

MODBUS RTU / MODBUS TCP

For DELPHYS XM UPS range



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1. FOREWORD

Thank you for choosing a SOCOMEC product.

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Conditions of use

Read these operating instructions carefully before using the MODBUS interface.

Repairs must only be carried out by suitably qualified, authorized staff.

It is advisable to keep the UPS environment below manufacturer-specified values for optimum operation.

UPS Operating Reference Standard

Comply with safety requirements.

Read the UPS operating instructions carefully.

2. GENERAL AIM

This document provides information about MODBUS RTU and TCP protocol for:

- DELPHYS XM

Before connecting monitoring equipment or a BMS system (building management system) to the UPS, it is necessary to install and set up the serial interface or network configurations in the case of a network connection.

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3. MODBUS RTU – RS485 INTERFACE (ADC+SL card)

3.1 Installation of the RTU card

The interface must first be installed in the appropriate slot and fastened to the com slots using 2 screws.

USING ADC+SL OPTION

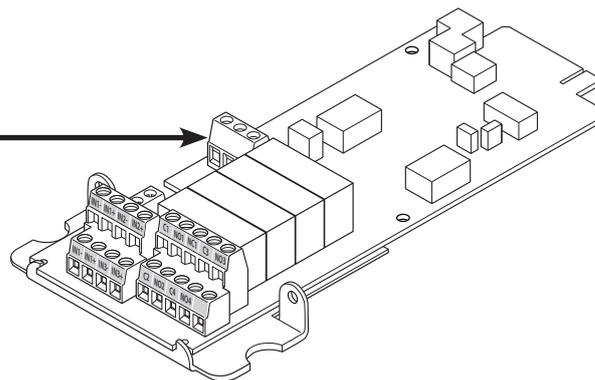
This board includes RS485 insulated serial link and advanced dry input and output contacts.

Installation

- Slot 1 or slot 2
- Screws for fixing

Cabling:

- RTX+ / RTX- connector
- Terminal resistor



MODBUS RTU serial setting via HMI:

- Slave number
- Baud rate (2400 / 9600 / 19200)
- Parity (none, even, odd)
- N bit (8)
- Stop bit set to 1 by default



NOTE!
Refers to ADC+SL quick start document.

4. MODBUS TCP – IDA interface (MODBUS TCP card)

4.1 Installation of the MODBUS TCP card

The interface must first be installed in the appropriate slot and fastened to the com slots using 2 screws.

4.2 Serial connection default setting

Serial connection parameters are set by an auto baud rate detection at boot sequence..

4.3 Features and LED description

Standard supported:

IEEE 802.3

Mode supported:

10/100Base-T

10/100Mbps (auto sensing)

Half-duplex & Full-duplex mode (auto sensing)

Connector type:

RJ-45

MODBUS TCP

Port: 502 by default



NOTE!

Refer to MODBUS TCP user manual.

5. MODBUS UPS DATA ACCESS

5.1 MODBUS global table

Address	Table	Data Type	Description	Length in word	Acronym	Access
0x0001	UPS Configuration	Integer bit field	List of configurations	15	T001 – T015	Read
0x0010	Serial Number	char	String	10	R000	Read
0x001A	Socomec ref	char	Socomec range name	10	R001	Read
0x0024	User device ref	char	Custom reference	6	R002	Read
0x002A	User device location	char	Customer location	6	R003	Read
0x0030	Status	bit	Bits field	8	S000-S127	Read
0x0038	Alarms	bit	Bits field	8	A000-A127	Read
0x0040	Measurements	signed int unsigned int	List of values	80	M000-M079	Read
0x00CB	UPS clock	integer	MSB/lb format	5	K000-K004	R / W

