COUNTIS M06 MBUS protocol V1.2

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 Baudrate

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	fe	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:
(1) How to change Baudrate to 2400bps
Master to slave: 68 03 03 68 53 fe bb 0c 16
Slave to master: e5
(2) How to change Baudrate to 9600
Master to slave: 68 03 03 68 53 fe bd 0E 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 fe 3e 16

Slave to master：e5

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	FE	51	07	79	4 byte	2 byte	1 byte	1 byte	CS	16

Master to slave: 68 0D 0D 68 53 FE 51 07 79 78 56 34 12 24 40 01 02 9D 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 ，Current Value
		04	VIF: 10w (0.01Kw)
		78 56 34 12	123456.78kwh
7	Current import active energy	0C	DIF: 8digit BCDFIE，Current Value
		04	VIF: 10w (0.01Kw)
		78 56 34 12	123456.78kwh
7	Current export active energy	0C	DIF: 8digit BCDFIECurrent Value
		04	VIF: 10w (0.01Kw)
		78 56 34 12	123456.78kwh
6	Current resettable total active energy	0C	DIF: 8digit BCD ，Current Value
		04	VIF: 10w (0.01Kw)
		78 56 34 12	123456.78kwh
7	Current resettable import active energy	0C	DIF: 8digit BCDFIE，Current Value
		04	VIF: 10w (0.01Kw)
		78 56 34 12	123456.78kwh
7	Current resettable export active energy	0C	DIF: 8digit BCDFIE，Current Value
		04	VIF: 10w (0.01Kw)
		78 56 34 12	123456.78kwh
7	Current total reactive energy	0C	DIF: 8digit BCD ，Current Value
		FD	VIF:fd
		3A	VIFE: dimensionless / no VIF
		78 56 34 12	123456.78kVarh
8	Current import reactive energy	0C	DIF: 8digit BCDFIE，Current Value
		FD	VIF:fd
		3A	VIFE: dimensionless / no VIF
		78 56 34 12	123456.78kVarh
8	Current export reactive energy	8C	DIF: 8digit BCDFIECurrent Value
		FD	VIF:fd
		3A	VIFE: dimensionless / no VIF
		78 56 34 12	123456.78kVarh
7	Current total resettable reactive energy	0C	DIF: 8digit BCD ，Current Value
		FD	VIF:fd
		3A	VIFE: dimensionless / no VIF
		78 56 34 12	123456.78kVarh
8	Current resettable import reactive energy	0C	DIF: 8digit BCDFIE，Current Value
		FD	VIF:fd
		3A	VIFE: dimensionless / no VIF
		78 56 34 12	123456.78kVar
8	Current resettable export reactive energy	0C	DIF: 8digit BCDFIE，Current Value
		FD	VIF:fd
		3A	VIFE: dimensionless / no VIF
		78 56 34 12	123456.78kVar
1	CHECK SUM	CS	
1	End	16	

6. Read out of instantaneous electrical information

The instantaneous electrical information includes:

V，I，P ，Q，S，PF , Hz ect. MD

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 05 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	eader telegram	68 90 90 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	Voltage	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47	VIFE: 0.01V
		56 34 12	1234.56V
6	Reserve	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47	VIFE: 0.01V
		00 00 00	0
6	Reserve	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47	VIFE: 0.01V
		00 00 00	0

6	Reserve	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47	VIFE: 0.01V
		00 00 00	0000.00
6	Reserve	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47	VIFE: 0.01V
		00 00 00	0000.00
6	Reserve	0b	DIF: 6digit BCD
		Fd	VIF:fd
		47	VIFE: 0.01V
		00 00 00	0
6	current	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59	VIFE: 1mA(xxx.xxxA)
		56 34 12	123456mA(123.456A)
6	Reserve	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59	VIFE: 1mA(xxx.xxxA)
		00 00 00	0
6	Reserve	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59	VIFE: 1mA(xxx.xxxA)
		00 00 00	0
6	Reserve	0b	DIF: 6digit BCD
		Fd	VIF:fd
		59	VIFE: 1mA(xxx.xxxA)
		00 00 00	0
5	active power	0b	DIF: 6digit BCD
		2a	VIF:0.1W(xx.xxxxkw)
		56 34 12	12345.6w(12.3456kw)
5	Reserve	0b	DIF: 6digit BCD
		2a	VIF:0.1W(xx.xxxxkw)
		00 00 00	0
5	Reserve	0b	DIF: 6digit BCD
		2a	VIF:0.1W(xx.xxxxkw)
		00 00 00	0
5	Reserve	0b	DIF: 6digit BCD
		2a	VIF:0.1W(xx.xxxxkw)
		00 00 00	0
6	reactive power	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		56 34 12	12345.6w(12.3456kw)
6	Reserve	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 00 00	0
6	Reserve	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 00 00	0
6	Reserve	0b	DIF: 6digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 00 00	0
5	power factor	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 05	0.500
5	Reserve	0a	DIF: 4digit BCD
		Fd	VIF:fd

