COUNTIS M46 MBUS protocol V1.3

1. Initialization slave

Format:

Start	C Field	A Field	Check Sum	Stop
10	40	XX	CS	16

XX=1 to FF

The address field serves to address the recipient in the calling direction, and to identify the sender of information in the receiving direction.

The size of this field is one Byte and can therefore take values from 0 to 255. The addresses 1 to 250 can be allocated to the individual slaves up to a maximum of 250.Unconfigured slaves are given the address 0 by default when manufactured, and as a rule are allocated one of these addresses when connected to the M-Bus.

The addresses decimal 254 (0xFE) and 255 (0xFF) are used to transmit information to all participants (Broadcast). With address 255 none of the slaves reply and with address 254 all slaves reply with their own addresses.
The latter case naturally results in collisions when two or more slaves are connected, and should only be used for test purposes.
The address 253 (FD) indicates that the addressing has been performed in the Network Layer instead of Data Link Layer,
The FD used when using The second level address. The remaining addresses 251 and 252 have been kept for future applications.

1.1 How to initialize a meter which you don't know the address

Master to slave :10 40 fe 3e 16

Slave to master：e5(success)

1.2 Remove the secondary address matching symbol of all the meters on BUS.

Master to slave : 10 40 fd 3d 16

Slave : No answer

1.3 How to initialize all meters on the bus line by using FF as broadcast address

Master to slave : 10 40 ff 3f 16

Slave : No answer

1.4 How to Initialize a Slave with specific address

Example:Address 01

Master to slave : 10 40 01 41 16

Slave to master: e5

2. How to Set Baut rate

2.1 Point to point baud-rate setting command format(Control Frame)

Start	L Field	L Field	Start	C Field	A Field	CI Field	Check Sum	Stop
68H	03	03	68H	53/73	Addr	b8~bd	CS	16

L Field----- Byte length

C Field -------Control Field, Function Field

A Field ------- Address Field

CI Field--------control information field

Check Sum ----- The Check Sum is calculated from the arithmetical sum of the data mentioned above, without taking carry digits into account.

B8------ 300

B9------ 600

BA ------1200

BB ------2400

BC ------4800

BD ------9600

Example: (Meter address is 01)

(1) How to change Baudrate to 2400bps

Master to slave: 68 03 03 68 53 01 BB 0F 16

Slave to master: E5

(2) How to change Baudrate to 9600

Master to slave: 68 03 03 68 53 01 BD 11 16

Slave to master: E5

2.2 how to use Broadcast command to set baudrate

Format:

Start	**L Field**	**L Field**	**Start**	**C Field**	**A Field**	**CI Field**	**Check Sum**	**Stop**
68H	03	03	68H	53/73	ff	b8~bd	CS	16

Slave to master: no answer

B8------ 300

B9------ 600

BA ------1200

BB ------2400

BC ------4800

BD ------9600

Example:

Change all the meters' baudrate to 2400bps

Master to slave:： 68 03 03 68 53 **ff** bb 0d 16

Slave to Master: No answer

3. How to Set primary address

3.1 How to set the address of a Slave to 01

Format:

Start	L Field	L Field	Start	C Field	A Field	CI Field	DIF	VIF	Address Data	Check Sum	Stop
68H	06	06	68H	53/73	fe	51	01	7A	XX	CS	16

Example：

Master to slave : 68 06 06 68 53 fe 51 01 7a **01** 1e 16

Slave to master :e5

3.2 How to use Broadcast Command to set primary address to 01

Master to slave: 68 06 06 68 53 **ff** 51 01 7a **01** 1f 16

Start	L Field	L Field	Start	C Field	A Field	CI Field	DIF	VIF	Address Data	Check Sum	Stop
68H	06	06	68H	53/73	ff	51	01	7A	XX	CS	16

Slave :no answer

3.3 How to change Address from 01 to 02

Format

Start	L Field	L Field	Start	C Field	A Field	CI Field	DIF	VIF	Address Data	Check Sum	Stop
68H	06	06	68H	53/73	XX	51	01	7A	YY	CS	16

XX--current primary Address

YY--new primary address

Master to slave: 68 06 06 68 73 **01** 51 01 7A **02** 42 16

Slave to master :e5

3.4 How to Set primary address to 01 by using secondary address

For example: secondary address:12345678

Step1 Initialize the slave

Master to slave ： 10 40 ff 3f 16

Slave to master： no answer

Step2 Check the secondary address. After receiving the command, the Slave will check if the secondary address in the command is same with its secondary address or not.

