

## ADT260Ex SCPI Commands Set- User Version

--V0.0.18

### 1 Commands Instruction

SCPI means Standard Commands for Programmable Instruments, which defines a set of standard syntax and commands for controlling programmable instruments. It communicates with the instrument through ASCII string format. A command generally consists of a series of keywords, some of which also need have parameters. In the protocol, the command is specified in the following form: \* IDN?. In use, it can be the full name or only abbreviations containing uppercase letters. Usually, instrument commands can be divided into controlling commands and query commands. The controlling commands do not have return values, its result can be checked by sending the command SYSTem: ERRor?. The query commands have returned value, and it is also ASCII string.

#### 1.1 Format

Each command includes two parts: **keyword** and **parameter**, different keywords are separated by a colon ':', followed by optional parameters. If there is a "?" after the command, it indicates it is query command. The keyword and the first parameter should be separated by a space

For example:

Command **MEASure:FUNCtion V** has first keyword **MEASure**, and the second keyword is **FUNCtion**. The keywords are separated by ":", with **V** being the parameter and separated from the keywords by space.

Command **MEASure:FUNCtion?** The question mark "?" indicates a query.

#### 1.2 About the symbol

The following symbols are not sent with the command.

a. Vertical line |

A vertical line is used to separate multiple parameters, and one of the parameters must be selected when using the command.

b. Square brackets []

The content in square brackets can be omitted.

c. Triangle brackets<>

The parameters in the triangle brackets must be replaced with a valid value.

### 1.3 About the abbreviation

All commands are not case sensitive, you can use all uppercase or lowercase. But if you want to abbreviate, you must enter all uppercase letters in the command format.

For example: **MEASure:VALUe?** Can be abbreviated as **MEAS:VALU?**

### 1.4 Terminator

The SCPI command must include a command terminator, which can be one of the follows (excluding double quotation marks): "\r\n", "\r", "\n" or "\0". In some serial communication software, select the option "send line break" means that the software will automatically send the command terminator.

## 2 Command lists

### 2.1 IEEE488.2 common commands

| No | Commands | Description                                                                                                                                                 | Parameter | Returned value                                                                   |
|----|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------|
| 1  | *CLS     | Clear error queue                                                                                                                                           | -         | -                                                                                |
| 2  | *IDN?    | Device identification query, the returned data is divided into 4 parts:<br>1. Product serial number<br>2. Software version<br>3. Sub-model type<br>4. Model | -         | 1. Product serial number<br>2. Software version<br>3. Sub-model type<br>4. Model |
| 3  | *RST     | Program reset                                                                                                                                               | -         | -                                                                                |

## 2.2 Measurement and configuration commands

| No | Commands                                                                           | Description                                                                                                                                                                                                                                         | Parameter                                                                                                                                                                                                                                                                                                                           | Returned value                                                                                                                                                                                                                                                                                                                        |
|----|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | MEASure:RANge? "<UnquoStr>,<UnquoStr>,<UnquoStr>,<UnquoStr>,<UnquoStr>,<UnquoStr>" | Read the range of the current measure item, up to 6 channels, but must be the current channel                                                                                                                                                       | Double quoted string, separated by ","<br>Channel name: V mV mA Hz Pulse Switch   DRTD_CH1 DRTD_CH2 DPM EPMA EPMB IPM ATM                                                                                                                                                                                                           | "channel name, lower limit, upper limit, unit ID", different sequences are separated by semicolons;<br>Each sequence contains "channel name, lower limit, upper limit, unit ID";                                                                                                                                                      |
| 2  | MEASure:RTD1:CONFig?                                                               | Read RTD1 channel configuration (available when RTD_CH1 is in current list)<br>For device with firmware version DPC-EX V0.33.29.8 and higher, we suggest replace this commands with<br><b>DATAlogger:RTD#:RTDConfig?</b>                            | -                                                                                                                                                                                                                                                                                                                                   | Parameter 1, Parameter 2 [Parameter 3, Parameter 4]<br>Parameter 1: Sensor type: Please refer to appendix 5.<br>Parameter 2: wires 2(2 wires), 3(3 wires), 4(4 wires)<br>Parameter 3: temperature unit<br>1000(K),1002(F),1001(°C)<br>Parameter 4: decimal digits(0,1,2,3)<br>Parameter 3 and parameter 4 are only for non-ohm sensor |
| 3  | MEASure:RTD1:CONFig <int>,0[1 2 >,<int>,0[1 2 3]                                   | Set RTD1 channel configuration (available when RTD_CH1 is in current list and data log has not started)<br>For device with firmware version DPC-EX V0.33.29.8 and higher, we suggest replace this commands with<br><b>DATAlogger:RTD#:RTDConfig</b> | Parameter 1, Parameter 2 [Parameter 3, Parameter 4]<br>Parameter 1: Sensor type: Please refer to appendix 5.<br>Parameter 2: wires 2(2 wires), 3(3 wires), 4(4 wires)<br>Parameter 3: temperature unit 1000(K),1002(F),1001(°C)<br>Parameter 4: decimal digits (0,1,2,3)<br>Parameter 3 and parameter 4 are only for non-ohm sensor | -                                                                                                                                                                                                                                                                                                                                     |

