

xSM Sensor Configuration Tool User Manual

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Introduction

Radiocrafts Sensor Configuration Tool is a tool to help with configuration of the sensors. The tool takes an input file describing the sensor configuration in an easy to understand format and converts it into a complete configuration string that can be used directly to configure the module.

Set up and installation

The tool is a free standing executable and runs without installation. Simply download the tool from www.radiocrafts.com, unpack and execute the file.

Input file

The input file must be in the same directory as the tool and must be called "config.json". The input file is a regular file written in JSON format. The top level structure of the file must be as shown in the following example

```
{
  "Sensors": [
    {
      SENSOR PARAMETERS HERE
    }, {
      SENSOR PARAMETERS HERE
    }
  ]
}
```

The sensor parameters are dependent of the type of sensor. Example for ADC is shown here, for other sensors, see example later in this chapter.

```
"Type" : "ADC",
"Version" : "1",
"Period" : "10",
"DSP_Operator" : "NONE",
"DSP_Param1" : "0",
"DSP_Param2" : "0",
"Threshold_Operator" : "NONE",
"Threshold_Param1" : "0",
"Threshold_Param2" : "0"
```

The following table shows all parameters supported. More details can be found in the RC16xxxx-SSM User Manual and RCxxxxxx-MSM User Manual. See later in this chapter for a complete example.

Parameter name	Description	Note
Type	Type of sensor to configure. Can be <i>HDC2010, SHT35, ADC, GPIO, LIS3DE</i>	
Version	Driver version. Must be <i>1</i>	For future backwards compability

Period	How often the sensor is read, in number of seconds	Not applicable to GPIO, which is checked every second
DSP_Operator	Which DSP operator to apply. Can be <ul style="list-style-type: none"> • “NONE” – Do not use DSP • “AVG” – Averaging • “MIN” – Keep minimum value • “MAX” – Keep maximum value 	
DSP_Param1	Which sensor channel to apply the DSP operator to. Value dependent on sensor type.	See RC16xxxx-SSM and RCxxxxxxx-MSM user manuals for details
DSP_Param2	Not used	Not used
Threshold_Operator	Which threshold operator (“trigger”) to apply. If this happens, a packet is transmitted. Can be: <ul style="list-style-type: none"> • “NONE” – Do not use threshold • “>” – If value of param1 is greater than param2 • “<” – If value of param1 is less than param 2 • “=” – If value of param1 is equal to param2 • “DELTA” – If change in value of param1 is greater than param2 	
Threshold_Param1	Which sensor channel to apply the threshold operator to. Value dependent on sensor type.	See RC16xxxx-SSM and RCxxxxxxx-MSM user manuals for details
Threshold_Param2	Value to compare with	
GPIOx_Direction	GPIO direction. Can be <ul style="list-style-type: none"> • “IN” GPIO pin is input • “OUT” GPIO pin is output 	
GPIOx_Initial_State	Keep this value until GPIOx_Initial_Delay has passed. Can be: <ul style="list-style-type: none"> • “0” – Pin is low 	Only applicable if GPIO is configured as output

	• "1" – Pin is high	
GPIOx_Initial_Delay	How long to keep "Initial_State". Value is in seconds	Only applicable if GPIO is configured as output
GPIOx_Low_Time	How long to keep pin low during infinite cycling after initial delay. Value is in seconds.	Only applicable if GPIO is configured as output. Infinite cycle starts after Initial Delay period
GPIOx_Hight_Time	How long to keep pin high during infinite cycling after initial delay. Value is in seconds.	Only applicable if GPIO is configured as output. Infinite cycle starts after Initial Delay period.

