RADIONODE

# Technical Note

## AT Commands Description for UA Sensors

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**Overview**

Radionode USB Sensor transmitter series has simple text commands to read or set parameters of sensor. The commands are very similar to AT commands of old fashioned telephone modem. UA series device has USB CDC ( Communication Device Class) that make it connected to many operating system such as Windows,Linux,MacOS and Android via USB port.

Simply with the command "**ATCD**" user can read digital value of sensor. All the UA series are using a same command to read the sensors.

## 1.UA Sensor Types

| Model Group | Model Description | Type |
|---|---|---|
| UA1X Series Temperature | UA10 : Temp/ RH<br>UA11 : ThermoCouple Temp 2CH (T,K)<br>UA12 : ThermoCouple Temp 2CH (K,J,T,N,S,E,B,R )<br>UA13 : PT100 Temp. 1CH | Temperature |
| UA5X Series Gas Sensor | MEMS Type<br>● UA50 : tVOC sensor<br>Optical Type<br>● UA52-O2 : O2 Sensor<br>● UA52-CO2 : CO2 Sensor<br>ElectroChemical Film<br>● UA53-CO : CO Sensor<br>● UA53-SO2 : SO2 Sensor<br>● UA53-NO2<br>● UA53-H2S<br>ElectroChemical Cell<br>● UA54-NH3<br>● UA54-H2S<br>● UA54-EO<br>● UA54-HCL<br>● UA54-C2H4<br>● UA58-KFG (CO, O2, H2S, CO2)<br>● UA59-CO2 | Gas |
| UA2X Series Converter | UA20-A: 4-20mA Input 2CH<br>UA20-B: 4-20mA Input 1 CH with 12V output 1CH<br>UA20-C: 0~1V Input 2CH<br>UA20-D: Pulse Input | Converter |

## 2.UA1X, UA20 Series AT Commands

the calibration parameters are not listed here. If you need the professional calibration commands, please contact the Radionode Manufacturer DEKIST Co., Ltd.

** CR(\r), LF(\n)

**ATCD**

to request the value of sensor data. (two channels)

| Example | Description |
|---|---|
| IN ATCD<CR><LF><br>OUT ATCD 20.11, 23.44<CR><LF> | to request the value of sensor data.<br>ATCD <channel1>,<channel2><br><channel1>=Temperature<br><channel2>= RH or Temperature<br><br>UA10 : <ch1=Temperature><ch2=Humidity><br>UA11 : <ch1=Temperature><ch2=Temperature><br>UA20 : <ch1= user defined><ch2=user defined> |

**ATCSM**

to set stream mode. In stream mode UA1X send sensor value every 1 sec without any receiving user command. all the channel will be output. Currently supported for UA10.

| Example | Description |
|---|---|
| IN ATCSM 1<CR><LF><br>OUT ATCSM OK<CR><LF><br><br>OUT STREAM 12.33, 34.56<CR><LF> | to enable stream mode. (1:Enable , 0:Disable)<br>the below string will be output automatically every 1 sec<br>STREAM <channel1>,<channel2> |

**ATCZ**

It check USB connection and device status.

| Example | Description |
|---|---|
| IN ATCZ<CR><LF><br>OUT ATCZ OK<CR><LF> | It check USB Connection. |

**ATCC**

to set Celsius temperature

| Example | Description |
|---|---|
| IN ATCC<CR><LF><br>OUT ATCC OK<CR><LF> | to set Celsius temperature scale. |

**ATCF**

to set Fahrenheit temperature

| Example | Description |
|---|---|
| IN ATCF<CR><LF><br>OUT ATCF OK<CR><LF> | to set Fahrenheit temperature scale. |

**ATCVER**

to request the version of this device.

| Example | Description |
|---|---|
| IN ATCVER<CR><LF><br>OUT ATCVER UA10H_1V0<CR><LF> | to request the version of this device. |

**ATCMODEL**

to request the serial number of this model

| Example | Description |
|---|---|
| IN ATCMODEL<CR><LF><br>OUT ATCMODEL 17091345<CR><LF> | to request the serial number of this model. |

**ATCOFF1**

to set the offset value of channel 1 output

| Example | Description |
|---|---|
| IN ATCOFF1 -0.5<CR><LF><br>OUT ATCOFF1 -0.5<CR><LF> | to set the offset value of channel 1 output. |

**ATCOFF2**

to set the offset value of channel 2 output

| Example | Description |
|---|---|
| IN ATCOFF2 -0.5<CR><LF><br>OUT ATCOFF2 -0.5<CR><LF> | to set the offset value of channel 2 output. |

