

NG9 /96 Modbus RTU

Specifications and definitions for Modbus registers, version 0.1 date 07/11/2016

Reference to Firmware Version: FW 2.0.6

Instrument setting

In standard Setup, set the following parameters:

Modbus address: enter the address of the instrument; set a value from 1 to 247, making sure that there aren't duplicate addresses between instruments connected to the same cable.

Set the next parameters with the same values used by the master which interrogates the instrument.

SPEED: select a value among 9600 and 115200 bps.

PARITY: select a value among EVEN; ODD and NONE.

STOP BIT: select 1 or 2.

When finishing the changes, exit the menu and restart the instrument.

After a reset, the instrument is set with the following parameters: Address 1; Speed 19200 bps; Parity even; Stop bit 1.

Reading from the registers

Supported functions: 03 - read holding registers; 06 - write single register; 16 - write multiple registers.

The floating point measures at 32 bit (4 bytes) and integer at 32 bit, use two consecutive Modbus registers (each measure); then the system must read SIMULTANEOUSLY two Modbus registers to get the value of a measure. In this interval, when an odd number of registers is read, a response with error code ILLEGAL ADDRESS will be generated. This error code will also be generated when an initial register odd is read.

ID shown is equivalent to DATA ADDRESS 7000, corresponding to Input Register 37001.
When writing into registers, only the function 16 is supported (write multiple registers).

Mapping of registers

Configuration

ID	Format	Content	Note
0000	U16 RW	Year on 4 digits	1,2
0001	U16 RW	Month	1,2
0002	U16 RW	Day	1,2
0003	U16 RW	Hour	1,2
0004	U16 RW	Minutes	1,2
0005	U16 RW	Seconds	1,2
1100	U16 RW	Time-Zone 0= CET (GMT+1) 1= WET (GMT+0) 2= EET (GMT+2)	2,3
1101	U16 RW	DST management enabled 0= DST disabled 1= DST enabled	2
1102	U16 RW	Time format for writing/reading data into registers 0000-0005 0= Wall time (the local time includes DST) 1= Local time (the local time doesn't include DST) 2= GMT	2
1103	U16 RW	Modality to represent the sign of the Power factor 0= PF1 (positive: import, negative: export) 1= PF2 (positive: inductive, negative: capacitive)	2
1104	U16 RW	Insertion, number of three-phase systems 0= 0 three-phase 9 single-phase 1= 1 three-phase 6 single-phase 2= 2 three-phase 3 single-phase 3= 3 three-phase 0 single-phase	2
1105	U16 RW	Type and range for L1 sensor 17: manufacturing check, don't use. 18: disabled channel. 34: TA5 range 1A 35: TA5 range 2,5A 36: TA5 range 5A 37: NG-AIN 4_20mA 38: NG-AIN 20mA-10V 39: NG-RTD 40: NG-DIG STATE 41: NG-DIG COUNTER 99: Third channel calculated	2,3

ID	Format	Content	Note
1106	U16 RW	Type and range for sensor L2, See the register 1105	2,3
1107	U16 RW	Type and range for sensor L3, See the register 1105	2,3
1108	U16 RW	Type and range for L4 sensor 0: CC06 range 1 A 1: CC06 range 2 A 2: CC06 range 5 A 3: CC06 range 10 A 4: CC16 range 10 A 5: CC16 range 20 A 6: CC16 range 40 A 7: CC16 range 100 A 8: CC24 range 20 A 9: CC24 range 40 A 10: CC24 range 80 A 11: CC24 range 200 A 12: RG2K range 100 A 13: RG2K range 200 A 14: RG2K range 400 A 15: RG2K range 1000 A 16: RG2K range 2000 A 17: manufacturing check, don't use. 18: disabled channel. 19: RG4K-200 20: RG4K-400 21: RG4K-800 22: RG4K-2000 23: RG4K-4000 24: RG4K-400 25: RG8K-800 26: RG8K-1600 27: RG8K-4000 28: RG8K-8000 37: NG-AIN 4_20mA 38: NG-AIN 20mA-10V 39: NG-RTD 40: NG-DIG STATE 41: NG-DIG COUNTER 99: Third channel calculated	2,3
1109	U16 RW	Type and range for sensor L5, See the register 1108	2,3
1110	U16 RW	Type and range for sensor L6, See the register 1108	2,3
1111	U16 RW	Type and range for sensor L7, See the register 1108	2,3
1112	U16 RW	Type and range for sensor L8, See the register 1108	2,3
1113	U16 RW	Type and range for sensor L9, See the register 1108	2,3
1114	U16 RW	Sensor L1, correspondence to voltmetric channel for Power calculation. 0= Voltage L1 1= Voltage L2 2= Voltage L3 Default value: 0	2,3
1115	U16 RW	Sensor L2, correspondence to voltmetric channel for Power calculation. See the register 1114 Default value: 1	2,3

