Din rail mounted energy meter modbus communication

This manual is applicable to the product model

-L3F1946-P

Content

1. Modbus-RTU communication

1.1 Message format

Read data register value (function code 0x03/0x04)

	frame structure	address code	FC	numeric data code		check code
				Start register address	Number of registers	
master request	occupied byte	1byte	1byte	2byte	2byte	2byte
	data area	1~247	0x03/0x04		Max 100	CRC16
	examples of messages	0x01	0x03	0x00 0x00	0x00 0x06	0xC5 0xC8
Slave response	frame structure	address code	FC	numeric data code		check code
				Register bytes	register value	
	occupied byte	1byte	1byte	2byte	12byte	2byte
	examples of messages	0x01	0x03	0x0C	12	CRC16

Note: The start register address of the host request is the data header address of the query. The number of the registers is the length of the query data. For example, the address of the upper start register is the "0x0000", and the number of the registers is 6 (0x0006).

Write setting register (function code 0x10)

	frame structure	address code	FC	numeric data code		check code
				Start register address	Number of registers	
master request	occupied byte	1byte	1byte	2byte	2byte	2byte
	data area	1~247	0x10	0x0802	Max 100	CRC16
	examples of messages	0x01	0x10	0x08 0x02	0x00 0x06	0x2FE2
Slave response	frame structure	address code	FC	numeric data code		check code
				Register bytes	register value	
	occupied byte	1byte	1byte	2byte	12byte	2byte
	examples of messages	0x01	0x10	0x08 0x02	0x00 0x01	0xA269

Note: Please set the information address table in strict accordance with the following instrument when writing the setting register. Do not attempt to modify the unused area. The write data does not allow the setting range to be exceeded. The wrong write-setting register has the potential to cause the instrument to work abnormally. Be careful.

1.2 MODBUS-RTU Address Information

Data register:

Address	Format	Data description	Unit	R/W
0000-0001	float	A phase voltage	V	R
0002-0003	float	B phase voltage	V	R
0004-0005	float	C phase 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	A phase current	A	R
000E-000F	float	B phase current	A	R
0010-0011	float	C phase current	A	R
0012-0013	float	A Phase active power	kW	R
0014-0015	float	B Phase active power	kW	R
0016-0017	float	C Phase active power	kW	R
0018-0019	float	Total active power	kW	R
001A-001B	float	A Active power	kvar	R
001C-001D	float	B Active power	kvar	R
001E-001F	float	C Active power	kvar	R
0020-0021	float	Total reactive power	kvar	R
0022-0023	float	A Phase view power	kVA	R
0024-0025	float	B Phase view power	kVA	R
0026-0027	float	C Phase view power	kVA	R
0028-0029	float	Total apparent power	kVA	R
002A-002B	float	A Phase power factor	-	R
002C-002D	float	B Phase power factor	-	R
002E-002F	float	C Phase power factor	-	R
0030-0031	float	Total power factor	-	R
0032-0033	float	frequency	Hz	R
0034-0035	float	Positive Active Power	kWh	R
0036-0037	float	Reverse Active Power	kWh	R
0038-0039	float	Positive reactive power	kvarh	R
003A-003B	float	Reverse reactive power	kvarh	R
003C-00FF	--	--	--	--
0100	Int	Time (high byte: year, low byte: month)	-	R
0101	Int	Time (high byte: day, low byte: time)	-	R
0102	Int	Time (high byte: minute, low byte: second)	-	R
0103-0105	--	--	--	--

