Modbus communication protocol

6M.TA – 6M.TB – 6M.TF

Contents

Summary

Function code

3: Read multiple register, max 100
6: write single
16: write multiple

Custom settings

In order to use the 6M.Tx with the customer settings, is necessary to switch of the 6M.Tx,
change the selection of dip-switch and connect the 6M to the power supply again.
It is salso possible to send via Modbus the reset command.

Measurement Update

Measurements are updated every 50 cycles or every 1s.

6M.TA – 6M.TB – 6M.TF – MODBUS RS485 PROTOCOL STRUCTURE

INFO - Instantaneous Values - Modbus parameters

Register Name	Comment	Register Type	R/W	Default Value	Range	Modbus Address
Machine ID	6M.TA.9.024.1200 (7), 6M.TF.9.024.1200 (18), 6M.TB.9.024.1200 (48)	Unsigned short	R			**40001**
Firmware version	Firmware version	Unsigned short	R	0		**40002**
Address	Modbus address	Unsigned short	R/W	1		**40003**
Dealy	Machine answer delay (in characters)	Unsigned short	R/W	1	**1...1000**	**40004**
Baudrate	0=1200, 1=2400, 2=4800, 3=9600, 4=19200, 5=38400 6=57600, 7=115200	Unsigned short	R/W	1	**0...7**	**40005**
Parity	0=NO, 1=ODD, 2=EVEN	Unsigned short	R/W	0	**0...2**	**40006**
DC Filter	Number of tenths of second (1/10) for all RMS calculation in DC	Unsigned short	R/W	10	**1...65535**	**40007**
Flag Measurement	**bit 0** :[0= TRMS value (without sign); 1 = DC_measurement (with sign)]; **bit 1** :[0= Energy storing disable; 1= Energy storing enable]; **bit 2** :[0= Frequency detect on Voltage channel; 1= Frequency detect on Current channel].	Unsigned short	R/W	0x10		**40008**
TV_Ratio	Voltage transformer ratio	Float (LSW first)	R/W	1.0		**40009**
						40010
TA_Ratio	Current transformer ratio	Float (LSW first)	R/W	1.0		**40011**
						40012
Current and Power CUT OFF	**LSB: Current** in mA (250) for 6M.TA.9.024.1200, in 10xmA (**1500**) for 6M.TA.9.024.1200, in 10xmA (**500**) for 6M.TF.9.024.1200- **MSB:Power** in W (1) 6M.TB.9.024.1200, in 10xW (**10**) for , 6M.TA.9.024.1200, 6M.TF.9.024.1200, 6M.TB.9.024.1200	Unsigned short	R/W	See comment		**40013**
# of ZX for VI measurement	Number of ZX for_AC Meas Number of line cycle Zero Crossing for AC measurement RMN	Unsigned short	R/W	50	**1...65535**	**40014**

6M.TA – 6M.TB – 6M.TF – MODBUS RS485 PROTOCOL STRUCTURE
FLOAT MSW FIRST - All measurement register

Register Name	Comment	Register Type	R/W	Default Value	Range	Modbus Address
STATUS	**bit 0**: flash settings error; **bit 1**: flash calibration error; **bit 2**: Voltage Over Range; **bit 3**: Voltage Under Range; **bit [4:5]** don't care; **bit 6**: Zero crossing detecting; **bit [7:9]** don't care; **bit 10**: Energy storing error; **bit 11**: Energy initialization error; **bit 12**: don't care; **bit 13**: Current Over Range **bit 14**: Current Under Range; **bit 15**: don't care	Unsigned short	R			40132
V RMS SW	Voltage RMS measurement (V) swapped	Float (MSW first)	R			40133 / 40134
I RMS SW	Current RMS measurement (mA) swapped	Float (MSW first)	R			40135 / 40136
P SW	Power measurement (W) swapped	Float (MSW first)	R			40137 / 40138
Q SW	Reactive Power measurement Q (var) swapped	Float (MSW first)	R			40139 / 40140
S SW	Apparent Power measurement S (VA) swapped	Float (MSW first)	R			40141 / 40142
Cosφ SW	Cosφ measurement swapped	Float (MSW first)	R			40143 / 40144
Frequency SW	Frequency measurement (Hz) swapped	Float (MSW first)	R			40145 / 40146
THD SW	THD swapped	Float (MSW first)	R			40147 / 40148
Energy SW	Total Energy measurement (kWh) swapped	Float (MSW first)	R			40149 / 40150
Energy positive SW	Only positive Energy Measurement (kWh) swapped	Float (MSW first)	R			40151 / 40152
Energy negative SW	Only negative Energy Measurement (kWh) swapped	Float (MSW first)	R			40153 / 40154
V peak SW	Instantaneous Voltage Peak (V) swapped	Float (MSW first)	R/W			40155 / 40156
I peak SW	Instantaneous Current Peak (mA) swapped	Float (MSW first)	R/W			40157 / 40158
V MAX SW	Max RMS Voltage (V) swapped	Float (MSW first)	R/W			40159 / 40160
V min SW	Min RMS Voltage (V) swapped	Float (MSW first)	R/W			40161 / 40162
I MAX SW	Max RMS Current (mA) swapped	Float (MSW first)	R/W			40163 / 40164
I min SW	Min RMS Current (mA) swapped	Float (MSW first)	R/W			40165 / 40166
P MAX SW	Max RMS Pover (W) swapped	Float (MSW first)	R/W			40167 / 40168
P min SW	Min RMS Power (W) swapped	Float (MSW first)	R/W			40169 / 40170
Q MAX SW	Max Reactive Power (var) swapped	Float (MSW first)	R/W			40171 / 40172
Q min SW	Min Reactive Power (var) swapped	Float (MSW first)	R/W			40173 / 40174
S MAX SW	Max Apparent Power (VA) swapped	Float (MSW first)	R/W			40175 / 40176
S min SW	Min Apparent Power (VA) swapped	Float (MSW first)	R/W			40177 / 40178
Cosφ MAX SW	Max Cosφ swapped	Float (MSW first)	R/W			40179 / 40180
Cosφ min SW	Min Cosφ swapped	Float (MSW first)	R/W			40181 / 40182
Frequency MAX SW	Max Frequency (Hz) swapped	Float (MSW first)	R/W			40183 / 40184
Frequency min SW	Min Frequency (Hz) swapped	Float (MSW first)	R/W			40185 / 40186