1116	U16 RW	Sensor L3, correspondence to voltmetric channel for Power calculation. See the register 1114 Default value: 2	2,3
1117	U16 RW	Sensor L4, correspondence to voltmetric channel for Power calculation. See the register 1114 Default value: 0	2,3
1118	U16 RW	Sensor L5, correspondence to voltmetric channel for Power calculation. See the register 1114 Default value: 1	2,3

ID	Format	Content	Note
1119	U16 RW	Sensor L6, correspondence to voltmetric channel for Power calculation. See the register 1114 Default value: 2	2,3
1120	U16 RW	Sensor L7, correspondence to voltmetric channel for Power calculation. See the register 1114 Default value: 0	2,3
1121	U16 RW	Sensor L8, correspondence to voltmetric channel for Power calculation. See the register 1114 Default value: 1	2,3
1122	U16 RW	Sensor L9, correspondence to voltmetric channel for Power calculation. See the register 1114 Default value: 2	2,3
1123	U16 RW	Modbus Address from 1 to 247 Default value: 1	2,3
1124	U16 RW	Serial line speed 0= 9600 bps 1= 19200 bps 2= 38400 bps 3= 57600 bps 4= 115200 bps	2,3
1125	U16 RW	Serial line Parity 0= none 1= even 2= odd	2,3
1126	U16 RW	Stop bit serial line 0= 1 stop bit 1= 2 stop bit	2,3
1127	U16 RW	Protection PIN against accidental writing Default value: 0 1..65535 settable value	2
1128	U16 RW	Energy register scale 0= x 1Wh 1= x 10 Wh 2= x 100 Wh 3= x 1 kWh	2
1129	U16 RW	To enable Unidirectional measure 0= Disabled (measure on 4 quadrants) 1= Enabled (measure on 2 quadrants)	2
1130	CHAR[2] RW	Label for Channel L1, characters 1 and 2 (used also for three-phase channel L123)	2

ID	Format	Content	Note
		LSB is the left character, use only ASCII characters from <space> to 'Z', characters not used must be filled with spaces (32 ASCII character).	
1131	CHAR[2] RW	Label for Channel L1, characters 3 and 4 (used also for three-phase channel L123)	2
1132	CHAR[2] RW	Label for Channel L1, characters 5 and 6 (used also for three-phase channel L123)	2
1133	CHAR[2] RW	Label for Channel L1, characters 7 and 8 (used also for three-phase channel L123)	2
1134	CHAR[2] RW	Label for Channel L2, characters 1 and 2	2
1135	CHAR[2] RW	Label for Channel L2, characters 3 and 4	2
1136	CHAR[2] RW	Label for Channel L2, characters 5 and 6	2
1137	CHAR[2] RW	Label for Channel L2, characters 7 and 8	2
1138	CHAR[2] RW	Label for Channel L3, characters 1 and 2	2
1139	CHAR[2] RW	Label for Channel L3, characters 3 and 4	2
1140	CHAR[2] RW	Label for Channel L3, characters 5 and 6	2
1141	CHAR[2] RW	Label for Channel L3, characters 7 and 8	2
1142	CHAR[2] RW	Label for Channel L4, characters 1 and 2 (used also for three-phase channel L456)	2
1143	CHAR[2] RW	Label for Channel L4, characters 3 and 4 (used also for three-phase channel L456)	2
1144	CHAR[2] RW	Label for Channel L4, characters 5 and 6 (used also for three-phase channel L456)	2
1145	CHAR[2] RW	Label for Channel L4, characters 7 and 8 (used also for three-phase channel L456)	2
1146	CHAR[2] RW	Label for Channel L5, characters 1 and 2	2
1147	CHAR[2] RW	Label for Channel L5, characters 3 and 4	2
1148	CHAR[2] RW	Label for Channel L5, characters 5 and 6	2
1149	CHAR[2] RW	Label for Channel L5, characters 7 and 8	2
1150	CHAR[2] RW	Label for Channel L6, characters 1 and 2	2
1151	CHAR[2] RW	Label for Channel L6, characters 3 and 4	2
1152	CHAR[2] RW	Label for Channel L6, characters 5 and 6	2
1153	CHAR[2] RW	Label for Channel L6, characters 7 and 8	2
1154	CHAR[2] RW	Label for Channel L7, characters 1 and 2 (used also for three-phase channel L789)	2
1155	CHAR[2] RW	Label for Channel L7, characters 3 and 4 (used also for three-phase channel L789)	2
1156	CHAR[2] RW	Label for Channel L7, characters 5 and 6 (used also for three-phase channel L789)	2
1157	CHAR[2] RW	Label for Channel L7, characters 7 and 8 (used also for three-phase channel L789)	2
1158	CHAR[2] RW	Label for Channel L8, characters 1 and 2	2
1159	CHAR[2] RW	Label for Channel L8, characters 3 and 4	2

