ADT672 Communicationprotocol

(1) Instructionformat

① Data sendingformat:

A: X: Knnnn: C0: C1: C2: C3: C4+EOS (end of symbol)

A: 1 byte, the instrument's communicationaddress

X: 1 byte, only for W (write) or R(read)

K: 1 byte, M (measure), F (File), O(others)

nnnn: 2-5 bytes, the items operated by Kinstruction

C0: C1: C2: C3: C4: Parameter, please refer the specified instruction introduction Eos：0x0(hex)

② Data returningformat：

A: X: Knnnn: C0: C1: C2: C3: C4+ Eos, hereinto:

A: Instrument communicationaddress

X: E or F, E is error info of this frame dates, F is feedback

info Knnnn: It is same as the instruction from uppermachine

C0: C1: C2: C3: C4: Feedback data or error info

Eos:0x0(hex)

③ The communication setting of serialport

A(address)：the range is 1～112, factory default setting is1

Baud rate: 1200、2400、4800 and 9600 is selected, the factory default setting is 9600 Data bit length: 8bits

Stop bit: 2 bits

Parity digit:N/A

Data flow control:N/A

(2) Instructiondetails

Instructions									FunctionIntroduction	Correct returnvalue
A	X	Knnnn	C0	C1	C2	C3	C4	Eos		
Address	R	OVER	-	-	-	-	-	0X00	Read software versionNo.	A:F:OVER:version No.+Eos
	R	OTYPE	-	-	-	-	-		Read instrument ModeNo.	A:F:OVOK:Mode No.+Eos
	R	OCODE	-	-	-	-	-		Read serialnumber	A:F:OCODE:serial No. OK+Eos
	R	OPRDA	-	-	-	-	-		Read productiondate	A:F:OPRDA:production date OK+Eos
	W	OBLAC	0(close) 1(open)	-	-	-	-		Open/closebacklight	A:F:OBLAC:OK+Eos
	W	OBEEP	0(close) 1(open)	-	-	-	-		Open/closebuzzer	A:F:OBEEP:OK+Eos
	W	OKEY	0(close) 1(open)	-	-	-	-		Open/closekeypad	A:F:OKEY:OK+Eos
	R	OTIME	-	-	-	-	-		Read clock'stime	A:F:OTIME: H: M: S:+Eos
	W	OTIME	hour	minute	second	-	-		Set up clock'sdate	A:F:OTIME:OK+Eos
	R	ODATE	-	-	-	-	-		Read clock'sdate	A:F:ODATE:Y:M:D+Eos
	W	ODATE	year	month	day	-	-		Write clock'sdate	A:F:ODATE:OK+Eos
	R	OBATV	-	-	-	-	-		Read battery's totalvoltage	A:F:OBATV:total voltage+Eos
	R	EXMENU	-	-	-	-	-		Read menu status (0:N/A;1:Available)	A:F:EXMENU:menu status+Eos
	W	EXMENU	-	-	-	-	-		Quit menustatus	A:F:EXMENU:OK+Eos
	R	OADDR	-	-	-	-	-		Read series port'sadd(1-121)	A:F:OADDR:address+Eos
	W	OADDR	address	-	-	-	-		Set series port'sadd(1-121)	A:F:OADDR:OK+Eos
	W	OBAUD	Baudrate	-	-	-	-		1200，2400，4800，9600	A:F:OBAUD:OK+Eos
	W	O24V	0(close) 1(open)	-	-	-	-		Open/close 24Voutput	A:F:O24V:OK+Eos
	W	O24VT	1 (10minute) 2 (30minute) 3 (60minute) 4 (full-open)	-	-	-	-		Set up working time of24V	A:F:O24V:OK+Eos