Maseter to slave:68 0B 0B 68 73 **FD** 52 **78 56 34 12** FF FF FF FF D2 16

FD--- the primary Address used when you use secondary address to read data.

78 56 34 12 ---the meter's secondary address is 12 34 56 78

Master to slave :e5(success)

Step3 Change the primary address to 01

Master to slave :68 06 06 68 73 FD 51 01 7A **01** 3D

01 ---- new primary address

Slave to master:e5

4. Set the complete identification of the slave
(ID=12345678, Man=4024h (PAD), Gen=1, Med=02 (energy))

Start	L Field	L Field	Start	C Field	A Field	CI Field	DIF	VIF	Identification No	Manufact -urer ID	Generati -on	Medium	Check Sum	Stop
68H	0D	0D	68H	53/73	addr	51	07	79	4 byte	2 byte	1 byte	1 byte	CS	16

For example: (Meter address is 01)
Master to slave: 68 0D 0D 68 53 01 51 07 79 78 56 34 12 24 40 01 02 A0 16
Slave to master:e5

5. How to read out of Energy information
5.1 Use primary address 01 to read Energy information
Format:
Master to slave: 10 7B/5B adr cs 16
Slave to master: Variable data structure
Example: 10 7B 01 7C 16

5.2 How to read out a meter's Energy information by using broadcast address 254 (FE)
Master to slave: 10 7b/5b fe cs 16
Slave to master: Variable data structure
Example: 10 5B FE 59 16

5.3 How to read out the meter's Energy information by using secondary Address
For example: Secondary address:12 34 56 78

Step1 initialize the slave
Master to slave:10 40 ff 3f 16
Slave to master：No answer

Step2 Check the secondary address. After receiving the command, the Slave will check if the secondary address in the command is same with its secondary address or not.

Master to slave:68 0b 0b 68 73 fd 52 78 56 34 12 FF FF FF FF d2 16
Slave to master:E5

Step3 Read the Energy information
Master to slave :10 7b fd 78 16
Slave to master:
DIF=====Coding of t e Data Information Field
VIF=====Codes for Value Information Field