ID	Format	Content	Note
1160	CHAR[2] RW	Label for Channel L8, characters 5 and 6	2
1161	CHAR[2] RW	Label for Channel L8, characters 7 and 8	2
1162	CHAR[2] RW	Label for Channel L9, characters 1 and 2	2
1163	CHAR[2] RW	Label for Channel L9, characters 3 and 4	2
1164	CHAR[2] RW	Label for Channel L9, characters 5 and 6	2
1165	CHAR[2] RW	Label for Channel L9, characters 7 and 8	
1166		Reserved	
1167		Reserved	
1168		Reserved	
1169		Reserved	
1170		Reserved	
1171		Reserved	
1172		Reserved	
1173		Reserved	
1174		Reserved	
1175		Reserved	
1176		Reserved	
1177		Reserved	
1178		Reserved	
1179		Reserved	

32-bit Configuration registers

ID	Format	Content	UdM	Note
1200	FP32 RW	Voltmetric Constant	V/V	2,3
1202	FP32 RW	Amperometric Constant L1		2,3,4
1204	FP32 RW	Amperometric Constant L2		2,3,4
1206	FP32 RW	Amperometric Constant L3		2,3,4
1208	FP32 RW	Amperometric Constant L4		2,3,4
1210	FP32 RW	Amperometric Constant L5		2,3,4
1212	FP32 RW	Amperometric Constant L6		2,3,4
1214	FP32 RW	Amperometric Constant L7		2,3,4
1216	FP32 RW	Amperometric Constant L8		2,3,4
1218	FP32 RW	Amperometric Constant L9		2,3,4
1220	FP32 RW	Offset Channel L1		2,3,4
1222	FP32 RW	Offset Channel L2		2,3,4
1224	FP32 RW	Offset Channel L3		2,3,4
1226	FP32 RW	Offset Channel L4		2,3,4
1228	FP32 RW	Offset Channel L5		2,3,4
1230	FP32 RW	Offset Channel L6		2,3,4
1232	FP32 RW	Offset Channel L7		2,3,4
1234	FP32 RW	Offset Channel L8		2,3,4
1236	FP32 RW	Offset Channel L9		2,3,4
1238	FP32 RW	Pulse weight, Digital channel L1		2,3,4
1240	FP32 RW	Pulse weight, Digital channel L2		2,3,4
1242	FP32 RW	Pulse weight, Digital channel L3		2,3,4
1244	FP32 RW	Pulse weight, Digital channel L4		2,3,4
1246	FP32 RW	Pulse weight, Digital channel L5		2,3,4
1248	FP32 RW	Pulse weight, Digital channel L6		2,3,4
1250	FP32 RW	Pulse weight, Digital channel L7		2,3,4
1252	FP32 RW	Pulse weight, Digital channel L8		2,3,4
1254	FP32 RW	Pulse weight, Digital channel L9		2,3,4

Calibration parameters, writing protected by special register

ID	Format	Content	Note
1344	CHAR[2] RO	Serial number, characters 1 and 2 LSB is the left character	
1345	CHAR[2] RO	Serial number, characters 3 and 4	
1346	CHAR[2] RO	Serial number, characters 5 and 6	
1347	CHAR[2] RO	Serial number, characters 7 and 8	

ID	Format	Content	Note
1348	CHAR[2] RO	Serial number, characters 9 and 10	
1349	CHAR[2] RO	Serial number, characters 11 and 12	
1350	CHAR[2] RO	Serial number, characters 13 and 14	
1351	CHAR[2] RO	Serial number, characters 15 and 16	
1352	CHAR[2] RO	FW Version, main processor	
1353	CHAR[2] RO	FW Version, voltage processor	
1354	U32 RO	Result of the last diagnostic check. To be valid, it must have the bit 31 set.	

32-bit Instantaneous measures

ID	Format	Content	UdM	Note
7000	FP32 RO	Voltage L1-L2	V	
7002	FP32 RO	Voltage L2-L3	V	
7004	FP32 RO	Voltage L3-L1	V	
7006	FP32 RO	Voltage L1-N	V	
7008	FP32 RO	Voltage L2-N	V	
7010	FP32 RO	Voltage L3-N	V	
7012	FP32 RO	Instantaneous Current L1	A	
7014	FP32 RO	Instantaneous Current L2	A	
7016	FP32 RO	Instantaneous Current L3	A	
7018	FP32 RO	Instantaneous Current L4	A	
7020	FP32 RO	Instantaneous Current L5	A	
7022	FP32 RO	Instantaneous Current L6	A	
7024	FP32 RO	Instantaneous Current L7	A	
7026	FP32 RO	Instantaneous Current L8	A	
7028	FP32 RO	Instantaneous Current L9	A	
7030	FP32 RO	Apparent Power L1	VA	
7032	FP32 RO	Apparent Power L2	VA	
7034	FP32 RO	Apparent Power L3	VA	
7036	FP32 RO	Apparent Power L4	VA	
7038	FP32 RO	Apparent Power L5	VA	
7040	FP32 RO	Apparent Power L6	VA	
7042	FP32 RO	Apparent Power L7	VA	
7044	FP32 RO	Apparent Power L8	VA	
7046	FP32 RO	Apparent Power L9	VA	
7048	FP32 RO	Active Power L1	W	
7050	FP32 RO	Active Power L2	W	
7052	FP32 RO	Active Power L3	W	
7054	FP32 RO	Active Power L4	W	