Instructions									FunctionIntroduction	Correct returnvalue
A	X	Knnnn	C0	C1	C2	C3	C4	Eos		
Address	W	OBIT	P(pressure) E(electricity) A(all)	0 (5digits) 1 (6digits)	-	-	-	0X00	Switch the displayresolution	A:F:OBIT:OK+Eos
	W	OCONT	0(close) 1(open)	-	-	-	-		Set data sendingcontinuously	A:F:OCONT:OK+Eos
	R	ORAN	-	-	-	-	-		Read pressure range andtype (0: gauge or absolute, 1: differential)	A:F:ORAN:lower limit: high limit: pressure unit+Eos
	R	MRMD	-	-	-	-	-		Read current pressurevalue.	A:F:MRMD:P value: unit+Eos
	R	OUINF	-	-	-	-	-		Read the selected pressure unit info code, refer toApp.(5)	A:F:OUINF:unit info code+Eos
	W	OUNIT	ShorteningUnit	-	-	-	-		Switch pressure unit, refer App.4	A:F:OUNIT:OK+Eos
	W	OZERO	-	-	-	-	-		Pressure tozero	A:F:OZERO:OK+Eos
	W	MZERO	P (Pressure) I (Current) V(Voltage)	-	-	-	-		Cancel the previouszeroing	A:F:MZERO:OK+Eos
	R	OPEAK	-	-	-	-	-		Read peakpressure	A:F:OPEAK:High peak value:Lower peak value :unit +Eos
	W	OPKZE	-	-	-	-	-		Clear peak pressure to presentvalue.	A:F:OPKZE:OK+Eos
	W	MRATE	0(low speed) 1(highspeed)	-	-	-	-		Adjust pressuresresponsetime	A:F:MRATE:OK+Eos
	W	MCONE	I (current) V(voltage) T(temperature) S(switch) L(count-down) H(HART)	-	-	-	-		Switch measureitems	A:F:MCONE:OK+Eos

Instructions									FunctionIntroduction	Correct returnvalue
A	X	Knnnn	C0	C1	C2	C3	C4	Eos		
Address	R	MVAL	-	-	-	-	-	0X00	Read measuring electricitydate	Current, voltage, temperature A:F:MVAL:value: mA /V/℃+Eos Switch A:F:MVAL:ON/OFF:SW+Eos Count down A:F:MVAL:START: Start pressure: END:final pressure: hour: minute: second+Eos Return HART function, please refer(8)
	W	OVALZ	-	-	-	-	-		Electnicity zeroing is only effective for I&V	A:F:OVALZ:OK+Eos
	R	OTEMP	-	-	-	-	-		Read environmentTEMP.	A:F:OTEMP:temperature:℃+Eos
	W	MSWI	0 (notrigger) 1 (off→on) 2 (on→off) 3(off→on→off) 4(on→off→on)	-	-	-	-		Set up pressure switch's workingtype.	A:F:MSWI：OK+Eos
	W	MSTIO	-	-	-	-	-		Unlock the triggerswitch	A:F:MSTIO:OK+Eos
	R	RSWI	-	-	-	-	-		Read switch's triggervalue	A:F:RSWI:pressure value: unit: switch on/off status: trigger
	W	MLEKT	hour	minute	second	-	-		Set up leak huntingtime	A:F:MLEKT:OK+Eos
	W	HARTSW	0-8 HARTfunction	-	-	-	-		Switch HART function item0-8	A:F:HARTSW:OK+Eos
	W	FIXAO	4-20mA currentvalue	-	-	-	-		Set transmitter outputting the fixed current. It is canceled if current is0.	A:F:FIXAO:OK+Eos
	W	AOCAIB	0 (4mA) 1 (20mA)	Current calibration	-	-	-		Calibrate the transmitter's loopcurrent	A:F:AOCAIB:OK+Eos
	W	PVCAIB	0 (ZERO) 1 (SPAN)	-	-	-	-		Calibrate the high and lower limit of transmitter	A:F:PVCAIB:OK+Eos
	W	PVTRAN	Highlimit	Lowerlimit	Unit	-	-		Transfer transmitterrange	A:F:PVTRAN:OK+Eos
	W	DAMPING	Dampvalue	-	-	-	-		Set transmitter dampvalue	A:F:DAMPING:OK+Eos
	R	HARTSTA	-	-	-	-	-		Read HART order implementstatus	A:F:HARTSTA:Status (0/1) +Eos