bytes	Parameters	data structure	Notice
4	header telegram	68 5d 5d 68	eader of RSP_UD telegram
3		08 A 72	C field =08 address A CI field 72
4		78 65 34 21	Identification number =12345678
2		24 40	Manufacturer ID 4024
1		01	Generation 1
1		02	Energy Meter
1		55	ACCESS NO
1		00	STATUS
2		00 00	Signature
6	Current total active energy	0C	DIF: 8digit BCD
		04 (1)	VIF: 10wh (0.01Kwh) (1)
		78 56 34 12	123456.78kwh
6	Current import active energy	0C	DIF: 8digit BCD
		04(1)	VIF: 10wh (0.01Kwh) (1)
		78 56 34 12	123456.78kwh
6	Current export active energy	0C	DIF: 8digit BCD
		04(1)	VIF: 10wh (0.01Kwh) (1)
		78 56 34 12	123456.78kwh
6	Current resettable total active energy	0C	DIF: 8digit BCD
		04(1)	VIF: 10wh (0.01Kwh) (1)
		78 56 34 12	123456.78kwh
6	Current resettable import active energy	0C	DIF: 8digit BCD
		04(1)	VIF: 10wh (0.01Kwh) (1)
		78 56 34 12	123456.78kwh
6	Current resettable export active energy	0C	DIF: 8digit BCD
		04(1)	VIF: 10wh (0.01Kwh) (1)
7	Current total reactive energy	0C	DIF: 8digit BCD
		FD	VIF:fd
		3D (2)	VIFE: 10VArh(0.01kVArh) (2)
		78 56 34 12	123456.78KVArh
7	Current import reactive energy	0C	DIF: 8digit BCD
		FD	VIF:fd
		3D (2)	VIFE: 10VArh(0.01kVArh) (2)
		78 56 34 12	123456.78KVArh
7	Current export reactive energy	8C	DIF: 8digit BCD
		FD	VIF:fd
		3D (2)	VIFE: 10VArh(0.01kVArh) (2)
		78 56 34 12	123456.78KVArh
7	Current total resettable reactive energy	0C	DIF: 8digit BCD
		FD	VIF:fd
		3D (2)	VIFE: 10VArh(0.01kVArh) (2)
		78 56 34 12	123456.78KVArh
7	Current resettable import reactive energy	0C	DIF: 8digit BCD
		FD	VIF:fd
		3D (2)	VIFE: 10VArh(0.01kVArh) (2)
		78 56 34 12	123456.78KVArh
7	Current resettable export reactive energy	0C	DIF: 8digit BCD
		FD	VIF:fd
		3D (2)	VIFE: 10VArh(0.01kVArh) (2)
		78 56 34 12	123456.78KVArh
1	CHECK SUM	CS	
1	End	16	

Note(1)：VIF=04，unit=10Wh；VIF=05，unit=100Wh; VIF=06，unit=1Kwh Note(2)：VIFE=3D，unit=10VArh；VIF=3E，unit=100VArh; VIF=3F，unit=1KVArh;

6. Read out of instantaneous electrical information

The instantaneous electrical information includes:

V，I，P，Q，PF，Hz

6.1 How to read instantaneous electrical information by using primary address:

Start	L Field	L Field	Start	C Field	A Field	CI Field	C eck Sum	Stop
68	3	3	68	53/73	XX	B1	CS	16

Master to slave : 68 03 03 68 53 XX b1 CS 16

Slave to master: Variable data structure (instantaneous electrical information)

If the primary address is 01 then XX=01

6.2 How to use Secondary Address to read out the instantaneous electrical information

Step1 Initialization slave

Master to slave:10 40 ff 3f 16

Slave to master：No answer

Step2 Check the secondary address. After receiving the command, the Slave will check if the secondary address in the command is same with its secondary address or not.

Master to slave: 68 0b 0b 68 73 fd 52 78 56 34 12 ff ff ff ff d2 16

Slave to master:E5

Step3 Use Secondary Address to read out the instantaneous electrical information

Master to slave : 68 03 03 68 53 fd b1 01 16

Slave to master: Variable data structure

bytes		data structure	Notice
4	header telegram	68 90 90 68	leader of RSP_UD telegram
3		08 a 72	C field =08 address A CI field 72
4		78 65 34 21	Identification number =12345678
2		24 40	Manufacturer ID 4024
1		01	Generation 1
1		02	Energy Meter
1		55	ACCESS NO
1		00	STATUS
2		00 00	Signature
6	L1 Voltage	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47 (1)	VIFE: 0.01V(1)
		56 34 12	1234.56V
6	L2 Voltage	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47(1)	VIFE: 0.01V(1)
		56 34 12	1234.56V
6	L3 Voltage	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47(1)	VIFE: 0.01V(1)
		56 34 12	1234.56V