7056	FP32 RO	Active Power L5	W	
7058	FP32 RO	Active Power L6	W	
7060	FP32 RO	Active Power L7	W	
7062	FP32 RO	Active Power L8	W	

ID	Format	Content	UdM	Note
7064	FP32 RO	Active power L9	W	
7066	FP32 RO	Reactive power L1	VAr	
7068	FP32 RO	Reactive power L2	VAr	
7070	FP32 RO	Reactive power L3	VAr	
7072	FP32 RO	Reactive power L4	VAr	
7074	FP32 RO	Reactive power L5	VAr	
7076	FP32 RO	Reactive power L6	VAr	
7078	FP32 RO	Reactive power L7	VAr	
7080	FP32 RO	Reactive power L8	VAr	
7082	FP32 RO	Reactive power L9	VAr	
7084	FP32 RO	Power factor L1	-	
7086	FP32 RO	Power factor L2	-	
7088	FP32 RO	Power factor L3	-	
7090	FP32 RO	Power factor L4	-	
7092	FP32 RO	Power factor L5	-	
7094	FP32 RO	Power factor L6	-	
7096	FP32 RO	Power factor L7	-	
7098	FP32 RO	Power factor L8	-	
7100	FP32 RO	Power factor L9	-	
7102	FP32 RO	Equivalent phase voltage	V	
7104	FP32 RO	Equivalent star voltage	V	
7106	FP32 RO	Equivalent Current L123	A	
7108	FP32 RO	Equivalent Current L456	A	
7110	FP32 RO	Equivalent Current L789	A	
7112	FP32 RO	Apparent power L123	VA	
7114	FP32 RO	Apparent power L456	VA	
7116	FP32 RO	Apparent power L789	VA	
7118	FP32 RO	Active power L123	W	
7120	FP32 RO	Active power L456	W	
7122	FP32 RO	Active power L789	W	
7124	FP32 RO	Reactive power L123	W	
7126	FP32 RO	Reactive power L456	W	
7128	FP32 RO	Reactive power L789	W	
7130	FP32 RO	Power factor L123	-	
7132	FP32 RO	Power factor L456	-	
7134	FP32 RO	Power factor L789	-	
7136	FP32 RO	Frequency L1-N	Hz	
7138	FP32 RO	Internal instrument temperature	°C	
7140	FP32 RO	VDD	V	
7142	FP32 RO	VBAT	V	
7144	FP32 RO	VAN1	V	
7146	FP32 RO	VAN2	V	

Instantaneous measures of maximum current

ID	Format	Content	UdM	Note
7200	FP32 RO	Maximum current L1	A	5
7202	FP32 RO	Maximum current L2	A	5
7204	FP32 RO	Maximum current L3	A	5
7206	FP32 RO	Maximum current L4	A	5
7208	FP32 RO	Maximum current L5	A	5
7210	FP32 RO	Maximum current L6	A	5
7212	FP32 RO	Maximum current L7	A	5
7214	FP32 RO	Maximum current L8	A	5
7216	FP32 RO	Maximum current L9	A	5

Instantaneous quadrant and frequency mode

ID	Format	Content	Note
7250	U16 RO	Quadrant L1 0: Q1 P+ Q+ inductive absorbed 1: Q2 P- Q+ capacitive delivered 2: Q3 P- Q- inductive delivered 3: Q4 P+ Q- capacitive absorbed	
7251	U16 RO	Quadrant L2	
7252	U16 RO	Quadrant L3	
7253	U16 RO	Quadrant L4	
7254	U16 RO	Quadrant L5	
7255	U16 RO	Quadrant L6	
7256	U16 RO	Quadrant L7	
7257	U16 RO	Quadrant L8	
7258	U16 RO	Quadrant L9	
7259	U16 RO	Quadrant L123	
7260	U16 RO	Quadrant L456	
7261	U16 RO	Quadrant L789	
7262	U16 RO	Frequency modality 0: frequency measured 1: default frequency	

Energies

ID	Format	Content	UdM	Note
7500	U32 RW	Active energy absorbed L1	Wh	2,6
7502	U32 RW	Active energy delivered L1	Wh	2,6
7504	U32 RW	Inductive energy absorbed (Q1) L1	Wh	2,6