0106-0107	Long	Positive Active Power	10Wh	R
0108-0109	Long	Reverse Active Power	10Wh	R
010A-010B	Long	Positive reactive power	10varh	R
010C-010D	Long	Reverse reactive power	10varh	R
010E-010F	Long	Sight electrical energy	10VAh	R
0110-0111	Long	First quadrant reactive power	10varh	R
0112-0113	Long	Second quadrant reactive power	10varh	R
0114-0115	Long	Third quadrant reactive power	10varh	R
0116-0117	Long	Fourth quadrant reactive power	10varh	R
0118-0119	Long	Active Power [Total]	10Wh	R
011A-011B	Long	Active power [tip]	10Wh	R
011C-011D	Long	Active power [peak]	10Wh	R
011E-011F	Long	Active Power [Flat]	10Wh	R
0120-0121	Long	Active Power [Valley]	10Wh	R
0122-0123	Long	Active Power this month [Total]	10Wh	R
0124-0125	Long	Active Power this month[tip]	10Wh	R
0126-0127	Long	Active Power this month[Peak]	10Wh	R
0128-0129	Long	Active Power this month[Flat]	10Wh	R
012A-012B	Long	Active Power this month[Valley]	10Wh	R
012C-012D	Long	Active Power Last month[total]	10Wh	R
012E-012F	Long	Active Power last month[tip]	10Wh	R
0130-0131	Long	Active Power last month[Peak]	10Wh	R
0132-0133	Long	Active Power last month[Flat]	10Wh	R
0134-0135	Long	Active Power last month[Valley]	10Wh	R
0136-0137	Long	Active power the month before last month	10Wh	R
0138-0139	Long	Active power the month before last month[T]	10Wh	R
013A-013B	Long	Active power the month before last month[P]	10Wh	R
013C-013D	Long	Active power the month before last month[F]	10Wh	R
013E-013F	Long	Active power the month before last month[V]	10Wh	R
0140-01FF	--	--	--	--
0200	Int	A phase voltage	0.1V	R
0201	Int	B phase voltage	0.1V	R
0202	Int	C phase 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	A phase current	0.01A	R
0207	Int	B phase current	0.01A	R
0208	Int	C phase current	0.01A	R

0209	Int	A Phase active power	10W	R
020A	Int	B Phase active power	10W	R
020B	Int	C Phase active power	10W	R
020C	Int	Total active power	10W	R
020D	Int	A Active power	10var	R
020E	Int	B Active power	10var	R
020F	Int	C Active power	10var	R
0210	Int	Total reactive power	10var	R
0211	Int	A Phase view power	10VA	R
0212	Int	B Phase view power	10VA	R
0213	Int	C Phase view power	10VA	R
0214	Int	Total apparent power	10VA	R
0215	Int	A Phase power factor		R
0216	Int	B Phase power factor		R
0217	Int	C Phase power factor		R
0218	Int	Total power factor		R
0219	Int	frequency	0.01Hz	R
021A-05FF	--	--	--	--
0600	Int	Maximum phase voltage	0.1V	R
0601	Int	Maximum line voltage	0.1V	R
0602	Int	Maximum current	0.01A	R
0603	Int	Maximum active power	10W	R
0604	Int	Maximum reactive power	10var	R
0605	Int	Maximum apparent power	10VA	R
0606	Int	Maximum active power requirement	10W	R
0607	Int	Maximum reactive power requirement	10var	R
0608	Int	Maximum apparent power requirement	10VA	R
0609	Int	Maximum phase voltage this month	0.1V	R
060A	Int	Maximum line voltage this month	0.1V	R
060B	Int	Maximum current this month	0.01A	R
060C	Int	Maximum active power this month	10W	R
060D	Int	Maximum reactive power this month	10var	R
060E	Int	Maximum power available this month	10VA	R
060F	Int	Maximum active power requirement this month	10W	R
0610	Int	Maximum reactive power requirement this month	10var	R
0611	Int	Maximum power requirement this month	10VA	R
0612	Int	Current active power requirements	10W	R
0613	Int	Current reactive power requirements	10var	R
0614	Int	Current apparent power requirement	10VA	R
0615	Int	Average phase voltage	0.1V	R
0616	Int	Average line voltage	0.1V	R

0617	Int	Current average	0.01A	R
0618	Int	Average active power	10W	R
0619	Int	Average reactive power	10var	R
061A	Int	Average apparent power	10VA	R
0061B	--	--	--	--
061C	char	Time recorded on power (high byte: times, low byte: years)		R
061D	char	Time recorded on power (high byte: month, low byte: day)		R
061E	char	Time recorded on power (high byte: time, low byte: fraction)		R
061F	char	Timing of programming records (high byte: number of times, low byte: year)		R
0620	char	Time recorded by programming (high byte: month, low byte: day)		R
0621	char	Timing of programming records (high byte: time, low byte: fraction)		R
0622	char	Time of power clearing (high byte: times, low byte: years)		R
0623	char	Time of power clearing (high byte: month, low byte: day)		R
0624	char	Time for zeroing (high byte: time, low byte: minute)		R

Set register:

