TOKY Communication Protocol

RS485 bps has 9.6K, 19. 2K, 38. 4K for optional. It uses standard non-return-zero format (one start bit, eight data bits and one end bit),altogether 10 bits. In case the data flow of start bit, data bits and the end bit is not correct, the received data will be invalid. In case it is correct but the command or length of data is incorrect, it will returned error information. All data in the meter is HEX 1 or 3 float bytes transmission.

The format of 3 bytes:

Address Low Mid High

Mantissa XX XX XX Index, Offset 40H, more than 40H is integer, less than 40H is decimal fraction. Change to integer by shift left, change to decimal fraction by shift right, If the MSB is "1", it means negative; if the MSB is "0", it means positive number. To let mantissa to be available, this mantissa will be always formatted, the MSB is "1".

Example:

1.234D = 1.3BE7H = 44.13BEH Formatted to: 41.9DF3H = F3 9D 41

-1.234D = -1. 3BE7H = C4.13BEH Formatted to: C1.9DF3H = F3 9D C1

0.5 = 0.8000H = 40.8000H = 00 B0 40

-0.0625= 0.l00H = CO.1000H Fonnatted t0: 8D.80000 = 00 00 BD

The format of writing and reading is the same for 1 or 3 bytes floating number. Considering the address of memory, in case state the length of communication is 4 bytes, the fourth byte can be added as any other figures. But the software will ignore it.

1. Host computer transmission address

EOT	ENQ	Add	XOR	ETX
04	5	XX	XX	03

2. The meter return data

ACK	Add	XOR	ETX
04	XX	XX	03

3. Host computer reading data

ENQ	Add	Read	First add	Leght	XOR	ETX
05	XX	52	XX	XX	XX	03

The meter receiving correctly and returns data

ACK	Add	Read	First add	Lenght	Data	XOR	ETX
06	XX	52	XX	XX	XX	XX	03

4. Host computer writing data

ENQ	Add	Write	First add	Lenght	Data	XOR	ETX
05	XX	57	XX	XX	XX	XX	03

The meter receiving correctly and returns data

ACK	Add	Write	0	K	XOR	ETX
06	XX	57	4B	4F	XX	03

5. Host computer writing data

ENQ	Add	Name	XOR	ETX
05	XX	4E	XX	03

The meter receiving correctly and returns data

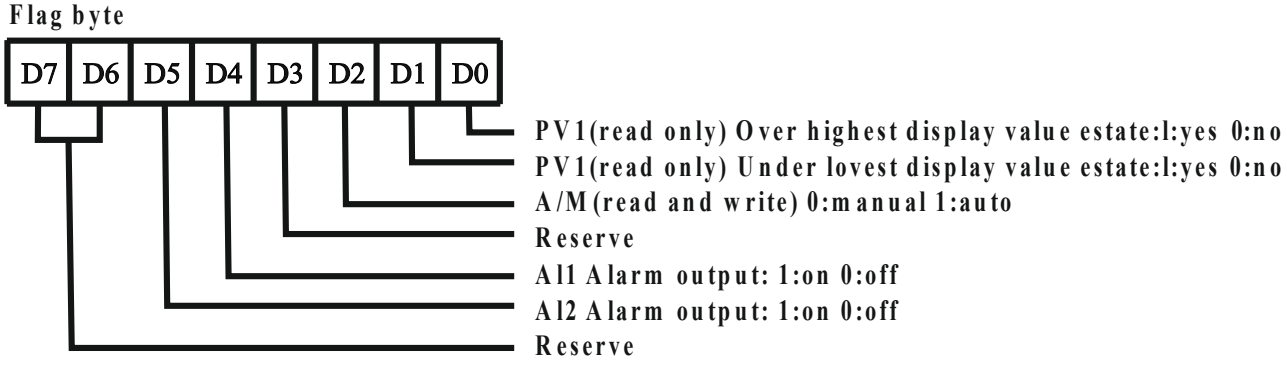
ACK	Add	Name	Meter Name	XOR	ETX
06	XX	4E	Xx	XX	03