Instructions									FunctionIntroduction	Correct returnvalue
A	X	Knnnn	C0	C1	C2	C3	C4	Eos		
Address	W	HARTCMD	HART sendingframe	-	-	-	-	0X00	Set up HART's command inrandom	HART returnframe
	W	FMODE	0(manual) 1(auto)	0(hour) 1(interval)	0(short) 1(long)	-	-		Set up file storagemode	A:F:FMODE : OK+Eos
	R	FMODE	-	-	-	-	-		Read savemode	A:F:FMODE: manual/automatic: hour : interval: interval time: file (Y/N)+Eos
	W	FTIME	hour	minute	second	-	-		Set the time ofhour-record	A:F:FTIME:OK+Eos
	W	FSTART	1 ~ 30	-	-	-	-		Appoint a file and enter savestatus	A:F:FSTART:OK+Eos
	W	FSAVE	-	-	-	-	-		Save a newrecord	A:F:FSAVE:OK+Eos
	W	FSTOP	-	-	-	-	-		Quit savestatus	A:F:FSTOP:OK+Eos
	R	FRDO	Filenumber	-	-	-	-		Read a file'sdata	Return format refer to(1)
	W	FDELO	Filenumber	-	-	-	-		Delete afile	A:F:FDELO:OK+Eos
	W	FDELA	-	-	-	-	-		Delete allfiles	A:F:FDELA:OK+Eos
	W	OCPS	-	-	-	-	-		Entrance instruction of pressurecalibration	A:F:OCPS:OK+Eos
	W	OCP	Z(zero) M(middle) F(full)	Standard P at calibrationpoint	-	-	-		Input the pressure value and relative calibration point,	A:F:OCP:OK+Eos
	W	OCPOK	1(save)0(cancel)	-	-	-	-		Quit pressurecalibration	A:F:OCPOK:OK+Eos
	W	OCIS	-	-	-	-	-		Entrance instruction for currentcalibration	A:F:OCIS:OK+Eos
	W	OCI	1/ 2/3	Standard I at calibrationpoint	-	-	-		Input the current value and relative calibration point,	A:F:OCI:OK+Eos
	W	OCIOK	1(save)0(cancel)	-	-	-	-		Quit currentcalibration	A:F:OCIOK:OK+Eos
	W	OCVS	-	-	-	-	-		Entrance instruction for voltagecalibration	A:F:OCVS:OK+Eos
	W	OCV	1/ 2/3	Standard V at calibrationpoint	-	-	-		Input the voltage value and relative calibration point,	A:F:OCV:OK+Eos
	W	OCVOK	1(save)0(cancel)	-	-	-	-		Quit voltagecalibration	A:F:OCVOK:OK+Eos
	W	OFALT	P/ I/V	-	-	-	-		Cancel calibration parameter and calculation for P/ I/V, go back to factory	A:F:OFALT:OK+Eos
	W	OTAG	NoteNo.(1 ~ 10)	Notecontent 50 byteslongest	-	-	-		Write note'sinformation	A:F:OTAG:OK+Eos
	R	OTAG	NoteNo.(1 ~ 10)	-	-	-	-		Read note'sinformation	A:F:OTAG:Note #:Note info+Eos

(3) The file's transferformat

```
Filename:F01                /* File name*/
Number:111111               /* the serial No. of second gauge*/
Minscale:001.000            /* Minimum scale value*/
Datesum:01                  /* the saved points in file*/
No.0106/07/0310:29:53       /* Point number, save date,time*/
0.0108MPA                   /* Pressure measure value*/
-0.0000mA                   /* Electricity measure value*/
```

(4) Pressure units shorteninglist

Shortening	H_2O	HG	PSI	MBAR	BAR	PA	KPA	MPA
Standard	mmH_2O	mmHg	psi	mbar	bar	Pa	kPa	MPa

(5) Pressure units infocode

Info code use 1 byte.1: this pressure unit is available; 0:N/A

HG	H_2O	PSI	BAR	MBAR	MPA	KPA	PA
MSB							LSB

(6) The format of automatically datasending

The format length is 32 bytes, and add the Eos 0x0 at the end. Example: *P 0.0364 MPA*I-0.0001 mA

*P 0.0367 MPA*V-0.0158 V

*P 0.0374 MPA*T32.19 ℃

*P 0.0375 MPA*S000000.0 0

*P 0.0397 MPA *L10:00:05

(7) Wrong sequence numberexplanation

1000 Accept outflow frombuffer.
1001 The instruction is being protectednow.
1004 Digital character string havenon-permittedcharacters.
1005 Pressure unit isirregular.
1007 Parameter iswrong.
1016 The data can't meet thezeroingrequirements.
1017 The parameter quantities is notenough.
1018 Unsupportedinstruction.
1019 The format of operation passwordiswrong.
1020 r/w Symbol iswrong.
1021 The file number is out ofrange.
1023 The shortening pressure unitiswrong.
1024 This pressure unit can'tuse.
1025 The series address is out ofrange1-112.
1026 Baud rate iswrong.
1027 The time parameter of 24V open/closeiswrong.
1029 Parameter is toolong.
1030 Not contact with HARTyet.