5.2 Detail of data type

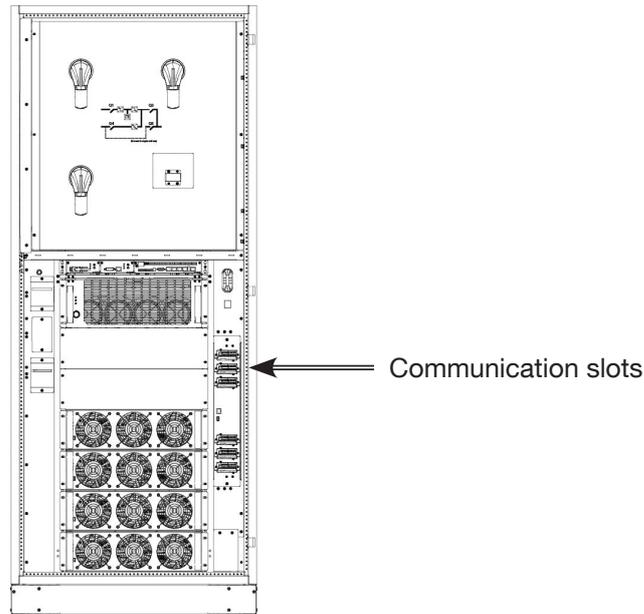
Word - unsigned or signed integer format															
b15	b14	b13	b12	b11	b10	b09	b08	b07	b06	b05	b04	b03	b02	b01	b00
16bits value 0 ... 65535 -32768 ... 32768															

Word - ASCII format															
b15	b14	b13	b12	b11	b10	b09	b08	b07	b06	b05	b04	b03	b02	b01	b00
MSB								lsb							
Char 1								Char 2							

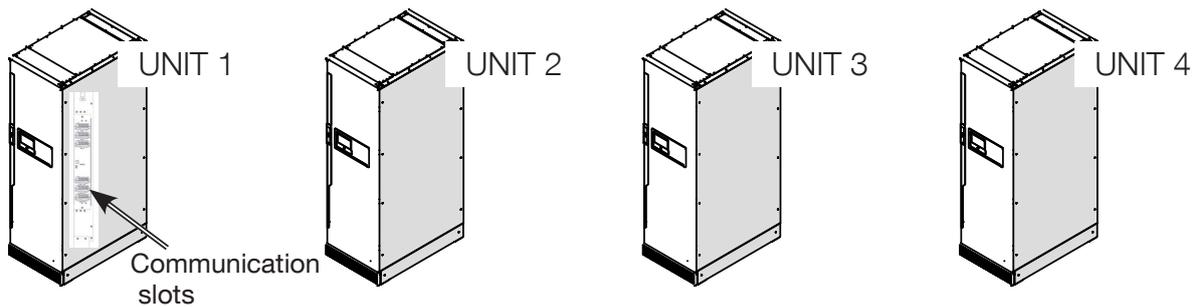
Word - 16 bits field															
b15	b14	b13	b12	b11	b10	b09	b08	b07	b06	b05	b04	b03	b02	b01	b00
A015	Alarms bit														A000
S015	Status bit														S000

6. MODBUS TABLE FOR DELPHYS XM

6.1 DELPHYS XM UPS



6.2 DELPHYS XM Parallel System



In case of DELPHYS XM parallel system the MODBUS interface is installed on unit 1 by default. This MODBUS interface allows reading the data of all units of the system.

6.2.1 MODBUS address table for DELPHYS XM system

The MODBUS interface allows reading data of the MODULYS XM System and Units connected.

The MSB of MODBUS address defines the unit number to read.

Access level	MODBUS Address MSB Defines the level	MODBUS Address lsb Defines the MODBUS table
SYSTEM	0x00	for example: 0x30 = status 0x38 = alarms 0x40 = measurements
Unit 1	0x10	
Unit 2	0x20	
Unit 3	0x30	
Unit 4	0x40	

NOTE: the data at System level is a combination of data coming from all units. This level is like a 'Concentrator' of the all data of the UPS. The combination from Units level to System level is mostly an 'OR' combination, expected for specific status or alarms linked to redundancy management.

6.3 UPS configuration MODBUS table

6.3.1 System configuration (0x0001 – 15 words)

ADD	ACRON	Description	MSB: UPS installation Code	LSB: Device type																						
0x0001	T001	UPS ID Code	1 6	For single unit UPS For Parallel System																						
0x0002	T002	Number of units	1 to 4																							
0x0003	T003	Position of Units	<table border="1"> <tr> <td>b15</td> <td>b14</td> <td>...</td> <td>b11</td> <td>...</td> <td>b05</td> <td>b04</td> <td>b03</td> <td>b02</td> <td>b01</td> <td>b00</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td colspan="4">Unit presence</td> </tr> </table>		b15	b14	...	b11	...	b05	b04	b03	b02	b01	b00								Unit presence			
b15	b14	...	b11	...	b05	b04	b03	b02	b01	b00																
							Unit presence																			
0x0004	T004	Device number	Unit number where the Communication interface is connected																							
0x0005	T005	Nominal kVA																								
0x0006	T006	Nominal kW																								
0x0007	T007	Phases number	Input phases 1 – 3	Output phases 1 - 3																						
0x0008	T008	Function	b00 = 1 if eco mode functioning enabled b01 = 1 if energy saver function enabled b02 = 1 if Line-interactive mode enabled																							
0x0009	T009	Reserved																								
0x000A	T010	UPS Backup	b00 = 1 if battery present																							
0x000B	T011	Reserved																								
0x000C	T012	UPS Backup ID																								
0x000D	T013	Reserved																								
0x000E	T014	Measurements factor	0 = no factor																							
0x000F	T015	Device reference code	0x8500	DELPHYS XM																						