| No  | Commands                                                                           | Description                                                                                                                                                                                                                                         | Parameter                                                                                                                                                                                                                                                                                                                           | Returned value                                                                                                                                                                                                                                                                                                                      |
|-----|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4 - | MEASure:RTD2:CONFig?                                                               | Read RTD2 channel configuration (available when RTD_CH2 is in current list)<br>For device with firmware version DPC-EX V0.33.29.8 and higher, we suggest replace this commands with<br><b>DATAlogger:RTD#:RTDConfig?</b>                            | -                                                                                                                                                                                                                                                                                                                                   | Parameter 1, Parameter 2 [Parameter 3, Parameter 4]<br>Parameter 1: Sensor type: Please refer to appendix 5.<br>Parameter 2: wires 2(2 wires), 3(3 wires), 4(4 wires)<br>Parameter 3: temperature unit 1000(K),1002(F),1001(°C)<br>Parameter 4: decimal digits (0,1,2,3)<br>Parameter 3 and parameter 4 are only for non-ohm sensor |
| 5   | MEASure:RTD2:CONFig <int>,0[1]2[,<int>,0[1]2[3]                                    | Set RTD2 channel configuration (available when RTD_CH2 is in current list and data log has not started)<br>For device with firmware version DPC-EX V0.33.29.8 and higher, we suggest replace this commands with<br><b>DATAlogger:RTD#:RTDConfig</b> | Parameter 1, Parameter 2 [Parameter 3, Parameter 4]<br>Parameter 1: Sensor type: Please refer to appendix 5.<br>Parameter 2: wires 2(2 wires), 3(3 wires), 4(4 wires)<br>Parameter 3: temperature unit 1000(K),1002(F),1001(°C)<br>Parameter 4: decimal digits (0,1,2,3)<br>Parameter 3 and parameter 4 are only for non-ohm sensor | -                                                                                                                                                                                                                                                                                                                                   |
| 6   | MEASure:VALue? "<UnquoStr>,<UnquoStr>,<UnquoStr>,<UnquoStr>,<UnquoStr>,<UnquoStr>" | Read the measured value of the current measure item, up to 6 channels, but must be the current channel                                                                                                                                              | Double quoted string, separated by ","<br>Channel name: V mV mA Hz Pulse Switch   DRTD_CH1  DRTD_CH2 DPM EPMA EPMB IPM ATM                                                                                                                                                                                                          | "channel name, measured value, unit ID", different sequences are separated by semicolons;<br>Each sequence contains "channel name, measured value, unit ID ";<br>For DRTD channel, it has two measured                                                                                                                              |

| No | Commands                                | Description                                                                                                                                                                                                                  | Parameter                                                                                 | Returned value                                                                                                                                                                                  |
|----|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                         |                                                                                                                                                                                                                              |                                                                                           | values, they are "channel name, measured value, unit ID, measured value 2, measured value 2 unit ID";<br>For ATM channel, it is "channel name, measured value, unit ID, env.temperature, 1001"; |
| 7  | MEASure:ZERO <UnquoStr >                | Channel zero (available when the channel is in current list and data log has not started)                                                                                                                                    | Parameter 1: channel name: V  mV  mA  Hz  Pulse <br>DRTD_CH1  DRTD_CH2  DPM EPMA EPMB IPM | -                                                                                                                                                                                               |
| 8  | MEASure:CZERo <UnquoStr >               | Cancel channel zero (available when the channel is in current list and data log has not started)                                                                                                                             | Parameter 1: channel name: V  mV  mA  Hz  Pulse <br>DRTD_CH1  DRTD_CH2  DPM EPMA EPMB IPM | -                                                                                                                                                                                               |
| 9  | MEASure:CURRent24V?                     | Read the loop power status of current channel                                                                                                                                                                                | -                                                                                         | 1(on), 0(off)                                                                                                                                                                                   |
| 10 | MEASure:CURRent24V <boolean> <br>On Off | Set the loop power status of current channel                                                                                                                                                                                 | 0 or Off<br>1 or On                                                                       | -                                                                                                                                                                                               |
| 11 | DATALOGger:RTD#.RTDConfig?              | Read designated RTD channel configuration, channel is defined by suffix (1 or 2)<br>Firmware version should be at least DPC-EX V0.33.29.8<br>Examples:<br>DATALOGger:RTD1:RTDConfig:ECHO?<br>DATALOGger:RTD2:RTDConfig:ECHO? |                                                                                           | Sensor name<br>Temperature unit ID<br>Resolution 0->0 1->0.1 2->0.01 3->0.001<br>Wire 2,3,4                                                                                                     |

| No | Commands                  | Description                                                                                                                                                                                                                                                          | Parameter                                                                                                                                                   | Returned value |
|----|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 12 | DATALOGger:RTD#:RTDConfig | Set designated RTD channel configuration, channel is defined by suffix (1 or 2)<br>Firmware version should be at least DPC-EX V0.33.29.8<br>Examples:<br>DATALOGger:RTD1:RTDConfig:ECHO<br>"Cu50(428)", 1002,2,2<br>DATALOGger:RTD1:RTDConfig:ECHO<br>"ohm",1281,3,4 | Parameter 1 Sensor type, such as:<br>"Pt50(385)", "400ohm", "Cu50(428)"<br>Parameter 2 unit ID<br>Parameter 3 resolution 0,1,2,3<br>Parameter 4 wires 2,3,4 | None           |

### 2.3 Pressure commands

| No | Commands                                | Description                                                                                      | Parameter                                                                                                                                                                                        | Returned value                           |
|----|-----------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| 1  | PRESSure:RANGe? 0 1 2 3 4,0 1           | Read the range of designated module (valid when the module is online)                            | Parameter 1: 0 IPM; 1 ExtA; 2 ExtB; 3 DP; 4 ATM<br>Parameter 2: 0 origin range, 1 display range                                                                                                  | Lower limit, upper limit, unit ID, G A D |
| 2  | PRESSure? 0 1 2 3 4                     | Read the measured value of the designated module (valid when the module online)                  | 0: IPM<br>1: ExtA<br>2: ExtB<br>3: DP<br>4: ATM                                                                                                                                                  | measured value, unit ID, G A D           |
| 3  | PRESSure:EPM:STAT? 1 2                  | Read the online status of external module                                                        | Parameter: 1 ExtA; 2 ExtB;                                                                                                                                                                       | 0 offline; 1 online                      |
| 4  | PRESSure:UNIT 0 1 2 3, <int> <QuoteStr> | Set the unit of designated module (valid when the module is online and it is the current module) | Parameter 1: 0 IPM; 1 ExtA; 2 ExtB; 3 DP<br>Parameter 2: unit ID or unit string (allow users set custom unit string, case sensitive, cannot be special mark like °C, °F, need double quote mark) | -                                        |