Address	form	Data description	Unit	R/W
0801	Int	High byte: Power pulse constant	0x00: 400imp/kWh 0x01: 800imp/kWh 0x02:1600imp/kWh	R/W
0802	Int	High byte: loop display	0x01: Cycle display !(0x01):Invalid cycle	R/W
		Low byte: Power up display interface	0x00:U, 0x01:I 0x02:F, 0x03:P 0x04:Q, 0x05:S 0x06:PF, 0x07:E	R/W

0803	--	--	--	--
0804	Int	High byte: Instrument address	1-247	R/W
		Low byte: baud rate	0: 300bps 1: 600bps 2: 1200bps 3: 2400bps 4: 4800bps 5: 9600bps	
0805	Int	High byte: communication data format	0: N,8,1 1: E,8,1 2: O,8,1 3: N,8,2	R/W
0806-0810	--	--	--	--
0811	Int	Current change ratio		R/W
0812-081F	--	--	--	--
0820	Int	Required items	Default active reactive power apparent power	R
0821	Int	Work mode required	0: Sliding block 1: stationary block	R/W
0822	Int	Demand slip time（t）	1～9999s	R/W
0823	Int	Demand cycle（T）	1～30t	R/W
0824-0843	--	--	--	--
0844	Int	First set of day rates #1 period start time	Fixed 00h: 00min	R/W
8045	Int	First set of day rates #2 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
8046	Int	First set of day rates #3 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
8047	Int	First set of day rates #4 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
8048	Int	First set of day rates #5 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
8049	Int	First set of day rates #6 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
804A	Int	First set of day rates #7 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
804B	Int	First set of day rates #8 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
804C	Int	First set of day rates #9 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
804D	Int	First set of day rates #10 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W

804E	Int	First set of day rates #11 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
084F	Int	First set of day rates #12 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
0850	Int	Second set of day rates #1 period start time	固定为00h：00min	R/W
0851	Int	Second set of day rates #2 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
0852	Int	Second set of daily rate tables #3 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
0853	Int	Second set of day rates #4 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
0854	Int	Second set of day rates #5 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
0855	Int	Second set of day rates #6 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
0856	Int	Second set of day rates #7 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
0857	Int	Second set of day rates #8 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
0858	Int	Second set of day rates #9 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
0859	Int	Second set of day rates #10 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
085A	Int	Second set of day rates #11 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
085B	Int	Second set of day rates #12 period start time	High byte :00-23:00h Low byte :00-59 minutes	R/W
085C	Int	Schedule #1 and #2 rates for the first set of day rates	High Byte :#1 Time Rate Low byte :#2 time period rate 0-tip ,1-peak, 2-Flat ,3-valley	R/W
085D	Int	Schedule #3 #4 of the first set of day rates	High Byte :#1 Time Rate Low byte :#2 time period rate 0-tip ,1-peak, 2-Flat ,3-valley	R/W
085E	Int	Schedule #5,#6 of the first set of day rates	High Byte :#1 Time Rate Low byte :#2 time period rate 0-tip ,1-peak, 2-Flat ,3-valley	R/W
085F	Int	Schedule #7 and #8 rates	High Byte :#1 Time Rate	R/W

		for the first set of day rates	Low byte :#2 time period rate 0-tip ,1-peak, 2-Flat ,3-valley	
0860	Int	First set of days rate table #9,#10	High Byte :#1 Time Rate Low byte :#2 time period rate 0-tip ,1-peak, 2-Flat ,3-valley	R/W
0861	Int	First set of day rates #11#12	High Byte :#1 Time Rate Low byte :#2 time period rate 0-tip ,1-peak, 2-Flat ,3-valley	R/W
0862	Int	Schedule #1 and #2 rates for the second set of daily rates	High Byte :#1 Time Rate Low byte :#2 time period rate 0-tip ,1-peak, 2-Flat ,3-valley	R/W
0863	Int	Schedule #3#4 of the second set of daily rates	High Byte :#1 Time Rate Low byte :#2 time period rate 0-tip ,1-peak, 2-Flat ,3-valley	R/W
0864	Int	Schedule #5#6 of the second set of daily rates	High Byte :#1 Time Rate Low byte :#2 time period rate 0-tip ,1-peak, 2-Flat ,3-valley	R/W
0865	Int	Schedule #7 and #8 rates for the second set of day rates	High Byte :#1 Time Rate Low byte :#2 time period rate 0-tip ,1-peak, 2-Flat ,3-valley	R/W
0866	Int	Second set of daily rate statement #9,#10 period rates	High Byte :#1 Time Rate Low byte :#2 time period rate 0-tip ,1-peak, 2-Flat ,3-valley	R/W
0867	Int	Second set of daily rate table #11,#12 period rates	High Byte :#1 Time Rate Low byte :#2 time period rate 0-tip ,1-peak, 2-Flat ,3-valley	R/W