6.3.2 Unit configuration (0xu001 – 15 words)

ADD	ACRON	Description	MSB: UPS installation Code	LSB: Device type
0xu001	T001	UPS ID Code	1	XM Unit
0xu002	T002	Number of devices	0	
0xu003	T003	Position of devices present	0	
0xu004	T004	Device number	Unit number	
0xu005	T005	Nominal kVA	Value * 10	
0xu006	T006	Nominal kW	Value * 10	
0xu007	T007	Phases number	Input phases 1 – 3	Output phases 1 - 3
0xu008	T008	Function	b00 = 1 if eco mode functioning enabled b01 = 1 if energy saver function enabled b02 = 1 if Line-interactive mode enabled	
0xu009	T009	Reserved		
0xu00A	T010	UPS Backup	b00 = 1 if battery present	
0xu00B	T011	Reserved		
0xu00C	T012	UPS Backup ID		
0xu00D	T013	Reserved		
0xu00E	T014	Measurements factor	1 = factor * 10	
0x000F	T015	Device reference code	0x8500	DELPHYS XM

6.4 UPS status MODBUS table: (MSB)(0x30) – 6 words

How to read the table:

The lsb has to be added to the MSB to build the MODBUS address according the level and the table to read.

MODBUS address = level + table = **MSB + lsb**

lsb of MODBUS Address	MODBUS TABLE			MSB of MODBUS Address		Group
	Bits	Acronym	Description	System	Unit 1 to 4	
				0x00	0x01 to 0x04	
0x30	b00	S000	Load protected by Inverter	X	X	OUTPUT STATUS
	b01	S001				
	b02	S002	Load supplied by automatic Bypass	X	X	
	b03	S003	Load supplied by Maintenance Bypass	X	X	
	b04	S004	Load OFF	X	X	
	b05	S005				FUNCTIONING MODE
	b06	S006	In eco mode (**)	X	X	
	b07	S007	energy saver (**)	X	X	
	b08	S008				
	b09	S009	In Service mode	X	X	
	b10	S010	Line-Interactive mode (**)	X	X	DEVICE STATUS
	b11	S011	Operating	X	X	
	b12	S012	Available	X	X	
	b13	S013	On Standby	X	X	
	b14	S014	Isolated	X	X	
0x31	b15	S015				DEVICE ENVIRONMENT
	b00	S016	Output Breaker closed	X	X	
	b01	S017	Maintenance Bypass closed	X	X	
	b02	S018				
	b03	S019				
	b04	S020				
	b05	S021				
	b06	S022				
	b07	S023	Gen set ON	X	X	
	b08	S024				
	b09	S025				
	b10	S026				
	b11	S027				
	b12	S028				
	b13	S029				
b14	S030					
b15	S031					