**ATTQOFF1**

to set Temperature Offset in AREA1 ** Only For UA10H Ver1.0 or later

| Example | Description |
|---|---|
| IN ATTQOFF1 30,1.54,-0.004<CR><LF><br>OUT ATTQOFF1 30,1.54,-0.004<CR><LF> | to set Temperature Offset in AREA1<br>it is quadratic equation offset algorithm. |

**ATTQOFF2**

to set Temperature Offset in AREA2 ** Only For UA10H Ver1.0 or later

| Example | Description |
|---|---|
| IN ATTQOFF2 30,1.54,-0.004<CR><LF><br>OUT ATTQOFF2 30,1.54,-0.004<CR><LF> | to set Temperature Offset in AREA1<br>it is quadratic equation offset algorithm. |

**ATHQOFF1**

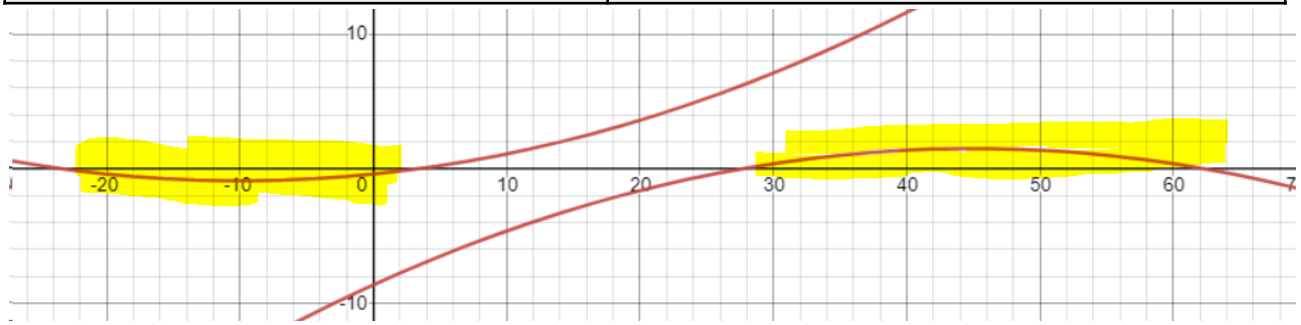
to set Humidity Offset in AREA1 ** Only For UA10H Ver1.0 or later

| Example | Description |
|---|---|
| IN ATTQOFF1 30,1.54,-0.004<CR><LF><br>OUT ATTQOFF1 30,1.54,-0.004<CR><LF> | to set Humidity Offset in AREA1<br>it is quadratic equation offset algorithm. |

**ATHQOFF2**

to set Humidity Offset in AREA2 ** Only For UA10H Ver1.0 or later

| Example | Description |
|---|---|
| IN ATTQOFF2 30,1.54,-0.004<CR><LF><br>OUT ATTQOFF2 30,1.54,-0.004<CR><LF> | to set Humidity Offset in AREA2<br>it is quadratic equation offset algorithm. |




quadratic equation offset example

**ATCCH1WIN**

Digital Filter Weight Value for Channel 1 ** Only For UA11, UA13

| Example | Description |
|---|---|
| IN ATCCH1WIN 4<CR><LF><br>OUT ATCCH1WIN 4<CR><LF> | To Set or To Get filter parameters 1~ 15<br>1: the highest sensitivity (fast)<br>15: insensitivity (slow) |

**ATCCH2WIN**

Digital Filter Weight Value for Channel 2 ** For Only For UA11, UA13

| Example | Description |
|---|---|
| IN ATCCH1WIN<CR><LF><br>OUT ATCCH1WIN 14<CR><LF> | To Set or To Get filter parameters 1~ 15<br>1: the highest sensitivity (fast)<br>15: insensitivity (slow) |

**ATCCTS1**

Sensor type (thermocouple) setting for Channel 1 ** Only For UA12

| Example | Description |
|---|---|
| IN ATCCTS1 4<CR><LF><br>OUT ATCCTS1 4<CR><LF> | To Set or To Get sensor type -1 ~ 7<br>-1: Type None 0: K Type<br>1: J Type 2: T Type<br>3: N Type 4: S Type<br>5: E Type 6: B Type<br>7: R Type |

**ATCCTS2**

Sensor type (thermocouple) setting for Channel 2 ** For Only For UA12

| Example | Description |
|---|---|
| IN ATCCTS2 7<CR><LF><br>OUT ATCCTS2 7<CR><LF> | To Set or To Get sensor type -1 ~ 7<br>-1: Type None 0: K Type<br>1: J Type 2: T Type<br>3: N Type 4: S Type<br>5: E Type 6: B Type<br>7: R Type |