0868	Int	Monthly rates (January/February)	High byte: January-day rate table Low byte: February-day rate table 0: First set of daily rates 1: second set of daily rates	R/W
0869	Int	Monthly rates (March/April)	High byte: March day rate table Low byte: April-day rate table 0: First set of daily rates 1: second set of daily rates	R/W
086A	Int	Monthly rates (May/June)	High byte: May Day rate table Low byte: June-day rate table 0: First set of daily rates 1: second set of daily rates	R/W
086B	Int	Monthly rate schedule (July/August)	High byte: July Day rate table Low byte: daily August rate table 0: First set of daily rates 1: second set of daily rates	R/W
086C	Int	Monthly rates (9 October)	High byte: September-day rate table Low byte: October-day rate table 0: First set of daily rates 1: second set of daily rates	R/W
086D	Int	Monthly rates (11 December)	High byte: November Day rate table Low byte: December day	R/W

|			rate table	
			0: First set of daily rates	
			1: second set of daily rates	
086E	Int	Meter reading day	High byte :00-23:00h Low byte :00-59 minutes	R/W

2. DL/T 645 Communicating protocol

2.1 Transfer characteristic

The main-slave half-duplex communication mode and the establishment and cancellation of communication links are controlled by the information frames sent by the main station. Each frame has a frame starter, which is composed of seven parts: station address domain, control code, data length, frame information longitudinal check code and frame Terminator. Each part consists of a number of bytes.

Half dual port communication mode, baud rate: 1200bps;

Byte format: each byte contains 8-bit binary code, with a starting bit (0), an even check bit and a stop bit (1). The transmission sequence as shown in figure 1.D0 is the lowest valid bit of bytes and D 7 is the highest valid bit of bytes. Pass low first, then pass high.

←	0	D0	D1	D2	D3	D4	D5	D6	D7	P	1

Transmission direction

12
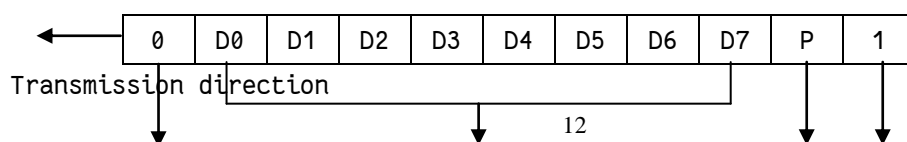
start bit   8 bit data   Parity check bit stop bit

Figure 1 byte transmission sequence

explain	code
frame start	68H
address field	A_0 A_1 A_2 A_3 A_4 A_5
frame start	68
control code	C
Data length domain	L
data field	DATA
check code	CS
tailed	16H

The frame format is shown below.

Address field A0-A5:2-bit BCD code per byte. The low address is before and the high address is after. When the address is 99 99 99 99 99 H, it is the broadcast address.

The communication address uses the table number, and at least 2 bits or more of the low table number bit can be entered to communicate. Less input can be easily operated.

Control code C: the format of the control code.

D7＝0: The command frame sent by the master station.
D7＝1: A response frame sent from the station.
D6＝0: Answer correctly from the station.
D6＝1: slave response to abnormal information.
D5＝0: No post-read data frame.
D4～D0: Request and answer function code.
00001: read data
00100: Write data
01000: broadcast school
01111: Modify the password
Data length L: the number of bytes in the data field, hexadecimal number.
The data field data: the data field includes data identification and data whose structure changes with the function of the control code. At the time of transmission, the sender adds the 33H process according to the byte, and the receiver performs the 33H process according to the byte.
The sum of the modulo 256 of all the bytes prior to the start of the frame start to the check code, i. e., the binary arithmetic sum of the bytes, and the overflow value of not more than 256.
The end of the frame information is indicated by the end of the frame information 16h.
Preamble byte:Before sending frame information, send 1-4 FEHs to wake up the receiver.
Transmission order: All data items should be first transferred to lower byte and then high byte.
Transmission response:each communication is started by the master station sending a request command frame to the slave station selected according to the address field of the information frame, and the requested slave station responds according to the requirements of the control code in the command frame.
The response delay Td:20ms ≤ Td ≤ 500ms after receiving the command frame,
Pause time between bytes Tb: Tb ≤ 500ms
Error control: the byte check is even, the frame check is longitudinal information checksum, the receiver abandons the information frame regardless of the parity error or longitudinal information checksum error, and does not respond.

