1.Eastron SDM630-TCP Smart Meter Modbus Protocol Implementation V1.0

1.1 Input register

Input registers are used to indicate the present values of the measured and calculated electrical quantities. Each parameter is held in two consecutive16 bit register.The following table details the 3X register address, and the values of the address bytes within the message. A (*) in the column indicates that the parameter is valid for the particular wiring system. Any parameter with a cross(X) will return the value zero. Each parameter is held in the 3X registers. Modbus Protocol function code 04 is used to access all parameters.

For example, to request: Amps 1 Start address=0006
No. of registers =0002
Amps 2 Start address=0008
No. of registers=0002

Each request for data must be restricted to 50 parameters or less. Exceeding the 50 parameter limit will cause a Modbus Protocol exception code to be returned.

1.1.1 SDM630-TCP Input Registers

Address (Register)	Parameter Number	SDM630-TCP Input Register Parameter		Modbus Protocol Start Address Hex		3 Ø	3 Ø	1 Ø
		Description	Units	Hi Byte	Lo Byte	4 W	3 W	2 W
30001	1	Phase 1 line to neutral volts.	Volts	00	00	√	X	√
30003	2	Phase 2 line to neutral volts.	Volts	00	02	√	X	X
30005	3	Phase 3 line to neutral volts.	Volts	00	04	√	X	X
30007	4	Phase 1 current.	Amps	00	06	√	√	√
30009	5	Phase 2 current.	Amps	00	08	√	√	X
30011	6	Phase 3 current.	Amps	00	0A	√	√	X
30013	7	Phase 1 power.	Watts	00	0C	√	X	√
30015	8	Phase 2 power.	Watts	00	0E	√	X	√
30017	9	Phase 3 power.	Watts	00	10	√	X	X
30019	10	Phase 1 volt amps.	VA	00	12	√	X	√
30021	11	Phase 2 volt amps.	VA	00	14	√	X	X
30023	12	Phase 3 volt amps.	VA	00	16	√	X	X
30025	13	Phase 1 volt amps reactive.	VAr	00	18	√	X	√
30027	14	Phase 2 volt amps reactive.	VAr	00	1A	√	X	X
30029	15	Phase 3 volt amps reactive.	VAr	00	1C	√	X	X
30031	16	Phase 1 power factor (1).	None	00	1E	√	X	√
30033	17	Phase 2 power factor (1).	None	00	20	√	X	X
30035	18	Phase 3 power factor (1).	None	00	22	√	X	X
30037	19	Phase 1 phase angle.	Degrees	00	24	√	X	√

30039	20	Phase 2 phase angle.	Degrees	00	26	√	X	X
30041	21	Phase 3 phase angle.	Degrees	00	28	√	X	X
30043	22	Average line to neutral volts.	Volts	00	2A	√	X	X
30047	24	Average line current.	Amps	00	2E	√	√	√
30049	25	Sum of line currents.	Amps	00	30	√	√	√
30053	27	Total system power.	Watts	00	34	√	√	√
30057	29	Total system volt amps.	VA	00	38	√	√	√
30061	31	Total system VAr.	VAr	00	3C	√	√	√
30063	32	Total system power factor (1).	None	00	3E	√	√	√
30067	34	Total system phase angle.	Degrees	00	42	√	√	√
30071	36	Frequency of supply voltages.	Hz	00	46	√	√	√
30073	37	Import Wh since last reset (2).	kWh/MWh	00	48	√	√	√
30075	38	Export Wh since last reset (2).	kWH/MWh	00	4A	√	√	√
30077	39	Import VArh since last reset (2).	kVArh/MVArh	00	4C	√	√	√
30079	40	Export VArh since last reset (2).	kVArh/MVArh	00	4E	√	√	√
30081	41	VAh since last reset (2).	kVAh/MVAh	00	50	√	√	√
30083	42	Ah since last reset(3).	Ah/kAh	00	52	√	√	√
30085	43	Total system power demand (4).	W	00	54	√	√	√
30087	44	Maximum total system power demand (4).	VA	00	56	√	√	√
30101	51	Total system VA demand.	VA	00	64	√	√	√
30103	52	Maximum total system VA demand.	VA	00	66	√	√	√
30105	53	Neutral current demand.	Amps	00	68	√	X	X
30107	54	Maximum neutral current demand.	Amps	00	6A	√	X	X
30201	101	Line 1 to Line 2 volts.	Volts	00	C8	√	√	X
30203	102	Line 2 to Line 3 volts.	Volts	00	CA	√	√	X
30205	103	Line 3 to Line 1 volts.	Volts	00	CC	√	√	X
30207	104	Average line to line volts.	Volts	00	CE	√	√	X
30225	113	Neutral current.	Amps	00	E0	√	X	X
30235	118	Phase 1 L/N volts THD	%	00	EA	√	X	√
30237	119	Phase 2 L/N volts THD	%	00	EC	√	X	X
30239	120	Phase 3 L/N volts THD	%	00	EE	√	X	X
30241	121	Phase 1 Current THD	%	00	F0	√	√	√
30243	122	Phase 2 Current THD	%	00	F2	√	√	X
30245	123	Phase 3 Current THD	%	00	F4	√	√	X