6. The meter receiving incorrectly and returns data

NAk	Add	Error code	XOR	ETX
15	XX	XX	XX	03

For: TH Series

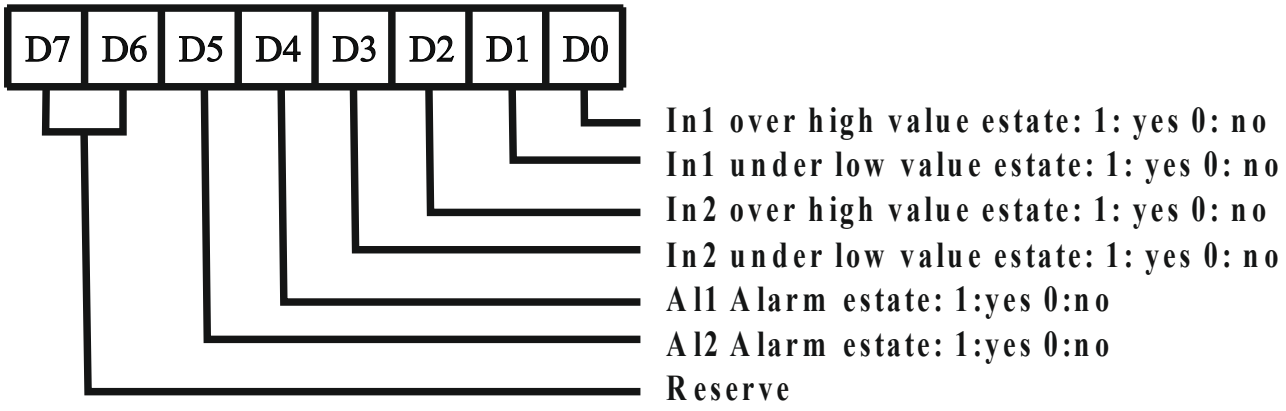
Address	Type	Length	Range	Note
68H	FLAG (Read only)	1	0~3FH	The flag of working estate, it can write A/M.
69-6BH	MV (Read only)	3	0.01~100. 0	Control' ouput
C9-CBH	PV1 (Read only)	3	-1999~9999	Main measuring value
CCH-CEH	PV2 (Read onl v)	3	-1999~9999	Vice measuring value
10H-12H	SV (Read/wri te)	3	-1999~9999	Setting value
13H	Add (Read/write)	1	0~255	Address
14-17H	P (Read/write)	4	0.0~3600%	Proportion
18-1BH	I (Read/write)	4	0.0~3600	Integral time
lC-1EH	P (Read/write)	3	0/1	Differential time
1FH	dr (Read/write)	1	0~250	Control mode
20-22H	HY (Read/write)	3	0.0~9999	Location control Hysteresis
23H	Ct (Read/write)	1	0~250	Output mode
24H-27H	AL1 (Read/write)	4	-1999~9999	#1 Alarm setting value
28-2AH	HY1 (Read/write)	3	0.0~9999	#1 Alarm hysteresis
2BH	Ad1 (Read/write)	1	0~3	#1 Alarm mode
2C-2FH	AL2 (Read/write)	4	-1999~9999	#2 Alarm setting value
30-32H	HY2 (Read/write)	3	0.0~9999	#2 Alarm hysteresis
33H	Ad2 (Read/write)	1	0~3	#2 Alarm mode
34H	MAN (Read/write)	1	0/1	Power-on Man/Auto mode selection
35H	At (Read/write)	1	0/1	Auto-turn selection
36H	LCK (Read/write)	1	0~250	Password setting
37H	IN1 (Read/write)	1	0~9	Input signal selection
38-3BH	FL1 (Read/write)	4	-1999~9999	Lowest display value
3C-3EH	FH1 (Read/write)	3	-1999~9999	Highest display value



For: DH Series

Address	Type	Length	Range	Note
61H	FLAG (Read only)	1	0~3FH	Estate signal
62H	PV1(Read only)	3	-1999~9999	Measuring value 1
65H	PV2(Read only)	3	-1999~9999	Measuring value 2
C8~CBH	AL1 (Read&write)	4	-1999~9999	#1 Alarm setting value
CC~CEH	HY1 (Read&write)	3	0.0~9999	#1 Alarm hysteresis
CFH	AD1 (Read&write)	1	0~3	#1 Alarm mode
D0~D3H	AL2 (Read&write)	4	-1999~9999	#2 Alarm setting value
D4~D6H	HY2 (Read&write)	3	0.0~9999	#2 Alarm hysteresis
D7H	AD2 (Read&write)	1	0~3	#2 Alarm mode
D8H	LOCK (Read&write)	1	0~255	Password setting
D9H	In1 (Read&write)	1	0~255	Addres
DA~DBH	ADD (Read&write)	2	0~3	In1 input display unit selection
DC~DFH	FL1 (Read&write)	4	-1999~9999	In1 input low value
EO-E2H	FH1 (Read&write)	3	-1999~9999	In1 input high value