| No | Commands                                                                                                   | Description                                                                                              | Parameter                                                                                                                                                                                                                                                                                                                                                 | Returned value                                                                                                                                                                                                                                                                                                                                                |
|----|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5  | PRESsure:BASEconfig? 0 1 2 3                                                                               | Read the parameter of designated module<br>(valid when the module is online)                             | Parameter 1: 0 IPM; 1 ExtA; 2 ExtB; 3 DP                                                                                                                                                                                                                                                                                                                  | When parameter= 0   1   2, return:<br>1: Unit ID,<br>2: G A,<br>3: resolution,<br>4: measurement frequency,<br>5: tare enable,<br>6: tare value,<br>7: stabilization enable,<br>8: stabilization value%<br>9: stabilization time<br>When parameter= 3, return:<br>1: Unit ID,<br>2: stabilization enable,<br>3: stabilization value%<br>4: stabilization time |
| 6  | PRESsure:BASEconfig 0 1 2 3,<int> <QuoteStr>,<boolean>,<value>,<value>[,G A,<int>,<int>,<boolean>,<value>] | Set the parameter of designated module<br>(valid when the module is online and it is the current module) | Parameter 1: 0 IPM; 1 ExtA; 2 ExtB; 3 DP<br>When parameter 1=0   1   2,<br>2: unit ID or unit string (allow users set custom unit string, case sensitive, cannot be special mark like °C, °F, need double quote mark)<br>3: stabilization enable(0 1)<br>4: stabilization value [0.001~5] %<br>5: stabilization time[1~60](unit: s)<br>6: G A(G:GP, A:AP) | -                                                                                                                                                                                                                                                                                                                                                             |

| No | Commands                                                                                  | Description                   | Parameter                                                                                                                                                                                                                                                                                                                                                                                    | Returned value                                                                                                                                                                                                                    |
|----|-------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                                                           |                               | 7: resolution [4~6]<br>8: measurement frequency[1~10](unit: Hz)<br>9: tare enable(0 1)<br>10: tare value<br>When parameter 1=3,<br>2: unit ID or unit string (allow users set custom unit string, case sensitive, cannot be special mark like °C, °F, need double quote mark)<br>3: stabilization enable(0 1)<br>4: stabilization value [0.001~5] %<br>5: stabilization time [1~60](unit: s) |                                                                                                                                                                                                                                   |
| 7  | DIFFpressure:BASEconfig?                                                                  | Read DP module(app) parameter | -                                                                                                                                                                                                                                                                                                                                                                                            | Parameter 1: status, 0=disable; 1=enable<br>Parameter 2: original resolution<br>Parameter 3: original lower limit<br>Parameter 4: original upper limit<br>Parameter 5: original unit ID<br>Parameter 6: calculation, 0=A-B; 1=B-A |
| 8  | DIFFpressure:BASEconfig<br><boolean>,4 5 6 <br>7,<value>,<value>,<int> <br><QuoteStr>,0 1 | Set DP module(app) parameter  | Parameter 1: status, 0=disable; 1=enable<br>Parameter 2: original resolution<br>Parameter 3: original lower limit<br>Parameter 4: original upper limit<br>Parameter 5: original range unit ID or unit string (allow users set custom unit string, case sensitive, cannot be special mark like °C, °F, need double quote mark)                                                                | -                                                                                                                                                                                                                                 |

| No | Commands                                               | Description                                                                                                      | Parameter                                                                                                                                                                                           | Returned value                                                                                                                                                                                   |
|----|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9  | PRESsure:STABleconfig? 0 1 2 3                         | Read stabilization parameter of designated module (valid when the module is online)                              | Parameter 6: calculation, 0=A-B; 1=B-A<br>0:IPM<br>1:ExtA<br>2:ExtB<br>3:DP                                                                                                                         | 0 1(enable status), stabilization value(%), stabilization time(s)                                                                                                                                |
| 10 | PRESsure:STABleconfig 0 1 2 3, <boolean>,<value>,<int> | Set stabilization parameter of designated module (valid when the module is online and it is the current channel) | Parameter 1:0 IPM; 1 ExtA; 2 ExtB; 3 DP<br>Parameter 2: stabilization enable, 0=disable, 1=enable<br>Parameter 3: stabilization value [0.001~5] %<br>Parameter 4: stabilization time[1~60](unit: s) | -                                                                                                                                                                                                |
| 11 | PRESsure:TAREconfig? 0 1 2                             | Read the tare parameter of the designated module (valid when the module is online)                               | Parameter 1:0 IPM;1 ExtA; 2 ExtB;                                                                                                                                                                   | Parameter 1: 0=disable, 1=enable<br>Parameter 2: tare value<br>Parameter 3: Unit ID                                                                                                              |
| 12 | PRESsure:TAREconfig 0 1 2,0 1,<Numeric>                | Set the tare parameter of the designated module (valid when the module is online and it is the current channel)  | Parameter 1:0 IPM; 1 ExtA; 2 ExtB;<br>Parameter 2: tare enable, 0=disable, 1=enable<br>Parameter 3: tare value(based on current Unit)                                                               | -                                                                                                                                                                                                |
| 13 | PRESsure:FILTer? 0 1 2 3                               | Read the filter parameter of the designated module (valid when the module is online)                             | Parameter 1:0 IPM;1 ExtA; 2 ExtB; 3 DP                                                                                                                                                              | Parameter 1:0 1, enable status<br>Parameter 2:0, first-order filter; 1, average filter<br>Parameter 3:<br>When Parameter 2=0, first-order filter coefficient;<br>When Parameter 2=1, window size |
| 14 | PRESsure:FILTer 0 1 2 3, <boolean>,0 1,<value>         | Set the filter parameter of the designated module (valid when the module is online)                              | Parameter 1: 0 IPM; 1 ExtA; 2 ExtB; 3 DP<br>Parameter 2: enable status 0 1,                                                                                                                         | -                                                                                                                                                                                                |

| No | Commands               | Description                               | Parameter                                                                                                                                                                 | Returned value      |
|----|------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
|    |                        | and it is the current channel)            | Parameter 3: 0, first-order filter; 1, average filter<br>Parameter 4: when parameter 3=0, first-order filter coefficient [0.01~1]; when parameter 3=1, window size [1~50] |                     |
| 15 | PRESSure:EPM:STAT? 1 2 | Read the online status of external module | Parameter: 1 ExtA; 2 ExtB;                                                                                                                                                | 0 offline; 1 online |

