ56	CH56 harmonic voltage/	Float lower 2 bytes
4133	34134	1025		current phase difference	Float upper 2 bytes
4134	34135	1026	Θ67	CH67 harmonic voltage/	Float lower 2 bytes
4135	34136	1027		current phase difference	Float upper 2 bytes
4136	34137	1028	Θ78	CH78 harmonic voltage/	Float lower 2 bytes
4137	34138	1029		current phase difference	Float upper 2 bytes
4138	34139	102A	Θ123	CH123 harmonic voltage/	Float lower 2 bytes
4139	34140	102B		current phase difference	Float upper 2 bytes
4140	34141	102C	Θ234	CH234 harmonic voltage/	Float lower 2 bytes
4141	34142	102D		current phase difference	Float upper 2 bytes
4142	34143	102E	Θ345	CH345 harmonic voltage/	Float lower 2 bytes
4143	34144	102F		current phase difference	Float upper 2 bytes
4144	34145	1030	Θ456	CH456 harmonic voltage/	Float lower 2 bytes
4145	34146	1031		current phase difference	Float upper 2 bytes
4146	34147	1032	Θ567	CH567 harmonic voltage/	Float lower 2 bytes
4147	34148	1033		current phase difference	Float upper 2 bytes
4148	34149	1034	Θ678	CH678 harmonic voltage/	Float lower 2 bytes
4149	34150	1035		current phase difference	Float upper 2 bytes
4150	34151	1036	HDUk1	CH1 harmonic voltage	Float lower 2 bytes
4151	34152	1037		content percentage	Float upper 2 bytes
4152	34153	1038	HDUk2	CH2 harmonic voltage	Float lower 2 bytes
4153	34154	1039		content percentage	Float upper 2 bytes
4154	34155	103A	HDUk3	CH3 harmonic voltage	Float lower 2 bytes
4155	34156	103B		content percentage	Float upper 2 bytes
4156	34157	103C	HDUk4	CH4 harmonic voltage	Float lower 2 bytes
4157	34158	103D		content percentage	Float upper 2 bytes
4158	34159	103E	HDUk5	CH5 harmonic voltage	Float lower 2 bytes
4159	34160	103F		content percentage	Float upper 2 bytes
4160	34161	1040	HDUk6	CH6 harmonic voltage	Float lower 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
4161	34162	1041		content percentage	Float upper 2 bytes
4162	34163	1042	HDUk7	CH7 harmonic voltage	Float lower 2 bytes
4163	34164	1043		content percentage	Float upper 2 bytes
4164	34165	1044	HDUk8	CH8 harmonic voltage	Float lower 2 bytes
4165	34166	1045		content percentage	Float upper 2 bytes
4166	34167	1046	HDIk1	CH1 harmonic current	Float lower 2 bytes
4167	34168	1047		content percentage	Float upper 2 bytes
4168	34169	1048	HDIk2	CH2 harmonic current	Float lower 2 bytes
4169	34170	1049		content percentage	Float upper 2 bytes
4170	34171	104A	HDIk3	CH3 harmonic current	Float lower 2 bytes
4171	34172	104B		content percentage	Float upper 2 bytes
4172	34173	104C	HDIk4	CH4 harmonic current	Float lower 2 bytes
4173	34174	104D		content percentage	Float upper 2 bytes
4174	34175	104E	HDIk5	CH5 harmonic current	Float lower 2 bytes
4175	34176	104F		content percentage	Float upper 2 bytes
4176	34177	1050	HDIk6	CH6 harmonic current	Float lower 2 bytes
4177	34178	1051		content percentage	Float upper 2 bytes
4178	34179	1052	HDIk7	CH7 harmonic current	Float lower 2 bytes
4179	34180	1053		content percentage	Float upper 2 bytes
4180	34181	1054	HDIk8	CH8 harmonic current	Float lower 2 bytes
4181	34182	1055		content percentage	Float upper 2 bytes
4182	34183	1056	HDPk1	CH1 harmonic power	Float lower 2 bytes
4183	34184	1057		content percentage	Float upper 2 bytes
4184	34185	1058	HDPk2	CH2 harmonic power	Float lower 2 bytes
4185	34186	1059		content percentage	Float upper 2 bytes
