

### ADT161 Communication protocol

Data sending format:

|                                                                          |             |
|--------------------------------------------------------------------------|-------------|
| A; X; Command; Parameter 0; Parameter 1; Parameter 2; .....; Parameter 5 | 0x00        |
| ASC code                                                                 | Hexadecimal |

Data returning format:

|                                                                            |             |
|----------------------------------------------------------------------------|-------------|
| A; F/E; Command; Parameter 0; Parameter 1; Parameter 2; .....; Parameter 5 | 0x00        |
| ASC code                                                                   | Hexadecimal |

Note:

A: Address. It is the module's serial address, the range is 001~127, factory default setting is 001.

X: R/W, R=read, W=write.

Command: The specific items of commands.

F/E: F=command was sent correctly, E= command sent error.

| Commands |   |       |              |               |    |    |    |     | Description                                                     | Returned value                                                 |
|----------|---|-------|--------------|---------------|----|----|----|-----|-----------------------------------------------------------------|----------------------------------------------------------------|
| A        | X | Knnnn | C0           | C1            | C2 | C3 | C4 | EOS |                                                                 |                                                                |
|          | R | OADD  | -            | -             | -  | -  | -  | 0x0 | Read series port's address (001~127)                            | A: F: OADD: address +EOS                                       |
|          | W | OADD  | address      | -             | -  | -  | -  | 0x0 | Set series port's address (001~127)                             | A: F: OADD: OK+EOS                                             |
|          | W | OBAUD | Baud rate    | -             | -  | -  | -  | 0x0 | Set Baud rate, 4800/9600/19200/38400/115200                     | A: F: OBAUD: OK+EOS                                            |
|          | R | OVER  | -            | -             | -  | -  | -  | 0x0 | Read software version                                           | A: F: OVER: version+ EOS                                       |
|          | R | OCODE | -            | -             | -  | -  | -  | 0x0 | Read serial number                                              | A: F: OCODE: serial number +EOS                                |
|          | R | ODATE | -            | -             | -  | -  | -  | 0x0 | Read production date, e.g. 2015-01-31                           | A: F: ODATE: production date +EOS                              |
|          | R | TAG   | Label length | -             | -  | -  | -  | 0x0 | Read sensor label                                               | A: F: TAG: sensor label +EOS                                   |
|          | W | TAG   | Label length | Label content | -  | -  | -  | 0x0 | Write sensor label                                              | A: F: TAG: OK+EOS                                              |
|          | R | ORAN  | -            | -             | -  | -  | -  | 0x0 | Read range                                                      | A: F: ORAN: lower limit: high limit:; sensor type accuracy+EOS |
|          | W | MWORK | Work mode    | -             | -  | -  | -  | 0x0 | Set work mode, 2=Linear correction<br>0= non linear correction  | A: F: MWORK: OK+EOS                                            |
|          | R | MWORK | -            | -             | -  | -  | -  | 0x0 | Read work mode, 2=Linear correction<br>0= non linear correction | A: F: MWORK: work mode +EOS                                    |
|          | W | OCS   | -            | -             | -  | -  | -  | 0x0 | Start user calibration                                          | A: F: OCS: OK+EOS                                              |

|  |   |        |                        |                      |                   |   |   |     |                                                                                                                                                                                                                                                                                                                     |                                                                 |
|--|---|--------|------------------------|----------------------|-------------------|---|---|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
|  | W | OCP    | Standard point         | Standard value       | -                 | - | - | 0x0 | Calibration point: Z-zero, M-middle, F-full scale<br>Note: need run "OCS" before calibration. Need run "OCALD" before calibrating middle point and enable 3-point calibration                                                                                                                                       | A: F: OCP: OK+EOS                                               |
|  | W | OCPOK  | 0 or 1                 | -                    | -                 | - | - | 0x0 | Save calibration data and exit                                                                                                                                                                                                                                                                                      | A: F: OCPOK: OK+EOS                                             |
|  | W | OFALT  | -                      | -                    | -                 | - | - | 0x0 | Cancel user calibration                                                                                                                                                                                                                                                                                             | A: F: OFALT: OK+EOS                                             |
|  | R | OCDATE | -                      | -                    | -                 | - | - | 0x0 | Read user calibration date, e.g. 2015-01-31                                                                                                                                                                                                                                                                         | A: F: OCDATE: calibration date +EOS                             |
|  | W | OCDATE | Calibration date       | -                    | -                 | - | - | 0x0 | Write user calibration date, e.g. 2015-01-31                                                                                                                                                                                                                                                                        | A: F: OCDATE: OK+EOS                                            |
|  | W | OCRAM  | calibration point sign | Calibration pressure | Measured pressure | - | - | 0x0 | Write user calibration information, unit is kPa.<br>Note: need run "OCS" at first. It can be 1,2 and 3, totally 3 points. When enabling "OCALD" for 3 point calibration, all the points are valid; when it is not enabled, only 2 and 3 can be used. After writing, it needs run "OCPOK" to start user calibration. | A: F: OCRM: OK+EOS                                              |
|  | R | OCRAW  | calibration point sign | -                    | -                 | - | - | 0x0 | Read user calibration information, unit is kPa.                                                                                                                                                                                                                                                                     | A: F: OCRM: calibration point sign; standard pressure; measured |