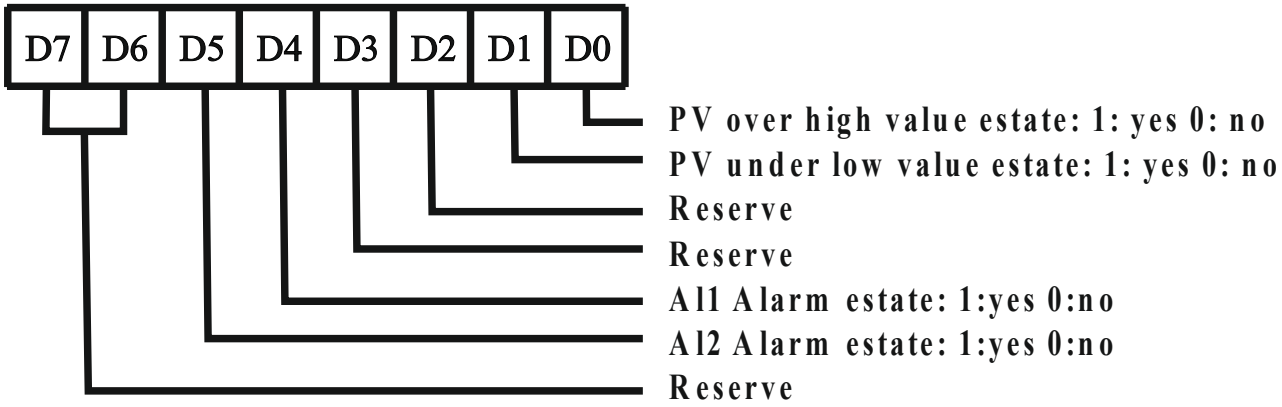
DH FLAG estate signal



For: SV8

Address	Type	Length	Range	Note
61H	FLAG (Read only)	1	0~3FH	Estate signal
62~64H	PV (Read only)	3	-1999~9999	Measuring value
C8~CBH	AL1 (Read&write)	4	-1999~9999	#1 Alarm setting value
CC~CEH	HY1 (Read&write)	3	0.0~9999	#1 Alarm hysterezis
CFH	Ad1 (Read&write)	1	0/1	#1 Alarm mode
D0~D3H	AL2 (Read&write)	4	-1999~9999	#2 Alarm setting value
D4~D6H	HY2 (Read&write)	3	0.0~9999	#2 Alarm hysterezis
D7H	Ad2 (Read&write)	1	0/1	#2 Alarm mode
D8~DAH	PS1 (Read&write)	3	-50.0~50.0	Modify value
DBH	Add (Read&write)	1	0~255	Address
DCH	LOCK (Read&write)	1	0~255	Password setting
DDH	In1 (Read&write)	1	0~8	In1 input display unit selection

SV8 FLAG estate signal



For: DW8

Address	Type	Length	Range	Note
B5H	FLAG (Read only)	1	0~255	Estate signal
B6-B8H	AV (Read only)	3	-1999~9999	Voltage measuring value
B9-BBH	AI (Read only)	3	-1999~9999	Current measuring value
BCH	HZ (Read only)	1	0~500	Watt
BD-BFH	PF (Read only)	3	-1.000~1.000	Power factor
C0-C2H	VAR (Read only)	3	-1999~9999	Active power
C3-C5H	VA (Read only)	3	-1999~9999	Apparent power
C6-C8H	KW (Read only)	3	-1999~9999	Reactive power
C9-CDH	KWH (Read only)	5	-1999~9999	Energy consumption
D1-D4H	AL1(Read & write)	4	-1999~9999	#1 Alarm setting value
D5-D7H	HY1(Read & write)	3	0.000~9999	#1 Alarm hysterezis
D8H	Ad1(Read & write)	1	0/1	#1 Alarm mode
D9-DCH	AL2(Read & write)	4	-1999~9999	#2 Alarm setting value
DD-DFH	HY2(Read & write)	3	0.000~9999	#2 Alarm hysterezis
E0H	Ad2(Read & write)	1	0/1	#2 Alarm mode
E1-E4H	LOCK(Read & write)	1	0~255	Password setting
E5-E7H	ADD(Read & write)	1	0~255	Address

For: PW9

Address	Type	Length	Range	Note
B5H	FLAG (Read only)	1	0~255	Estate signal
B6-B8H	AV (Read only)	3	-1999~9999	Voltage measuring value
B9-BBH	AI (Read only)	3	-1999~9999	Current measuring value
BCH	HZ (Read only)	1	0~500	Watt
BD-BFH	PF (Read only)	3	-1.000~1.000	Power factor
C0-C2H	VAR (Read only)	3	-1999~9999	Active power
C3-C5H	VA (Read only)	3	-1999~9999	Apparent power
C6-C8H	KW (Read only)	3	-1999~9999	Reactive power
C9-CDH	KWH (Read only)	5	-1999~9999	Energy consumption
D1-D4H	AL1 (Read & Write)	4	-1999~9999	#1 Alarm setting value
D5-D7H	HY1 (Read & Write)	3	0.000~9999	#1 Alarm hysterezis
D8H	Ad1 (Read & Write)	1	0/1	#1 Alarm mode
D9-DCH	AL2 (Read & Write)	4	-1999~9999	#2 Alarm setting value
DD-DFH	HY2 (Read & Write)	3	0.000~9999	#2 Alarm hysterezis
E0H	Ad2 (Read & Write)	1	0/1	#2 Alarm mode
E1H	LOCK (Read & Write)	1	0~255	Password setting
E2H	ADD (Read & Write)	1	0~255	Address

DW8, PW9 FLAG estate signal