4186	34187	105A	HDPk3	CH3 harmonic power	Float lower 2 bytes
4187	34188	105B		content percentage	Float upper 2 bytes
4188	34189	105C	HDPk4	CH4 harmonic power	Float lower 2 bytes
4189	34190	105D		content percentage	Float upper 2 bytes
4190	34191	105E	HDPk5	CH5 harmonic power	Float lower 2 bytes
4191	34192	105F		content percentage	Float upper 2 bytes
4192	34193	1060	HDPk6	CH6 harmonic power	Float lower 2 bytes
4193	34194	1061		content percentage	Float upper 2 bytes
4194	34195	1062	HDPk7	CH7 harmonic power	Float lower 2 bytes
4195	34196	1063		content percentage	Float upper 2 bytes
4196	34197	1064	HDPk8	CH8 harmonic power	Float lower 2 bytes
4197	34198	1065		content percentage	Float upper 2 bytes
4198	34199	1066	HDPk12	CH12 harmonic power	Float lower 2 bytes
4199	34200	1067		content percentage	Float upper 2 bytes
4200	34201	1068	HDPk23	CH23 harmonic power	Float lower 2 bytes
4201	34202	1069		content percentage	Float upper 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
4202	34203	106A	HDPk34	CH34 harmonic power	Float lower 2 bytes
4203	34204	106B		content percentage	Float upper 2 bytes
4204	34205	106C	HDPk45	CH45 harmonic power	Float lower 2 bytes
4205	34206	106D		content percentage	Float upper 2 bytes
4206	34207	106E	HDPk56	CH56 harmonic power	Float lower 2 bytes
4207	34208	106F		content percentage	Float upper 2 bytes
4208	34209	1070	HDPk67	CH67 harmonic power	Float lower 2 bytes
4209	34210	1071		content percentage	Float upper 2 bytes
4210	34211	1072	HDPk78	CH78 harmonic power	Float lower 2 bytes
4211	34212	1073		content percentage	Float upper 2 bytes
4212	34213	1074	HDPk123	CH123 harmonic power	Float lower 2 bytes
4213	34214	1075		content percentage	Float upper 2 bytes
4214	34215	1076	HDPk234	CH234 harmonic power	Float lower 2 bytes
4215	34216	1077		content percentage	Float upper 2 bytes
4216	34217	1078	HDPk345	CH345 harmonic power	Float lower 2 bytes
4217	34218	1079		content percentage	Float upper 2 bytes
4218	34219	107A	HDPk456	CH456 harmonic power	Float lower 2 bytes
4219	34220	107B		content percentage	Float upper 2 bytes
4220	34221	107C	HDPk567	CH567 harmonic power	Float lower 2 bytes
4221	34222	107D		content percentage	Float upper 2 bytes
4222	34223	107E	HDPk678	CH678 harmonic power	Float lower 2 bytes
4223	34224	107F		content percentage	Float upper 2 bytes
4224	34225	1080	fHRM1	CH1 harmonics	Float lower 2 bytes
4225	34226	1081		synchronization frequency	Float upper 2 bytes
4226	34227	1082	fHRM2	CH2 harmonics	Float lower 2 bytes
4227	34228	1083		synchronization frequency	Float upper 2 bytes
4228	34229	1084	fHRM3	CH3 harmonics	Float lower 2 bytes
4229	34230	1085		synchronization frequency	Float upper 2 bytes
4230	34231	1086	fHRM4	CH4 harmonics	Float lower 2 bytes
4231	34232	1087		synchronization frequency	Float upper 2 bytes
4232	34233	1088	fHRM5	CH5 harmonics	Float lower 2 bytes
4233	34234	1089		synchronization frequency	Float upper 2 bytes
4234	34235	108A	fHRM6	CH6 harmonics	Float lower 2 bytes
4235	34236	108B		synchronization frequency	Float upper 2 bytes
4236	34237	108C	fHRM7	CH7 harmonics	Float lower 2 bytes
4237	34238	108D		synchronization frequency	Float upper 2 bytes
4238	34239	108E	fHRM8	CH8 harmonics	Float lower 2 bytes
4239	34240	108F		synchronization frequency	Float upper 2 bytes

