MODBUS TABLE ORGANIZATION

Starting Address of the Group Registers (Dec)	Starting Address of the Group Registers (Hex)	System Version (Release)	System Version (Build)	Group Name (Text)	Group Code (Hex)	Group Complexity (Hex)	Group Version (Hex)
0	0	01	19	Modbus settings	00 01	10	01 00
4096	1000	01	19	External input	10 00	10	01 00
20480	5000	01	19	Single-phase Electric Measurement	71 03	40	01 00
20480	5000	01	19	Measure configuration	71 03	40	01 00
29696	7400	01	19	Pulse measurement	74 00	10	01 00

MODBUS PROTOCOL DETAILS

Function Code (Dec)	Exception Codes (Dec)	Data Encoding
2 (Read Discrete Inputs)	1, 2, 3	"Big Endian" (most significant byte first)
1 (Read Coils)	1, 2, 3	"Big Endian" (most significant byte first)
5/15 (Write Single/Multiple Coils)	1, 2, 3	"Big Endian" (most significant byte first)
4 (Read Input Registers)	1, 2, 3	"Big Endian" (most significant byte first)
3 (Read Holding register)	1, 2, 3	"Big Endian" (most significant byte first)
6/16 (Write Single/Multiple Holding register)	1, 2, 3, 4	"Big Endian" (most significant byte first)

MODBUS OVER SERIAL DETAILS

Physical Layer	Trasmission Modes	Device Addressing	Baud Rates (bit/s)	Data Bits	Data bits trasmission sequence	Parity	Stop Bits
standard EIA/TIA 485 (RS-485) two-wire configuration	RTU	1÷255	programmable (4800, 9600, 19200, 38400)	8	Least significant bit first	programmable (NONE, EVEN, ODD)	1

MASTER/SLAVE COMMUNICATION TIMING

Timer Description	Timer Value (msec)
Inter-character time-out	< 1,5 character times
Response delay (from master request)	programmable (0 ÷ 99 ms)
Delay Time (between two master trasmissions)	-

REFER ALSO TO: www.modbus.org
- MODBUS over serial line specification and implementation guide V1.02
- MODBUS APPLICATION PROTOCOL SPECIFICATION V1.1b

NOTE: File and printed copies of this document are not subject to document change control.

Register Number	Register Address (Dec)	Register Address (Hex)	Dimension [bit]	Description	Note	Read Function Codes (Dec)	Data Storing
4097	**4096**	**1000**	**1**	**External input**			
4097	4096	1000	1	Current active tariff	*See Note 1*	2	

Note 1
0: Tariff 1 1: Tariff 2

Register Number	Register Address (Dec)	Register Address (Hex)	Dimension [bit]	Description	Note	Read Function Codes (Dec)	Write Function Codes (Dec)	Data Storing
(no COILS availables)								

Register Number	Register Address (Dec)	Register Address (Hex)	Dimension [word]	Bit Position	Description	Type	Scale	Unit	Range	Note	Read Function Code (Dec)	Data Storing
20481	**20480**	**5000**	**140**		**Single-phase Electric Measurement**							
20481	20480	5000	2		Single-phase Current Value	unsigned integer	1	mA		*See Note 1*	4	
20483	20482	5002	27		*RESERVED (all return "8000h")*							
20510	20509	501D	2		Single-phase Voltage L-N	unsigned integer	1	mV		*See Note 1*	4	
20512	20511	501F	26		*RESERVED (all return "8000h")*							
20538	20537	5039	1		Single-phase frequency	unsigned integer	0,01	Hz		*See Note 1*	4	
20539	20538	503A	13		*RESERVED (all return "8000h")*							
20552	20551	5047	2		Single-phase Active Power	signed integer	0,01	W		*See Note 2*	4	
20554	20553	5049	4		*RESERVED (all return "8000h")*							
20558	20557	504D	2		Single-phase Reactive power	signed integer	0,01	var		*See Note 2*	4	
20560	20559	504F	10		*RESERVED (all return "8000h")*							
20570	20569	5059	2		Single-phase Apparent Power	unsigned integer	0,01	VA		*See Note 1*	4	
20572	20571	505B	10		*RESERVED (all return "8000h")*							
20582	20581	5065	1		Single-phase Power Factor (PF)	signed integer				*See Note 2*	4	
20583	20582	5066	5		*RESERVED (all return "8000h")*							
20588	20587	506B	1		Single-phase Power Factor (sector)	unsigned integer				*See Note 5*	4	
20589	20588	506C	4		*RESERVED (all return "8000h")*							
20593	20592	5070	2		Positive Single-phase Active Energy	unsigned integer	0,01	kWh		*See Note 1*	4	Y
20595	20594	5072	2		Negative Single-phase Active Energy	unsigned integer	0,01	kWh		*See Note 1*	4	Y
20597	20596	5074	2		*RESERVED (returns "8000h")*							
20599	20598	5076	2		Positive Single-phase Reactive Energy	unsigned integer	0,01	kVarh		*See Note 1*	4	Y
20601	20600	5078	2		Negative Single-phase Reactive Energy	unsigned integer	0,01	kVarh		*See Note 1*	4	Y
20603	20602	507A	2		*RESERVED (returns "8000h")*							
20605	20604	507C	2		Positive Single-phase Active Energy (Tariff 1)	unsigned integer	0,01	kWh		*See Notes 1 and 6*	4	Y
20607	20606	507E	2		Negative Single-phase Active Energy (Tariff 1)	unsigned integer	0,01	kWh		*See Notes 1 and 6*	4	Y
20609	20608	5080	2		Positive Single-phase Reactive Energy (Tariff 1)	unsigned integer	0,01	kVarh		*See Notes 1 and 6*	4	Y
20611	20610	5082	2		Negative Single-phase Reactive Energy (Tariff 1)	unsigned integer	0,01	kVarh		*See Notes 1 and 6*	4	Y
20613	20612	5084	2		Positive Single-phase Active Energy (Tariff 2)	unsigned integer	0,01	kWh		*See Notes 1 and 6*	4	Y
20615	20614	5086	2		Negative Single-phase Active Energy (Tariff 2)	unsigned integer	0,01	kWh		*See Notes 1 and 6*	4	Y
20617	20616	5088	2		Positive Single-phase Reactive Energy (Tariff 2)	unsigned integer	0,01	kVarh		*See Notes 1 and 6*	4	Y
20619	20618	508A	2		Negative Single-phase Reactive Energy (Tariff 2)	unsigned integer	0,01	kVarh		*See Notes 1 and 6*	4	Y