6	L1-L2 Voltage	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47 (1)	VIFE: 0.01V(1)
		56 34 12	1234.56V
6	L2-L3 Voltage	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47 (1)	VIFE: 0.01V(1)
		56 34 12	1234.56V
6	L3-L1 Voltage	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47 (1)	VIFE: 0.01V(1)
		56 34 12	1234.56V
6	L1 current	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59(2)	VIFE: 1mA(xxx.xxxA) (2)
		56 34 12	123456mA(123.456A)
6	L2 current	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59 (2)	VIFE: 1mA(xxx.xxxA) (2)
		56 34 12	123456mA(123.456A)
6	L3 current)	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59 (2)	VIFE: 1mA(xxx.xxxA) (2)
		56 34 12	123456mA(123.456A)
6	N current	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59 (2)	VIFE: 1mA(xxx.xxxA) (2)
		56 34 12	123456mA(123.456A)
5	total active power	0b	DIF: 6digit BCD
		2b(3)	VIF:1W(xxx.xxxkw) (3)
		56 34 12	123456w(123.456kw)
5	L1 active power	0b	DIF: 6digit BCD
		2b(3)	VIF:1W(xxx.xxxkw) (3)
		56 34 12	123456w(123.456kw)
5	L2 active power	0b	DIF: 6digit BCD
		2b(3)	VIF:1W(xxx.xxxkw) (3)
		56 34 12	123456w(123.456kw)
5	L3 active power	0b	DIF: 6digit BCD
		2b(3)	VIF:1W(xxx.xxxkw) (3)
		56 34 12	123456w(123.456kw)
5	total reactive power	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3b(4)	VIFE：0.1var(4)
		56 34 12	123456 * VIFE
5	L1 reactive power	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3b(4)	VIFE：0.1var(4)
		56 34 12	123456 * VIFE
5	L2 reactive power	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3b(4)	VIFE：0.1var(4)
		56 34 12	123456 * VIFE
5	L3 reactive power	0b	DIF: 6digit BCD
		FD	VIF:fd
		3b(4)	VIFE：0.1var(4)
		56 34 12	123456 * VIFE
5	Total power factor	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF

		00 05	0.500
5	A power factor	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 05	0.500
5	B power factor	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 05	0.500
5	C power factor	0a	DIF: 4digit BCD
		fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 05	0.500
5	Frequency	0a	DIF: 4digit BCD
		fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 50	50.00Hz
1	End	CS	
1		16	

Note(1)：VIFE=47，unit=0.01V；VIFE=48，unit=0.1V；VIFE=49，unit=1V; Note(2)：VIFE=59，unit=1mA ；VIFE=5A，unit=10mA；VIFE=5B，unit=100mA; Note(3)：VIF=2a，unit=0.1W；VIF=2b，unit=1W； VIF=2c，unit=10W；VIF=2d，unit=100W; Note(4)：VIFE=3b，unit=0.1VAr；VIFE=3c，unit=1VAr； VIFE=3d，unit=10VAr； VIFE=3e，unit=100VAr;

7 Read out of instantaneous electrical information

7.1 How to read THD electrical information by using primary address:

Start	L Field	L Field	Start	C Field	A Field	CI Field	C eck Sum	Stop
68	3	3	68	53/73	XX	B2	CS	16

Master to slave : 68 03 03 68 53 XX b2 CS 16
Slave to master: Variable data structure (instantaneous electrical information)
If the primary address is 01 then XX=01

7.2 How to use Secondary Address to read out the instantaneous electrical information

Step1 Initialization slave
Master to slave:10 40 ff 3f 16
Slave to master：No answer

Step2 Check the secondary address. After receiving the command, the Slave will check if the secondary address in the command is same with its secondary address or not.
Master to slave: 68 0b 0b 68 73 fd 52 78 56 34 12 ff ff ff ff d2 16
Slave to master:E5

Step3 Use Secondary Address to read out the instantaneous electrical information
Master to slave : 68 03 03 68 53 fd b2 02 16
Slave to master: Variable data structure

bytes		data structure	Notice
4	header telegram	68 37 37 68	leader of RSP_UD telegram
3		08 A 72	C field =08 address A CI field 72
4		78 65 34 21	Identification number =12345678