3.1.8 Inter-harmonic measurement items

The following items are all 1st order measurement data in the initial settings

Reference: 3.3 Harmonic Measurement Items

Reg No.	Ref No.	Hex No.	Register name	Register description	
4500	34501	1194	iUk1	CH1 inter-harmonic	Float lower 2 bytes
4501	34502	1195		voltage RMS value	Float upper 2 bytes
4502	34503	1196	iUk2	CH2 inter-harmonic	Float lower 2 bytes
4503	34504	1197		voltage RMS value	Float upper 2 bytes
4504	34505	1198	iUk3	CH3 inter-harmonic	Float lower 2 bytes
4505	34506	1199		voltage RMS value	Float upper 2 bytes
4506	34507	119A	iUk4	CH4 inter-harmonic	Float lower 2 bytes
4507	34508	119B		voltage RMS value	Float upper 2 bytes
4508	34509	119C	iUk5	CH5 inter-harmonic	Float lower 2 bytes
4509	34510	119D		voltage RMS value	Float upper 2 bytes
4510	34511	119E	iUk6	CH6 inter-harmonic	Float lower 2 bytes
4511	34512	119F		voltage RMS value	Float upper 2 bytes
4512	34513	11A0	iUk7	CH7 inter-harmonic	Float lower 2 bytes
4513	34514	11A1		voltage RMS value	Float upper 2 bytes
4514	34515	11A2	iUk8	CH8 inter-harmonic	Float lower 2 bytes
4515	34516	11A3		voltage RMS value	Float upper 2 bytes
4516	34517	11A4	iHDUk1	CH1 inter-harmonic	Float lower 2 bytes
4517	34518	11A5		voltage content percentage	Float upper 2 bytes
4518	34519	11A6	iHDUk2	CH2 inter-harmonic	Float lower 2 bytes
4519	34520	11A7		voltage content percentage	Float upper 2 bytes
4520	34521	11A8	iHDUk3	CH3 inter-harmonic	Float lower 2 bytes
4521	34522	11A9		voltage content percentage	Float upper 2 bytes
4522	34523	11AA	iHDUk4	CH4 inter-harmonic	Float lower 2 bytes
4523	34524	11AB		voltage content percentage	Float upper 2 bytes
4524	34525	11AC	iHDUk5	CH5 inter-harmonic	Float lower 2 bytes
4525	34526	11AD		voltage content percentage	Float upper 2 bytes
4526	34527	11AE	iHDUk6	CH6 inter-harmonic	Float lower 2 bytes
4527	34528	11AF		voltage content percentage	Float upper 2 bytes
4528	34529	11B0	iHDUk7	CH7 inter-harmonic	Float lower 2 bytes
4529	34530	11B1		voltage content percentage	Float upper 2 bytes
4530	34531	11B2	iHDUk8	CH8 inter-harmonic	Float lower 2 bytes

Reg No.	Ref No.	Hex No.	Register name	Register description	
4531	34532	11B3		voltage content percentage	Float upper 2 bytes
4532	34533	11B4	iIk1	CH1 inter-harmonic	Float lower 2 bytes
4533	34534	11B5		current RMS value	Float upper 2 bytes
4534	34535	11B6	iIk2	CH2 inter-harmonic	Float lower 2 bytes
4535	34536	11B7		current RMS value	Float upper 2 bytes
4536	34537	11B8	iIk3	CH3 inter-harmonic	Float lower 2 bytes
4537	34538	11B9		current RMS value	Float upper 2 bytes
4538	34539	11BA	iIk4	CH4 inter-harmonic	Float lower 2 bytes
4539	34540	11BB		current RMS value	Float upper 2 bytes
4540	34541	11BC	iIk5	CH5 inter-harmonic	Float lower 2 bytes
4541	34542	11BD		current RMS value	Float upper 2 bytes
4542	34543	11BE	iIk6	CH6 inter-harmonic	Float lower 2 bytes
4543	34544	11BF		current RMS value	Float upper 2 bytes
4544	34545	11C0	iIk7	CH7 inter-harmonic	Float lower 2 bytes
4545	34546	11C1		current RMS value	Float upper 2 bytes
4546	34547	11C2	iIk8	CH8 inter-harmonic	Float lower 2 bytes
4547	34548	11C3		current RMS value	Float upper 2 bytes
4548	34549	11C4	iHDIk1	CH1 inter-harmonic	Float lower 2 bytes
4549	34550	11C5		current content percentage	Float upper 2 bytes
4550	34551	11C6	iHDIk2	CH2 inter-harmonic	Float lower 2 bytes
4551	34552	11C7		current content percentage	Float upper 2 bytes
4552	34553	11C8	iHDIk3	CH3 inter-harmonic	Float lower 2 bytes
4553	34554	11C9		current content percentage	Float upper 2 bytes
4554	34555	11CA	iHDIk4	CH4 inter-harmonic	Float lower 2 bytes
4555	34556	11CB		current content percentage	Float upper 2 bytes
4556	34557	11CC	iHDIk5	CH5 inter-harmonic	Float lower 2 bytes
4557	34558	11CD		current content percentage	Float upper 2 bytes
4558	34559	11CE	iHDIk6	CH6 inter-harmonic	Float lower 2 bytes
4559	34560	11CF		current content percentage	Float upper 2 bytes
4560	34561	11D0	iHDIk7	CH7 inter-harmonic	Float lower 2 bytes
4561	34562	11D1		current content percentage	Float upper 2 bytes
4562	34563	11D2	iHDIk8	CH8 inter-harmonic	Float lower 2 bytes
4563	34564	11D3		current content percentage	Float upper 2 bytes