Isb	bits	Acronym	Descriptions	System 0x00	Unit 0xu0	Group
0x32	b00	S032	Battery OK	X	X	BATTERY
	b01	S033	Battery charged	X	X	
	b02	S034	Battery Test in progress	X	X	
	b03	S035				
	b04	S036	Battery charging	X	X	
	b05	S037				
	b06	S038				DC STORAGE
	b07	S039				
	b08	S040				
	b09	S041				
	b10	S042				
	b11	S043				
	b12	S044				
	b13	S045				
	b14	S046				
b15	S047					
0x33	b00	S048	Rectifier Input Supply present	X	X	RECTIFIER
	b01	S049	Rectifier ON	X	X	
	b02	S050	Charger ON	X	X	
	b03	S051				INVERTER
	b04	S052	Inverter ON	X	X	
	b05	S053				
	b06	S054				BYPASS
	b07	S055				
	b08	S056	Bypass Input Supply present	X	X	
	b09	S057	Bypass Static Switch closed	X	X	
	b10	S058				
	b11	S059				
	b12	S060				
	b13	S061				
	b14	S062				
b15	S063					
0x34	b00	S064	Card in Slot 1 present (*)	X		OPTIONS
	b01	S065	Card in Slot 2 present (*)	X		
	b02	S066	Card in Slot 1-Ext present (*)	X		
	b03	S067	Card in Slot 2-Ext present (*)	X		
	b04	S068	Card in Slot 3	X		
	b05	S069				
	b06	S070				ADC Card IN/OUT
	b07	S071				
	b08	S072	Programmable S072 (*)	X		
	b09	S073	Programmable S073 (*)	X		
	b10	S074	Programmable S074 (*)	X		
	b11	S075	Programmable S075 (*)	X		
	b12	S076	Programmable S076 (*)	X		
	b13	S077	Programmable S077 (*)	X		
	b14	S078	Programmable S078 (*)	X		
b15	S079	Programmable S079 (*)	X			

0x35	b00	S080				MISC.
	b01	S081				
	b02	S082	UPS in Line-Interactive operation	X	X	
	b03	S083				
	b04	S084				
	b05	S085				
	b06	S086				
	b07	S087				
	b08	S088				
	b09	S089				
	b10	S090				
	b11	S091				
	b12	S092				
	b13	S093				
	b14	S094				
b15	S095					

(*) available if the option is present or linked to additional info coming from ADC+SL Option card.

(**) available if the function is enabled.

6.5 Units or Modules Synthesis Table: (MSB)(0x36) – 2 Words

lsb	bits	Acronym	Descriptions	System 0x00	Unit 0xu0	Group
0x36	b00	S096	1 Operating	Unit 1		UNITS SYNTHESIS
	b01	S097	2 Operating	Unit 2		
	b02	S098	3 Operating	Unit 3		
	b03	S099	4 Operating	Unit 4		
	b04	S100				
	b05	S101				
	b06	S102				
	b07	S103				
	b08	S104				
	b09	S105				
	b10	S106				
	b11	S107				
	b12	S108				
	b13	S109				
	b14	S110				
b15	S111					
0x37	b00	S112				UNITS SYNTHESIS
	b01	S113				
	b02	S114				
	b03	S115				
	b04	S116				
	b05	S117				
	b06	S118				
	b07	S119				
	b08	S120				
	b09	S121				
	b10	S122				
	b11	S123				
	b12	S124				
	b13	S125				
	b14	S126				
b15	S127					

6.6 UPS alarms MODBUS table: (MSB)(0x38) – 6 words

Lsb of MODBUS Address	MODBUS TABLE			MSB of MODBUS Address		Group
	Bits	Acronym	Description	System	Unit 1 to 4	
				0x00	0x01 to 0x04	
0x38	b00	A000	Imminent Stop	X	X	LOAD
	b01	A001	Overload	X	X	
	b02	A002	Ambient Temperature Alarm	X	X	
	b03	A003	Transfer locked	X	X	
	b04	A004	Transfer impossible	X	X	
	b05	A005	Insufficient Resources	X	X	
	b06	A006	Redundancy loss	X	X	
	b07	A007	Output short circuit detection	X	X	
	b08	A008				MODE
	b09	A009				
	b10	A010	On bypass for 1 hour	X	X	
	b11	A011				SERVICE
	b12	A012	Maintenance Alarm	X	X	
	b13	A013				
	b14	A014				
b15	A015	General Alarm	X	X		
0x39	b00	A016	Battery disconnected	X	X	BATTERY
	b01	A017	Battery discharged	X	X	
	b02	A018	End of Backup Time - Battery Low	X	X	
	b03	A019	Battery discharging	X	X	
	b04	A020				
	b05	A021				
	b06	A022				
	b07	A023				
	b08	A024				
	b09	A025				
	b10	A026	Insulation fault	X	X	
	b11	A027	Battery Alarm	X	X	
	b12	A028				
	b13	A029				
	b14	A030				
b15	A031					