|   |       |                             |   |   |   |   |     |                                                                                                            | pressure+EOS                      |
|---|-------|-----------------------------|---|---|---|---|-----|------------------------------------------------------------------------------------------------------------|-----------------------------------|
| R | OCALD | -                           | - | - | - | - | 0x0 | Read the forced 3-point calibration sign: 0=3 point calibration is invalid, 1=3 point calibration is valid | A: F: OCALD: calibration sign+EOS |
| W | ODLEN | Data length                 | - | - | - | - |     | Write output data length, 5~9                                                                              | A: F: ODLEN: OK+EOS               |
| W | OZERO | -                           | - | - | - | - | 0x0 | Zero, valid when pressure deviation less than 2%FS, only for current mode                                  | A: F: OZERO: OK+EOS               |
| W | MZERO | -                           | - | - | - | - | 0x0 | Cancel zero offset, only for current mode                                                                  | A: F: MZERO: OK+EOS               |
| W | ABSZ  | Current barometric pressure | - | - | - | - | 0x0 | Absolute pressure zero, also for calibrating current standard, standard pressure                           | A: F: ABSZ: OK+EOS                |
| R | MRMD  | -                           | - | - | - | - | 0x0 | Read current measured value, return measured value                                                         | A: F: MRMD: measured data +EOS    |
| R | MRMN  | -                           | - | - | - | - | 0x0 | Read the data without any corrections                                                                      | A: F: MRMN: measured data +EOS    |
| W | OCONT | Reading status              | - | - | - | - | 0x0 | Read the measured data sent by the device, 1=continuous send, 0=end                                        | A: F: OCONT: OK+EOS               |
| R | OSENS | -                           | - | - | - | - | 0x0 | Read sensor type, A(absolute), D(differential), G(gauge)                                                   | A: F: OSENS: sensor type+EOS      |
| R | MRATE | -                           | - | - | - | - | 0x0 | Read the rate of sensor output data, unit: times/s, default is 50                                          | A: F: MRATE: output rate+EOS      |
| R | OCALI | -                           | - | - | - | - | 0x0 | Read calibration data:1/0(factory                                                                          | A: F: OCALI: factory calibration  |

|   |        |                     |   |   |   |   |     |                                                                                         |                                                                                                                                                                              |
|---|--------|---------------------|---|---|---|---|-----|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |        |                     |   |   |   |   |     | calibrated);1/0(user calibrated):<br>2/3(number of current valid<br>calibration points) | status: user calibration status; number of<br>calibration points+EOS                                                                                                         |
| R | OACCY  | -                   | - | - | - | - | 0x0 | Read device accuracy,<br>parameter: 20(0.2%), 10(0.1%),<br>5(0.05%), 2(0.02%), 1(0.01%) | A: F: OACCY: device accuracy+EOS                                                                                                                                             |
| R | OPFILT | -                   | - | - | - | - | 0x0 | Read status for pressure filter and<br>first-order coefficient                          | V03.xx version: A:F:OPFILT: filter status:<br>first-order coefficient +EOS; V08.xx<br>version: A:F:OPFILT:low rate filter: high<br>rate filter: first-order coefficient +EOS |
| R | BMP    | -                   | - | - | - | - | 0x0 | Read barometric sensor measured<br>value, returned value, unit kPa                      | A: F: BMP: measure data; KPA+EOS                                                                                                                                             |
| W | OCALD  | Calibration<br>sign | - | - | - | - | 0x0 | Write forced 3-point calibration sign,<br>0=cancel, 1=enable                            | A: F: OCALD: OK+EOS                                                                                                                                                          |
| R | OTFILT | -                   | - | - | - | - | 0x0 | Read status for temperature filter<br>and first-order coefficient                       | A: F: OTFILT: filter sign:<br>first-order coefficient +EOS                                                                                                                   |
| R | ODLEN  | -                   | - | - | - | - | 0x0 | Read the output data length                                                             | A: F: ODLEN: data length +EOS                                                                                                                                                |

**Error code:**

- ◆ 1015 The parameter is too long.
- ◆ 1025 The series address is out of range 001~127.
- ◆ 1007 Parameter is wrong.
- ◆ 1030 data is out of zero range.
- ◆ 1006 Illegal range.
- ◆ 1005 Illegal unit.

- ◆ 1001 Out-of-channel operation.
- ◆ 1013 The total number of linear points is out of range.
- ◆ 1014 Working mode is wrong.
- ◆ 1023 Pressure unit name is wrong.
- ◆ 1024 Non-selectable pressure unit.
- ◆ 1031 Erase ferroelectric storage verification errors.
- ◆ 1040 No zero in absolute mode.