## 3. UA50 (VoC Gas) AT Commands

### ATCZ

It checks USB connection and device status.

| Example | Description |
|---|---|
| IN ATCZ<CR><LF><br>OUT ATCZ OK<CR><LF> | It checks USB Connection. |

### ATCD

to request the value of sensor data. (two channels)

| Example | Description |
|---|---|
| IN ATCD<CR><LF><br>OUT ATCD 20.11, 23.44<CR><LF> | to request the value of sensor data.<br>ATCD <channel1>,<channel2> |

### ATCQ

to request the value of sensor data. (four channels)

| Example | Description |
|---|---|
| IN ATCQ<CR><LF><br>OUT ATCQ 1.11,5.11,1113----<CR><LF> | to request the value of sensor data.<br>ATCQ <channel1>,<channel2><channel3>,<----><br>- channel1 : TVOC[ppm or ppb]<br>- channel2 : Absolute humidity[g/m$^3$]<br>- channel3 : CO2-equivalent[ppm or %] |

### ATCMODE

to change the sensor output mode of ATCD command.

| Example | Description |
|---|---|
| IN ATCMODE 1<CR><LF><br>OUT ATCMODE 1<CR><LF><br>IN ATCMODE 2<CR><LF><br>OUT ATCMODE 2<CR><LF> | MODE1 : TVOC [ppm or ppb],absolute humidity [g/m$^3$]<br>MODE2 : TVOC [ppm or ppb],CO2-equivalent [ppm or %] |

### ATCC

to set Celsius temperature

| Example | Description |
|---|---|
| IN ATCC<CR><LF><br>OUT ATCC OK<CR><LF> | to set Celsius temperature scale. |

### ATCF

to set Fahrenheit temperature

| Example | Description |
|---|---|
| IN ATCF<CR><LF><br>OUT ATCF OK<CR><LF> | to set Fahrenheit temperature scale. |

**ATCVER**

to request the version of this device.

| Example | Description |
|---|---|
| IN ATCVER<CR><LF><br>OUT ATCVER UA50_5V0<CR><LF> | to request the version of this device. |

**ATCMODEL**

to request the serial number of this model

| Example | Description |
|---|---|
| IN ATCMODEL<CR><LF><br>OUT ATCMODEL 17091345<CR><LF> | to request the serial number of this model. |

**ATCVOCU**

to change the CO2 output unit of ATCD command

| Example | Description |
|---|---|
| IN ATCVOCU 0<CR><LF><br>OUT ATCVOCU 0<CR><LF><br>IN ATCVOCU 1<CR><LF><br>OUT ATCVOCU 1<CR><LF> | TVOC ppm output<br>TVOC ppb output |

**ATCCU**

to change the CO2-equivalent output unit of ATCD command

| Example | Description |
|---|---|
| IN ATCCU 0<CR><LF><br>OUT ATCCU 0<CR><LF><br>IN ATCCU 1<CR><LF><br>OUT ATCCU 1<CR><LF> | CO2-equivalent % output<br>CO2-equivalent ppm output |

**ATCOFF1**

to set the offset value of channel 1 output

| Example | Description |
|---|---|
| IN ATCOFF1 -0.5<CR><LF><br>OUT ATCOFF1 -0.5<CR><LF> | to set the offset value of channel 1 output. |

**ATCOFF2**

to set the offset value of channel 2 output

| Example | Description |
|---|---|
| IN ATCOFF2 -0.5<CR><LF><br>OUT ATCOFF2 -0.5<CR><LF> | to set the offset value of channel 2 output. |

## 4. UA52-O2 (Gas Oxygen) AT Commands

### ATCZ

It checks USB connection and device status.

| Example | Description |
|---|---|
| IN ATCZ<CR><LF><br>OUT ATCZ OK<CR><LF> | It checks USB Connection. |

### ATCD

to request the value of sensor data. (two channels)

| Example | Description |
|---|---|
| IN ATCD<CR><LF><br>OUT ATCD 20.11, 23.44<CR><LF> | to request the value of sensor data.<br>ATCD <channel1>,<channel2> |

### ATCH

to request the value of sensor data. (six channels)

| Example | Description |
|---|---|
| IN ATCH<CR><LF><br>OUT ATCH 205.11,20.37,203728.56,1001.44,<br>10309.17,23.44 <CR><LF> | to request the value of sensor data.<br>ATCD <channel1>,<channel2>,<channel3>,<br><channel4>,<channel5>,<channel6><br>- channel1: Oxegen [mBar],<br>- channel2: Oxegen [%]<br>- channel3: Oxegen [ppm],<br>- channel4: Barometer[mBar],<br>- channel5: Barometer[mmH2O]<br>- channel6: Temperature[°C/°F] |