lsb	bits	Acronym	Descriptions	System 0x00	Unit 0xu0	Group
0x3A	b00	A032	Rectifier Critical Alarm	X	X	RECTIFIER
	b01	A033	Rectifier Preventive Alarm	X	X	
	b02	A034				
	b03	A035	Rectifier Input Supply not OK	X	X	
	b04	A036				
	b05	A037	Charger Critical Alarm	X	X	
	b06	A038				
	b07	A039				INVERTER
	b08	A040	Inverter Critical Alarm	X	X	
	b09	A041	Inverter Preventive Alarm	X	X	
	b10	A042				
	b11	A043				
	b12	A044				
	b13	A045				
	b14	A046	Parallel board Critical Alarm	X		
b15	A047	Parallel board Preventive Alarm	X			
0x3B	b00	A048	Bypass Critical Alarm	X	X	BYPASS
	b01	A049	Bypass Preventive Alarm	X	X	
	b02	A050	Bypass Input Supply not OK	X	X	
	b03	A051	Phase Rotation fault	X	X	
	b04	A052	Bypass Backfeed detection	X	X	
	b05	A053				
	b06	A054	Fan Failure	X	X	
	b07	A055				OPTION
	b08	A056	Maintenance Bypass Alarm	X	X	
	b09	A057				
	b10	A058				
	b11	A059	UPS Power OFF	X	X	
	b12	A060	Wrong Configuration	X	X	
	b13	A061	Internal / Communication failure	X	X	
	b14	A062	Option Board Alarm (*)	X		
b15	A063				ADC Card IN/OUT	
0x3C	b00	A064	Programmable A064 (*)	X		
	b01	A065	Programmable A065(*)	X		
	b02	A066	Programmable A066 (*)	X		
	b03	A067	Programmable A067 (*)	X		
	b04	A068	Programmable A068 (*)	X		
	b05	A069	Programmable A069 (*)	X		
	b06	A070	Programmable A070 (*)	X		
	b07	A071	Programmable A071 (*)	X		
	b08	A072				
	b09	A073				
	b10	A074				
	b11	A075				
	b12	A076				
	b13	A077				
	b14	A078				
b15	A079					

(*) available if the option is present or linked to additional info coming from ADC+SL Option card.

(**) available if the function is enabled.

Isb	bits	Acronym	Descriptions	System 0x00	Unit 0xu0	Group
0x3D	b00	A080				MISC.
	b01	A081				
	b02	A082				
	b03	A083				
	b04	A084				
	b05	A085				
	b06	A086				
	b07	A087				
	b08	A088				
	b09	A089				
	b10	A090				
	b11	A091				
	b12	A092				
	b13	A093				
	b14	A094				
b15	A095					

6.7 Units or Modules Synthesis Table (MSB) (0x3E – 2 words)

Isb	Bits	Acronym	Descriptions	System 0x00	Unit 0xu0	Group
0x3E	b00	A096	1 General Alarm	Unit 1		Units SYNTHESIS
	b01	A097	2 General Alarm	Unit 2		
	b02	A098	3 General Alarm	Unit 3		
	b03	A099	4 General Alarm	Unit 4		
	b04	A100				
	b05	A101				
	b06	A102				
	b07	A103				
	b08	A104				
	b09	A105				
	b10	A106				
	b11	A107				
	b12	A108				
	b13	A109				
	b14	A110				
b15	A111					
0x3F	b00	A112	1 Imminent STOP	Unit 1		Units SYNTHESIS
	b01	A113	2 Imminent STOP	Unit 2		
	b02	A114	3 Imminent STOP	Unit 3		
	b03	A115	4 Imminent STOP	Unit 4		
	b04	A116				
	b05	A117				
	b06	A118				
	b07	A119				
	b08	A120				
	b09	A121				
	b10	A122				
	b11	A123				
	b12	A124				
	b13	A125				
	b14	A126				
b15	A127					

6.8 Measurements table (MSB) (0x40 – 80 words)

The MSB of the MODBUS address managed in the same manner as for other tables. For System the MSB=0x00, for Unit the MSB=0xu0 (u=Unit number)