2.2 Application description

Read data:

Master station request frame

function request read data

Control code C =01H.

Data length L = 02H

Frame format:

Function from station to normal response

        Control code C = 81H

        Data length L ≤ 02H m (data length)

        data frame format

Slave station anomaly response frame

The function receives an illegal data request or no such data from the station

Control code C = C1H

Frame format:

 Write data:

 Write data request frame

 The functional master station requests setting data (or programming) from the slave station

 Control code C = 04H

 Data length L ≤ 02H m (data length) password 4 bytes

 Frame format:

68H	A0	..	A5	68H	04H	L	DI_0	DI_1	PAn	$P0_N$	$P1_N$	$P2_N$	N1	∘∘	Nm	CS	16H

From the station normal response frame.

the function informs the master station of the result of the execution of the request command

Control code C = 84H

Data length L = 00H

68H	A0	∘∘∘	A5	68H	84H	00H	CS	16H

Frame format:

slave station anomaly response frame

 Control code C=C4H

 Data length L = 01H

Frame format:

68H	A0	...	A5	68H	C4H	01H	ERR	CS	16H

broadcast school

Functions Synchronize slave and master station time.

Control code C = 08H

Data length L = 06H

Data field YYMMDDhhhmss

Frame format:

68H	99H	…	99H	68H	08H	06H	ss	mm	hh	DD	MM	YY	CS	16H

Note:

1. No response is required when broadcasting school.

2. Broadcasting schools are not allowed to be implemented within the range of 23 / 50 / 10.

3.School hours can only be allowed once a day, with a range of 30 seconds per minute. The maximum allowable error in broadcasting school is ±20 minutes.

To modify the password:

Write password request frame

The function changes the current password from the station

Control code C = 0 FH

Data length L = 08H

Data domain PA 0 P 00 P 10 P 20 PAN P 0 NP 1 NP 2 N.

Frame format:

68H	A0	…	A5	68H	0FH	08H	PA_0	$P0_0$	$P1_0$	$P2_0$	PA_N	$P0_N$	$P1_N$	$P2_N$	CS	16H

P00P10P20 is the password of the new password or higher permission. PA0 represents the password permission: P0NP1NP2N is the new password or the password to be set, PAN is the permission of the new password. PA0, the value range of PAN is 0 to 9, 0 is the higher the permission, the lower the numerical permission.

Radio frozen electricity

Function: freeze the power immediately after receiving the command from the station.

Control code: C = 05H

Data length: l ≤ 02H

Frame format:

68H	99H	…	99H	68H	05H	02H	CS	16H

2.3 DL/T 645-1997 Communication Protocol.

2.3.1 Electrical energy data

Identification code	Data format	length	unit	Read	write	Data item name
9010	XXXXXX.XX	4	kWh	*		Positive active electric energy [total]
9011	XXXXXX.XX	4	kWh	*		Forward active power [tip]
9012	XXXXXX.XX	4	kWh	*		Positive active energy[peak]
9013	XXXXXX.XX	4	kWh	*		Positive active power [flat]
9014	XXXXXX.XX	4	kWh	*		Positive active energy[valley]
901F		20	kWh	*		Forward active power packet
9020	XXXXXX.XX	4	kWh	*		Reverse active power
9110	XXXXXX.XX	4	kvarh	*		Forward reactive power
9120	XXXXXX.XX	4	kvarh	*		reverse reactive energy
9130	XXXXXX.XX	4	kvarh	*		first-quadrant reactive power
9140	XXXXXX.XX	4	kvarh	*		fourth-quadrant reactive power
9150	XXXXXX.XX	4	kvarh	*		Second quadrant reactive power
9160	XXXXXX.XX	4	kvarh	*		third quadrant reactive power
9410	XXXXXX.XX	4	kWh	*		Active electricity [total] last month
9411	XXXXXX.XX	4	kWh	*		Active electricity [tip] last month
9412	XXXXXX.XX	4	kWh	*		last month active energy[peak]
9413	XXXXXX.XX	4	kWh	*		Active electricity [flat] last month
9414	XXXXXX.XX	4	kWh	*		last month active electric energy[valley]
941F		20	kWh	*		last month active power data packet
9810	XXXXXX.XX	4	kWh	*		Active electricity [total] last month
9811	XXXXXX.XX	4	kWh	*		The last month was active [sharp].
9812	XXXXXX.XX	4	kWh	*		last month active energy[peak]
9813	XXXXXX.XX	4	kWh	*		Last month active energy[Ping]
9814	XXXXXX.XX	4	kWh	*		Active electricity [valley] last month
981F		20	kWh	*		Active power packet last month
9FFF		88	kWh	*		All of the above power packets