### ATCMODE

to change the sensor output mode of ATCD command.

| Example | Description |
|---|---|
| IN ATCMODE 1<CR><LF><br>OUT ATCMODE 1<CR><LF><br>IN ATCMODE 3<CR><LF><br>OUT ATCMODE 3<CR><LF> | MODE1 : Oxegen [%] , Temperature[°C/°F]<br>MODE2 : Oxegen [mBar] , Barometer[mBar]<br>MODE3 : Oxegen [ppm] , Barometer[mmH2O]<br>MODE4 : Oxegen [%] , Barometer[mBar]<br>MODE5 : Oxegen [%]] |

### ATCC

to set Celsius temperature

| Example | Description |
|---|---|
| IN ATCC<CR><LF><br>OUT ATCC OK<CR><LF> | to set Celsius temperature scale. |

**ATCF**

to set Fahrenheit temperature

| Example | Description |
|---|---|
| IN ATCF<CR><LF><br>OUT ATCF OK<CR><LF> | to set Fahrenheit temperature scale. |

**ATCVER**

to request the version of this device.

| Example | Description |
|---|---|
| IN ATCVER<CR><LF><br>OUT ATCVER UA52-O2_0V1<CR><LF> | to request the version of this device. |

**ATCMODEL**

to request the serial number of this model

| Example | Description |
|---|---|
| IN ATCMODEL<CR><LF><br>OUT ATCMODEL 17091345<CR><LF> | to request the serial number of this model. |

**ATCOFF1**

to set the offset value of channel 1 output

| Example | Description |
|---|---|
| IN ATCOFF1 -0.5<CR><LF><br>OUT ATCOFF1 -0.5<CR><LF> | to set the offset value of channel 1 output. |

**ATCOFF2**

to set the offset value of channel 2 output

| Example | Description |
|---|---|
| IN ATCOFF2 -0.5<CR><LF><br>OUT ATCOFF2 -0.5<CR><LF> | to set the offset value of channel 2 output. |

## 5. UA52-CO2/ UA59 (High density CO2 Gas) AT Commands

### ATCZ

It checks USB connection and device status.

| Example | Description |
|---|---|
| IN ATCZ<CR><LF><br>OUT ATCZ OK<CR><LF> | It checks USB Connection. |

### ATCD

to request the value of sensor data. (two channels)

| Example | Description |
|---|---|
| IN ATCD<CR><LF><br>OUT ATCD 0.23, 19.85<CR><LF> | to request the value of sensor data.<br>ATCD <channel1>,<channel2><br>- channel1 : CO2 [% or ppm]<br>- channel2 : Temperature [°C/°F] |

### ATCC

to set Celsius temperature

| Example | Description |
|---|---|
| IN ATCC<CR><LF><br>OUT ATCC OK<CR><LF> | to set Celsius temperature scale. |

### ATCF

to set Fahrenheit temperature

| Example | Description |
|---|---|
| IN ATCF<CR><LF><br>OUT ATCF OK<CR><LF> | to set Fahrenheit temperature scale. |

### ATCVER

to request the version of this device.

| Example | Description |
|---|---|
| IN ATCVER<CR><LF><br>OUT ATCVER UA52-CO2_2V8<CR><LF> | to request the version of this device.<br>ex) UA52-CO2_2V8 |

### ATCMODEL

to request the serial number of this model

| Example | Description |
|---|---|
| IN ATCMODEL<CR><LF><br>OUT ATCMODEL 20110011<CR><LF> | to request the serial number of this model. |

**ATCCU**

to change the CO2 output unit of ATCD command

| Example | Description |
|---|---|
| IN ATCCU 0<CR><LF><br>OUT ATCCU 0<CR><LF><br>IN ATCCU 1<CR><LF><br>OUT ATCCU 1<CR><LF> | CO2 % output<br>CO2 ppm output |

**ATCCAL**

Set to CO2 ppm calibration gas concentration

| Example | Description |
|---|---|
| IN ATCCAL 50000<CR><LF><br>OUT ATCCAL 50000<CR><LF> | Calibrate the sensor to 50000ppm =5%<br>unit : ppm |

**ATCSPAN**

Set the barometric pressure

| Example | Description |
|---|---|
| IN ATCSPAN air pressure<CR><LF><br>OUT ATCSPAN 1013<CR><LF> | CO2 output according to the barometric pressure<br>unit : mbar |