2		24 40	Manufacturer ID 4024
1		01	Generation 1
1		02	Energy Meter
1		55	ACCESS NO
1		00	STATUS
2		00 00	Signature
5	3P4W：Phase 1 L/N volts THD 3P4W ： Line 1 to line 2 volts THD.	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 20	20.00%
5	3P4W：Phase 2 L/N volts THD 3P4W ： Line 2 to line 3 volts THD.	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 20	20.00%
5	3P4W：Phase 3 L/N volts THD 3P4W：Line 3 to line 1 volts THD.	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 20	20.00%
5	Phase 1 Current THD	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 20	20.00%
5	Phase 2 Current THD	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 20	20.00%
5	Phase 3 Current THD	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 20	20.00%
5	3P4W：Average line to neutral volts THD. 3P3W：Average line to line volts THD	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 20	20.00%
5	Average line current THD	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 20	20.00%
1	End	CS	
1		16	

8 Read out of instantaneous electrical information

8.1 How to read instantaneous electrical information by using primary address:

Start	L Field	L Field	Start	C Field	A Field	CI Field	C eck Sum	Stop
68	3	3	68	53/73	XX	B3	CS	16

Master to slave : 68 03 03 68 53 XX b3 CS 16

Slave to master: Variable data structure (instantaneous electrical information)

If the primary address is 01 then XX=01

8.2 How to use Secondary Address to read out the instantaneous electrical information

Step1 Initialization slave

Master to slave:10 40 ff 3f 16

Slave to master：No answer

Step2 Check the secondary address. After receiving the command, the Slave will check if the secondary address in the command is same with its secondary address or not.

Master to slave: 68 0b 0b 68 73 fd 52 78 56 34 12 ff ff ff ff d2 16

Slave to master:E5

Step3 Use Secondary Address to read out the instantaneous electrical information

Master to slave : 68 03 03 68 53 fd b3 03 16

Slave to master: Variable data structure

bytes		**data structure**	**Notice**
4	header telegram	68 65 65 68	eader of RSP_UD telegram
3		08 A 72	C field =08 address A CI field 72
4		78 65 34 21	Identification number =12345678
2		24 40	Manufacturer ID 4024
1		01	Generation 1
1		02	Energy Meter
1		55	ACCESS NO
1		00	STATUS
2		00 00	Signature
6	Total system volt amps	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3b(1)	VIFE: 0.1VA(1)
		56 34 12	12345.6VA(12.3456KVA)
6	Phase 1 volt amps	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3b(1)	VIFE: 0.1VA(1)
		56 34 12	12345.6VA(12.3456KVA)
6	Phase 2 volt amps	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3b(1)	VIFE: 0.1VA(1)
		56 34 12	12345.6VA(12.3456KVA)
6	Phase 3 volt amps	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3b(1)	VIFE: 0.1VA(1)
		56 34 12	12345.6VA(12.3456KVA)
6	Average line to neutral volts	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47 (2)	VIFE: 0.01V(2)
		56 34 12	1234.56V
6	Average line to line volts	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47 (2)	VIFE: 0.01V(2)
		56 34 12	1234.56V
6	Average line current	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59 (3)	VIFE: 1mA(xxx.xxxA) (3)
		56 34 12	123456mA(123.456A)
6	Sum of line currents	0b	DIF: 6digit BCD
		Fd	VIF:fd

		59 (3)	VIFE: 1mA(xxx.xxxA) (3)
		56 34 12	123456mA(123.456A)
6	Total system phase angle	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		06 12 01	112.06 degrees
6	Phase 1 phase angle.	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		06 12 01	112.06 degrees
6	Phase 2phase angle.	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		06 12 01	112.06 degrees
6	Phase 3 phase angle.	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		06 12 01	112.06 degrees
7	VAh since last reset	0c	DIF: 8digit BCDFIE，Current Value
		FD	VIF:fd
		3d(4)	VIF: 10VAh (0.01KVAh)(4)
		78 56 34 12	123456.78kVAh
7	Ah since last reset	0c	DIF: 8digit BCDFIE，Current Value
		FD	VIF:fd
		3a	VIF: 0.1Ah
		78 56 34 12	1234567.8Ah
1	End	CS	
1		16	