2.3.2 variable data

Identification code	data format	length	unit	read	write	Data item name
B611	XXXX	2	V	*		A phase voltage
B612	XXXX	2	V	*		B phase voltage
B613	XXXX	2	V	*		C phase voltage
B61F		6	V	*		Phase Voltage Data Pack
B691	XXXX	2	V	*		AB line voltage
B692	XXXX	2	V	*		BC line voltage
B693	XXXX	2	V	*		CA line voltage
B69F		6	V	*		Line voltage data packet
B621	XX.XX	2	A	*		A phase current
B622	XX.XX	2	A	*		B phase current
B623	XX.XX	2	A	*		C phase current
B62F		6	A	*		Current Data Pack
B630	XX.XXXX	3	kW	*		Total active power
B631	XX.XXXX	3	kW	*		A Phase active power
B632	XX.XXXX	3	kW	*		B Phase active power
B633	XX.XXXX	3	kW	*		C Phase active power
B63F		12	kW	*		Active power data packet
B640	XX.XX	2	kvar	*		Total reactive power
B641	XX.XX	2	kvar	*		A Active power
B642	XX.XX	2	kvar	*		B Active power
B643	XX.XX	2	kvar	*		C Active power
B64F		8	kvar	*		Reactive Power Data Pack
B650	X.XXX	2	0.001	*		Total power factor
B651	X.XXX	2	0.001	*		A Phase power factor
B652	X.XXX	2	0.001	*		B Phase power factor
B653	X.XXX	2	0.001	*		C Phase power factor
B65F		8	0.001	*		Power factor data packet
B660	XX.XX	2	kVA	*		Total apparent power
B661	XX.XX	2	kVA	*		A apparent power
B662	XX.XX	2	kVA	*		B apparent power
B663	XX.XX	2	kVA	*		C apparent power
B66F		8	kVA	*		Visual power packets
B680	XX.XX	2	Hz	*		frequency
B6FF	–	56	–	*		Instantaneous Electricity Data Pack

2.3.3 parametric data

Identification code	data format	length	unit	read	write	Data item name	
C010	YYMMDDWW	4	Year, month, day, week	*	*	Date and week	This identity code is invalid when there is no duplicate rate function
C011	hhmmss	3	Time and second	*	*	time	
C117	DDhh	2	daytime	*	*	Automatic meter reading date	
C023	XX	1		*		Power meter operation status word 2 (see note)	
C030	NNNNNN	3	imp/kWh	*	*	active pulse constant	
C031	NNNNNN	3	imp/kvarh	*	*	reactive pulse constant	
C032	NNNNNNNNNNN	6		*	*	Table No. (Table No. data is less than 247)	
C331	hhmmNN	3	time-division rate	*	*	Period 1 (start time default is 00:00)	The data encoding is not valid when there is no complex rate function.
C332	hhmmNN	3	time-division rate	*	*	Period 2	
C333	hhmmNN	3	time-division rate	*	*	Period 3	
C334	hhmmNN	3	time-division rate	*	*	Period 4	
C335	hhmmNN	3	time-division rate	*	*	Period 5	
C336	hhmmNN	3	time-division rate	*	*	Time 6	
C337	hhmmNN	3	time-division rate	*	*	Period 7	
C338	hhmmNN	3	time-division rate	*	*	Period 8	
C339	hhmmNN	3	time-division rate	*	*	Period 9	
C33A	hhmmNN	3	time-division rate	*	*	Period 10	
C33B	hhmmNN	3	time-division rate	*	*	11th Session	
C33C	hhmmNN	3	time-division rate	*	*	Period 12	

Note:

The address of the device and the communication rate shall be changed, and the communication protocol of the multi-function electric energy meter shall be in accordance with the DL/ T645-1997 <multifunction electric energy meter communication protocol.

