1. Comunicação Modbus-RTU – MEDIDOR PL-MT100

Formato de mensagem do protocolo de comunicação Modbus-RTU
Leia o valor do registro de dados (código de função 0x03/0x04)

	Frame structure	address code	function code	data code		CRC check code
				initial register address	number of register	
Host request	Byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes
	data range	1～247	0x03/ 0x04		max 100	CRC16
	message example	0x01	0x03	0x00 0x00	0x00 0x06	0xC5 0xC8
Slave response	frame structure	address code	function code	data code		CRC check code
				byte of register	register value	
	byte	1 byte	1 byte	1 byte	12 bytes	2 bytes
	message example	0x01	0x03	0x0C	12-byte data	CRC16

Observação: O endereço de registro inicial na consulta do host é o endereço inicial dos dados coletados da rede elétrica. O número do registrador indica o comprimento dos dados. Na lista superior o endereço de registro “0x00 0x00” indica o endereço inicial dos dados de flutuação de tensão de fase de três fases, e o número de registro “0x00 0x06” indica que o comprimento dos dados é 6 (três dados de flutuação ocupam seis registros). Consulte a tabela de informações de endereço de comunicação MODBUS-RTU no apêndice 1

Gravar valor de registro de configuração (código de função 0x10)

	frame structure	address code	function code	data code				CRC check code
				initial relay address	relay length	relay byte	written value	
host request	byte	1 byte	1 byte	2 bytes	2 bytes	1 byte	2N bytes	2 byte
	data range	1～247	0x10	0x0802	0x0001	N		CRC16

	message example	0x01	0x10	0x08 0x02	0x00 0x01	0x02	0x01 0x00	0x2FE2

slave response	frame structure	address code	function code	data code		CRC check code
				initial relay address	relay length	
	byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes
	message example	0x01	0x10	0x08 0x02	0x00 0x01	0xA269

Observação: Siga rigorosamente a lista de endereços de informações de configuração do medidor no apêndice ao escrever o registro de configuração. Não altere os dados reservados. Os dados escritos não devem exceder o intervalo definido. A operação incorreta pode causar danos ao medidor.

Apêndice 1

Lista de informações de endereço de comunicação MODBUS-RTU (medidor monofásico)
0x03/0x04 endereço de registro de dados de comando:

Address	Format	Data description	Unit	R/W
float type data				
0000-0001	float	voltage	V	R
0002-0003	float	current	A	R
0004-0005	float	active power	kW	R
0006-0007	float	reactive power	kvar	R
0008-0009	float	apparent power	kVA	R
000A-000B	float	power factor		R
000C-000D	Float	frequency	1Hz	
000E-000F	float	import active energy	kWh	R
0010-0011	float	export active energy	kWh	R
0012-0013	float	import reactive energy	kvarh	R
0014-0015	float	export reactive energy	kvarh	R
0016-00FF	---			
time data				
0100	Char	time	year-month	R

0101	Char	time	day-hour	R
0102	Char	time	minute-second	R
0103	Char	time	week-reserved	R
0104-0105	---			
Energy data				
0106-0107	Long	import active energy	10Wh	R
0108-0109	Long	export active enregy	10Wh	R
010A-010B	Long	import reactive energy	10varh	R
010C-010D	Long	export reactive energy	10varh	R
010E-010F	Long	apparent energy	10VAh	R
0110-0111	Long	first quadrant reactive energy	10varh	R
0112-0113	Long	second quadrant reactive energy	10varh	R
0114-0115	Long	third quadrant reactive energy	10varh	R
0116-0117	Long	fourth quadrant reactive energy	10varh	R
0118-0119	Long	active energy [total]	10Wh	R
011A-011B	Long	active energy [tip]	10Wh	R
011C-011D	Long	active energy [peak]	10Wh	R
011E-011F	Long	active energy [level]	10Wh	R
0120-0121	Long	active energy [valley]	10Wh	R
0122-012B	Long	active energy of this month [total/tip/peak/level/valley]	10Wh	R
012C-0135	Long	active energy of last month [total/tip/peak/level/valley]	10Wh	R
0136-013F	Long	active energy of the month before last [total/tip/peak/level/valley]	10Wh	R
0140-01FF	---			
Electric quantity data				
0200	Int	voltage	0.1V	R
0201	Int	current	0.01A	R