## 2.4 Calibration commands

| No. | Commands                                                                            | Description                                                                                                                                      | Parameter                                                                                                                                                                                                                                                                                                                                                                           | Returned value                                                                           |
|-----|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| 1   | CALibration:EM:DATA<br>123456,<item>,<count>,<points>,<values>,<year>,<month>,<day> | Write EM board calibration data.<br>Cannot be used when the device is in calibration (valid when the measurement item is in the current channel) | 1. 123456: user calibration;<br>2.item: measurement item;<br>【 0: (-30~30)V measure, unit V<br>1: (-300~300)mV measure, unit mV<br>2: (-30~30)mA measure, unit mA<br>3: (0.01~50k)Hz measure, unit Hz】<br>3.count;<br>4.points: calibration points(quoted string, separated by comma)<br>5.values: reference value(quoted string, separated by comma)<br>6.year<br>7.month<br>8.day | -                                                                                        |
| 2   | CALibration:EM:DATA? 123456,<item>                                                  | Read EM board calibration data.<br>Cannot be used when the device is in                                                                          | 1. 123456: user calibration;<br>2. measurement item 【 0: (-30~30)V measure, unit V                                                                                                                                                                                                                                                                                                  | Points, calibration point list (quoted string, separated by comma), reference value list |

| No. | Commands                                                                              | Description                                                                                                                                                                                                      | Parameter                                                                                                                                                                                                                                                                                                           | Returned value                                                                                                              |
|-----|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
|     |                                                                                       | calibration (valid when the measurement item is in the current channel)                                                                                                                                          | 1: (-300~300)mV measure, unit mV<br>2: (-30~30)mA measure, unit mA<br>3: (0.01~50k)Hz measure, unit Hz】                                                                                                                                                                                                             | (quoted string, separated by comma), year, month, day<br><br>Return "No Calibration Data" when there is no calibration data |
| 3   | CALibration:EM:PRESet 123456,<item>                                                   | Reset/ clear EM board calibration data.<br>Cannot be used when the device is in calibration (valid when the measurement item is in the current channel)<br>(EM firmware needs to be EM-EX V00.00.00.12 or later) | 1. 3721: clear manufacturer calibration data;<br>123456: restore to manufacturer calibration data;<br>2.measurement item 【 0: (-30~30)V measure, unit V<br>1: (-300~300)mV measure, unit mV<br>2: (-30~30)mA measure, unit mA<br>3: (0.01~50k)Hz measure, unit Hz】                                                  | -                                                                                                                           |
| 4   | CALibration:DRTD:DATA<br>123456,<item>,<count>,<points>,<values>,<year>,<month>,<day> | Read DRTD calibration data. Cannot be used when the device is in calibration (valid when the measurement item is in the current channel)                                                                         | 1: 123456: user calibration<br>2: item: measurement item<br>【 0: CH1(0~400)Ω measure, unit Ω<br>1: CH2(0~400)Ω measure, unit Ω】<br>3: count:<br>4: points: calibration points(quoted string, separated by comma)<br>5: values: reference values(quoted string, separated by comma)<br>6: year<br>7: month<br>8: day | -                                                                                                                           |
| 5   | CALibration:DRTD:DATA?                                                                | Read DRTD calibration data. Cannot                                                                                                                                                                               | 1: 123456: user calibration                                                                                                                                                                                                                                                                                         | Points, calibration point list (quoted string,                                                                              |

| No. | Commands                                                                                            | Description                                                                                                                                         | Parameter                                                                                                                                                                                                                                         | Returned value                                                                                                                                                                                                      |
|-----|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | 123456,<item>                                                                                       | be used when the device is in calibration (valid when the measurement item is in the current channel)                                               | 2: item: measurement item<br>【 0: CH1(0~400) $\Omega$ measure, unit $\Omega$<br>1: CH2(0~400) $\Omega$ measure, unit $\Omega$ 】                                                                                                                   | separated by comma), reference value list (quoted string, separated by comma), year, month, day<br>Return "No Calibration Data" when there is no calibration data                                                   |
| 6   | CALibration:DRTD:PRESet<br>123456,<item>                                                            | Reset/ clear DRTD calibration data.<br>Cannot be used when the device is in calibration (valid when the measurement item is in the current channel) | 1: 123456: user calibration<br>2: item: measurement item<br>【 0: CH1(0~400) $\Omega$ measure, unit $\Omega$<br>1: CH2(0~400) $\Omega$ measure, unit $\Omega$ 】                                                                                    | -                                                                                                                                                                                                                   |
| 7   | CALibration:BARosensor:DUALdata<br>123456,<point1>, <value1>,<point2>,<value2>,<year>,<month>,<day> | Write dual-point calibration data of the barometric sensor, unit is kPa, absolute.<br>Cannot be used when the device is in calibration              | 1. 123456: user calibration ;<br>2.point1: reference point 1 [60~130] kPa ;<br>3.value1: original measure value 1, kPa ;<br>4.point2: reference point 2 [60~130] kPa ;<br>5.value2: original measure value 2, kPa ;<br>6.year<br>7.month<br>8.day | -                                                                                                                                                                                                                   |
| 8   | CALibration:BARosensor:DUALdata?<br>123456                                                          | Read dual-point calibration data of the barometric sensor, unit is kPa, absolute<br>Cannot be used when the device is in calibration                | 123456: user calibration                                                                                                                                                                                                                          | If calibration data exists:<br>points, calibration points list(quoted string, separated by comma), reference value list (quoted string, separated by comma), year, month, day<br>If calibration data doesn't exist: |

| No. | Commands                                                                     | Description                                                                                                                | Parameter                                                                                                                                    | Returned value                                                                                                                         |
|-----|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                              |                                                                                                                            |                                                                                                                                              | No Calibration Data                                                                                                                    |
| 9   | CALibration:BARosensor:PRESetdual<br>123456                                  | Restore dual-point calibration data of the barometric sensor<br><br>Cannot be used when the device is in calibration       | 123456: user calibration                                                                                                                     | -                                                                                                                                      |
| 10  | CALibration:BARosensor:OFFSet<br>123456,<point>,<value>,<year>,<month>,<day> | Write single-point calibration data of barometric sensor, unit kPa<br><br>Cannot be used when the device is in calibration | 1. 123456: user calibration ;<br>2.point: reference value [60~130] kPa<br>3.value: original measure value, kPa<br>3.year<br>4.month<br>5.day | -                                                                                                                                      |
| 11  | CALibration:BARosensor:OFFSet?<br>123456                                     | Read single-point calibration data of barometric sensor, unit kPa<br><br>Cannot be used when the device is in calibration  | 123456: user calibration                                                                                                                     | If calibration data exists:<br>reference value, readout, year, month, day<br>If calibration data doesn't exist:<br>No Calibration Data |
| 12  | CALibration:BARosensor:PRESetoffset<br>123456                                | Restore single-point calibration data of barometric sensor<br><br>Cannot be used when the device is in calibration         | 123456: user calibration                                                                                                                     | -                                                                                                                                      |