Note(1)：VIFE=3b，unit=0.1VAr；VIFE=3c，unit=1VAr；VIFE=3d，unit=10VAr； VIFE=3e，unit=100VAr; Note(2)：VIFE=47，unit=0.01V；VIFE=48，unit=0.1V；VIFE=49，unit=1V; Note(3)：VIFE=59，unit=1mA；VIFE=5A，unit=10mA；VIFE=5B，unit=100mA; Note(4)：VIFE=3D，unit=10VAh；VIF=3E，unit=100Vah

9. Read Maximum damand information

9.1 How to read Maximum damand information by using primary address:

Start	L Field	L Field	Start	C Field	A Field	CI Field	Check Sum	Stop
68	3	3	68	53/73	XX	B4	CS	16

Master to slave : 68 03 03 68 53 XX b4 XX 16
Slave to master: Variable data structure (instantaneous electrical information)
If the primary address is 01 then XX=01

9.2 How to use Secondary Address to read out the Maximum damand information

Step1 Initialization slave
Master to slave:10 40 ff 3f 16
Slave to master：No answer

Step2 Check the secondary address. After receiving the command, the Slave will check if the secondary address in the command is same with its secondary address or not.
Master to slave: 68 0b 0b 68 73 fd 52 78 56 34 12 ff ff ff ff d2 16
Slave to master:E5

Step3 Use Secondary Address to read out the instantaneous electrical information

Master to slave : 68 03 03 68 53 fd b4 04 16

Slave to master: Variable data structure

bytes		data structure	Notice
4	leader telegram	68 61 61 68	eader of RSP_UD telegram
3		08 A 72	C field =08 address A CI field 72
4		78 65 34 21	Identification number =12345678
2		24 40	Manufacturer ID 4024
1		01	Generation 1
1		02	Energy Meter
1		55	ACCESS NO
1		00	STATUS
2		00 00	Signature
5	Maximum total system power demand	0b	DIF: 6digit BCD
		2a (1)	VIF:0.1W(xx.xxxxkw) (1)
		56 34 12	12345.6w(12.3456kw)
6	Reserve	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3b	VIFE: dimensionless / no VIF
		00 00 00	0
6	Maximum total system VA demand.	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3b(2)	VIFE: 0.1VA(2)
		56 34 12	12345.6VA(12.3456KVA)
6	Maximum phase 1 current demand.	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59(3)	VIFE: 1mA(xxx.xxxA) (3)
		56 34 12	123456mA(123.456A)
6	Maximum phase 2 current demand.	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59 (3)	VIFE: 1mA(xxx.xxxA) (3)
		56 34 12	123456mA(123.456A)
6	Maximum phase 3 current demand.	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59(3)	VIFE: 1mA(xxx.xxxA) (3)
		56 34 12	123456mA(123.456A)
6	Maximum N current demand.	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59(3)	VIFE: 1mA(xxx.xxxA) (3)
		56 34 12	123456mA(123.456A)
5	total system power demand	0b	DIF: 6digit BCD
		2a(1)	VIF:0.1W(xx.xxxxkw) (1)
		56 34 12	12345.6w(12.3456kw)
6	Reserve	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3b	VIFE: dimensionless / no VIF
		00 00 00	0
6	total system VA demand.	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3b(2)	VIFE: 0.1VA(2)
		56 34 12	12345.6VA(12.3456KVA)

6	Phase 1 current demand.	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59(3)	VIFE: 1mA(xxx.xxxA) (3)
		56 34 12	123456mA(123.456A)
6	Phase 2 current demand.	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59(3)	VIFE: 1mA(xxx.xxxA) (3)
		56 34 12	123456mA(123.456A)
6	Phase 3 current demand.	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59(3)	VIFE: 1mA(xxx.xxxA) (3)
		56 34 12	123456mA(123.456A)
6	Phase N current demand.	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59(3)	VIFE: 1mA(xxx.xxxA) (3)
		56 34 12	123456mA(123.456A)
1	End	CS	
1		16	