3.1.9 CUSTOM screen items

Reg No.	Ref No.	Hex No.	Register name	Register description	
5000	35001	1388	8Item1	Measurement data	Float lower 2 bytes
5001	35002	1389		assigned to 8Item1	Float upper 2 bytes
:	:	:			
5014	35015	1396	8Item8	Measurement data	Float lower 2 bytes
5015	35016	1397		assigned to 8Item8	Float upper 2 bytes
5016	35017	1398	16Item1	Measurement data	Float lower 2 bytes
5017	35018	1399		assigned to 16Item1	Float upper 2 bytes
:	:	:			
5046	35047	13B6	16Item16	Measurement data	Float lower 2 bytes
5047	35048	13B7		assigned to 16Item16	Float upper 2 bytes
5048	35049	13B8	36Item1	Measurement data	Float lower 2 bytes
5049	35050	13B9		assigned to 36Item1	Float upper 2 bytes
:	:	:			
5118	35119	13FE	36Item36	Measurement data	Float lower 2 bytes
5119	35120	13FF		assigned to 36Item36	Float upper 2 bytes
5120	35121	1400	64Item1	Measurement data	Float lower 2 bytes
5121	35122	1401		assigned to 64Item1	Float upper 2 bytes
:	:	:			
5246	35247	147E	64Item64	Measurement data	Float lower 2 bytes
5247	35248	147F		assigned to 64Item64	Float upper 2 bytes

3.1.10 Optional output items

Output items specified using the communications command :MODBus:ITEM <Output No.>,<Output item>

Reg No.	Ref No.	Hex No.	Register name	Register description	
6000	36001	1770	Item1	Output items with	Float lower 2 bytes
6001	36002	1771		<Output No.>=1	Float upper 2 bytes
6002	36003	1772	Item2	Output items with	Float lower 2 bytes
6003	36004	1773		<Output No.>=2	Float upper 2 bytes
:	:	:			
Reg No.:6000+(X−1)×2			ItemX	Output items with	Float lower 2 bytes
Reg No.:6000+(X−1)×2+1				<Output No.>=X	Float upper 2 bytes
:	:	:			
7996	37997	1F3C	Item999	Output items with	Float lower 2 bytes
7997	37998	1F3D		<Output No.>=999	Float upper 2 bytes
7998	37999	1F3E	Item1000	Output items with	Float lower 2 bytes
7999	3800	1F3F		<Output No.>=1000	Float upper 2 bytes