## 2.5 System commands

| No. | Commands                                               | Description                                                              | Parameter                                         | Returned value                                                                  |
|-----|--------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------|
| 1   | SYSTem:VERsion?<br>["APPLication"]["HARDware"]["EM:FIR | Read the device version information<br>(note to input correct parameter) | Optional parameter:<br>APPLication" host version, | The default return is host version, otherwise it will be corresponding versions |

| No. | Commands                                                                                                                                                                   | Description                                                                                                                                                                                                       | Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Returned value |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|     | Mware"]["EM:HARDware"]["DTM:FIR<br>Mware"]["DTM:HARDware"]["IPM:FIR<br>Mware"]["IPM:HARDware"]["EPMA:FI<br>RMware"]["EPMA:HARDware"]["EPM<br>B:FIRMware"]["EPMB:HARDware"] |                                                                                                                                                                                                                   | "HARDware" OS hardware version ,<br>"EM:FIRMware" EM board firmware version ,<br>"EM:HARDware" EM board hardware version ,<br>"DTM:FIRMware" dual-channel RTD measurement board<br>firmware version,<br>"DTM:HARDware" dual-channel RTD measurement board<br>hardware version,<br>"IPM:FIRMware" internal pressure module firmware<br>version,<br>"IPM:HARDware" internal pressure module hardware<br>version,<br>"EPMA:FIRMware" external pressure module A firmware<br>version,<br>"EPMA:HARDware" external pressure module A hardware<br>version,<br>"EPMB:FIRMware" external pressure module B firmware<br>version,<br>"EIPMB:HARDware" external pressure module A hardware<br>version. |                |
| 2   | SYSTem:ERRor?                                                                                                                                                              | Read the next error item in error queue and<br>delete it. Error queue can store up to 20<br>items. If more than 20 items, the last one<br>will be -350, " Queue overflow"<br>Powering off the system or send *CLS | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Error message  |

| No. | Commands                                | Description                                                         | Parameter                                                                             | Returned value       |
|-----|-----------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------|
|     |                                         | command can clear the error queue                                   |                                                                                       |                      |
| 3   | SYSTem:ERRor:COUNT?                     | Read the count of error items                                       | -                                                                                     | -                    |
| 4   | SYSTem:SN?                              | Read unit's serial number                                           | -                                                                                     | Serial number        |
| 5   | SYSTem:MODEl?                           | Read unit's model                                                   | -                                                                                     | Model                |
| 6   | SYSTem:DATE<br><year>,<month>,<day>     | Set system date                                                     | Year:< numeric_value>; [2000~2099]<br>Month:< numeric_value>;<br>Day:< numeric_value> | -                    |
| 7   | SYSTem:DATE?                            | Read system date                                                    | -                                                                                     | Year, month, day     |
| 8   | SYSTem:TIME<br><hour>,<minute>,<second> | Set system time                                                     | hour:< numeric_value>;<br>minute:< numeric_value>;<br>second:< numeric_value>         | -                    |
| 9   | SYSTem:TIME?                            | Read system time                                                    | -                                                                                     | Hour, minute, second |
| 10  | SYSTem:BATTery:Backlight?               | Read backlight status                                               | -                                                                                     | 1, ON; 0, OFF        |
| 11  | SYSTem:BATTery:Backlight 0 1            | Set backlight status                                                | 1, ON; 0, OFF                                                                         |                      |
| 12  | SYSTem:BATTery:BLOF?                    | Read auto backlight off time:<br>1: 30 s<br>2: 5 mins<br>3: 30 mins | -                                                                                     | 1 2 3                |
| 13  | SYSTem:BATTery:BLOF 1 2 3               | Set auto backlight off time:<br>1: 30 s<br>2: 5 mins<br>3: 30 mins  | 1 2 3                                                                                 | -                    |
| 14  | SYSTem:BATTery:ASleep?                  | Read auto sleep time:<br>0: never                                   |                                                                                       | 0 3 4 5              |

| No. | Commands                      | Description                                                                        | Parameter | Returned value                             |
|-----|-------------------------------|------------------------------------------------------------------------------------|-----------|--------------------------------------------|
|     |                               | 3: 30 mins;<br>4: 60 mins;<br>5: 90 mins;                                          |           |                                            |
| 15  | SYSTem:BATTery:ASLeep 0 3 4 5 | Set auto sleep time:<br>0: never<br>3: 30 mins;<br>4: 60 mins;<br>5: 90 mins;      | 0 3 4 5   | -                                          |
| 16  | SYSTem:BATTery:POTime?        | Read auto power off time:<br>0: never<br>3: 30 mins;<br>4: 60 mins;<br>5: 90 mins; | -         | 0 3 4 5                                    |
| 17  | SYSTem:BATTery:POTime 0 3 4 5 | Set auto power off time:<br>0: never<br>3: 30 mins;<br>4: 60 mins;<br>5: 90 mins;  | 0 3 4 5   | -                                          |
| 18  | SYSTem:BATTery:CHARGing?      | Read battery(charge) status                                                        |           | 0 normal;<br>1 low battery;<br>2 charging; |
| 19  | SYSTem:BATTery:TYPE?          | Read battery type                                                                  |           | 0: dry battery<br>1: Li-ion battery        |
| 20  | SYSTem:BATTery:ADAPter?       | Read the power adaptor status                                                      |           | 0: no adaptor                              |

| No. | Commands                        | Description                    | Parameter                                                                                                                                                                                       | Returned value                                                                                        |
|-----|---------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
|     |                                 |                                |                                                                                                                                                                                                 | 1: adaptor plugged                                                                                    |
| 21  | SYSTem:BATTery:VOLTage?         | Read battery voltage (unit: V) |                                                                                                                                                                                                 | Battery voltage                                                                                       |
| 22  | SYSTem:SCREentest <Int>         | Read screen test result        | Types of test:<br>0: dead pixel detection;<br>1: touch test<br>2: button test<br>3: beep test                                                                                                   | Result:<br>0: no result<br>1: failure<br>2: pass                                                      |
| 23  | SYSTem:SCREentest:CLR [0 1 2 3] | Clear result of screen test    | Below parameters are optional. In case of no parameter, all results will be returned.<br>0: clear dead pixel detection;<br>1: clear touch test;<br>2: clear button test;<br>3: clear beep test; | -                                                                                                     |
| 24  | SYSTem:SCREentest? <Int>        | Read screen test result        | Types of test:<br>0: dead pixel detection;<br>1: touch test<br>2: button test<br>3: beep test                                                                                                   | Result:<br>0: no result<br>1: failure<br>2: pass                                                      |
| 25  | SYSTem:LANGuage?                | Read system language           |                                                                                                                                                                                                 | [0: 简体中文; 1: English; 2: 繁體中文; 3: Deutsche; 4: Español; 5: Français; 6: Italiano; 7: 日本語; 8: Русский] |
| 26  | SYSTem:LANGuage <Int>           | Set system language            | Parameter<br>[0: 简体中文; 1: English; 2: 繁體中文; 3: Deutsche; 4: Español; 5: Français; 6: Italiano; 7: 日本語; 8: Русский]                                                                              |                                                                                                       |