The following snippet shows a complete example "config.json" input file

```
{
  "Sensors": [
    {
      "Type" : "HDC2010",
      "Version" : "1",
      "Period" : "20",
      "DSP_Operator" : "NONE",
      "DSP_Param1" : "0",
      "DSP_Param2" : "0",
      "Threshold_Operator" : "NONE",
      "Threshold_Param1" : "0",
      "Threshold_Param2" : "0"
    }, {
      "Type" : "ADC",
      "Version" : "1",
      "Period" : "20",
      "DSP_Operator" : "NONE",
      "DSP_Param1" : "0",
      "DSP_Param2" : "0",
      "Threshold_Operator" : "NONE",
      "Threshold_Param1" : "0",
      "Threshold_Param2" : "0"
    }, {
      "Type" : "LIS3DE",
      "Version" : "1",
      "Period" : "20",
      "DSP_Operator" : "NONE",
      "DSP_Param1" : "0",
      "DSP_Param2" : "0",
      "Threshold_Operator" : "NONE",
      "Threshold_Param1" : "0",
      "Threshold_Param2" : "0"
    }, {
      "Type" : "SHT35",
      "Version" : "1",
      "Period" : "1",
      "DSP_Operator" : "NONE",
      "DSP_Param1" : "0",
      "DSP_Param2" : "0",
    }
  ]
}
```

```
"Threshold_Operator" : "NONE",
"Threshold_Param1" : "0",
"Threshold_Param2" : "0"
} , {
  "Type" : "GPIO",
  "Version" : "1",

  "GPIO1_Initial_State" : "0",
  "GPIO1_Direction" : "OUT",
  "GPIO1_Initial_Delay" : "5",
  "GPIO1_Low_Time" : "1",
  "GPIO1_High_Time" : "1",

  "GPIO2_Initial_State" : "0",
  "GPIO2_Direction" : "IN",
  "GPIO2_Initial_Delay" : "1",
  "GPIO2_Low_Time" : "1",
  "GPIO2_High_Time" : "1",

  "GPIO3_Initial_State" : "0",
  "GPIO3_Direction" : "IN",
  "GPIO3_Initial_Delay" : "1",
  "GPIO3_Low_Time" : "1",
  "GPIO3_High_Time" : "1",

  "GPIO4_Initial_State" : "1",
  "GPIO4_Direction" : "OUT",
  "GPIO4_Initial_Delay" : "1",
  "GPIO4_Low_Time" : "0",
  "GPIO4_High_Time" : "1",

  "DSP_Operator" : "None",
  "DSP_Param1" : "0",
  "DSP_Param2" : "0",
  "Threshold_Operator" : "NONE",
  "Threshold_Param1" : "0",
  "Threshold_Param2" : "0"
}
]
```

