

SMART X835 Smart Meter Modbus Protocol

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 consecutive 16 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 40 parameters or less. Exceeding the 40 parameter limit will cause a Modbus Protocol exception code to be returned.

Address (Register)	Parameter Number	X835-AO Input Register Parameter		Modbus Protocol Start Address Hex		3	3	1
		Description	Units	Hi Byte	Lo Byte	Ø	Ø	Ø
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.	VoltAmps	00	12	√	X	√
30021	11	Phase 2 volt amps.	VoltAmps	00	14	√	X	X
30023	12	Phase 3 volt amps.	VoltAmps	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).	Watts	00	54	√	√	√
30087	44	Maximum total system power demand (4).	Watts	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).	Degrees	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	%	01	56	√	√	√
30345	173	Total kvarh	%	01	58	√	√	√
30399	200	Current KF		01	8E	√	√	X
30401	201	Voltage CF		01	90	√	√	X
30403	202-260	Ua 2-60 THD	%	01	92	√	√	√
30521	261-319	Ub 2-60 THD	%	02	08	√	√	X
30639	320-378	Uc 2-60 THD	%	02	7E	√	√	X
30757	379-437	Ia 2-60 THD	%	02	F4	√	√	√
30875	438-496	Ib 2-60 THD	%	03	6A	√	√	X
30993	497-555	Ic 2-60 THD	%	03	E0	√	√	X
31199	600	TIME1 import wh	kWh/MWh	04	AE	√	√	√
31201	601	TIME2 import wh	kWh/MWh	04	B0	√	√	√
31203	602	TIME3 import wh	kWh/MWh	04	B2	√	√	√

			Wh					
31205	603	TIME4 import wh	kWh/M Wh	04	B4	√	√	√
31207	604	TIME1 export wh	kWh/M Wh	04	B6	√	√	√
31209	605	TIME2 export wh	kWh/M Wh	04	B8	√	√	√
31211	606	TIME3 export wh	kWh/M Wh	04	BA	√	√	√
31213	607	TIME4 export wh	kWh/M Wh	04	BC	√	√	√
31215	608	TIME1 import varh	kVArh/ MVArh	04	BE	√	√	√
31217	609	TIME2 import varh	kVArh/ MVArh	04	C0	√	√	√
31219	610	TIME3 import varh	kVArh/ MVArh	04	C2	√	√	√
31221	611	TIME4 import varh	kVArh/ MVArh	04	C4	√	√	√
31223	612	TIME1 export varh	kVArh/ MVArh	04	C6	√	√	√
31225	613	TIME2 export varh	kVArh/ MVArh	04	C8	√	√	√
31227	614	TIME3 export varh	kVArh/ MVArh	04	CA	√	√	√
31229	615	TIME4 export varh	kVArh/ MVArh	04	CC	√	√	√
31231	616	Net Real energy	kWh/M Wh	04	CE	√	√	√
31233	617	Net reactive energy	kVArh/ MVArh	04	D0	√	√	√
31235	618	Abs real energy	kWh/M Wh	04	D2	√	√	√
31237	619	Abs reactive energy	kVArh/ MVArh	04	D4	√	√	√
31239	620	Maximum demand occurred at a time	kWh/M Wh MM DD HH MIN	04	D6	√	√	√

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.

Address Register	Parameter Number	Parameter	Modbus Protocol Start Address Hex		Valid range	Mode
			High Byte	Low Byte		
40001	1	Demand Time	00	00	Read minutes into first demand calculation. When the Demand Time reaches the Demand Period then the demand values are valid.	Ro
40003	2	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.	r/w
40007	4	System Volts	00	06	Read system voltage, VLL for 3P3W, VLN for others.	ro
40009	5	System Current	00	06	Write system current, limited to 1 to 9999A.Requires password, see parameter 13	ro
40011	6	System Type	00	08	Write system type: 3p4w = 3, 3p3w = 2 & 1p2w= 1 Requires password, see parameter 13	r/wp
40013	7	Relay Pulse	00	0A	Write relay on period in milliseconds: 60, 100 or 200,	r/wp

		Width			default 200.	
40015	8	Password Lock	00	0E	Write any value to password lock protected registers. Read password lock status: 0 = locked. 1 = unlocked. Reading will also reset the password timeout back to one minute.	r/w
40019	10	Network Parity Stop	00	12	Write the network port parity/stop bits for MODBUS Protocol, where: 0 = One stop bit and no parity, default. 1 = One stop bit and even parity. 2 = One stop bit and odd parity. 3 = Two stop bits and no parity. Requires a restart to become effective.	r/w
40021	11	Network Node	00	14	Write the network port node address: 1 to 247 for MODBUS Protocol, default 1. Requires a restart to become effective. Note, both the MODBUS Protocol and Johnson Controls node addresses can be changed via the display setup menus.	r/w
40023	12	Pulse Divisor	00	16	Write pulse divisor index: n = 2 to 6 in $Wh/10^n$, default 3.	r/w
40025	13	Password	00	18	Write password for access to protected registers. Read zero. Reading will also reset the password timeout back to one minute. Default password is 0000.	r/w
40029	15	Network Baud Rate	00	1C	Write the network port baud rate for MODBUS Protocol, where: 0 = 2400 baud. 1 = 4800 baud. 2 = 9600 baud, default. 3 = 19200 baud. 4 = 38400 baud. Requires a restart to become effective	r/w
40031	16	Energy Units Prefix	00	1E	Write the units prefix for energy output values. 0 = k, e.g. kWh, default. 1 = M, e.g. MWh. 2 = Ah for ampere hours. 3 = kAh for ampere hours.	r/w

40037	19	System Power	00	24	Read the total system power, e.g. for 3p4w returns System Volts x System Amps x 3.	ro
40041	21	Register Order	00	28	Write the value 2141 in the required register order.	r/w
40043	22	Serial Number Hi	00	2A	Read the first product serial number.	ro
40045	23	Serial Number Lo	00	2C	Read the second product serial number.	ro
40087	44	Relay1 Energy Type	00	56	Write MODBUS Protocol input parameter for pulse relay 1: 0 = relay off, 37 = Import Wh or 39 = Import VARh, default 37.	r/w
40089	45	Relay2 Energy Type	00	58	MODBUS Protocol input parameter for pulse relay 2: 0 = relay off, 37 = Import Wh or 39 = Import VARh, default 37.	r/w
40217	109	Reset Logged Data	00	D8	Write code to reset data group. Code 1 for Energy. Code 2 for Demand Maximums. Code 3 for Demand Maximums and Demand Time.	r/w
40257	129	System Time	01	00	Format :BCD Code 130806122030 mean At 12:20:30 on August 6, 2013	r/w
40260	130	Rates and the period setting	01	03	A total of 8 hours: For example: rate Start time time1: 01 07: 00 time2: 02 09: 00 time3: 03 12: 00 time4: 04 14: 00 time5: 01 17: 00 time6: 02 19: 00 time7: 03 21: 00 time8: 04 22: 00 Less than eight hours, only the front set Behind both complement 0; For example: rate Start time time1: 01 07: 00 time2: 02 20: 00 time3: 00 00: 00	r/w

					time4: 00 00: 00 time5: 00 00: 00 time6: 00 00: 00 time7: 00 00: 00 time8: 00 00: 00 12 WORD BCD	
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