When you change the communication parameters,1 Byte (right) + 3 Byte (password) is required to place the identification code. The default permissions and passwords are:00000000.

3 meter running status word 2 [C023] (1: reverse, 0: forward)

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
total reactive direction	--	--	--	Total active power direction	--	--	--

2.4 DL/T 645-2007 communicating protocol

2.4.1 electric energy data

Identification code	data format	length	unit	read	write	Data item name
00010000	XXXXXX.XX	4	kWh	*		Positive active electric energy [total]
00010100	XXXXXX.XX	4	kWh	*		Forward active power [tip]
00010200	XXXXXX.XX	4	kWh	*		Positive active energy[peak]
00010300	XXXXXX.XX	4	kWh	*		Positive active power [flat]
00010400	XXXXXX.XX	4	kWh	*		Positive active energy[valley]
0001FF00		20	kWh	*		Forward active power packet
00020000	XXXXXX.XX	4	kWh	*		Reverse active power
00030000	XXXXXX.XX	4	kvarh	*		Forward reactive power
00040000	XXXXXX.XX	4	kvarh	*		reverse reactive energy
00050000	XXXXXX.XX	4	kvarh	*		first-quadrant reactive power
00060000	XXXXXX.XX	4	kvarh	*		Second quadrant reactive power
00070000	XXXXXX.XX	4	kvarh	*		third quadrant reactive power
00080000	XXXXXX.XX	4	kvarh	*		fourth-quadrant reactive power
00010001	XXXXXX.XX	4	kWh	*		Active electricity [total] last month
00010101	XXXXXX.XX	4	kWh	*		Active electricity [tip] last month
00010201	XXXXXX.XX	4	kWh	*		last month active energy[peak]
00010301	XXXXXX.XX	4	kWh	*		Active electricity [flat] last month
00010401	XXXXXX.XX	4	kWh	*		last month active electric energy[valley]

20

0001FF0 1		20	kWh	*		last month active power data packet
0001000 2	XXXXXX.XX	4	kWh	*		Active electricity [total] last month
0001010 2	XXXXXX.XX	4	kWh	*		The last month was active [sharp].
0001020 2	XXXXXX.XX	4	kWh	*		last month active energy[peak]
0001030 2	XXXXXX.XX	4	kWh	*		Last month active energy[Ping]
0001040 2	XXXXXX.XX	4	kWh	*		Active electricity [valley] last month
0001FF0 2		20	kWh	*		Active power packet last month

2.4.2 Variables data

Identification code	data format	length	unit	read	write	Data item name
0201010 0	XXX.X	2	V	*		A phase voltage
0201020 0	XXX.X	2	V	*		B phase voltage
0201030 0	XXX.X	2	V	*		C phase voltage
0201ff0 0		6	V	*		Phase Voltage Data Pack
020c010 0	XXXX	2	V	*		AB line voltage
020c020 0	XXXX	2	V	*		BC line voltage
020c030 0	XXXX	2	V	*		CA line voltage
020cff0 0		6	V	*		Line voltage data packet
0202010 0	XXX.XXX	3	A	*		A phase current
0202020 0	XXX.XXX	3	A	*		B phase current
0202030 0	XXX.XXX	3	A	*		C phase current
0202ff0 0		9	A	*		Current Data Pack
0203000 0	XX.XXXX	3	kW	*		Total active power
0203010 0	XX.XXXX	3	kW	*		A Phase active power
0203020 0	XX.XXXX	3	kW	*		B Phase active power
0203030 0	XX.XXXX	3	kW	*		C Phase active power
0203ff0 0		12	kW	*		Active power data packet
0204000	XX.XXXX	3	kvar	*		Total reactive power

0						
02040100	XX.XXXX	3	kvar	*		A Active power
02040200	XX.XXXX	3	kvar	*		B Active power
02040300	XX.XXXX	3	kvar	*		C Active power
0204ff00		12	kvar	*		Reactive Power Data Pack
02060000	X.XXX	2	0.001	*		Total power factor
02060100	X.XXX	2	0.001	*		A Phase power factor
02060200	X.XXX	2	0.001	*		B Phase power factor
02060300	X.XXX	2	0.001	*		C Phase power factor
0206ff00		8	0.001	*		Power factor data packet
02050000	XX.XXXX	3	kVA	*		Total apparent power
02050100	XX.XXXX	3	kVA	*		A Phase view power
02050200	XX.XXXX	3	kVA	*		B Phase view power
02050300	XX.XXXX	3	kVA	*		C Phase view power
0205ff00		12	kVA	*		Visual power packets
02800002	XX.XX	2	Hz	*		frequency