Running the configuration tool

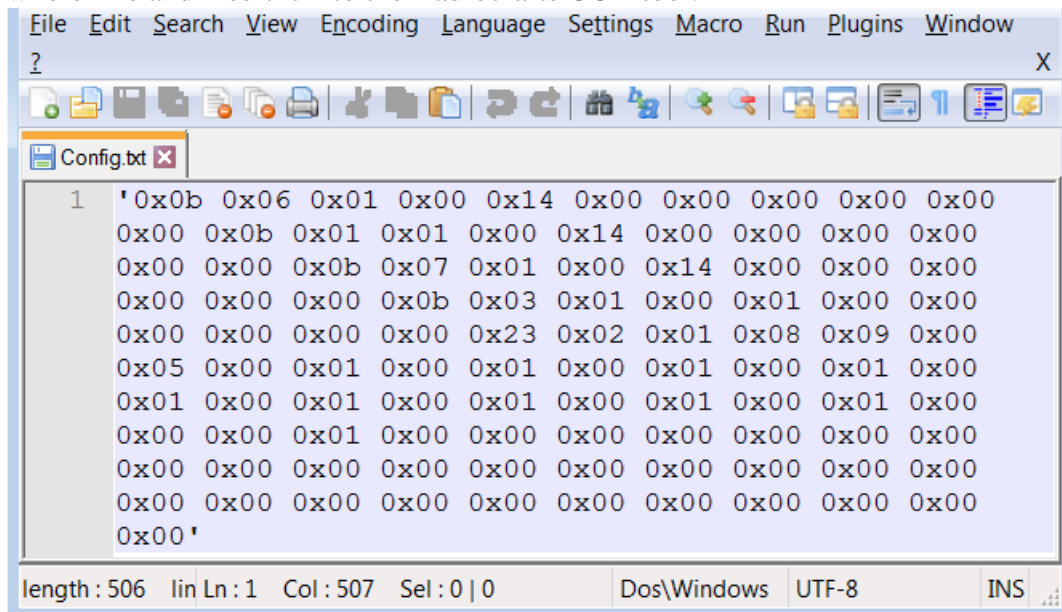
After creating the “config.json”-file, simply run the tool (“SensorConfigGenerator.exe”) without any parameters. A file “Config.txt” is created with the full configuration array. Also, during execution, listing of all sensors and the full configuration string is output on the console.

```
C:\Windows\system32\cmd.exe
igGenerator\dist>SensorConfigGenerator.exe
Sensor: HDC2010
0x0b 0x06 0x01 0x00 0x14 0x00 0x00 0x00 0x00 0x00 0x00
Sensor: ADC
0x0b 0x01 0x01 0x00 0x14 0x00 0x00 0x00 0x00 0x00 0x00
Sensor: LIS3DE
0x0b 0x07 0x01 0x00 0x14 0x00 0x00 0x00 0x00 0x00 0x00
Sensor: SHT35
0x0b 0x03 0x01 0x00 0x01 0x00 0x00 0x00 0x00 0x00 0x00
Sensor: GPIO
0x23 0x02 0x01 0x08 0x09 0x00 0x05 0x00 0x01 0x00 0x01 0x00 0x01 0x00 0x01 0x00
0x01 0x00 0x01 0x00 0x01 0x00 0x01 0x00 0x01 0x00 0x00 0x00 0x01 0x00 0x00 0x00
0x00 0x00 0x00

Final full configuration string:
'0x0b 0x06 0x01 0x00 0x14 0x00 0x00 0x00 0x00 0x00 0x00 0x0b 0x01 0x01 0x00 0x14
0x00 0x00 0x00 0x00 0x00 0x00 0x0b 0x07 0x01 0x00 0x14 0x00 0x00 0x00 0x00
0x00 0x0b 0x03 0x01 0x00 0x01 0x00 0x00 0x00 0x00 0x00 0x23 0x02 0x01 0x08
0x09 0x00 0x05 0x00 0x01 0x00 0x01 0x00 0x01 0x00 0x01 0x00 0x01 0x00 0x01
0x01 0x00 0x01 0x00 0x01 0x00 0x00 0x00 0x01 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x00'
```

File output

During execution, a file called “Config.txt” is created. The file contains one line which is the full configuration array as a plain text string of hexadecimal values. The string is enclosed in single quotation marks ('). This enables you to copy-paste the whole line and insert it into the Radiocrafts CCT-tool.



```
File Edit Search View Encoding Language Settings Macro Run Plugins Window
?
Config.txt
1 '0x0b 0x06 0x01 0x00 0x14 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x0b 0x01 0x01 0x00 0x14 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x0b 0x07 0x01 0x00 0x14 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x0b 0x03 0x01 0x00 0x01 0x00 0x00
0x00 0x00 0x00 0x00 0x23 0x02 0x01 0x08 0x09 0x00
0x05 0x00 0x01 0x00 0x01 0x00 0x01 0x00 0x01 0x00
0x01 0x00 0x01 0x00 0x01 0x00 0x01 0x00 0x01 0x00
0x00 0x00 0x01 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00'
```

length : 506 lin Ln: 1 Col: 507 Sel: 0 | 0 Dos\Windows UTF-8 INS

Sensor configuration

To do the actual sensors configuration, you must enter configuration mode. See the RC16xxxx-SSM and RCxxxxxx-MSM user manuals on details on how to enter configuration mode for your module.

Once in configuration mode, the sensors are configured using the 'J'-command. The J command is followed by a configuration array consisting of exactly 101 values describing all sensors and parameters. These 101 bytes are the ones generated and saved in the output file ("Config.txt"). After the command is executed, you will need to exit configuration mode. The module will then restart.

For example, to configure the RC1180-MSM:

1. Send 0xFF to wake up the module
2. Wait 100-2000ms
3. Send 0x00 to enter configuration mode
4. Wait for prompt ">"
5. Send 0x4A ("J")
6. Wait for prompt ">"
7. Send 101 bytes of configuration data
8. Wait for prompt ">"
9. Send 0x58 ("X") to exit configuration mode and restart the module

Document Revision History

Document Revision	Changes
1.00	First release

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