ID	Format	Content	UdM	Note
7506	U32 RW	Capacitive energy delivered (Q2) L1	Wh	2,6
7508	U32 RW	Inductive energy delivered (Q3) L1	Wh	2,6
7510	U32 RW	Capacitive energy absorbed (Q4) L1	Wh	2,6
7512	U32 RW	Active energy absorbed L2	Wh	2,6
7514	U32 RW	Active energy delivered L2	Wh	2,6
7516	U32 RW	Inductive energy absorbed (Q1) L2	Wh	2,6
7518	U32 RW	Capacitive energy delivered (Q2) L2	Wh	2,6
7520	U32 RW	Inductive energy delivered (Q3) L2	Wh	2,6
7522	U32 RW	Capacitive energy absorbed (Q4) L2	Wh	2,6
7524	U32 RW	Active energy absorbed L3	Wh	2,6
7526	U32 RW	Active energy delivered L3	Wh	2,6
7528	U32 RW	Inductive energy absorbed (Q1) L3	Wh	2,6
7530	U32 RW	Capacitive energy delivered (Q2) L3	Wh	2,6
7532	U32 RW	Inductive energy delivered (Q3) L3	Wh	2,6
7534	U32 RW	Capacitive energy absorbed (Q4) L3	Wh	2,6
7536	U32 RW	Active energy absorbed L4	Wh	2,6
7538	U32 RW	Active energy delivered L4	Wh	2,6
7540	U32 RW	Inductive energy absorbed (Q1) L4	Wh	2,6
7542	U32 RW	Capacitive energy delivered (Q2) L4	Wh	2,6
7544	U32 RW	Inductive energy delivered (Q3) L4	Wh	2,6
7546	U32 RW	Capacitive energy absorbed (Q4) L4	Wh	2,6
7548	U32 RW	Active energy absorbed L5	Wh	2,6
7550	U32 RW	Active energy delivered L5	Wh	2,6
7552	U32 RW	Inductive energy absorbed (Q1) L5	Wh	2,6
7554	U32 RW	Capacitive energy delivered (Q2) L5	Wh	2,6
7556	U32 RW	Inductive energy delivered (Q3) L5	Wh	2,6
7558	U32 RW	Capacitive energy absorbed (Q4) L5	Wh	2,6
7560	U32 RW	Active energy absorbed L6	Wh	2,6
7562	U32 RW	Active energy delivered L6	Wh	2,6
7564	U32 RW	Inductive energy absorbed (Q1) L6	Wh	2,6
7566	U32 RW	Capacitive energy delivered (Q2) L6	Wh	2,6
7568	U32 RW	Inductive energy delivered (Q3) L6	Wh	2,6
7570	U32 RW	Capacitive energy absorbed (Q4) L6	Wh	2,6
7572	U32 RW	Active energy absorbed L7	Wh	2,6
7574	U32 RW	Active energy delivered L7	Wh	2,6
7576	U32 RW	Inductive energy absorbed (Q1) L7	Wh	2,6
7578	U32 RW	Capacitive energy delivered (Q2) L7	Wh	2,6
7580	U32 RW	Inductive energy delivered (Q3) L7	Wh	2,6
7582	U32 RW	Capacitive energy absorbed (Q4) L7	Wh	2,6
7584	U32 RW	Active energy absorbed L8	Wh	2,6
7586	U32 RW	Active energy delivered L8	Wh	2,6
7588	U32 RW	Inductive energy absorbed (Q1) L8	Wh	2,6
7590	U32 RW	Capacitive energy delivered (Q2) L8	Wh	2,6

ID	Format	Content	UdM	Note
7592	U32 RW	Inductive energy delivered (Q3) L8	Wh	2,6
7594	U32 RW	Capacitive energy absorbed (Q4) L8	Wh	2,6
7596	U32 RW	Active energy absorbed L9	Wh	2,6
7598	U32 RW	Active energy delivered L9	Wh	2,6
7600	U32 RW	Inductive energy absorbed (Q1) L9	Wh	2,6
7602	U32 RW	Capacitive energy delivered (Q2) L9	Wh	2,6
7604	U32 RW	Inductive energy delivered (Q3) L9	Wh	2,6
7606	U32 RW	Capacitive energy absorbed (Q4) L9	Wh	2,6
7608	U32 RW	Active energy absorbed L123	Wh	6
7610	U32 RW	Active energy delivered L123	Wh	6
7612	U32 RW	Inductive energy absorbed (Q1) L123	Wh	6
7614	U32 RW	Capacitive energy delivered (Q2) L123	Wh	6
7616	U32 RW	Inductive energy delivered (Q3) L123	Wh	6
7618	U32 RW	Capacitive energy absorbed (Q4) L123	Wh	6
7620	U32 RW	Active energy absorbed L456	Wh	6
7622	U32 RW	Active energy delivered L456	Wh	6
7624	U32 RW	Inductive energy absorbed (Q1) L456	Wh	6
7626	U32 RW	Capacitive energy delivered (Q2) L456	Wh	6
7628	U32 RW	Inductive energy delivered (Q3) L456	Wh	6
7630	U32 RW	Capacitive energy absorbed (Q4) L456	Wh	6
7632	U32 RW	Active energy absorbed L789	Wh	6
7634	U32 RW	Active energy delivered L789	Wh	6
7636	U32 RW	Inductive energy absorbed (Q1) L789	Wh	6
7638	U32 RW	Capacitive energy delivered (Q2) L789	Wh	6
7640	U32 RW	Inductive energy delivered (Q3) L789	Wh	6
7642	U32 RW	Capacitive energy absorbed (Q4) L789	Wh	6