0202	Int	active power	10W	R
0203	Int	reactive power	10var	R
0204	Int	apparent power	10VA	R
0205	Int	power factor	0.001	R
0206	Int	frequency	0.01Hz	R
0207-00FF	---			
Demand				
0600	Int	Max. voltage value	0.1V	R
0601	Int	Max. current value	0.01A	R
0602	Int	Max. active power value	10W	R
0603	Int	Max. reactive power value	10var	R
0604	Int	Max. apparent power value	10VA	R
0605	Int	Max. active power demand value	10W	R
0606	Int	Max. reactive power demand value	10var	R
0607	Int	Max. apparent power demand value	10VA	R
0608	Int	Max. voltage value of this month	0.1V	R
0609	Int	Max. current value of this month	0.01A	R
060A	Int	Max. active power value of this month	10W	R
060B	Int	Max. reactive power value of this month	10var	R
060C	Int	Max. apparent power value of this month	10VA	R
060D	Int	Max. active power demand value of this month	10W	R
060E	Int	Max. reactive power demand value of this month	10var	R
060F	Int	Max. apparent power demand value of this month	10VA	R
0610	Int	active power demand value at	10W	R

		present		
0611	Int	reactive power demand value at present	10var	R
0612	Int	apparent power demand value at present	10VA	R
0613				
Events recording				
0614	char	power on record times and year	times-year	R
0615	char	power on record month and data	month-day	R
0616	char	power on record hour and minute	hour-minute	R
0617	char	programming record times and year	times-year	R
0618	char	programming record month and day	month-day	R
0619	char	programming record hour and minute	hour-minute	R
061A	char	energy clearing times and year	times-year	R
061B	char	energy clearing month and day	month-day	R
061C	char	energy clearing hour and minute	hour-minute	R
061D-07FF				

Parâmetros de configuração do sistema

Address	Format	Data instruction	Unit	R/W
System setting				
0800-0801	---			
0802	Int	High byte: cyclic display	0x01:cyclic display !(0x01):no cyclic display	R/W
		Lower byte: first display interface after power on	0x00:U, 0x01:I 0x02:F, 0x03:P 0x04:Q, 0x05:S	R/W

			0x06:PF, 0x07:EN	
0803	---			
0804	Int	high byte：#1 communication meter address	1-247	R/W
		lower byte：#1 communication baud rate	0: 300 1: 600 2：1200bps 3：2400bps 4：4800bps 5：9600bps	
0805	Int	high byte:#1 communication check mode	0：N,8,1 1：E,8,1 2：O,8,1 3：N,8,2 4：E,8,2 5: O,8,2	R/W
0806-0811	---			
0812	Int	#1 time zone starting time	high byte：hour lower byte： minute	
0813	Int	#2 time zone starting time	same to #1 time zone starting time	
0814	Int	#3 time zone starting time	same to #1 time zone starting time	
0815	Int	#4 time zone starting time	same to #1 time zone starting time	
0816	Int	#5 time zone starting time	same to #1 time zone starting time	
0817	Int	#6 time zone starting time	same to #1 time zone starting time	

0818	Int	#7 time zone starting time	same to #1 time zone starting time	
0819	Int	#8 time zone starting time	same to #1 time zone starting time	
081A	Int	#9 time zone starting time	same to #1 time zone starting time	
081B	Int	#10 time zone starting time	same to #1 time zone starting time	
081C	Int	#11 time zone starting time	same to #1 time zone starting time	
081D	Int	#12 time zone starting time	same to #1 time zone starting time	
081E	Int	Rates of time zone 1 and time zone 2	high byte：time zone 1 lower byte：time zone 2 Rates： 0： tip, 1：peak 2：level 3：valley	
081F	Int	Rates of time zone 3 and time zone 4	Same to time zone 1 and time zone 2	
0820	Int	Rates of time zone 5 and time zone 6	Same to time zone 1 and time zone 2	
0821	Int	Rates of time zone 7 and time zone 8	Same to time zone 1 and time zone 2	
0822	Int	Rates of time zone 9 and time zone 10	Same to time zone 1 and time zone 2	
0823	Int	Rates of time zone 11 and time zone 12	Same to time zone 1 and time zone 2	
0824	Int	meter reading time	high byte：day lower byte：hour	

Apêndice 2
Lista de informações de endereço de comunicação MODBUS-RTU (medidor trifásico)
0x03/0x04 endereço de registro de dados de comando:

Address	Format	Data description	Unit	R/W
float type data				
0000-0001	float	Phase A voltage	V	R
0002-0003	float	Phase B voltage	V	R
0004-0005	float	Phase C voltage	V	R
0006-0007	float	AB line voltage	V	R
0008-0009	float	BC line voltage	V	R
000A-000B	float	CA line voltage	V	R
000C-000D	float	Phase A current	A	R
000E-000F	float	Phase B current	A	R
0010-0011	float	Phase C current	A	R
0012-0013	float	Phase A active power	kW	R
0014-0015	float	Phase B active power	kW	R
0016-0017	float	Phase C active power	kW	R
0018-0019	float	total active power	kW	R
001A-001B	float	Phase A reactive power	kvar	R
001C-001D	float	Phase B reactive power	kvar	R
001E-001F	float	Phase C reactive power	kvar	R
0020-0021	float	total reactive power	kvar	R
0022-0023	float	Phase A apparent power	kVA	R
0024-0025	float	Phase B apparent power	kVA	R
0026-0027	float	Phase C apparent power	kVA	R
0028-0029	float	total apparent power	kVA	R
002A-002B	float	Phase A power factor	1	R
002C-002D	float	Phase B power factor	1	R

002E-002F	float	Phase C power factor	1	R
0030-0031	float	total power factor	1	R
0032-0033	float	frequency	Hz	R
0034-0035	float	import active energy	kWh	R
0036-0037	float	export active energy	kWh	R
0038-0039	float	import reactive energy	kvarh	R
003A-003B	float	export reactive energy	kvarh	R
003C-00FF	---			
time data				
0100	Char	time	year-month	R
0101	Char	time	day-hour	R
0102	Char	time	minute-second	R
0103-0105	---			
Energy data				
0106-0107	Long	import active energy	10Wh	R
0108-0109	Long	export active enregy	10Wh	R
010A-010B	Long	import reactive energy	10varh	R
010C-010D	Long	export reactive energy	10varh	R
010E-010F	Long	apparent energy	10VAh	R
0110-0111	Long	first quadrant reactive energy	10varh	R
0112-0113	Long	second quadrant reactive energy	10varh	R
0114-0115	Long	third quadrant reactive energy	10varh	R
0116-0117	Long	fourth quadrant reactive energy	10varh	R
0118-0119	Long	active energy [total]	10Wh	R
011A-011B	Long	active energy [tip]	10Wh	R
011C-011D	Long	active energy [peak]	10Wh	R
011E-011F	Long	active energy [level]	10Wh	R
0120-0121	Long	active energy [valley]	10Wh	R

0122-012B	Long	active energy of this month [total/tip/peak/level/valley]	10Wh	R
012C-0135	Long	active energy of last month [total/tip/peak/level/valley]	10Wh	R
0136-013F	Long	active energy of the month before last [total/tip/peak/level/valley]	10Wh	R
0140-01FF	---			
Electric quantity data				
0200	Int	Phase A voltage	0.1V	R
0201	Int	Phase B voltage	0.1V	R
0202	Int	Phase C voltage	0.1V	R
0203	Int	AB line voltage	0.1V	R
0204	Int	BC line voltage	0.1V	R
0205	Int	CA line voltage	0.1V	R
0206	Int	Phase A current	0.01A	R
0207	Int	Phase B current	0.01A	R
0208	Int	Phase C current	0.01A	R
0209	Int	Phase A active power	10W	R
020A	Int	Phase B active power	10W	R
020B	Int	Phase C active power	10W	R
020C	Int	total active power	10W	R
020D	Int	Phase A reactive power	10var	R
020E	Int	Phase B reactive power	10var	R
020F	Int	Phase C reactive power	10var	R
0210	Int	total reactive power	10var	R
0211	Int	Phase A apparent power	10VA	R
0212	Int	Phase B apparent power	10VA	R
0213	Int	Phase C apparent power	10VA	R
0214	Int	total apparent power	10VA	R

0215	Int	Phase A power factor		R
0216	Int	Phase B power factor		R
0217	Int	Phase C power factor		R
0218	Int	total power factor		R
0219	Int	frequency	0.01Hz	R
021A	Int	Phase A (AB line) voltage THD	0.01	R
021B	Int	Phase B voltage THD	0.01	R
021C	Int	Phase C (CB line) voltage THD	0.01	R
021D	Int	Phase A current THD	0.01	R
021E	Int	Phase B current THD	0.01	R
021F	Int	Phase C current THD	0.01	R
0220	Int	Phase A (AB line) voltage harmonic content	0.1V	R
0221	Int	Phase B voltage harmonic content	0.1V	R
0222	Int	Phase C (CB line) voltage harmonic content	0.1V	R
0223	Int	Phase A current harmonic content	0.01A	R
0224	Int	Phase B current harmonic content	0.01A	R
0225	Int	Phase C current harmonic content	0.01A	R
0226-05FF	---			
Demand				
0600	Int	Max. phase voltage value	0.1V	R
0601	Int	Max. line voltage value	0.1V	R
0602	Int	Max. current value	0.01A	R
0603	Int	Max. active power value	10W	R
0604	Int	Max. reactive power value	10var	R
0605	Int	Max. apparent power value	10VA	R
0606	Int	Max. active power demand value	10W	R
0607	Int	Max. reactive power demand value	10var	R
0608	Int	Max. apparent power demand value	10VA	R