| No. | Commands                        | Description                | Parameter       | Returned value                                     |
|-----|---------------------------------|----------------------------|-----------------|----------------------------------------------------|
| 27  | SYSTem:BT:STAT?                 | Read Bluetooth status      |                 | 0 off; 1 on                                        |
| 28  | SYSTem:BT:STAT <boolean> On Off | Set Bluetooth status       | 0, Off<br>1, On |                                                    |
| 29  | SYSTem:BT:MAC?                  | Read Bluetooth MAC address |                 | Bluetooth MAC address<br>sample: 68:0a:e2:de:a6:3d |
| 30  | SYSTem:BT:NAME?                 | Read Bluetooth name        |                 | Bluetooth name                                     |
| 31  | SYSTem:PWR:OFF                  | Power off                  |                 |                                                    |

## 2.6 Display commands

| No. | Commands                                                | Description                                                                           | Parameter                                                                                                                  | Returned value              |
|-----|---------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| 1   | DISPlay:HOME                                            | Jump to Home screen                                                                   | -                                                                                                                          |                             |
| 2   | DISPlay:SCREEn <val>                                    | Jump to designated screen                                                             | 0: dead pixel detection;<br>1: touch test<br>2: button test<br>3: beep test<br>4: Calibrator<br>5: Home                    |                             |
| 3   | DISPlay:SCREEn:SHOT                                     | Screenshot                                                                            |                                                                                                                            |                             |
| 4   | DISPlay:SCREEn:LOCK <Boolean> ON OFF                    | Set screen lock status                                                                | 0 OFF unlocked ;1 ON locked                                                                                                | None                        |
| 5   | DISPlay:SCREEn:LOCK?                                    | Read screen lock status                                                               | None                                                                                                                       | 0 OFF unlocked ;1 ON locked |
| 6   | DISPlay:ACLOud:CAPTcha <Boolean>[, <QuoteStr>, <Value>] | Enable/disable verification code window<br>example:<br>DISPlay:ACLOud:CAPTcha:ECHO 1, | 1: 0 1(off   on)<br>2: Display content of verification code window<br>3: Display time of verification code window (minute) | None                        |

| No. | Commands | Description                                 | Parameter | Returned value |
|-----|----------|---------------------------------------------|-----------|----------------|
|     |          | "123456",1<br>DISPlay:ACLOud:CAPTcha:ECHO 0 |           |                |

## 2.7 Data management commands

| No. | Commands                                                                                            | Description            | Parameter                                                                                                                                                                      | Returned value                                                   |
|-----|-----------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| 1.  | DATamanager:COUNt? LEAKtest <br>SAFEtyvalvetest  SNAPshot <br>DATAlogger ATT                        | Read data count        | LEAKtest<br>SAFEtyvalvetest<br>SNAPshot:<br>DATAlogger:<br>ATT: air tightness test                                                                                             | Data count                                                       |
| 2.  | DATamanager:INFo? LEAKtest <br>SAFEtyvalvetest  SNAPshot <br>DATAlogger <br>ATT,<Numeric>,<Numeric> | Read data information  | 1: LEAKtest<br>SAFEtyvalvetest<br>SNAPshot<br>DATAlogger<br>ATT: air tightness test<br>2: start, start data position (start from 0)<br>3: count , read length,[1 ~ data count] | Information (base64 format string, items are separated by comma) |
| 3.  | DATamanager:DEL LEAKtest <br>SAFEtyvalvetest  SNAPshot <br>DATAlogger ATT,< QuoteStr>               | Delete test result     | 1: LEAKtest<br>SAFEtyvalvetest<br>SNAPshot<br>DATAlogger<br>ATT: air tightness test<br>2: name of delete operation (quoted)                                                    | Success or not 0 1                                               |
| 4.  | DATamanager:DEL:ALL LEAKtest                                                                        | Delete all test result | 1: LEAKtest                                                                                                                                                                    | Success or not 0 1                                               |

|    |                                                                                                                |                                      |                                                                                                                                                                            |                      |
|----|----------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
|    | SAFEtyvalvetest  SNAPshot <br>DATAlogger ATT                                                                   |                                      | SAFEtyvalvetest<br>SNAPshot<br>DATAlogger<br>ATT: air tightness test                                                                                                       |                      |
| 5. | DATamanager:LENGth? LEAKtest <br>SAFEtyvalvetest  SNAPshot <br>DATAlogger ATT,< QuoteStr>                      | Read data length                     | 1: LEAKtest<br>SAFEtyvalvetest<br>SNAPshot<br>DATAlogger<br>ATT: air tightness test<br>2: data name(quoted)                                                                | Data length          |
| 6. | DATamanager:DATA? LEAKtest <br>SAFEtyvalvetest  SNAPshot <br>DATAlogger ATT,<<br>QuoteStr>,<Numeric>,<Numeric> | Read designated data                 | 1: LEAKtest<br>SAFEtyvalvetest<br>SNAPshot<br>DATAlogger<br>ATT: air tightness test<br>2: data name (quoted)<br>3: starting position (start from 0)<br>4: read data length | Base64 format string |
| 7. | DATamanager:LENGth:BYIndex?<br>LEAKtest SAFEtyvalvetest <br>SNAPshot DATAlogger ATT,<br><Numeric>              | Read data length based on file index | 1: LEAKtest<br>SAFEtyvalvetest<br>SNAPshot<br>ATT: air tightness test<br>2: file index                                                                                     | Data length          |
| 8. | DATamanager:DATA:BYIndex?<br>LEAKtest SAFEtyvalvetest                                                          | Read data based on file index        | 1: LEAKtest<br>SAFEtyvalvetest                                                                                                                                             | Base64 format string |

|  |                                                               |  |                                                                                                                    |  |
|--|---------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------|--|
|  | SNAPshot[DATAlogger]<br>ATT,<Numeric<br>>,<Numeric>,<Numeric> |  | SNAPshot<br>ATT: air tightness test<br>2: file index<br>3: starting position (start from 0)<br>4: read data length |  |
|--|---------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------|--|