THD and Harmonics

ID	Format	Content	UdM	Note
7700	FP32RO	THD Voltage L1	%	8
7702	FP32RO	THD Voltage L2	%	8
7704	FP32RO	THD Voltage L3	%	8
7706	FP32RO	THD Current L1	%	8
7708	FP32RO	THD Current L2	%	8
7710	FP32RO	THD Current L3	%	8
7712	FP32RO	THD Current L4	%	8
7714	FP32RO	THD Current L5	%	8
7716	FP32RO	THD Current L6	%	8
7718	FP32RO	THD Current L7	%	8
7720	FP32RO	THD Current L8	%	8
7722	FP32RO	THD Current L9	%	8
7724	FP32RO	H2 Voltage L1	H/H1%	8
7726	FP32RO	H3 Voltage L1	H/H1%	8
7728	FP32RO	H4 Voltage L1	H/H1%	8
7730	FP32RO	H5 Voltage L1	H/H1%	8
7732	FP32RO	H6 Voltage L1	H/H1%	8
7734	FP32RO	H7 Voltage L1	H/H1%	8
7736	FP32RO	H8 Voltage L1	H/H1%	8

ID	Format	Content	UdM	Note
7738	F32 RO	H9 Voltage L1	H/H1%	8
7740	F32 RO	H10 Voltage L1	H/H1%	8
7742	F32 RO	H11 Voltage L1	H/H1%	8
7744	F32 RO	H12 Voltage L1	H/H1%	8
7746	F32 RO	H13 Voltage L1	H/H1%	8
7748	F32 RO	H14 Voltage L1	H/H1%	8
7750	F32 RO	H15 Voltage L1	H/H1%	8
7752	F32 RO	H2 Voltage L2	H/H1%	8
7754	F32 RO	H3 Voltage L2	H/H1%	8
7756	F32 RO	H4 Voltage L2	H/H1%	8
7758	F32 RO	H5 Voltage L2	H/H1%	8
7760	F32 RO	H6 Voltage L2	H/H1%	8
7762	F32 RO	H7 Voltage L2	H/H1%	8
7764	F32 RO	H8 Voltage L2	H/H1%	8
7766	F32 RO	H9 Voltage L2	H/H1%	8
7768	F32 RO	H10 Voltage L2	H/H1%	8
7770	F32 RO	H11 Voltage L2	H/H1%	8
7772	F32 RO	H12 Voltage L2	H/H1%	8
7774	F32 RO	H13 Voltage L2	H/H1%	8
7776	F32 RO	H14 Voltage L2	H/H1%	8
7778	F32 RO	H15 Voltage L2	H/H1%	8
7780	F32 RO	H2 Voltage L3	H/H1%	8
7782	F32 RO	H3 Voltage L3	H/H1%	8
7784	F32 RO	H4 Voltage L3	H/H1%	8
7786	F32 RO	H5 Voltage L3	H/H1%	8
7788	F32 RO	H6 Voltage L3	H/H1%	8
7790	F32 RO	H7 Voltage L3	H/H1%	8
7792	F32 RO	H8 Voltage L3	H/H1%	8
7794	F32 RO	H9 Voltage L3	H/H1%	8
7796	F32 RO	H10 Voltage L3	H/H1%	8
7798	F32 RO	H11 Voltage L3	H/H1%	8
7800	F32 RO	H12 Voltage L3	H/H1%	8
7802	F32 RO	H13 Voltage L3	H/H1%	8
7804	F32 RO	H14 Voltage L3	H/H1%	8
7806	F32 RO	H15 Voltage L3	H/H1%	8
7808	F32 RO	H2 Current L1	H/H1%	8
7810	F32 RO	H3 Current L1	H/H1%	8
7812	F32 RO	H4 Current L1	H/H1%	8
7814	F32 RO	H5 Current L1	H/H1%	8
7816	F32 RO	H6 Current L1	H/H1%	8
7818	F32 RO	H7 Current L1	H/H1%	8
7820	F32 RO	H8 Current L1	H/H1%	8
7822	F32 RO	H9 Current L1	H/H1%	8