ACRON.	lsb	MEASUREMENTS		FORMAT 0x000E=0	FORMAT 0x000E=1	MCMT ¹	System Unit
M000	0x40	Output load rate	%	###	###	0xC0b00	X
M001	0x41	Output load rate L1	%	###	###	0xC0b01	X
M002	0x42	Output load rate L2	%	###	###	0xC0b02	X
M003	0x43	Output load rate L3	%	###	###	0xC0b03	X
M004	0x44	Output	kVA	## ###	# ###.#	0xC0b04	X
M005	0x45	Output	kW	## ###	# ###.#	0xC0b05	X
M006	0x46	Output current L1	A	## ###	# ###.#	0xC0b06	X
M007	0x47	Output current L2	A	## ###	# ###.#	0xC0b07	X
M008	0x48	Output current L3	A	## ###	# ###.#	0xC0b08	X
M009	0x49						
M010	0x4A	Output voltage L1	V	###	###	0xC0b10	X
M011	0x4B	Output voltage L2	V	###	###	0xC0b11	X
M012	0x4C	Output voltage L3	V	###	###	0xC0b12	X
M013	0x4D	Output frequency	x10Hz	##.#	##.#	0xC0b13	X
M014	0x4E						X
M015	0x4F	Ambient T°	°C	##.#	##.#	0xC0b15	X
M016	0x50	Battery voltage	V	# ###	###.#	0xC1b00	X
M017	0x51					0xC1b01	
M018	0x52	Battery current	A	## ###	# ###.#	0xC1b02	X
M019	0x53						
M020	0x54						
M021	0x55						
M022	0x56	Battery capacity	%	###	###	0xC1b06	X
M023	0x57	Battery capacity	Ah	## ###	# ###.#	0xC1b07	X
M024	0x58	Bat. remaining backup time	mn	###	###	0xC1b08	X
M025	0x59	Time on battery	s	###	###	0xC1b09	X
M026	0x5A	Battery temperature		##.#	##.#	0xC1b10	X
M027	0x5B						
M028	0x5C						
M029	0x5D						
M030	0x5E						
M031	0x5F						
M032	0x60	Rect. input supply volt. L1	V	###	###	0xC2b00	X
M033	0x61	Rect. input supply volt. L2	V	###	###	0xC2b01	X
M034	0x62	Rect. input supply volt. L3	V	###	###	0xC2b02	X
M035	0x63	Rect. input supply freq.	x10Hz	##.#	##.#	0xC2b03	X
M036	0x64	Rect. input supply volt. U12	V	###	###	0xC2b04	X
M037	0x65	Rect. input supply volt. U23	V	###	###	0xC2b05	X

ACRON.	Isb	MEASUREMENTS		FORMAT 0x000E=0	FORMAT 0x000E=1	MCMT ¹	System Unit
M038	0x66	Rect. input supply volt. U31	V	###	###	0xC2b06	X
M039	0x67	Bypass input supply voltage	L1	###	###	0xC2b07	X
M040	0x68	Bypass input supply voltage	L2	###	###	0xC2b08	X
M041	0x69	Bypass input supply voltage	L3	###	###	0xC2b09	X
M042	0x6A	Bypass input supply freq.	x10Hz	##.#	##.#	0xC2b10	X
M043	0x6B	Bypass input supply volt U12	V	###	###	0xC2b11	X
M044	0x6C	Bypass input supply volt U23	V	###	###	0xC2b12	X
M045	0x6D	Bypass input supply volt U31	V	###	###	0xC2b13	X
M046	0x6E						
M047	0x6F						
M048	0x70	Output Apparent P. L1	KVA	## ###	# ###.#	0xC3b00	X
M049	0x71	Output Apparent P. L2	KVA	## ###	# ###.#	0xC3b01	X
M050	0x72	Output Apparent P. L3	KVA	## ###	# ###.#	0xC3b02	X
M051	0x73	Output Active Power L1	KW	## ###	# ###.#	0xC3b03	X
M052	0x74	Output Active Power L2	KW	## ###	# ###.#	0xC3b04	X
M053	0x75	Output Active Power L3	KW	## ###	# ###.#	0xC3b05	X
M054	0x76	Output voltage U12	V	###	###	0xC3b06	X
M055	0x77	Output voltage U23	V	###	###	0xC3b07	X
M056	0x78	Output voltage U31	V	###	###	0xC3b08	X
M057	0x79	Output Power factor L1 (*)		#.##	#.##	0xC3b09	X
M058	0x7A	Output Power factor L2 (*)		#.##	#.##	0xC3b10	X
M059	0x7B	Output Power factor L3 (*)		#.##	#.##	0xC3b11	X
M060	0x7C	Output Crest factor L1		##.#	##.#	0xC3b11	X
M061	0x7D	Output Crest factor L2		##.#	##.#	0xC3b12	X
M062	0x7E	Output Crest factor L3		##.#	##.#	0xC3b13	X
M063	0x7F						
M064	0x80	Rect. Input Current L1	A	## ###	# ###.#	0xC4b00	X
M065	0x81	Rect. Input Current L2	A	## ###	# ###.#	0xC4b01	X
M066	0x82	Rect. Input Current L3	A	## ###	# ###.#	0xC4b02	X
M067	0x83	Rect. Active Power L1	KW	+/-## ###	+/-# ###.#	0xC4b03	X
M068	0x84	Rect. Active Power L2	KW	+/-## ###	+/-# ###.#	0xC4b04	X
M069	0x85	Rect. Active Power L3	KW	+/-## ###	+/-# ###.#	0xC4b05	X
M070	0x86	Bypass Input Current L1	A	## ###	# ###.#	0xC4b06	X
M071	0x87	Bypass Input Current L2	A	## ###	# ###.#	0xC4b07	X
M072	0x88	Bypass Input Current L3	A	## ###	# ###.#	0xC4b08	X
M073	0x89						
M074	0x8A						
M075	0x8B						
M076-79		reserved					