3.1.11 Measurement range setting items

Reg No.	Ref No.	Hex No.	Register name	Register description	
8000	38001	1F40	URange1	CH1 voltage range value	Float lower 2 bytes
8001	38002	1F41			Float upper 2 bytes
8002	38003	1F42	URange2	CH2 voltage range value	Float lower 2 bytes
8003	38004	1F43			Float upper 2 bytes
8004	38005	1F44	URange3	CH3 voltage range value	Float lower 2 bytes
8005	38006	1F45			Float upper 2 bytes
8006	38007	1F46	URange4	CH4 voltage range value	Float lower 2 bytes
8007	38008	1F47			Float upper 2 bytes
8008	38009	1F48	URange5	CH5 voltage range value	Float lower 2 bytes
8009	38010	1F49			Float upper 2 bytes
8010	38011	1F4A	URange6	CH6 voltage range value	Float lower 2 bytes
8011	38012	1F4B			Float upper 2 bytes
8012	38013	1F4C	URange7	CH7 voltage range value	Float lower 2 bytes
8013	38014	1F4D			Float upper 2 bytes
8014	38015	1F4E	URange8	CH8 voltage range value	Float lower 2 bytes
8015	38016	1F4F			Float upper 2 bytes
8016	38017	1F50	IRange1	CH1 current range value	Float lower 2 bytes
8017	38018	1F51			Float upper 2 bytes
8018	38019	1F52	IRange2	CH2 current range value	Float lower 2 bytes
8019	38020	1F53			Float upper 2 bytes
8020	38021	1F54	IRange3	CH3 current range value	Float lower 2 bytes
8021	38022	1F55			Float upper 2 bytes
8022	38023	1F56	IRange4	CH4 current range value	Float lower 2 bytes
8023	38024	1F57			Float upper 2 bytes
8024	38025	1F58	IRange5	CH5 current range value	Float lower 2 bytes
8025	38026	1F59			Float upper 2 bytes
8026	38027	1F5A	IRange6	CH6 current range value	Float lower 2 bytes
8027	38028	1F5B			Float upper 2 bytes
8028	38029	1F5C	IRange7	CH7 current range value	Float lower 2 bytes
8029	38030	1F5D			Float upper 2 bytes
8030	38031	1F5E	IRange8	CH8 current range value	Float lower 2 bytes
8031	38032	1F5F			Float upper 2 bytes
8032	38033	1F60	URangeA	CHA voltage range	Float lower 2 bytes
8033	38034	1F61			Float upper 2 bytes
8034	38035	1F62	URangeC	CHC voltage range	Float lower 2 bytes
8035	38036	1F63			Float upper 2 bytes
8036	38037	1F64	URangeE	CHE voltage range	Float lower 2 bytes
8037	38038	1F65			Float upper 2 bytes
8038	38039	1F66	URangeG	CHG voltage range	Float lower 2 bytes
8039	38040	1F67			Float upper 2 bytes

3.2 Float Format Data

Float is IEEE754 single-precision floating-point format (32-bit) data.

One Modbus register is fixed to 16 bits and the Float format data is divided and saved to two registers with 16 bits each.

As all Float format data for this instrument is arranged in Little Endian order (in order of lower 16 bits and upper 16 bits), specify “Little” for the data order in which Float format data is handled on the client side.

Example: When CH1 voltage RMS value Urms1 is 100 V, the reading of the register is as follows.

Input register: 0020 = “0x0000”

Input register: 0021 = “0x42C8”

Data when an error occurs is as follows.

Exceeded value	+99999.9E+30
Error value	+77777.7E+30
Unassigned register Example: 0846 to 999	0x7FC00000 (NAN)

3.3 Harmonic Measurement Items

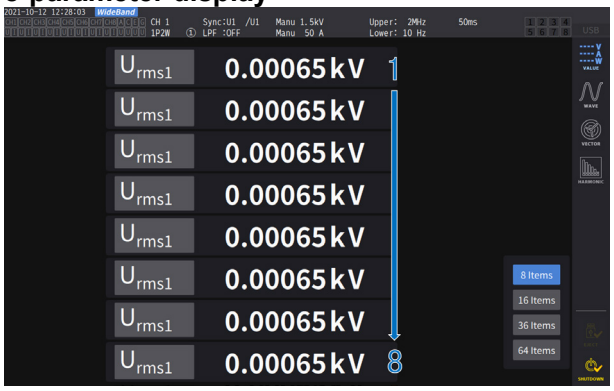
The harmonic measurement items for the input register (register No.: 4000 to 4563) are all primary measured data in the initial settings. By specifying the harmonic order in Harmonic Order (register No.: 0007) of the holding register, you can acquire the measured data of any order. For details of the register harmonic order, see “4.2.8 Harmonic order”.

Example: If you specify “100” for the harmonic order (register No.: 0007) for the holding register, the harmonic measurement items (register No.: 4000 to 4563) for the input register are all 100th measurement data.

3.4 CUSTOM Screen Items

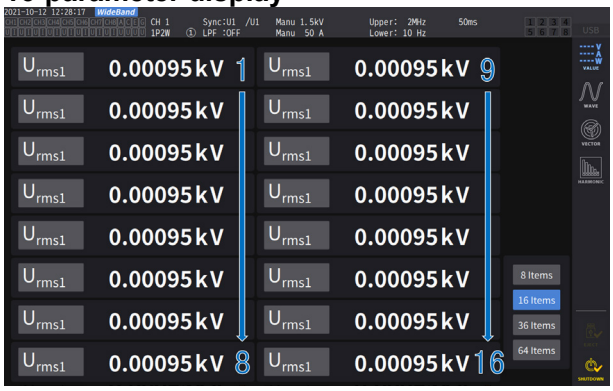
The correspondence between CUSTOM screen items of the input register (register No.: 5000 to 5247) 8ITEM1 to 8ITEM8, 16Item1 to 16Item16, 36Item1 to 36Item36, and 64Item1 to 64Item64 and the CUSTOM screen display of the instrument is as follows.