## 2.8 Data log commands

| No. | Commands                                                                                        | Description                                   | Parameter                                                                                                                                                                                                                      | Returned value |
|-----|-------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 1.  | CHANnel:LIST "<UnquoStr<br>>,<UnquoStr >,<UnquoStr<br>>,<UnquoStr >,<UnquoStr<br>>,<UnquoStr >" | Enable measurement channels, up to 6 channels | Channel name (double quoted, separated by comma)<br>Optional parameter list:<br>EM (choose only one channel from below)<br>V<br>mV<br>mA<br>Hz<br>Pulse<br>Switch<br>DRTD_CH1<br>DRTD_CH2<br>DPM<br>EPMA<br>EPMB<br>IPM<br>ATM | -              |

|    |                                                                                       |                                  |                                                                                                                                                                           |                                  |
|----|---------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|    |                                                                                       |                                  | Totally 8 channels, up to 6 can be selected                                                                                                                               |                                  |
| 2. | CHANnel:LIST?                                                                         | Read the current enabled channel |                                                                                                                                                                           | Channel name, separated by comma |
| 3. | LOGGer:StARt < Numeric >,< Numeric >,< Numeric >,0 1,<QuoteStr>,<QuoteStr>,<QuoteStr> | Start data log                   | 1: logging interval (unit is "s", 0.1s resolution)<br>2: logging count<br>3: logging duration<br>4: 24V status, 1= off, 0=on<br>5: logging name<br>6: operator<br>7: note | -                                |
| 4. | LOGGer:StOP 0 1[,<QuoteStr>,<QuoteStr>,<QuoteStr>]                                    | End data log                     | 1: save data or not. 1=save, 0= do not save<br>2: logging name<br>3: operator<br>4: note                                                                                  | -                                |

## 2.9 LiveData commands

| No. | Commands                              | Description                     | Parameter                                                      | Returned value                       |
|-----|---------------------------------------|---------------------------------|----------------------------------------------------------------|--------------------------------------|
| 1.  | DATA:LiVe?                            | Request livedata                | -                                                              | livedata (pb serialized data)        |
| 2.  | DATA:LiVe:UPLoad<boolean>[,<Numeric>] | Set livedata auto upload on/off | Parameter 1: 0 1<br>Parameter 2: auto upload interval, unit: s | -                                    |
| 3.  | DATA:DEViCeinfo?                      | Request deviceInfo              | -                                                              | deviceInfo data (pb serialized data) |

## 3 Unit name and ID

| Unit ID | Unit       |
|---------|------------|
| 2000    | Text       |
| 32767   | Empty unit |
|         |            |

|      |               |
|------|---------------|
| 1211 | mA            |
| 1212 | $\mu$ A       |
| 1209 | A             |
| 1240 | V             |
| 1243 | mV            |
| 1281 | $\Omega$      |
| 1284 | k $\Omega$    |
| 1283 | M $\Omega$    |
| 1077 | Hz            |
| 1081 | KHz           |
| 1080 | MHz           |
| 1082 | cpm           |
| 1083 | cph           |
| 1084 | 1/Hz(s)       |
| 1085 | 1/KHz(ms)     |
| 1086 | 1/MHz(us)     |
| 9999 | Pulse         |
| 1000 | K             |
| 1001 | $^{\circ}$ C  |
| 1002 | $^{\circ}$ F  |
| 1003 | $^{\circ}$ R  |
| 999  | $^{\circ}$ Re |
| 1133 | kPa           |
| 1130 | Pa            |
| 1131 | GPa           |

|      |                         |
|------|-------------------------|
| 1132 | MPa                     |
| 1134 | mPa                     |
| 1135 | $\mu$ Pa                |
| 1136 | hPa                     |
| 1137 | bar                     |
| 1138 | mbar                    |
| 1139 | torr                    |
| 1140 | atm                     |
| 1141 | psi                     |
| 1142 | psia                    |
| 1143 | psig                    |
| 1144 | gf/cm <sup>2</sup>      |
| 1145 | kgf/cm <sup>2</sup>     |
| 1147 | inH <sub>2</sub> O@4°C  |
| 1148 | inH <sub>2</sub> O@68°F |
| 1150 | mmH <sub>2</sub> O@4°C  |
| 1151 | mmH <sub>2</sub> O@20°C |
| 1153 | ftH <sub>2</sub> O@4°C  |
| 1154 | ftH <sub>2</sub> O@68°F |
| 1156 | inHg@0°C                |
| 1158 | mmHg@0°C                |
| 2001 | mtorr                   |
| 2002 | lb/ft <sup>2</sup>      |
| 2003 | tsi                     |
| 2004 | psf                     |

|      |                    |
|------|--------------------|
| 2005 | inH2O@60°F         |
| 2006 | ftH2O@60°F         |
| 2007 | cmH2O@4°C          |
| 2008 | mH2O@4°C           |
| 2009 | cmHg@0°C           |
| 2010 | mHg@0°C            |
| 2011 | kgf/m <sup>2</sup> |