6M.TA – 6M.TB – 6M.TF – MODBUS RS485 PROTOCOL STRUCTURE
FLOAT MSW FIRST - All measurement register

Register Name	Comment	Register Type	R/W	Default Value	Range	Modbus Address
THD MAX SW	Max THD swapped	Float (MSW first)	R/W			40187
						40188
THD min SW	Min THD swapped	Float (MSW first)	R/W			40189
						40190
STATUS 100	bit 0: flash settings error; bit 1: flash calibration error; bit 2: Voltage Over Range; bit 3: Voltage Under Range; bit [4:5] don't care; bit 6: Zero crossing detecting; bit [7:9] don't care; bit 10: Energy storing error; bit 11: Energy initialization error; bit 12: don't care; bit 13: Current Over Range bit 14: Current Under Range; bit 15: don't care	Unsigned short	R			40192
V RMS 100	Voltage RMS measurement (V/100) in hundredths	Signed long (LSW first)	R			40193
						40194
I RMS 100	Current RMS measurement (mA/100) in hundredths	Signed long (LSW first)	R			40195
						40196
P 100	Power measurement (W/100) in hundredths	Signed long (LSW first)	R			40197
						40198
Q 100	Reactive Power measurement Q (var/100) in hundredths	Signed long (LSW first)	R			40199
						40200
S 100	Apparent Power measurement S (VA/100) in hundredths	Signed long (LSW first)	R			40201
						40202
Cosφ 100	Cosφ measurement in hundredths	Signed long (LSW first)	R			40203
						40204
Frequency 100	Frequency measurement (Hz/100) in hundredths	Signed long (LSW first)	R			40205
						40206
THD 100	THD in hundredths	Signed long (LSW first)	R			40207
						40208
Energy 100	Total Energy Measurement (kWh) swapped	Signed long (LSW first)	R			40209
						40210
Energy positive 100	Only positive Energy Measurement (kWh/100) in hundredths	Signed long (LSW first)	R			40211
						40212
Energy negative 100	Only negative Energy Measurement (kWh/100) in hundredths	Signed long (LSW first)	R			40213
						40214
V peak 100	Instantaneous Voltage Peak (V/100) in hundredths	Signed long (LSW first)	R/W			40215
						40216
I peak 100	Instantaneous Current Peak (mA/100) in hundredths	Signed long (LSW first)	R/W			40217
						40218
V MAX 100	Max RMS Voltage (V/100) in hundredths	Signed long (LSW first)	R/W			40219
						40220
V min 100	Min RMS Voltage (V/100) in hundredths	Signed long (LSW first)	R/W			40221
						40222
I MAX 100	Max RMS Current (mA/100) in hundredths	Signed long (LSW first)	R/W			40223
						40224
I min 100	Min RMS Current (mA/100) in hundredths	Signed long (LSW first)	R/W			40225
						40226
P MAX 100	Max RMS Pover (W/100) in hundredths	Signed long (LSW first)	R/W			40227
						40228
P min 100	Min RMS Power (W/100) in hundredths	Signed long (LSW first)	R/W			40229
						40230
Q MAX 100	Max Reactive Power (var/100) in hundredths	Signed long (LSW first)	R/W			40231
						40232
Q min 100	Min Reactive Power (var/100) in hundredths	Signed long (LSW first)	R/W			40233
						40234
S MAX 100	Max Apparent Power (VA/100) in hundredths	Signed long (LSW first)	R/W			40235
						40236
S min 100	Min Apparent Power (VA/100) in hundredths	Signed long (LSW first)	R/W			40237
						40238
Cosφ MAX 100	Max Cosφ swapped in hundredths	Signed long (LSW first)	R/W			40239
						40240
Cosφ min 100	Min Cosφ swapped in hundredths	Signed long (LSW first)	R/W			40241
						40242