**ATCOFF1**

to set the offset value of channel 1 output

| Example | Description |
|---|---|
| IN ATCOFF1 -0.5<CR><LF><br>OUT ATCOFF1 -0.5<CR><LF> | to set the offset value of channel 1 output. |

**ATCOFF2**

to set the offset value of channel 2 output

| Example | Description |
|---|---|
| IN ATCOFF2 -0.5<CR><LF><br>OUT ATCOFF2 -0.5<CR><LF> | to set the offset value of channel 2 output. |

## 6. UA53-Series (Electrochemical Film Gas) AT Commands

### ATCZ

It checks USB connection and device status.

| Example | Description |
|---|---|
| IN ATCZ<CR><LF><br>OUT ATCZ OK<CR><LF> | It checks USB Connection. |

### ATCD

to request the value of sensor data. (two channels)

| Example | Description |
|---|---|
| IN ATCD<CR><LF><br>OUT ATCD 5.23, 19.85<CR><LF> | to request the value of sensor data.<br>ATCD <channel1>,<channel2><br>- channel1 : Gas concentration [ppm]<br>- channel2 : Temperature [°C/°F] |

### ATCQ

to request the value of sensor data. (four channels)

| Example of UA53-CO | Description |
|---|---|
| IN ATCQ<CR><LF><br>OUT ATCQ 3.00,26.00,36.00,----<CR><LF> | to request the value of sensor data.<br>ATCQ <channel1>,<channel2><channel3>,<----><br>- channel1 :CO [ppm ]<br>- channel2 : Temperature [C or F]<br>- channel3 : Humidity[ % ] |

### ATCC

to set Celsius temperature

| Example | Description |
|---|---|
| IN ATCC<CR><LF><br>OUT ATCC OK<CR><LF> | to set Celsius temperature scale. |

### ATCF

to set Fahrenheit temperature

| Example | Description |
|---|---|
| IN ATCF<CR><LF><br>OUT ATCF OK<CR><LF> | to set Fahrenheit temperature scale. |

### ATCVER

to request the version of this device.

| Example | Description |
|---|---|
| IN ATCVER<CR><LF><br>OUT ATCVER UA53-Gas_5V3<CR><LF> | to request the version of this device.<br>ex) UA53-CO_5V3 |

**ATCMODEL**

to request the serial number of this model

| Example | Description |
|---|---|
| IN ATCMODEL<CR><LF><br>OUT ATCMODEL 20120015<CR><LF> | to request the serial number of this model. |

**ATCCZR**

Set the zero (baseline) value

| Example | Description |
|---|---|
| IN ATCCZR<CR><LF><br>OUT ATCCZR 1510.02<CR><LF> | Set the baseline value [Micro voltage] |

**ATCCSP**

Set sensor-specific sensitivity (nA/ppm)

| Example | Description |
|---|---|
| IN ATCCSP sensitivity<CR><LF><br>OUT ATCCSP 3055.12,2.56,24.17<CR><LF> | Set sensor-specific sensitivity.<br>ATCSP baseline,sensitivity,calibration temperature <CR><LF><br>Unit<br>- baseline[zero] : [uV], sensitivity : [nA/ppm]<br>- calibration temperature : [°C] |

**ATCCAL**

Set the calibration parameter (calibration)

| Example | Description |
|---|---|
| IN ATCCAL baseline,sensitivity<CR><LF><br>OUT ATCCAL 3055.12,2.56<CR><LF> | Set the calibration parameter.<br>ATCCAL baseline,sensitivity<CR><LF> Unit<br>- baseline[zero] : [uV], sensitivity : [nA/ppm] |

**ATCOFF1**

to set the offset value of channel 1 output

| Example | Description |
|---|---|
| IN ATCOFF1 -0.5<CR><LF><br>OUT ATCOFF1 -0.5<CR><LF> | to set the offset value of channel 1 output. |

**ATCOFF2**

to set the offset value of channel 2 output

| Example | Description |
|---|---|
| IN ATCOFF2 -0.5<CR><LF><br>OUT ATCOFF2 -0.5<CR><LF> | to set the offset value of channel 2 output. |

## 7. UA54-Series (Electrochemical Gas) AT Commands

### ATCZ

It checks USB connection and device status.

| Example | Description |
|---|---|
| IN ATCZ<CR><LF><br>OUT ATCZ OK<CR><LF> | It checks USB Connection. |