30249	125	Average line to neutral volts THD.	%	00	F8	√	X	√
30251	126	Average line current THD.	%	00	FA	√	√	√
30255	128	Total system power factor (5).	Degree	00	FE	√	√	√
30259	130	Phase 1 current demand.	Amps	01	02	√	√	√
30261	131	Phase 2 current demand.	Amps	01	04	√	√	X
30263	132	Phase 3 current demand.	Amps	01	06	√	√	X
30265	133	Maximum phase 1 current demand.	Amps	01	08	√	√	√
30267	134	Maximum phase 2 current demand.	Amps	01	0A	√	√	X
30269	135	Maximum phase 3 current demand.	Amps	01	0C	√	√	X
30335	168	Line 1 to line 2 volts THD.	%	01	4E	√	√	X
30337	169	Line 2 to line 3 volts THD.	%	01	50	√	√	X
30339	170	Line 3 to line 1 volts THD.	%	01	52	√	√	X
30341	171	Average line to line volts THD.	%	01	54	√	√	X
30343	172	Total kwh	kwh	01	56	√	√	√
30345	173	Total kvarh	kvarh	01	58	√	√	√
30347	174	L1 import kwh	kwh	01	5a	√	√	√
30349	175	L2 import kwh	kwh	01	5c	√	√	√
30351	176	L3 import kWh	kwh	01	5e	√	√	√
30353	177	L1 export kWh	kwh	01	60	√	√	√
30355	178	L2 export kwh	kwh	01	62	√	√	√
30357	179	L3 export kWh	kwh	01	64	√	√	√
30359	180	L1 total kwh	kwh	01	66	√	√	√
30361	181	L2 total kWh	kwh	01	68	√	√	√
30363	182	L3 total kwh	kwh	01	6a	√	√	√
30365	183	L1 import kvarh	kvarh	01	6c	√	√	√
30367	184	L2 import kvarh	kvarh	01	6e	√	√	√
30369	185	L3 import kvarh	kvarh	01	70	√	√	√
30371	186	L1 export kvarh	kvarh	01	72	√	√	√
30373	187	L2 export kvarh	kvarh	01	74	√	√	√
30375	188	L3 export kvarh	kvarh	01	76	√	√	√
30377	189	L1 total kvarh	kvarh	01	78	√	√	√
30379	190	L2 total kvarh	kvarh	01	7a	√	√	√
30381	191	L3 total kvarh	kvarh	01	7c	√	√	√

Notes:

1. The power factor has its sign adjusted to indicate the nature of the load. Positive for capacitive and negative for inductive.

2. The negative total system power factor is a sign inverted version of parameter 32, the magnitude is the

same as parameter 32.

1.2 Modbus Protocol Holding Registers and Digital meter set up

Holding registers are used to store and display instrument configuration settings. All holding registers not listed in the table below should be considered as reserved for manufacturer use and no attempt should be made to modify their values.

The holding register parameters may be viewed or changed using the Modbus Protocol. Each parameter is held in two consecutive 4X registers. Modbus Protocol Function Code 03 is used to read the parameter and Function Code 16 is used to write. Write to only one parameter per message.

1.1.2 SDM630-TCP MODBUS Protocol Holding Register Parameters

Address Register	Parameter	Modbus Protocol Start Address Hex		Valid range	Mode
		High Byte	Low Byte		
40003	Demand Period	00	02	Write demand period: 0, 5,8, 10, 15, 20, 30 or 60 minutes, default 60. Setting the period to 0 will cause the demand to show the current parameter value, and demand max to show the maximum parameter value since last demand reset. **Length : 4 byte** **Data Format : Float**	r/w
40007	System Volts	00	06	system voltage **Length : 4 byte** **Data Format : Float**	R
40009	System Current	00	08	system current **Length : 4 byte** **Data Format : Float**	R
40011	System Type	00	0A	Write system type: 3p4w = 3, 3p3w = 2 & 1p2w= 1 **Length : 4 byte** **Data Format : Float** (KPPA is asked)	r/w
40015	Key Parameter Programming Authorization	00	0E	Read: to get the status of the KPPA 0 = not authorized；1 = authorized Write the correct password to get KPPA,	r/w

	(KPPA)			enable to program key parameters. Length : 4 byte Data Format : Float	
40021	Network Node	00	14	Write the network port node address: 1 to 247 for MODBUS Protocol, default 1. Requires a restart to become effective. **Length : 4 byte** **Data Format : Float**	r/w
40025	Password	00	18	Read: to get the password of the meter Write: to program the new password of the meter Default 1000 **Length : 4 byte** **Data Format : Float**	r/w
40037	System Power	00	24	Read the total system power, e.g. for 3p4w returns System Volts x System Amps x 3. **Length : 4 byte** **Data Format : Float**	r
40061	Backlit time	00	3C	Default 60, min Range 0~121，0 means backlit always on ，121 means backlit always off **Length : 4byte** **Data Format : Float**	r/w
461447	Ethernet communication Parameter	F0	06	Ethernet communication parameter includes: IP address (4byte)，subnet mask (4byte)，default gateway (4byte)，IP port(2 byte) Data format：IP Address-Subnet mask-default gateway- IP port，High byte first. Default：IP Address = 192-168-1-200 Subnet mask = 255-255-255-0 Gate way = 192-168-1-1 IP Port = 502 Note：When the DHCP function is enabled, this register cannot be set, but can only be read. **Length : 14byte** **Data Format: Hex**	r/w
461455	Automatically gains the IP address (DHCP)	F0	0E	Automatically gains the IP address 00 00 = turn off the DHCP function 00 01 = turn on the DHCP function **Length : 2byte**	r/w

				Data Format: Hex (KPPA is asked)	

Register Order controls the order in which the Eastron Digital meter receives or sends floating-point numbers: - normal or reversed register order. In normal mode, the two registers that make up a floating point number are sent most significant register first. In reversed register mode, the two registers that make up a floating point number are sent least significant register first.

Password

Some of the parameters described above are password protected and thus require the password to be entered at the Password register before they can be changed. The default password is 1000. When the password has been entered it will timeout in one minute unless the Password or Password Lock register is read to reset the timeout timer. Once the required changes have been made to the protected parameters the password lock should be reapplied by

a) allowing the password to timeout, or

b) writing any value to the Password Lock register, or

c) power cycling the instrument.