Note(1)：VIF=2a，unit=0.1W；VIF=2b，unit=1W；VIF=2c，unit=10W；VIF=2d，unit=100W; Note(2)：VIFE=3b，unit=0.1VAr；VIFE=3c，unit=1VAr；VIFE=3d，unit=10VAr； VIFE=3e，unit=100VAr; Note(3)：VIFE=59，unit=1mA；VIFE=5A，unit=10mA；VIFE=5B，unit=100mA;

9. How to read password

Start	L Field	L Field	Start	C Field	A Field	CI Field	C eck Sum	Stop
68	3	3	68	11	addr	03	CS	16

Master to Slave：68 03 03 68 11 addr 03 cs 16
Slave to Master：68 05 05 68 11 addr 03 passwordH passwordL cs 16

10. Change to a new Password

Start	L Field	L Field	Start	C Field	A Field	CI Field	Data		C eck Sum	Stop
68	5	5	68	11	addr	04	Password	PasswordL	CS	16

Master to Slave：68 05 05 68 11 addr 04 passwordH passwordL cs 16
Slave to Master：E5

11. Reset demand and resettable energy

Start	L Field	L Field	Start	C Field	A Field	CI Field	data	Check Sum	Stop
68	04	04	68	11	addr	0e	xx	CS	16

Example:(Meter address is 01)
Master to Slave: 68 04 04 68 11 01 0e **00** 20 16
Slave to Master: e5

xx = 0 **Reset demand**
xx = 1 **Reset resettable energy**

12. Set Demand interval、slide time、Display time、LED time

Send：68 09 09 68 53 FE 51 30 01 60 01 05 06 3F 16

Start	L Field	L Field	Start	C Field	A Field	CI Field	DIF	VIF	data	Check Sum	Stop
68H	09	09	68H	53/73	FE	51	30	01	Demand interval、slide time、Display time 、 LED time Display time=0 ： the display does not scroll automatically. LED time=0 ： Backlight always on min-min-s-min 4 bytes	cs	16

Example:(Meter address is 01)

Master to Slave：68 09 09 68 53 FE 51 30 01 60 01 05 06 3F 16

Slave to Master：E5

13. Read Demand interval、slide time、Display time、LED time

Start	L Field	L Field	Start	C Field	A Field	CI Field	DIF	VIF	Check Sum	Stop
68H	05	05	68H	53/73	FE	51	30	81	cs	16

Example:(Meter address is 01)

Master to Slave：68 05 05 68 53 FE 51 30 81 53 16

Slave to Master：E5

Bytes	Parameters	Data structure	Notice
4	eader telegram	68 16 16 68	eader of RSP_UD telegram
3		08 A 72	C field =08 address A CI field 72
4		78 56 34 21	Identification number =12345678
2		24 40	Manufacturer ID 4024
1		01	Generation 1
1		02	Energy Meter
1		55	ACCESS NO
1		00	STATUS
2		00 00	Signature
7	Demand interval、slide	0a	DIF: 30digit BCD
		Fd	VIF:fd
	time、Display time、LED time	3a	VIFE: dimensionless / no VIF
		15010610	Demand interval: 15 min slide time: 01min Display time: 06s LED time: 10s
1	CHECK SUM	CS	
1	End	16	

14. Read the output mode of Pulse 1

Start	L Field	L Field	Start	C Field	A Field	CI Field	Check Sum	Stop
68	03	03	68	11	addr	10	CS	16

Example:(Meter address is 01)

Master to Slave:68 03 03 68 11 01 10 22 16

Slave to Master:68 04 04 68 11 01 10 **02** 23 16

The red-lighted **02** represents the output mode of Pulse1

02: Import + export active energy,

06: Import + export reactive energy(default).