		3a	VIFE: dimensionless / no VIF
		00 00 00	0
5	Reserve	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 00 00	0
5	Reserve	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 00 00	0
5	Frequency	0a	DIF: 4digit BCD
		Fd	VIF:fd
		3a	VIFE: dimensionless / no VIF
		00 50	50.00 z
1	End	CS	
1		16	

7. 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

7.1 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	Password L	CS	16

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

8. How to reset all resettable energy data

Start	L Field	L Field	Start	C Field	A Field	CI Field	C eck Sum	Stop
68	3	3	68	11	addr	0d	CS	16

Master to Slave：68 03 03 68 11 01 0d 1f 16
Slave to Master：e5

9. 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

10. 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 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
7	Demand interval、slide time、Display time、LED time	0a	DIF: 30digit BCD
		Fd	VIF:fd
		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	

11. Read the measurement mode

Start	L Field	L Field	Start	C Field	A Field	CI Field	Check Sum	Stop
68	03	03	68	11	addr	**09**	CS	16

Example:(Meter address is 01)

Master to Slave:68 03 03 68 11 **01** 09 1b 16

Slave to Master:68 04 04 68 11 01 09 **01** 1c 16

The red-lighted **01** represents the measurement mode

01 means Active energy

02 means Active energy+Reactive energy

03 means Active energy- Reactive energy

12. Set up the measurement mode

Start	L Field	L Field	Start	C Field	A Field	CI Field	data	Check Sum	Stop
68	04	04	68	11	addr	**0A**	01/02/03	CS	16

Example:(Meter address is 01)

Master to Slave:68 04 04 68 11 01 0A **01** 1d 16

Slave to Master:e5

The red-lighted **01** represents the measurement mode
01means Active energy
02means Active energy+Reactive energy
03emans Active energy- Reactive energy

13. 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 **01** 23 16
The red-lighted **01** represents the output mode of Pulse1
01: Import active energy,
02: Import + export active energy,
04:Exportactive energy(default).
05: Import reactive energy,
06: Import + export reactive energy,
08: Export reactive energy,

14. 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	08	08	68	11	addr	11	01/02/04/05/06/08	CS	16

Example:(Meter address is 01)
Master to Slave: 68 04 04 68 11 01 11 **01** 24 16
Slave to Master:e5
The red-lighted **01** represents the output mode of Pulse1
01: Import active energy,
02: Import + export active energy,
04:Exportactive energy, (default).
05: Import reactive energy,
06: Import + export reactive energy,
08: Export reactive energy,

15. 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 12 **00** 24 16
The red-lighted **00** represents the constant of Pulse1
00: 0.001kwh(kvarh)/imp(default)
01: 0.01kwh(kvarh)/imp
02: 0.1kwh(kvarh)/imp
03: 1kwh(kvarh)/imp

16. 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	00/01/02/03	CS	16

Example:(Meter address is 01)

Master to Slave: 68 04 04 68 11 01 13 **00** 25 16

Slave to Master: e5

The red-lighted **00** represents the constant of Pulse1

00: 0.001kwh(kvarh)/imp(default)

01: 0.01kwh(kvarh)/imp

02: 0.1kwh(kvarh)/imp

03: 1kwh(kvarh)/imp

17. Read the parity bit of MBUS

Start	L Field	L Field	Start	C Field	A Field	CI Field	Check Sum	Stop
68	03	03	68	11	addr	14	CS	16

Example:(Meter address is 01)

Master to Slave: 68 03 03 68 11 01 14 26 16

Slave to Master:68 04 04 68 11 01 14 **00** 26 16

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

00： none

01： even

02： odd

18. Set up the parity bit of MBUS

Start	L Field	L Field	Start	C Field	A Field	CI Field	data	Check Sum	Stop
68	08	08	68	11	addr	15	00/01/02	CS	16

Example:(Meter address is 01)

Master to Slave: 68 04 04 68 11 01 15 **00** 27 16

Slave to Master: e5

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

00： none

01： even

02： odd

19. 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	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 **00** 28 16

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

00： 60ms

01： 100ms

02： 200ms

20. Set the Pulse Width of pluse1

Start	L Field	L Field	Start	C Field	A Field	CI Field	data	Check Sum	Stop
68	08	08	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 Pulse Width of pluse1

00： 60ms

01： 100ms

02： 200ms