ID	Format	Content	UdM	Note
7824	F32 RO	H10 Current L1	H/H1%	8
7826	F32 RO	H11 Current L1	H/H1%	8
7828	F32 RO	H12 Current L1	H/H1%	8
7830	F32 RO	H13 Current L1	H/H1%	8
7832	F32 RO	H14 Current L1	H/H1%	8
7834	F32 RO	H15 Current L1	H/H1%	8
7836	F32 RO	H2 Current L2	H/H1%	8
7838	F32 RO	H3 Current L2	H/H1%	8
7840	F32 RO	H4 Current L2	H/H1%	8
7842	F32 RO	H5 Current L2	H/H1%	8
7844	F32 RO	H6 Current L2	H/H1%	8
7846	F32 RO	H7 Current L2	H/H1%	8
7848	F32 RO	H8 Current L2	H/H1%	8
7850	F32 RO	H9 Current L2	H/H1%	8
7852	F32 RO	H10 Current L2	H/H1%	8
7854	F32 RO	H11 Current L2	H/H1%	8
7856	F32 RO	H12 Current L2	H/H1%	8
7858	F32 RO	H13 Current L2	H/H1%	8
7860	F32 RO	H14 Current L2	H/H1%	8
7862	F32 RO	H15 Current L2	H/H1%	8
7864	F32 RO	H2 Current L3	H/H1%	8
7866	F32 RO	H3 Current L3	H/H1%	8
7868	F32 RO	H4 Current L3	H/H1%	8
7870	F32 RO	H5 Current L3	H/H1%	8
7872	F32 RO	H6 Current L3	H/H1%	8
7874	F32 RO	H7 Current L3	H/H1%	8
7876	F32 RO	H8 Current L3	H/H1%	8
7878	F32 RO	H9 Current L3	H/H1%	8
7880	F32 RO	H10 Current L3	H/H1%	8
7882	F32 RO	H11 Current L3	H/H1%	8
7884	F32 RO	H12 Current L3	H/H1%	8
7886	F32 RO	H13 Current L3	H/H1%	8
7888	F32 RO	H14 Current L3	H/H1%	8
7890	F32 RO	H15 Current L3	H/H1%	8
7892	F32 RO	H2 Current L4	H/H1%	8
7894	F32 RO	H3 Current L4	H/H1%	8
7896	F32 RO	H4 Current L4	H/H1%	8
7898	F32 RO	H5 Current L4	H/H1%	8
7900	F32 RO	H6 Current L4	H/H1%	8
7902	F32 RO	H7 Current L4	H/H1%	8
7904	F32 RO	H8 Current L4	H/H1%	8
7906	F32 RO	H9 Current L4	H/H1%	8
7908	F32 RO	H10 Current L4	H/H1%	8

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ID	Format	Content	UdM	Note
7910	F32 RO	H11 Current L4	H/H1%	8
7912	F32 RO	H12 Current L4	H/H1%	8
7914	F32 RO	H13 Current L4	H/H1%	8
7916	F32 RO	H14 Current L4	H/H1%	8
7918	F32 RO	H15 Current L4	H/H1%	8
7920	F32 RO	H2 Current L5	H/H1%	8
7922	F32 RO	H3 Current L5	H/H1%	8
7924	F32 RO	H4 Current L5	H/H1%	8
7926	F32 RO	H5 Current L5	H/H1%	8
7928	F32 RO	H6 Current L5	H/H1%	8
7930	F32 RO	H7 Current L5	H/H1%	8
7932	F32 RO	H8 Current L5	H/H1%	8
7934	F32 RO	H9 Current L5	H/H1%	8
7936	F32 RO	H10 Current L5	H/H1%	8
7938	F32 RO	H11 Current L5	H/H1%	8
7940	F32 RO	H12 Current L5	H/H1%	8
7942	F32 RO	H13 Current L5	H/H1%	8
7944	F32 RO	H14 Current L5	H/H1%	8
7946	F32 RO	H15 Current L5	H/H1%	8
7948	F32 RO	H2 Current L6	H/H1%	8
7950	F32 RO	H3 Current L6	H/H1%	8
7952	F32 RO	H4 Current L6	H/H1%	8
7954	F32 RO	H5 Current L6	H/H1%	8
7956	F32 RO	H6 Current L6	H/H1%	8
7958	F32 RO	H7 Current L6	H/H1%	8
7960	F32 RO	H8 Current L6	H/H1%	8
7962	F32 RO	H9 Current L6	H/H1%	8
7964	F32 RO	H10 Current L6	H/H1%	8
7966	F32 RO	H11 Current L6	H/H1%	8
7968	F32 RO	H12 Current L6	H/H1%	8
7970	F32 RO	H13 Current L6	H/H1%	8
7972	F32 RO	H14 Current L6	H/H1%	8
7974	F32 RO	H15 Current L6	H/H1%	8
7976	F32 RO	H2 Current L7	H/H1%	8
7978	F32 RO	H3 Current L7	H/H1%	8
7980	F32 RO	H4 Current L7	H/H1%	8
7982	F32 RO	H5 Current L7	H/H1%	8
7984	F32 RO	H6 Current L7	H/H1%	8
7986	F32 RO	H7 Current L7	H/H1%	8
7988	F32 RO	H8 Current L7	H/H1%	8
7990	F32 RO	H9 Current L7	H/H1%	8
7990	F32 RO	H10 Current L7	H/H1%	8
7994	F32 RO	H11 Current L7	H/H1%	8