8-parameter display



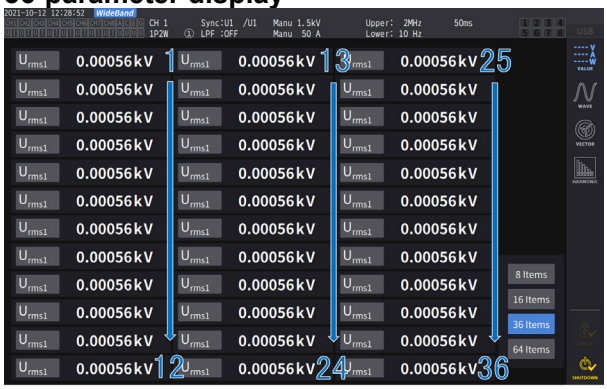
8Item1 to 8Item8 from top

16-parameter display



1st column from left: 16Item1 to 16Item8 from top
2nd column from left: 16Item9 to 16Item16 from top

36-parameter display



1st column from left: 36Item1 to 36Item12 from top
2nd column from left: 36Item13 to 36Item24 from top
3rd column from left: 36Item25 to 36Item36 from top

64-parameter display

1st column from left: 64Item1 to 64Item16 from top
2nd column from left: 64Item17 to 64Item32 from top
3rd column from left: 64Item33 to 64tem48 from top
4th column from left: 64Item49 to 64Item64 from top

3.5 Registering Optional Output Items

3.5.1 Registration of optional output items

For the input register optional output items (register No.: 6000 to 7999), up to 1000 optional output items can be assigned using the communications command :MODBus:ITEM. For details, see the register map under “3.1.8 Optional output items”. In the initial settings, “Pattern 1” of the preset output items is assigned to this area. For details on the preset output items, see “3.5.2 Preset output items”.

The optional output item registration is reset when the power is turned on again and “Pattern 1” of the preset output items is set every time the instrument starts up. The registration information of the optional output items cannot be saved in the settings file.

For the procedure to assign and preset output items using a communications command, see the PW8001 Communications Command Instruction Manual.

3.5.2 Preset output items

Preset output items can be specified using the communications command :MODBus:ITEM:PRESet. There is only one pattern for the preset output items that can be specified. The information of preset pattern 1 is as follows.

Pattern 1

Output No.	Output item
1	Urms1
2	Umn1
3	Uac1
4	Udc1
5	Ufnd1
6	PUpk1
7	MUpk1
8	Uthd1
9	Urf1
10	Irms1
11	Imn1
12	Iac1
13	Idc1
14	Ifnd1
15	PIpk1
16	MIpk1
17	Ithd1
18	Irf1
19	P1
20	Pfnd1
21	S1
22	Sfnd1
23	Q1

Output No.	Output item
24	Qfnd1
25	PF1
26	PFfnd1
27	Udeg1
28	Ideg1
29	DEG1
30	FU1
31	FI1
32	PIH1
33	MIH1
34	IH1
35	PWP1
36	MWP1
37	WP1
38 to 74	Urms2 to WP2
75 to 111	Urms3 to WP3
112 to 148	Urms4 to WP4
149 to 185	Urms5 to WP5
186 to 222	Urms6 to WP6
223 to 259	Urms7 to WP7
260 to 296	Urms8 to WP8
297	Urms12
298	Umn12
299	Irms12
300	Imn12
301	P12
302	Pfnd12
303	S12
304	Sfnd12
305	Q12
306	Qfnd12
307	PF12
308	PFfnd12
309	DEG12
310	PWP12
311	MWP12
312	WP12
313 to 328	Urms23 to WP23
329 to 344	Urms34 to WP34
345 to 360	Urms45 to WP45
361 to 376	Urms56to WP56
377 to 392	Urms67 to WP67

Output No.	Output item
393 to 408	Urms78 to WP78
409	Urms123
410	Umn123
411	Uunb123
412	Irms123
413	Imn123
414	Iunb123
415	P123
416	Pfnd123
417	S123
418	Sfnd123
419	Q123
420	Qfnd123
421	PF123
422	PFfnd123
423	DEG123
424	PWP123
425	MWP123
426	WP123
427 to 444	Urms234 to WP234
445 to 462	Urms345 to WP345
463 to 480	Urms456 to WP456
481 to 498	Urms567 to WP567
499 to 516	Urms678 to WP678
517 to 1000	OFF

Note: When items to which OFF is specified are read, an error value is returned.