2.4.3 Total harmonic distortion data

Identification code	data format	length	unit	read	write	Data item name
02080100	XX.XX	2	0.01%	*		A phase voltage THD
02080200	XX.XX	2	0.01%	*		B phase voltage THD
02080300	XX.XX	2	0.01%	*		C phase voltage THD
0208ff00		6	0.01%	*		3 phase voltage THD data packet
02090100	XX.XX	2	0.01%	*		A phase current THD
02090200	XX.XX	2	0.01%	*		B phase current THD
02090300	XX.XX	2	0.01%	*		C phase current THD
0209ff00		6	0.01%	*		3 phase current THD data packet

2.4.4 Demand data

Identif	data	leng	unit	re	wri	Data item name

ication code	format	th		ad	te	
	XXX.X	2	0.1V	*		Maximum phase voltage this month
	XXX.X	2	0.1V	*		Maximum line voltage this month
	XXX.XXX	3	1mA	*		Maximum current this month
	XX.XXXX	3	1kW	*		Maximum active power this month
	XX.XXXX	3	1kvar	*		Maximum reactive power this month
	XX.XXXX	3	1kVA	*		Maximum power available this month
	XX.XXXX	3	1kW	*		Maximum active demand this month
	XX.XXXX	3	1kvar	*		Maximum reactive power requirement this month
	XX.XXXX	3	1kVA	*		Maximum demand this month
0101ff00		25				Maximum and maximum demand packets for the month
	XXX.X	2	0.1V	*		Maximum phase voltage
	XXX.X	2	0.1V	*		Maximum line voltage
	XXX.XXX	3	1mA	*		Maximum current
	XX.XXXX	3	1kW	*		Maximum active power
	XX.XXXX	3	1kvar	*		Maximum reactive power
	XX.XXXX	3	1kVA	*		Maximum apparent power
	XX.XXXX	3	1kW	*		Maximum active demand
	XX.XXXX	3	1kvar	*		Maximum reactive power requirement
	XX.XXXX	3	1kVA	*		Maximum view demand
0101ff01		25				Maximum and maximum requirement packets

2.4.5 parametric data

characteristic encoded	data format	length	unit	read	write	Data item name	
04000101	YYMMDDWW	4	Year, month, day, week	*	*	Date and week	This identity code is invalid when there is no duplicate rate function
04000102	hhmmss	3	Time and second	*	*	time	
04000B01	DDhh	2	daytime	*	*	Automatic meter reading date	
04000502	XXXX	2		*		Power meter operation status word 2 (see note)	
04000409	XXXXX	3	imp/kWh	*		active pulse constant	
0400040a	XXXXX	3	imp/kvarh	*		reactive pulse constant	
04000401	NNNNNNNNNNNN	6		*	*	Communication address (data less than 247)	
04010001 (up to 36 bytes in length)	hhmmNN	3	time-division rate	*	*	Period 1 (start time default is 00:00)	The data encoding is not valid when there is no complex rate function.
	hhmmNN	3	time-division rate	*	*	Period 2	
	hhmmNN	3	time-division rate	*	*	Period 3	
	hhmmNN	3	time-division	*	*	Period 4	

		rate			
hhmmNN	3	time-division rate	★	★	Period 5
hhmmNN	3	time-division rate	★	★	Period 6
hhmmNN	3	time-division rate	★	★	Period 7
hhmmNN	3	time-division rate	★	★	Period 8
hhmmNN	3	time-division rate	★	★	Period 9
hhmmNN	3	time-division rate	★	★	Period 10
hhmmNN	3	time-division rate	★	★	Period 11
hhmmNN	3	time-division rate	★	★	Period 12

Note:

The communication address shall be written and the communication protocol of the multi-function electric energy meter shall be in accordance with the DL/ T645-2007 <multifunction electric energy meter communication protocol.

When you change the communication parameters, a 4 Byte (password) + 4 Byte (operator code) is required to place the identification code. The default password and operator code are:01010102020202.

3 meter running status word 2 [04000502] (1: reverse, 0: forward)

Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8
leave out	leave out	leave out	leave out	leave out	leave out	leave out	leave out
Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
reactive direction	leave out	leave out	leave out	active direction	leave out	leave out	leave out