（1） Transmission code

The information transmit in asynchronous mode in bytes. The communication information transmitting between the host computer and the slave computer is the 10 bits format，including one initial bit. 8date bit (firstly transmitting the least effective bit) . without parity check bit，1 stop bit

（2） Data frame format

Address code	Function code	Data area	CRC check code
1 byte	1 byte	N byte	2 byte

Address code: address code is located at beginning of frame . composed of one byte (8 bit binary system code) decimal is 0-255 in the ACR meters . just 1-247 is used . other address is reserved. These bits indicate terminal device address specified by users . this device will receive the connecting host computer data. Every terminal device has only one address . only the addressing terminal respond to enquiry including this address. When terminal is transmitting one responding . the responding slave address data tell host computer that which terminal is it .

Function code : function code tell the target terminal to execute what function. Below table list . function code used in this series meters and their meaning and function .

Function	Definition	Operation
03H/04H	Read and data	Obtain current binary system value of one or multiple register
10H	Preset multi-register	Set binary system value into a series of multiple register

Data area: data area includes the data needed by terminal for executing specific function or the collected data when terminal is responding enquiry . content of these data could be value reference address or setting value . for example , the function code tell terminal to read one register . the data area need to specify the starting register and read how many data . the built-in address and data have different content depending on type and slave computer .

CRC check code : error check (CRC) domain occupies 2 byte . including one 16 bit binary system value. CRC value is calculated by transmission device. And then attached to the data frame . the receiving device . while receiving ,it calculates the CRC value again. Then comparing it with the receiving CRC domain value. If these two values are not equal . it and error occurs.。

Flow for forming one CRC：

1. Preset one 16 bit register as 0FFFFH（All-1）called as CRC register
2. 8 bit of data frame first byte and low byte of CRC register carry out exclusive or operation . the save its result back to CRC register .
3. Right shift CRC register for one bit . the most significant bit is filled with 0 . the least significant bit is shifted out and tested .
4. If the least significant bit is 0 . repeat the third step(next shift) if the significant bit is 1 .CRC register and preset fixed value specified (0A001H)

carry out exclusive or operation .

5．Repeat the third step and fourth step until shift for 8 times. The complete 8 bit is done .

6．Repeat the second step to fifth step to treat next 8 bit until all the byte is treated .

7．The CRC register final value is CRC value . besides . there is another CRC calculation method by preset table. Its main feature is fast calculating speed . but large saving space is needed . please refer to related data .

5.4.54. explain for communication applicable format

（1） Function 03H：read register

This function allow user to obtain data and parameters collected and recorded by equipment . data amount of once requested by host computer have no limit . but the address should be in range .

following example is one basic data read from 01 slave (each address in data frame occupy 2 bytes) the collected data is the total electric energy E(occupy 4 bytes) other address is 00H

（2） Function code 10H ：writing register

Function code 10H allows the user to change the contents multiple registers .time ,data, rate period of time etc . in meter can be written by this function code . the one shot maximum write in data (32 bytes) of host computer is 16 .

Below meter example show : preset address 01 data ,time :12:00 , 01/02/2008

Master transmitting		Transmitting information		Slave returning		Returning information
Address code		01H		Address code	01H	
Function code		10H		Function code	10H	
Initial address	High byte	00H		Initial address	High byte	00H
	Low byte	12H			Low byte	12H
Register No.	High byte	00H		Register No.	High byte	00H
	Low byte	03H			Low byte	03H
Byte number		06H		CRC check code	High byte	20H
0012H Data to be written	High byte	08H			Low byte	0DH
	Low byte	02H				
0013H Data to be written	High byte	01H				
	Low byte	0CH				
0014H Data to be written	High byte	00H				
	Low byte	00H				
CRC check code	High byte	FFH				
	Low byte	A8H				

Attachment：

1. belong to read/write："R" read only，read this parameter use 03H command. "R/W" readable/writable write parameter use 10H command . write in address of non-listed or no-writable address is forbidden.

2. the communication address of electric energy meter is given with delivery . also read out through the software provided by our company.

3. the voltage value detected by electric energy meter is fixed by 2 bit decimal number . data format is XXX.XX , unit is V . if communication read out voltage value is 55EEH（21998）, then voltage actual value is 219.88V. the measured current value is fixed by 3 bit decimal number . data format is XX.XXX unit is A . if communication read out current value is 05DBH（1499），then current actual value is 1.499A

4. the active and reactive power value by electric energy meter is fixed by 2 bits decimal number . data format is XXX.XX ,unit is kW(kvar)。If communication read out the active and reactive power value is 0020H（0032），then the active and reactive power actual value is 0.32kW(kvar) ,the apparent power value is fixed by 1 bit decimal number . data format is XXXX.X unit is VA. If communication read out the apparent power actual value is CE44H（3300），then the apparent power actual value is 330.0VA

5. the electric energy value measured by electric energy meter occupy 4 bytes. Unit is kWh . the high bit is before the low bit . if reading value is 0012D687H（1234567），then the electric energy metering value is 1234567x0.01=12345.67kWh

6. order of 14-period of time parameter setting information of above address table

14-period of time parameter setting information	Note
Rate number for 1st period of time NN	1. starting time for 1st period of time 00:00
Terminal time for 1st period of time——minute	2. in DDS238-2 ZN DDS238-4 ZN between rate No. and rate period
Rate number for 2nd period of time NN	
Terminal time for 2nd period of time——minute	
Terminal time for 2nd period of time——hour	01-spike 02-peak 03-flat 04-valley
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Rate number for 14th period of time NN	
Terminal time for 14th period of time——minute	
Terminal time for 14th period of time——hour	

5．5 Notice

5．5．1 the loading capacity of electric energy meter is 0.5lb—Imax (direct connecting)或 0.02Ib—Imax (connecting via current transformer) if this loading capacity range is exceeded . the electric energy metering will be incorrect or damageable。

5．5．2 when electric energy meter is directly connected its electric energy reading value is actual kWh . when electric energy meter is equipped with current transformer . the electric energy reading value must multiply the current transformer rate multiply power to obtain actual kWh