(8) HART function's returnformat

▶Function 0: Linked the POLLINGsuccessfully

Address: F: MVAL: DEVICE: Manufacture: Equipment type: Equipment
ID Example: 001: F: MVAL: DEVICE: Endress & Hauser: Cerabar M:

▶Function 1: Display the sensor ranges used by HARTtransmitter.

Address: F: MVAL: SENSOR_RANGE: Lower limit of sensor: Higher limit of sensor: Pressureunit

Switch to function 1,it is returned but not enter into the interface yet (example 1); oppositely, it returns after interface displayed (example2)

Example 1: 001: F: MVAL: SENSOR_RANGE: 0.00000000: 0.00000000:NC

Example 2: 001: F: MVAL: SENSOR_RANGE: -40.0000000: 40.0000000:KPA

▶Function 2: Display and transfer the PV range of transmitter, switch PVunits

Address: F: MVAL: PV_RANGE: Lower limit of PV range: Higher limit of PV range: Pressureunit

Switch to function 2, it returned but not enter in the PV interface yet (example 1); oppositely, it returns after interface displayed (example2)

Example------001: F: MVAL: PV_RANGE: 0.00000000: 0.00000000: NC

Example------001: F: MVAL: PV_RANGE: -0.01506382: -0.02472788:KPA

▶Function 3: Display and adjust transmitter's dampvalue

Address: F: MVAL: DAMPING: damp value: Unit

(second) Example------001: F: MVAL: DAMPING: 1.000:s

▶Function 4: Simultaneously display the pressure value measured by calibrator andtransmitter.

Address: F: MVAL: PV/MP_VALUE: pressure measured by transmitter:Unit:pressure measured by calibrator:Unit

Switch to function 4, it returned but not enter in the PV/MP interface (example 1); oppositely, it returns after interface displayed (example2)

Example 1------001: F: MVAL: PV/MP_VALUE: 0.00000: NC: 0.01414:KPA

Example 2------001: F: MVAL: PV/MP_VALUE: 0.00973: KPA: 0.00984:KPA

▶Function 5: Simultaneously display the pressure value measured by calibrator and the current value measured by transmitter

Address:F:MVAL:AO/MP_VALUE:Current value measured by transmitter:Unit:pressure value measured by calibrator:Unit Switch to function 5, it returned but not enter in the AO/MP interface yet (example 1); oppositely, it returns after interface displayed (example2)

Example 1------001: F: MVAL: AO/MP_VALUE: 0.00000: MA: 0.01088:KPA

Example 1------001: F: MVAL: AO/MP_VALUE: 4.00000: MA: 0.01012:KPA

▶Function 6: Simultaneously display the both current value measured by calibrator andtransmitter.

Address: F: MVAL: AO/MI_VALUE:Current value measured by transmitter:unit:current value measured by calibrator:unit Example: 001: F: MVAL: AO/MI_VALUE: 4.00000: MA 4.00265:MA

▶Function 7: Appoint to the fixed current output from transmitter; calibrate the current output fromtransmitter

Address: F: MVAL: FIXAO/MI_VALUE: Current output from transmitter: unit: current value measured by calibrator: unit Switch to function 7, it returned but not enter in the FIXAO/MI_VALUE yet (example 1); oppositely, it returns after it is displayed (example2)

Example1: 001: F: MVAL: FIXAO/MI_VALUE: 0.00000: MA 4.00255:MA

Example2: 001: F: MVAL: FIXAO/MI_VALUE: 4.00000: MA 4.00249:MA

▶Function 8: Calibrate the PV ranges oftransmitter

Address: F: MVAL: MP_VALUE: The pressure value measured by calibrator: unit Example: 001: F: MVAL: MP_VALUE: 0.01025:KPA

▶Function 9: Special calibrationmode

Address: F: MVAL: MP/MI_VALUE: Pressure value measured by calibrator: current value measured by calibrator: unit Example: 001: F: MVAL: MP/MI_VALUE: 0.00346: KPA: 4.00242:MA