6M.TA – 6M.TB – 6M.TF – MODBUS RS485 PROTOCOL STRUCTURE

FLOAT MSW FIRST - All measurement register

Register Name	Comment	Register Type	R/W	Default Value	Range	Modbus Address
Frequency MAX 100	Max Frequency (Hz/100) in hundredths	Signed long (LSW first)	R/W			40243
						40244
Frequency min 100	Min Frequency (Hz/100) in hundredths	Signed long (LSW first)	R/W			40245
						40246
THD MAX 100	Max THD swapped in hundredths	Signed long (LSW first)	R/W			40247
						40248
THD min 100	Min THD swapped in hundredths	Signed long (LSW first)	R/W			40249
						40250
Command	**Flash settings save command** = 0xC1C0; **Reset command** = 0xC1A0; **Load Energy command** = 0xBABA (energy to load must be written in Command_aux); **Load Positive Energy command** = 0xBABB (positive energy to load must be written in Command_aux); **Load Negative Energy command** = 0xBABC (negative energy to load must be written in Command_aux	Unsigned short	R/W	0		40252
Command aux	Auxiliary Register for Energy Command (see command register)	Float (LSW first)	R/W	0		40253
						40254

6M.TA – 6M.TB – 6M.TF – MODBUS RS485 PROTOCOL STRUCTURE
FLOAT LSW FIRST - All measurement register

Register Name	Comment	Register Type	R/W	Default Value	Range	Modbus Address
STATUS	bit 0: flash settings error; bit 1: flash calibration error; bit 2: Voltage Over Range; bit 3: Voltage Under Range; bit [4:5] don't care; bit 6: Zero crossing detecting; bit [7:9] don't care; bit 10: Energy storing error; bit 11: Energy initialization error; bit 12: don't care; bit 13: Current Over Range bit 14: Current Under Range; bit 15: don't care	Unsigned short	R	0		40072
V RMS	Voltage RMS Measurement (V)	Float (LSW first)	R			40073 / 40074
I RMS	Current RMS Measurement (mA)	Float (LSW first)	R			40075 / 40076
P	Active Power Measurement (W)	Float (LSW first)	R			40077 / 40078
Q	Reactive Power Measurement (var)	Float (LSW first)	R			40079 / 40080
S	Apparent Power Measurement (VA)	Float (LSW first)	R			40081 / 40082
Cosφ	Cosφ Measurement	Float (LSW first)	R			40083 / 40084
Frequency	Frequency Measurement (Hz)	Float (LSW first)	R			40085 / 40086
THD	THD Measurement	Float (LSW first)	R			40087 / 40088
Energy	Total Energy Measurement (kWh)	Float (LSW first)	R			40089 / 40090
Energy positive	Only positive Energy Measurement (kWh)	Float (LSW first)	R			40091 / 40092
Energy negative	Only negative Energy Measurement (kWh)	Float (LSW first)	R			40093 / 40094
V peak	Instantaneous Voltage Peak (V)	Float (LSW first)	R/W			40095 / 40096
I peak	Instantaneous Current Peak (mA)	Float (LSW first)	R/W			40097 / 40098
V MAX	Max RMS Voltage (V)	Float (LSW first)	R/W			40099 / 40100
V min	Min RMS Voltage (V)	Float (LSW first)	R/W			40101 / 40102
I MAX	Max RMS Current (mA)	Float (LSW first)	R/W			40103 / 40104
I min	Min RMS Current (mA)	Float (LSW first)	R/W			40105 / 40106
P MAX	Max RMS Pover (W)	Float (LSW first)	R/W			40107 / 40108
P min	Min RMS Power (W)	Float (LSW first)	R/W			40109 / 40110
Q MAX	Max Reactive Power (var)	Float (LSW first)	R/W			40111 / 40112
Q min	Min Reactive Power (var)	Float (LSW first)	R/W			40113 / 40114
S MAX	Max Apparent Power (VA)	Float (LSW first)	R/W			40115 / 40116
S min	Min Apparent Power (VA)	Float (LSW first)	R/W			40117 / 40118
Cosφ MAX	Max Cosφ	Float (LSW first)	R/W			40119 / 40120
Cosφ min	Min Cosφ	Float (LSW first)	R/W			40121 / 40122
Frequency MAX	Max Frequency (Hz)	Float (LSW first)	R/W			40123 / 40124
Frequency min	Min Frequency (Hz)	Float (LSW first)	R/W			40125 / 40126

6M.TA – 6M.TB – 6M.TF – MODBUS RS485 PROTOCOL STRUCTURE
FLOAT LSW FIRST - All measurement register

Register Name	Comment	Register Type	R/W	Default Value	Range	Modbus Address
THD MAX	Max THD	Float (LSW first)	R/W			40127
						40128
THD min	Min THD	Float (LSW first)	R/W			40129
						40130