### ATCD

to request the value of sensor data. (two channels)

| Example | Description |
|---|---|
| IN ATCD<CR><LF><br>OUT ATCD 5.23, 19.85<CR><LF> | to request the value of sensor data.<br>ATCD <channel1>,<channel2><br>- channel1 : Gas concentration [ppm]<br>● O2 model : Gas concentration [%]<br>● H2 model: Gas concentration [%] or LEL (Lower explosive level)<br>- channel2 : Temperature [°C/°F] |

### ATCC

to set Celsius temperature

| Example | Description |
|---|---|
| IN ATCC<CR><LF><br>OUT ATCC OK<CR><LF> | to set Celsius temperature scale. |

### ATCF

to set Fahrenheit temperature

| Example | Description |
|---|---|
| IN ATCF<CR><LF><br>OUT ATCF OK<CR><LF> | to set Fahrenheit temperature scale. |

### ATCHLEL

to request H2 % concentration or H2 LEL

| Example | Description |
|---|---|
| IN ATCHLEL 0<CR><LF><br>OUT ATCHLEL 0<CR><LF><br><br>IN ATCHLEL 1<CR><LF><br>OUT ATCHLEL 1<CR><LF> | to request H2 % concentration (default value)<br><br>to request H2 LEL |

**ATCVER**

to request the version of this device.

| Example | Description |
|---|---|
| IN ATCVER<CR><LF><br>OUT ATCVER UA54-Gas_5V3<CR><LF> | to request the version of this device.<br>ex) UA54-NH3-100_5V3 |

**ATCMODEL**

to request the serial number of this model

| Example | Description |
|---|---|
| IN ATCMODEL<CR><LF><br>OUT ATCMODEL 17091345<CR><LF> | to request the serial number of this model. |

**ATCCZR**

Set the zero (baseline) value

| Example | Description |
|---|---|
| IN ATCCZR<CR><LF><br>OUT ATCCZR 7510.02<CR><LF> | Set the baseline value [Micro voltage] |

**ATCCSP**

Set the span value for gas concentration

| Example | Description |
|---|---|
| IN ATCCSP Gas concentration<CR><LF><br>OUT ATCCSP 5.00,0.000036,23055.12,162526.09,<br>24.17<CR><LF> | Set the calibration gas concentration.<br>ATCSP calibration gas,calibration slope,<br>baseline, span, calibration temperature <CR><LF><br>Unit<br>- calibration gas : [ppm], calibration slope: [ ppm/uV]<br>- baseline[zero] : [uV], span : [uV]<br>- calibration temperature : [°C] |

**ATCCAL** (calibration)

Set the calibration parameter

| Example | Description |
|---|---|
| IN ATCCAL baseline,span,calibration gas<CR><LF><br>OUT ATCCAL 23055.12,162526.09,5.00<CR><LF> | Set the calibration parameter.<br>ATCCAL baseline,span,calibration gas<CR><LF><br>Unit<br>- baseline[zero] : [uV], span : [uV],<br>- calibration gas : [ppm] |

**ATCOFF1**

to set the offset value of channel 1 output

| Example | Description |
|---|---|
| IN ATCOFF1 -0.5<CR><LF><br>OUT ATCOFF1 -0.5<CR><LF> | to set the offset value of channel 1 output. |

**ATCOFF2**

to set the offset value of channel 2 output

| Example | Description |
|---|---|
| IN ATCOFF2 -0.5<CR><LF><br>OUT ATCOFF2 -0.5<CR><LF> | to set the offset value of channel 2 output. |

## 8. UA58-KFG (Multi Purpose Gas Sensor) AT Commands

**ATCZ**

It checks USB connection and device status.

| Example | Description |
|---|---|
| IN ATCZ<CR><LF><br>OUT ATCZ OK<CR><LF> | It checks USB Connection. |

**ATCD**

to request the value of sensor data (two channels)

| Example | Description |
|---|---|
| IN ATCD<CR><LF><br>OUT ATCD 5.23,20.8 <CR><LF> | to request the value of sensor data.<br>ATCD <channel1>,<channel2><br>- ch1: Carbon monoxide gas concentration [ppm]<br>- ch2: Oxygen gas concentration [%] |

*this command is supported since Ver 5.6

**ATCQ**

to request the value of sensor data (four channels)

| Example | Description |
|---|---|
| IN ATCQ<CR><LF><br>OUT ATCQ 5.23,20.8,10.2,989<CR><LF> | to request the value of sensor data.<br>ATCQ <channel1>,<channel2>,<channel3>,<channel4><br>- ch1: Carbon monoxide gas concentration [ppm]<br>- ch2: Oxygen gas concentration [%]<br>- ch3: Hydrogen sulfide gas concentration [ppm]<br>- ch4: Carbon dioxide gas concentration [ppm] |

