

## CR series counter communication protocol

CR series counters RS485 communications adopts asynchronous serial no zero NRZ (Nonreturn-to-zero) communications format, including 1 start bit, 8 data bits, 1 stop bit, a total of 10 bit. If the starting byte data stream, instrument address, three bytes of the command does not match, the received data will be invalid, no feedback. When the above three are correct, but behind the command / data length or part of the data is not correct, return error message. Except the instrument parameters defined below, other transmit data of the instrument using 16 hex. All data sent or received checksum value of the start byte XOR checksum value before.

### I. Communication Command definition

#### 1. Host to send instrument Address comm and format

EOT	ENQ	ADD	XOR	ETX
Initialization command	Send Request	Instrument address	XOR checksum	End Of Frame
04	05	XX	XX	03

#### 2. Instrument response format

ACK	ADD	XOR	ETX
response frame	Instrument address	XOR checksum	End Of Frame
06	XX	XX	03

#### 3. Command format of host reading instrument

ENQ	ADD	R	FADD	Length	XOR	ETX
Send Request	Instrument address	Read command	Read fist address	Read length	XOR checksum	End Of Frame
05	XX	52	XX	XX	XX	03

#### Response format of instrument receiving correctly

ENQ	ADD	R	FADD	Length	DATA	XOR	ETX
Send Request	Instrument address	Read command	Read fist address	Read length	Read data	XOR checksum	End Of Frame
06	XX	52	XX	XX	XX	XX	03

#### 4. Host write instrument command format

ENQ	ADD	W	FADD	Length	DATA	XOR	ETX
Send Request	Instrument address	Write command	Wirte fist address	Wirte length	Write data	XOR checksum	End Of Frame
05	XX	57	XX	XX	XX	XX	03

#### Response format of instrument receiving correctly

ENQ	ADD	W			XOR	ETX
Send Request	Instrument address	Write command	0	K	XOR checksum	End Of Frame
05	XX	57	4F	4B	XX	03

#### 5. Command format of host read instrument

EOT	ADD	N			XOR	ETX
Send request	Instrument address	Read names command			XOR checksum	End Of Frame
05	XX	4E			XX	03

#### Response format of instrument receiving correctly

ACK	ADD	N	Instrument name		XOR	ETX
Send request	Instrument address	Read names command	C	R	XOR checksum	End Of Frame
06	XX	4E	58	50	XX	03

#### Response format of instrument receiving correctly

NAK	ADD	ERR			XOR	ETX
Send request	Instrument address	Read name command			XOR checksum	End Of Frame
15	XX	45			XX	03

#### Instrument read-write Parameter list:

Parameter Address	Parameter Type	Data Length	Data Type	Data Range	Note
B7H-B9H	SVT (Read-Write)	3	BCD (Decimal)	0.00000-999999	Initial values
BAH-BCH	T1M(Read-Write)	3	BCD (Decimal)	0.00-9999.99	Alarm Delay Value
BDH	DPP(Read-Write)	1	HEX (hexadecimal)	01/02/04/08/10/20	Coefficient the decimal point setting
BEH-COH	P(Read-Write)	3	BCD (Decimal)	0.00000-999999	Scale factor setting
C1H-C3H	SV2(Read-Write)	3	BCD (Decimal)	0.00000-999999	SV2 Alarm Setting
C4H	DPSV(Read-Write)	1	HEX (hexadecimal)	01/02/04/08	PV value decimal point Setting

C5H-C7H	SV1(Read-Write)	3	BCD (Decimal)	0.00000-999999	SV1 Alarm Setting
C8H	OUT(Read-Write)	1	HEX (hexadecimal)	01/02/04/08/10/ 20/40/80	Alarm Mode Setting
C9H	IN(Read-Write)	1	HEX (hexadecimal)	01/02/04/08/10/ 20	Input Model setting
CAH CBH	DCK(Read-Write)	2	BCD (Decimal)	0000-9999	Button Password Setting
CCH	FLAG2(Read-Write)	1	HEX (hexadecimal)		Mark bit
CDH-CFH	PV(Read-Only)	3	BCD (Decimal)	19999-999999	Count value
D0H	FLAG1(Read-Only)	1	HEX (hexadecimal)		State flag

FLAG1(D5H) state flag definition:

Data Bit	Set bit (1) function	Reset (0) function
D0	SV2 alarm	SV2 no alarm
D1	SV1 alarm	SV1 no alarm
D2	undefinition	undefinition
D3	undefinition	undefinition
D4	undefinition	undefinition
D5	undefinition	undefinition
D6	undefinition	undefinition
D7	undefinition	undefinition

FLAG2(CFH) state flag definition:

Data Bit	Set bit (1) function	Reset (0) function
D0	NoInitial values	With Initial values
D1	The instrument have the memory when power off	The instrument have no memory when power off
D2	Count value is positive	Count value is negative
D3	The instrumen accept countingsign below5000Hz	The instrument accept counting sign below 30Hz
D4	undefinition	Undefinition
D5	undefinition	undefinition
D6	undefinition	undefinition
D7	undefinition	undefinition

DPP(B9H)Factor decimal point definition:

Value	Definition
01	Scale factor non-decimal
02	Scale factor one decimal
04	Scale factor two decimal
08	Scale factor three decimal
10	Scale factor four decimal

OLT(C8H) alarm mode definition:

Value	Definition
01	F alarm mode
02	N alarm mode
04	R alarm mode
08	C alarm mode
10	L alarm mode
20	K alarm mode
40	Q alarm mode
80	A alarm mode

DPSV(C4H) alarm value decimal definition:

Value	Definition
01	Alarm value have no decimal
02	Alarm value have one decimal
04	Alarm value have two decimal
08	Alarm value have three decimal
10	Alarm value have four decimal

IN(C9H) Input Mode Definition:

Value	Definition
01	L_N input mode
02	L_P input mode
04	d_N input mode
08	d_P input mode
10	Ud input mode