15.Set up the output mode of Pulse 1

Start	L Field	L Field	Start	C Field	A Field	CI Field	data	Check Sum	Stop
68	04	04	68	11	addr	11	02/06	CS	16

Example:(Meter address is 01)

Master to Slave: 68 04 04 68 11 01 11 02 25 16

Slave to Master:e5

The red-lighted **02** represents the output mode of Pulse1

02: Import + export active energy,

06: Import + export reactive energy(default).

16. Read the constant of Pulse 1

Start	L Field	L Field	Start	C Field	A Field	CI Field	Check Sum	Stop
68	03	03	68	11	addr	12	CS	16

Example:(Meter address is 01)

Master to Slave: 68 03 03 68 11 01 12 24 16

Slave to Master:68 04 04 68 11 01 10 **01** 23 16

The red-lighted 01 represents the constant of Pulse1

01: 0.01kwh(KVAh)/imp(default)

02: 0.1kwh(KVAh)/imp

03: 1kwh(KVAh)/imp

04: 10kwh(KVAh)/imp

05: 100kwh(KVAh)/imp

06:1000kwh(KVAh)/imp

17. Set up the constant of Pulse 1

Start	L Field	L Field	Start	C Field	A Field	CI Field	data	Check Sum	Stop
68	04	04	68	11	addr	13	01/02/03/04/05/06	CS	16

Example:(Meter address is 01)

Master to Slave: 68 04 04 68 11 01 13 **01** 26 16

Slave to Master: e5

The red-lighted **01** represents the constant of Pulse1

01: 0.01kwh(KVAh)/imp

02: 0.1kwh(KVAh)/imp

03: 1kwh(KVAh)/imp

04: 10kwh(KVAh)/imp

05: 100kwh(KVAh)/imp

06:1000kwh(KVAh)/imp

18.Read Communication parity bit and stop bit

Start	L Field	L Field	Start	C Field	A Field	CI Field	Check Sum	Stop
68	03	03	68	11	addr	16	CS	16

Example:(Meter address is 01)

Master to Slave: 68 03 03 68 11 01 16 28 16

Slave to Master:68 04 04 68 11 01 16 **01** 29 16

The red-lighted **01** represents the parity bit of MBUS

00： none，1 stop bit

01： even，1 stop bit

02： odd，1 stop bit

03： none，2 stop bit

19. Set communication parity bit and stop bit

Start	L Field	L Field	Start	C Field	A Field	CI Field	data	Check Sum	Stop
68	04	04	68	11	addr	17	00/01/02	CS	16

Example:(Meter address is 01)

Master to Slave: 68 04 04 68 11 01 17 **00** 29 16

Slave to Master: e5

The red-lighted **00** represents the parity bit of MBUS

00： none，1 stop bit

01： even，1 stop bit

02： odd，1 stop bit

03： none，2 stop bit

20.Read the Pulse Width of pluse1

Start	L Field	L Field	Start	C Field	A Field	CI Field	Check Sum	Stop
68	03	03	68	11	addr	18	CS	16

Example:(Meter address is 01)

Master to Slave: 68 03 03 68 11 01 18 2a 16

Slave to Master:68 04 04 68 11 01 18 **00** 2a 16

The red-lighted **00** represents the Pulse Width of pluse1

00： 60ms

01： 100ms

02： 200ms

21.Set the Pulse Width of pluse1

Start	L Field	L Field	Start	C Field	A Field	CI Field	data	Check Sum	Stop
68	04	04	68	11	addr	19	00/01/02	CS	16

Example:(Meter address is 01)

Master to Slave: 68 04 04 68 11 01 19 **00** 2b 16

Slave to Master: e5

The red-lighted **00** represents the Pulse Width of pluse1

00： 60ms

01： 100ms

02： 200ms

22.Read meter code

Start	L Field	L Field	Start	C Field	A Field	CI Field	Check Sum	Stop
68	03	03	68	11	addr	32	CS	16

Example:(Meter address is 01)

Master to Slave:68 03 03 68 11 **01** 32 44 16

Slave to Master:68 05 05 68 11 01 32 **00 02** 1c 16