0609	Int	Max. phase voltage value of this month	0.1V	R
060A	Int	Max. line voltage value of this month	0.1V	R
060B	Int	Max. current value of this month	0.01A	R
060C	Int	Max. active power value of this month	10W	R
060D	Int	Max. reactive power value of this month	10var	R
060E	Int	Max. apparent power value of this month	10VA	R
060F	Int	Max. active power demand value of this month	10W	R
0610	Int	Max. reactive power demand value of this month	10var	R
0611	Int	Max. apparent power demand value of this month	10VA	R
0612	Int	active power demand value at present	10W	R
0613	Int	reactive power demand value at present	10var	R
0614	Int	apparent power demand value at present	10VA	R
0615	Int	phase voltage average value	0.1V	R
0616	Int	line voltage average value	0.1V	R
0617	Int	current average value	0.01A	R
0618	Int	active power average value	10W	R
0619	Int	reactive power average value	10var	R
061A	Int	apparent power average value	10VA	R
0061B	--			
Events record				

061C	char	power on record times and year	times-year	R
061D	char	power on record month and day	month-day	R
061E	char	power on record hour and minute	hour-minute	R
061F	char	programming record times and year	times-year	R
0620	char	programming record month and day	month-day	R
0621	char	programming record hour and minute	hour-minute	R
0622	char	energy clearing times and year	times-year	R
0623	char	energy clearing month and day	month-day	R
0624	char	energy clearing hour and minute	hour-minute	R
0625-07FF				

Parâmetros de configuração do sistema

Address	Format	Data instruction	Unit	R/W
System setting				
0800	---			
0801	Int	High byte: energy pulse constant	0x00: 400imp/kWh 0x01: 800imp/kWh 0x02:1600imp/kWh	R/W
		Lower byte: reserved		
0802	Int	High byte: cyclic display	0x01:cyclic display !(0x01):no cyclic display	R/W
		Lower byte: first display interface after power on	0x00:U, 0x01:I 0x02:F, 0x03:P 0x04:Q, 0x05:S 0x06:PF, 0x07:EN	R/W
0803	---			
0804	Int	high byte：#1 communication	1-247	R/W

		meter address		
		lower byte : #1 communication baud rate	0: 300 1: 600 2：1200bps 3：2400bps 4：4800bps 5：9600bps	
0805	Int	high byte:#1 communication check mode	0：N,8,1 1：E,8,1 2：O,8,1 3：N,8,2	R/W
0806-0811	---			
0812	Int	#1 time zone starting time	high byte：hour lower byte：minute	
0813	Int	#2 time zone starting time	same to #1 time zone starting time	
0814	Int	#3 time zone starting time	same to #1 time zone starting time	
0815	Int	#4 time zone starting time	same to #1 time zone starting time	
0816	Int	#5 time zone starting time	same to #1 time zone starting time	
0817	Int	#6 time zone starting time	same to #1 time zone starting time	
0818	Int	#7 time zone starting time	same to #1 time zone starting time	
0819	Int	#8 time zone starting time	same to #1 time zone starting time	
081A	Int	#9 time zone starting time	same to #1 time zone starting time	
081B	Int	#10 time zone starting time	same to #1 time zone starting time	
081C	Int	#11 time zone starting time	same to #1 time zone	

			starting time	
081D	Int	#12 time zone starting time	same to #1 time zone starting time	
081E	Int	Rates of time zone 1 and time zone 2	high byte: time zone 1 lower byte: time zone 2 Rates: 0: tip, 1: peak 2: level 3: valley	
081F	Int	Rates of time zone 3 and time zone 4	Same to time zone 1 and time zone 2	
0820	Int	Rates of time zone 5 and time zone 6	Same to time zone 1 and time zone 2	
0821	Int	Rates of time zone 7 and time zone 8	Same to time zone 1 and time zone 2	
0822	Int	Rates of time zone 9 and time zone 10	Same to time zone 1 and time zone 2	
0823	Int	Rates of time zone 11 and time zone 12	Same to time zone 1 and time zone 2	
0824	Int	meter reading time	high byte: day lower byte: hour	

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