**ATCH**

to request the value of sensor data (six channels)

| Example | Description |
|---|---|
| IN ATCH<CR><LF><br>OUT ATCH 5.23,20.8,10.2,989,25.1, 50.5<CR><LF> | to request the value of sensor data.<br>ATCH <channel1>,<channel2>,<channel3>,<channel4>, <channel5>,<channel6><br>- ch1: Carbon monoxide gas concentration [ppm]<br>- ch2: Oxygen gas concentration [%]<br>- ch3: Hydrogen sulfide gas concentration [ppm]<br>- ch4: Carbon dioxide gas concentration [ppm]<br>- ch5: Temperature [°C/°F]<br>- ch6: Relative humidity [%] |

**ATCC**

to set Celsius temperature

| Example | Description |
|---|---|
| IN ATCC<CR><LF><br>OUT ATCC OK<CR><LF> | to set Celsius temperature scale. |

**ATCF**

to set Fahrenheit temperature

| Example | Description |
|---|---|
| IN ATCF<CR><LF><br>OUT ATCF OK<CR><LF> | to set Fahrenheit temperature scale. |

**ATCVER**

to request the version of this device.

| Example | Description |
|---|---|
| IN ATCVER<CR><LF><br>OUT ATCVER UA58-Gas_5v3<CR><LF> | to request the version of this device.<br>ex) UA58-KFG-_5v3<br>- UA58: Device model<br>- KFG: Gas model<br>- 5v3: FW Version |

**ATCMODEL**

to request the serial number of this model

| Example | Description |
|---|---|
| IN ATCMODEL<CR><LF><br>OUT ATCMODEL 17091345<CR><LF> | to request the serial number of this model. |

**ATCCZRA**

Set the zero (baseline) value from channel 1 to channel 3

| Example | Description |
|---|---|
| IN ATCCZRA<CR><LF><br>OUT ATCCZRA 7510.02,1020.22,98763.12<CR><LF> | Set the zero (baseline) value from channel 1 to channel 3 [Micro voltage] |

**ATCCZRn (n= 1~3)**

Set the zero (baseline) value for n channel

| Example | Description |
|---|---|
| IN ATCCZR1<CR><LF><br>OUT ATCCZR1 7510.02<CR><LF> | Set the zero (baseline) value for 1 channel [Micro voltage]<br><br>* An error is returned for channels other than 1 to 3 |

**ATCCSPn (n= 1~3)**

Set the span value for n channel gas concentration

| Example | Description |
|---|---|
| IN ATCCSP2 Calibration gas<CR><LF><br>OUT ATCCSP2 5.00,0.000036,23055.12,162526.09, 24.17<CR><LF> | Set the span value for 2 channel gas concentration<br>ATCCSP2 Calibration gas,Calibration slope, Baseline, Span, Calibration temperature <CR><LF><br>[Unit]<br>- Calibration gas : [ppm],<br>- Calibration slope: [ppm(%)/uV]<br>- Baseline[zero] : [uV], Span : [uV]<br>- Calibration temperature : [°C]<br><br>* An error is returned for channels other than 1 to 3 |

**ATCCALn (n= 1~3)**

Set the calibration parameter for n channel (Gas calibration)

| Example | Description |
|---|---|
| IN ATCCAL3 Baseline,Span,Calibration gas<CR><LF><br>OUT ATCCAL3 3055.12,162526.09,50.00<CR><LF> | Set the calibration parameter for 3 channels<br>ATCCAL3 Baseline,Span,Calibration gas<CR><LF><br>[Unit]<br>- Baseline[zero] : [uV], Span : [uV]<br>- Calibration gas : [ppm]<br><br>* An error is returned for channels other than 1 to 3 |

**ATCZCAL**

Set the zero (baseline) value for 4 channel (Carbon dioxide)

| Example | Description |
|---|---|
| IN ATCZCAL<CR><LF><br>OUT ATCZCAL OK<CR><LF> | Set the zero (400ppm) value for 4 channel (Carbon dioxide) |

**ATCOFFn (n= 1~6)**

to set the offset value of channel n output

| Example | Description |
|---|---|
| IN ATCOFF6 -0.5<CR><LF><br>OUT ATCOFF6 -0.5<CR><LF> | to set the offset value of channel 6 output.<br><br>ch1: ppm offset value (Carbon monoxide)<br>ch2: % offset value (Oxygen)<br>ch3: ppm offset value (Hydrogen sulfide)<br>ch4: ppm offset value (Carbon dioxide)<br>ch5: °C/°F offset value (Temperature)<br>ch6: % offset value (Relative humidity)<br>* An error is returned for channels other than 1 to 6 |