#### 4 Error definition

| No                     | Error code | Description of error       | Explanation                                                                        |
|------------------------|------------|----------------------------|------------------------------------------------------------------------------------|
| 1                      | 0          | No error                   | No error                                                                           |
| <b>Command error</b>   |            |                            |                                                                                    |
| 2                      | 120        | Command parameter error    | Command parameter error                                                            |
| 3                      | -108       | Parameter not allowed      | Too many parameters, or command without parameters have parameters                 |
| 4                      | -109       | Missing parameter          | Lack parameter                                                                     |
| 5                      | -110       | Command header error       | Command header error                                                               |
| 6                      | -114       | Header suffix out of range | Command suffix out of range                                                        |
| 7                      | -123       | Numeric overflow           | Numeric overflow, the absolute value of the index of the number is greater than 43 |
| 8                      | -151       | Invalid string data        | Invalid string data, eg.quotation mark mismatch                                    |
| 9                      | -171       | Invalid expression         | Invalid expression eg.bracket mismatch                                             |
| <b>Execution error</b> |            |                            |                                                                                    |
| 10                     | -200       | Execution error            | Execution error                                                                    |
| 11                     | -221       | Settings conflict          | Settings conflict                                                                  |
| 12                     | -222       | Data out of range          | The parameter value exceeds the valid range of the command                         |

| N<br>o | Error<br>code | Description of error                   | Explanation                                                                                                                                                                                            |
|--------|---------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13     | -223          | Too much data                          | Too much data to handle                                                                                                                                                                                |
| 14     | -224          | Illegal parameter value                | Illegal parameter value                                                                                                                                                                                |
| 15     | -230          | Data corrupt or stale                  | Invalid data , or data is being read, no valid data yet                                                                                                                                                |
| 16     | -240          | Hardware error                         | Hardware error                                                                                                                                                                                         |
| 17     | -256          | File name not found                    | File name not found                                                                                                                                                                                    |
| 18     | -282          | Illegal program name                   | Illegal program name                                                                                                                                                                                   |
| 19     | 220           | Measure error                          | Measure error                                                                                                                                                                                          |
| 20     | 221           | Failed to set measure function         | Failed to set measure function                                                                                                                                                                         |
| 21     | 222           | Failed to read measure value           | Failed to read measure value                                                                                                                                                                           |
| 22     | 223           | Failed to zero pressure module         | Failed to zero pressure module                                                                                                                                                                         |
| 23     | 224           | Failed to clear the auto zero value    | After zero the pressure module, it will also clear the auto zero value of the controller(valid when enable auto zero function), this error happens when fail to clear the controller's auto zero value |
| 24     | 240           | Control error                          | Control error                                                                                                                                                                                          |
| 25     | 241           | Failed to set target pressure          | Failed to set target pressure                                                                                                                                                                          |
| 26     | 242           | Failed to set pressure mode            | Failed to set pressure mode                                                                                                                                                                            |
| 27     | 243           | Failed to configure control parameters | Failed to configure control parameters, including controlling rate, pressure stability, pressure type, vent pressure, auto zero setting.                                                               |
| 28     | 260           | Calibration error                      | Calibration error                                                                                                                                                                                      |
| 29     | 261           | Calibration secured                    | The device is in calibration protection state and unable to perform calibration                                                                                                                        |
| 30     | 262           | Invalid calibration secure code        | Invalid calibration secure code                                                                                                                                                                        |
| 31     | 263           | Missing calibration value              | This error occurs when the calibration value is set without setting the calibration point during current/voltage calibration                                                                           |

| N<br>o              | Error<br>code | Description of error               | Explanation                                                                                         |
|---------------------|---------------|------------------------------------|-----------------------------------------------------------------------------------------------------|
| 32                  | 264           | Missing calibration data           | This error occurs when calibration points are set continuously without calibration values set       |
| 33                  | 265           | Failed to set calibration function | Failed to set calibration function                                                                  |
| 34                  | 266           | Calibration data is not enough     | When saving the calibration data, this error occurs if the calibration data does not reach 3 points |
| 35                  | 271           | Setion_name_not_found              | Section name not found                                                                              |
| 36                  | 272           | Key_name_not_found                 | Keyname not found                                                                                   |
| 37                  | 291           | Update secured                     | The device is in update protection state and cannot be update                                       |
| 38                  | 292           | Invalid update secure code         | Invalid update secure code                                                                          |
| 39                  | 293           | Not found the service pack         | Not found the update pack                                                                           |
| 40                  | 294           | The service pack unavailable       | The update pack unavailable                                                                         |
| 41                  | 295           | AppUpdate not found                | AppUpdate.exe not found                                                                             |
| <b>Device error</b> |               |                                    |                                                                                                     |
| 42                  | -310          | System error                       | System error                                                                                        |
| 43                  | -311          | Memory error                       | Memory error                                                                                        |
| 44                  | -350          | Queue overflow                     | Error queue overflow                                                                                |
| 45                  | -360          | Communication error                | Communication error                                                                                 |
| 46                  | 301           | Internal module is not connected   | Internal module is not connected                                                                    |
| 47                  | 302           | External module is not connected   | External module is not connected                                                                    |
| 48                  | 303           | Supply module is not connected     | Positive pressure module is not connected                                                           |
| 49                  | 304           | Vacuum module is not connected     | Negative pressure module is not connected                                                           |
| 50                  | 361           | Open WLAN Failed                   | Open WIFI failed                                                                                    |
| 51                  | 362           | Set WLAN address mode failed       | Set WIFI address mode failed                                                                        |

| No | Error code | Description of error                          | Explanation                                   |
|----|------------|-----------------------------------------------|-----------------------------------------------|
| 52 | 363        | Set WLAN address failed                       | Set WIFI address failed                       |
| 53 | 364        | Communication port to WIFI module is not open | Communication port to WIFI module is not open |
| 54 | 365        | WLAN is not connected                         | WIFI is not connected                         |

## 5 RTD Sensor list

| No. (command code) | Name                   | Note                                 |
|--------------------|------------------------|--------------------------------------|
| 0                  | Resistance signal(ohm) |                                      |
| 1                  | Pt100(385)             |                                      |
| 2                  | Pt10(385)              |                                      |
| 3                  | Pt50(385)              |                                      |
| 4                  | Pt200(385)             |                                      |
| 5                  | Pt400(385)             | Out of device's range, not supported |
| 6                  | Pt500(385)             | Out of device's range, not supported |
| 7                  | Pt1000(385)            | Out of device's range, not supported |
| 8                  | Pt25(385)              |                                      |
| 9                  | Pt100(3916)            |                                      |
| 10                 | Pt100(3926)            |                                      |
| 11                 | Pt100(3910)            |                                      |

|    |             |                                         |
|----|-------------|-----------------------------------------|
| 12 | Cu100(428)  |                                         |
| 13 | Cu100(100M) |                                         |
| 14 | Cu50(428)   |                                         |
| 15 | Cu50(426)   |                                         |
| 16 | Cu10(427)   |                                         |
| 17 | Ni100(617)  |                                         |
| 18 | Ni100(618)  |                                         |
| 19 | Ni120(672)  |                                         |
| 20 | Ni1000      | Out of device's range,<br>not supported |
|    |             |                                         |