4 Holding Register

4.1 Register Map

4.1.1 Control data

Reg No.	Ref No.	Hex No.	Register name	Register description		R/W
0000	40001	0000	Regster Hold	Register value hold/reset	uint16	R/W
0001	40002	0001	INTEG:All:Start/ Stop	All wiring integration start/stop	uint16	R/W
0002	40003	0002	INTEG:All:Reset	All wiring integration reset	uint16	W
0003	40004	0003	INTEG:Start	Each wiring integration start	uint16	R/W
0004	40005	0004	INTEG Stop	Each wiring integration stop	uint16	W
0005	40006	0005	INTEG:Reset	Each wiring integration reset	uint16	W
0006	40007	0006	HOLD	Measured value hold	uint16	R/W
0007	40008	0007	Harmonic Order	Harmonic order	uint16	R/W

For the procedure to use each register, see “4.2 Details of Control by Holding Register” in the following section.

4.2 Details of Control by Holding Register

4.2.1 Register value hold/reset

Reg No.	0000
Register name	Regster Hold
Description	Register value hold When the register value hold is executed, the input register values at that time are retained and set so that they cannot be updated even if the measured values of the instrument are updated. The values read from the input register in this state are saved as data at the time of execution of the register value hold. When the data is overwritten with 1 with the register value in the hold state, the input register is updated with the latest values at that time and retained with those values from then on. Register value reset Register value hold is reset. Along with the update of the measured values of the instrument, the input register values are updated to the latest measurement data.
Effective range	0 Reset 1 Hold Other Invalid
R/W	Read/write
Reference	・ Reading of Harmonic measurement items in the register value hold state When the harmonic order is changed with the register value in hold state, the harmonic measurement items of the input register are changed to the measurement data for the newly specified order. The data read at this time is measurement data at the time of execution of the register value hold but not the latest measurement data. When the register value hold is reset, the input register is updated with the latest measurement data. ・ Reading of CUSTOM screen items in the register value hold state When the display items of the CUSTOM screen are changed with the register value in hold state, the CUSTOM screen items of the input register are also changed in conjunction with the display items specified on the screen. The data read at this time is measurement data at the time of execution of the register value hold but not the latest measurement data. When the register value hold is reset, the input register is updated with the latest measurement data. ・ Reading of optional output items in the register value hold state When the output items using a communications command are changed with the register value in hold state, the optional output items of the input register are changed to the newly specified output items. The data read at this time is measurement data at the time of execution of the register value hold but not the latest measurement data. When the register value hold is reset, the input register is updated with the latest measurement data.

4.2.2 All wiring integration start/stop

Reg No.	0001
Register name	INTEG:All:Start/Stop
Description	All wiring integration start Starts the integration (time control) in the all wiring integration mode. If the integration control method is not all wiring integration, it is changed to the all wiring integration and the integration starts. When the integration state is RUN, 0ADJ, or OTHER, the integration start is not executed. All wiring integration stop Stops the integration (time control) of all wiring integration. If the integration control method is not all wiring integration, the integration stop is not executed. When the integration state is RESET, STOP, 0ADJ, or OTHER, the integration stop is not executed.
Effective range	0 Stop 1 Start Other Invalid
R/W	Read/write While the wiring integration is being executed, the read value of the register is 0 (stop).
Reference	The integration can be queried using the communications command :INTEGrate:STATe?. <Integration state> Integration state: RESET Integration is in reset; STOP Integration is in stop; WAIT Integration is in standby; RUN Integration is in process; OTHER States other than the above; 0ADJ Various zero adjustments are in process For details, see the PW8001 Communications Command Instruction Manual.