(*) to check the availability with MCMT bits

¹ Measurements Control Management Table

6.9 UPS date and time MODBUS table (0x00CB – 4 Words)

To update UPS date and time, write to addresses 0x00CB to 0x00CE using as a 'Function' the code '0x10'. See 'Functions used' and 'Summary' of frame format' paragraphs for Modbus frame description.

Address	Description	Value		Remarks
		MSB	LSB	
0x00CB	Minutes & Seconds	Minute: 0 - 59	Seconds: 0 - 59	read / write
0x00CC	Day & hours	Day: 1 - 31	Hours: 0-23	read / write
0x00CD	Month & day of the week	Month: 1 - 12	1= Monday --- 7=Sunday	read / write
0x00CE	Year	Year = value + 2000		read / write

Date and hours frame detail:

0x00CB		0x00CC		0x00CD		0x00CE
Minutes	Second	Day	Hours	Month	Day/week	Year + 2000

7. MODBUS PROTOCOL

7.1 Functions used

0x03	READ data
0x06	WRITE command or one word
0x10	WRITE several words

7.2 Summary of MODBUS frame format

Function 0x03: bytes frame description

Slave	Function	Address		Length		CRC	
1	0x03	MSB	lsb	MSB	lsb	MSB	lsb
By default		Address		Number of words		Compute	

UPS slave answer

Slave	Function	Nb bytes	Data Word0		Word1 ...	CRC	
1	0x03	2 * nb of words	MSB	lsb		MSB	lsb
			Values		Compute	

Function 0x06: bytes frame description

Slave	Function	Address		Data		CRC	
1	0x06	MSB	lsb	MSB	lsb	MSB	lsb
By default		Address		Value to write		Compute	

UPS slave answer

Slave	Function	Address		Data		CRC	
1	0x06	MSB	lsb	MSB	lsb	MSB	lsb
		Address		Value written		Compute	

Function 0x10: bytes frame description

Slave	Function	Address		Length word		Length	Data		CRC	
1	0x10	MSB	lsb	MSB	lsb		MSB	lsb	MSB	lsb
By default		Address		Number of words to write		Number of bytes	Values to write		Compute	

UPS slave answer

Slave	Function	Address		Length		CRC	
1	0x10	MSB	lsb	MSB	lsb	MSB	lsb
		Address		Nb of words written		Compute	

8. MODBUS TCP IDA SPECIFICATION

The frames below are only examples:

REQUEST FROM MASTER MODBUS TCP

Original frame: 01 03 1034 0003 40C5

Encapsulated frame: 0046 0000 0006 01 03 1034 0003

Where:

0046	corresponds to the transaction number
0000	corresponds to the protocol identifier
0006	corresponds to the number of bytes (length of the message)

Note: the CRC is removed in the encapsulated MODBUS frame.

REPLY FROM THE UPS MODBUS TCP:

Original frame: 01 03 06 0002 0184 0000 1960

Encapsulated frame: 0046 0000 0009 01 03 06 0002 0184 0000

Where:

0046	corresponds to the transaction number
0000	corresponds to the protocol identifier
0006	corresponds to the number of bytes (length of the message)

Note: the CRC is removed in the encapsulated MODBUS frame.

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