## 9. UA58-CH4 (Methane Sensor) AT Commands

**ATCZ**

It checks USB connection and device status.

| Example | Description |
|---|---|
| IN ATCZ<CR><LF><br>OUT ATCZ OK<CR><LF> | It checks USB Connection. |

**ATCD**

to request the value of sensor data. (two channels)

| Example | Description |
|---|---|
| IN ATCD<CR><LF><br>OUT ATCD 5.23, 19.85<CR><LF> | to request the value of sensor data.<br>ATCD <channel1>,<channel2><br>- channel1 : methane concentration [ppm]<br>- channel2 : Temperature [°C/°F] |

**ATCQ**

to request the value of sensor data. (four channels)

| Example of UA53-CO | Description |
|---|---|
| IN ATCQ<CR><LF><br>OUT ATCQ 3.00,26.00,36.00,----<CR><LF> | to request the value of sensor data.<br>ATCQ <channel1>,<channel2><channel3>,<----><br>- channel1 : $CH_4$ [ppm ]<br>- channel2 : Temperature [C or F]<br>- channel3 : Humidity[ % ] |

**ATCC**

to set Celsius temperature

| Example | Description |
|---|---|
| IN ATCC<CR><LF><br>OUT ATCC OK<CR><LF> | to set Celsius temperature scale. |

**ATCF**

to set Fahrenheit temperature

| Example | Description |
|---|---|
| IN ATCF<CR><LF><br>OUT ATCF OK<CR><LF> | to set Fahrenheit temperature scale. |

**ATCVER**

to request the version of this device.

| Example | Description |
|---|---|
| IN ATCVER<CR><LF><br>OUT ATCVER UA53-Gas_5V3<CR><LF> | to request the version of this device.<br>ex) UA58-CH3_0V1 |

**ATCMODEL**

to request the serial number of this model

| Example | Description |
|---|---|
| IN ATCMODEL<CR><LF><br>OUT ATCMODEL 20240130<CR><LF> | to request the serial number of this model. |

**ATCOFF1**

to set the offset value of channel 1 output

| Example | Description |
|---|---|
| IN ATCOFF1 -0.5<CR><LF><br>OUT ATCOFF1 -0.5<CR><LF> | to set the offset value of channel 1 output. |

**ATCOFF2**

to set the offset value of channel 2 output

| Example | Description |
|---|---|
| IN ATCOFF2 -0.5<CR><LF><br>OUT ATCOFF2 -0.5<CR><LF> | to set the offset value of channel 2 output. |

## 10. UA20D (Pulse Counter) AT Commands

### ATCZ

It checks USB connection and device status.

| Example | Description |
|---|---|
| IN ATCZ<CR><LF><br>OUT ATCZ OK<CR><LF> | It checks USB Connection. |

### ATCSM

to set stream mode. In stream mode UA2X send sensor value every 1 sec without any receiving user command. all the channel will be output. Currently supported for UA20.

| Example | Description |
|---|---|
| IN ATCSM 1<CR><LF> ,<br>ATCSM 0<CR><LF> ,<br><br>OUT ATCSM OK<CR><LF><br>ATCSM OFF<CR><LF><br><br>OUT STREAM 1<CR><LF><br>2<br>: | to enable stream mode. (1:Enable , 0:Disable)<br>the below string will be output automatically every 1 sec<br>STREAM <channel1> |

### ATCD

to request pulse count value (count max value is 99999999)

| Example | Description |
|---|---|
| IN ATCD<CR><LF><br>OUT ATCD 0 <CR><LF> | to request the value of pulse count data. |

| | |
|---|---|
| ATCD 1 <CR><LF><br>:<br> | ATCD |

*this command is supported since Ver 5.6

**ATCVER**

to request the version of this device.

| Example | Description |
|---|---|
| IN ATCVER<CR><LF><br>OUT ATCVER UA20D_1v7 <CR><LF> | to request the version of this device.<br>ex) UA20D_1v7<br>- UA20D: Device model<br>- 1v7: FW Version |

**ATCFTRST**

to request default start count

| Example | Description |
|---|---|
| IN ATCFTRST 9999<CR><LF><br>OUT ATCFTRST OK<CR><LF><br><br>OUT ATCD 10000<br>ATCD 10001<br>:<br> | to request default start count<br>ATCFTRST <default count >,<br>- default count : 0 & set desired number |

*this command is supported since Ver 5.6