4.2.3 All wiring integration reset

Reg No.	0002
Register name	INTEG:All:Reset
Description	Resets the integrated data of all wiring integration. If the integration control method is not all wiring integration, the integration reset is not executed. When the integration state is WAIT, RUN, 0ADJ, or OTHER, the integration reset is not executed.
Effective range	0 Reset Other Invalid
R/W	Write only
Reference	The integration can be queried using the communications command :INTEGrate:STATe?. For details, see the PW8001 Communications Command Instruction Manual.

4.2.4 Start of each wiring integration

Reg No. 0003

Register name INTEG:Start

Description Starts the integration (time control) of the wiring including the specified channel.
If the integration control method is not each wiring integration, it is changed to the each wiring integration and the integration starts.
Each wiring integration is executed in only the channel of the target channels that can start the integration.
When the integration state is RUN, 0ADJ, or OTHER, the integration start is not executed in this channel.

Specification of the channel to be controlled
Specifies the channel in a value from 0 to 255. Set the channel so that the bit of the target channel is 1.

128	64	32	16	8	4	2	1
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
CH8	CH7	CH6	CH5	CH4	CH3	CH2	CH1

Effective range 0 to 255

R/W Read/write
For the read value, the bit of the channel for which integration is being executed is 1 regardless of the integration control method.

Reference The integration can be queried using the communications command :INTEGrate:STATe?.
For details, see the PW8001 Communications Command Instruction Manual.

4.2.5 Stop of each wiring integration

Reg No. 0004

Register name INTEG:Stop

Description Stops the integration (time control) of the wiring including the specified channel.
If the integration control method is not each wiring integration, this control is not executed.
The integration stop is executed in only the channel of the target channels that can stop the integration.
When the integration state is RESET, STOP, 0ADJ, or OTHER, the integration stop is not executed in that channel.

Specification of the channel to be controlled
Specifies the channel in a value from 0 to 255. Set the channel so that the bit of the target channel is 1.

128	64	32	16	8	4	2	1
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
CH8	CH7	CH6	CH5	CH4	CH3	CH2	CH1

Effective range 0 to 255

R/W Write only

Reference The integration can be queried using the communications command :INTEGrate:STATe?.
For details, see the PW8001 Communications Command Instruction Manual.

4.2.6 Each wiring integration reset

Reg No.	0005
Register name	INTEG:Reset
Description	Resets the integrated data of the wiring including the specified channel. If the integration control method is not each wiring integration, this control is not executed. The integration reset is executed only in the channel of the target channels that can be reset. When the integration state is WAIT, RUN, 0ADJ, or OTHER, the integration reset is not executed in that channel. Specification of the channel to be controlled Specifies the channel in a value from 0 to 255. Set the channel so that the bit of the target channel is 1.

128	64	32	16	8	4	2	1
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
CH8	CH7	CH6	CH5	CH4	CH3	CH2	CH1

Effective range	0 to 255
R/W	Write only
Reference	The integration can be queried using the communications command :INTEGrate:STATe?. For details, see the PW8001 Communications Command Instruction Manual.

4.2.7 Measured value hold

Reg No.	0006	
Register name	HOLD	
Description	Sets hold state.	
Effective range	0	Hold OFF
	1	Hold ON
	2	Peak hold ON
	Other	Invalid
R/W	Read/write	
Reference		

4.2.8 Harmonic order

Reg No.	0007
Register name	Harmonic Order
Description	Specifies the order for the harmonic measurement items of the input register. The initial value is “1”.
Effective range	0 to 500
R/W	Read/write
Reference	For details, see “3.3 Harmonic Measurement Items”.

5 Troubleshooting

Problem	Cause	Solution/Reference
No communications.	The cable is not connected properly. The cable in use is an item other than specified.	Refer to “9 Connecting the Instrument to a PC” in the PW8001 Instruction Manual.
	Power supply to some of the devices in connection is not turned ON.	Turn ON all the devices.
	The communication setting of the Modbus/TCP client instrument is not identical to the one for the instrument. The IP address setting is identical to the one for another device.	Refer to “9 Connecting the Instrument to a PC” in the PW8001 Instruction Manual.
	The TCP/IP port number is incorrect.	Set the port number to 502.
Communications are not working properly.	Function codes not supported by the instrument are used.	See “1.2 Function Code”.
	The ID (server address) is not correct.	Sets the unit ID (server address) to “1”.
The response message is not the same as what is displayed on the instrument panel.	It is not an error. A response message is created when the instrument receives a message. The message may not be identical to the display when it is loaded by the computer.	

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Edited and published by HIOKI E.E. CORPORATION Printed in Japan

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