Note 1
Expressed on "numeric coding"; without mark (fixed more significant bit = 0);
Note 2
Expressed in "numeric coding"; with mark (more significant bit = mark);
Note 5
0: power factor = 1 1: inductive 2: capacitive
Note 6
Only if the input acts as "Tariff selector"
Note 7
Only if the input acts as "Pulse measurement"

Register Number	Register Address (Dec)	Register Address (Hex)	Dimension [word]	Bit Position	Description	Type	Scale	Unit	Range	Note	Read Function Codes (Dec)	Write Function Codes (Dec)	Data Storing
1	**0**	**0**	**1**		**Modbus settings**								
1	0	0	1		Protocol type	unsigned integer				*See Note 1*	3	16	Y
20481	**20480**	**5000**	**223**		**Measure configuration**								
20481	20480	5000	1		Measurement System Features	unsigned integer				*See Note 7*	3	16	Y
20482	20481	5001	1		Phase Currents Transformation Ratio (KTA)	unsigned integer	1		1	*See Note 7*	3	16	Y
20483	20482	5002	2		*RESERVED (all return "8000h")*								
20485	20484	5004	1		Voltage Transformation Ratio (KTV)	unsigned integer	0,01		100	*See Note 7*	3	16	Y
20486	20485	5005	2		Calculation Settings Requirement	unsigned integer				*See Note 4*	3	16	Y
20488	20487	5007	71		*RESERVED (all return "8000h")*								
20559	20558	504E	2		Partial Positive Three-phase Active Energy	unsigned integer	0,01	kWh		*See Note 5*	3	16	Y
20561	20560	5050	2		Partial Negative Three-phase Active Energy	unsigned integer	0,01	kWh		*See Note 5*	3	16	Y
20563	20562	5052	2		*RESERVED (all return "8000h")*								
20565	20564	5054	2		Partial Positive Three-phase Reactive Energy	unsigned integer	0,01	kvarh		*See Note 5*	3	16	Y
20567	20566	5056	2		Partial Negative Three-phase Reactive Energy	unsigned integer	0,01	kvarh		*See Note 5*	3	16	Y
20569	20568	5058	68		*RESERVED (all return "8000h")*								
20637	20636	509C	2		Total Active Power Requirement (MD)	unsigned integer	0,01	W		*See Note 7*	3	16	
20639	20638	509E	34		*RESERVED (all return "8000h")*								
20673	20672	50C0	2		Maximum Total Active Power Requirement Tariff 1 (PMD T1)	unsigned integer	0,01	W		*See Notes 5 and 9*	3	16	Y
20675	20674	50C2	4		*RESERVED (all return "8000h")*								
20679	20678	50C6	2		Maximum Total Active Power Requirement Tariff 2 (PMD T2)	unsigned integer	0,01	W		*See Notes 5 and 9*	3	16	Y
20681	20680	50C8	16		*RESERVED (all return "8000h")*								
20697	20696	50D8	1		Run hour meter threshold	unsigned integer	0,01	%	0 ÷ 5000		3	16	Y
20698	20697	50D9	2		Run hour meter (TOT)	unsigned integer		s		*See Note 6*	3	16	Y
20700	20699	50DB	2		Run hour meter (Tariff 1)	unsigned integer		s		*See Notes 7 and 9*	3	16	Y
20702	20701	50DD	2		Run hour meter (Tariff 2)	unsigned integer		s		*See Notes 7 and 9*	3	16	Y

Note 1

0: Standard MAP;
1: Basic MAP.

Note 2

Bit 6 = 0: the input acts as "Tariff selector";
Bit 6 = 1: the input acts as "Pulse measurement".

Note 3

BYTE1 (MSB):
"33": Three-pahse system without neutral 3-3E;
"34": Three-pahse system with neutral 3N-3E.

BYTE0 (LSB):
"00" ***[default]*** : if the active power flows in the normal/indicated direction (“upstream to downstream” or depending on the polarity indicated for the connection);

Note 4

WORD0 (LSW): calculation method
1: "sliding block interval"

WORD1 (MSW): calculation window (value in [min] (5, 8, 10, 15, 20, 30, 60), “default”=15)

Note 5

This register is writable, but only with zero

Note 6

This register is writable, but only with zero. Writing this register you will delete also the two tariffs values.

Note 7
Writing this register has no effect.
Note 8
0 : Wh (default) 1 : kWh 2 : MWh 3 : Varh 4 : kVarh 5 : MVarh 6 : VAh 7 : kVAh 8 : MVAh 9 : m^3 10 : km^3 11 : Mm^3 12 : Nm^3 (normal $meter^3$) 13 : kNm^3 14 : MNm^3 15 : J 16 : kJ 17 : MJ 18 : cal 19 : kcal 20: g 21: Kg 23: T
Note 9
Only if the input acts as "Tariff selector"