ID	Format	Content	UdM	Note
7996	F32 RO	H12 Current L7	H/H1%	8
7998	F32 RO	H13 Current L7	H/H1%	8
8000	F32 RO	H14 Current L7	H/H1%	8
8002	F32 RO	H15 Current L7	H/H1%	8
8004	F32 RO	H2 Current L8	H/H1%	8
8006	F32 RO	H3 Current L8	H/H1%	8
8008	F32 RO	H4 Current L8	H/H1%	8
8010	F32 RO	H5 Current L8	H/H1%	8
8012	F32 RO	H6 Current L8	H/H1%	8
8014	F32 RO	H7 Current L8	H/H1%	8
8016	F32 RO	H8 Current L8	H/H1%	8
8018	F32 RO	H9 Current L8	H/H1%	8
8020	F32 RO	H10 Current L8	H/H1%	8
8022	F32 RO	H11 Current L8	H/H1%	8
8024	F32 RO	H12 Current L8	H/H1%	8
8026	F32 RO	H13 Current L8	H/H1%	8
8028	F32 RO	H14 Current L8	H/H1%	8
8030	F32 RO	H15 Current L8	H/H1%	8
8032	F32 RO	H2 Current L9	H/H1%	8
8034	F32 RO	H3 Current L9	H/H1%	8
8036	F32 RO	H4 Current L9	H/H1%	8
8038	F32 RO	H5 Current L9	H/H1%	8
8040	F32 RO	H6 Current L9	H/H1%	8
8042	F32 RO	H7 Current L9	H/H1%	8
8044	F32 RO	H8 Current L9	H/H1%	8
8046	F32 RO	H9 Current L9	H/H1%	8
8048	F32 RO	H10 Current L9	H/H1%	8
8050	F32 RO	H11 Current L9	H/H1%	8
8052	F32 RO	H12 Current L9	H/H1%	8
8054	F32 RO	H13 Current L9	H/H1%	8
8056	F32 RO	H14 Current L9	H/H1%	8
8058	F32 RO	H15 Current L9	H/H1%	8

Apparent energy

ID	Format	Content	UdM	Note
8100	U32 RW	Apparent Energy L1	VAh	2,6,8
8102	U32 RW	Apparent Energy L2	VAh	2,6,8
8104	U32 RW	Apparent Energy L3	VAh	2,6,8
8106	U32 RW	Apparent Energy L4	VAh	2,6,8
8108	U32 RW	Apparent Energy L5	VAh	2,6,8
8110	U32 RW	Apparent Energy L6	VAh	2,6,8
8112	U32 RW	Apparent Energy L7	VAh	2,6,8
8114	U32 RW	Apparent Energy L8	VAh	2,6,8
8116	U32 RW	Apparent Energy L9	VAh	2,6,8
8118	U32 RW	Apparent Energy L123	VAh	2,6,8
8120	U32 RW	Apparent Energy L456	VAh	2,6,8
8122	U32 RW	Apparent Energy L789	VAh	2,6,8

Special registers, set only through WRITE SINGLE REGISTER (F06)

ID	Format	Content	Note
0999	U16 WO	Setup protection PIN (0000-9999) Initial value 0000	7
9738	U16 WO	Resets I _{max} registers	2,5
9739	U16 WO	Remote restarting	2

Notes

- 1 – The registers in the dater must be read or written simultaneously.
- 2 – Writing is protected if the PIN register (1127) is set to a value different from zero; in this case, before writing into the protected records, you must write the PIN value into the 999 register with the function 06, write single register.
N.B: Isn't possible read again the PIN register; if it is read, it always returns the 0 value.
- 3 – After modifying these registers, you have to restart the instrument (see register 9739).
- 4 – The secondary amperometric constant is only applied when a CC06 sensor is selected, in the other cases, the register value is ignored.
- 5 – The maximum current registers can be reset individually by writing the index of the channel-1 (from 0 to 8) into the register 9739. By writing the value 9, all the 9 registers are reset simultaneously.
- 6 – The read / written value takes into account of the setting in the register called "energy register Scale" (1128).
- 7 – See Note 2.

Data format

FLOAT 32 BIT

The lower register contains the most significant part of the float number.

Format for Float IEEE number:

B3	B2	B1	B0
SEEEEEEE	EMMMMMMM	MMMMMMMM	MMMMMMMM

Encoding of Modbus registers:

Register A		Register A+1	
B3 (MSB)	B2	B1	B0 (LSB)

Example:

The number 5000.0 is encoded into single-precision IEEE format as: 459C4000H

B3	B2	B1	B0
45H	9CH	40H	00H

The encoding in Modbus registers will be:

Register A		Register A+1	
45H	9CH	40H	00H
459CH (decimale 17820)		4000H (decimale 16384)	

INTEGER 32 BIT WITHOUT SIGN

Format for integer 32 bit:

The number 12345678H will be encoded in the Modbus registers as shown:

Register A		Register A+1	
12 (MSB)	34	56	78 (LSB)

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