

Configuration of RF Module & on-line calibration

The user has the opportunity during the Power-On-Self-Test (POST) procedure to turn the RF module on or off, to change the RF frequency, the Network Group and the Node ID. When running, the sensor calibration and various other settings can be adjusted.

To enter configuration mode at start-up, using the serial monitor part of the Arduino IDE, enter “+++” followed by the [Enter] key when prompted. You must respond within 10 seconds. If you do nothing, the start-up procedure continues normally after the timeout has expired.

You will then see a short menu:

Available commands for config during start-up:

```
b<n>      - set r.f. band n = a single numeral:
           4 = 433MHz, 8 = 868MHz, 9 = 915MHz
           (may require hardware change)
g<nnn>    - set Network Group nnn - an integer (OEM default = 210)
           (g - reports the network group)
i<nn>    - set node ID (standard node ids are 1..30)
           (i - reports the node ID)
r         - restore sketch defaults
s         - save config to EEPROM
v         - Show firmware version
w<x>     - turn RFM Wireless data on or off:
           x = 0 for OFF, x = 1 for ON, x = 2 for ON with whitening
x         - exit and continue
```

Available commands when running:

```
k<x> <yy.y> <zz.z>
- sensor calibration
  x = a single numeral:
    0 = voltage calibration,
    1 = ct1 calibration, 2 = ct2 calibration, etc
  yy.y = a floating point number for the voltage/current
        calibration constant
  zz.z = a floating point number for the phase calibration
        for this c.t.
        (z is not needed, or ignored if supplied, when x = 0)
        e.g.      k0 256.8
                  k1 90.9 2.00
l         - list the config values
m<x> <yy>
- meter pulse counting
  x = 0 for OFF, x = 1 for ON,
  yy = an integer for the pulse minimum period in ms.
      y is not needed, or ignored when x = 0)\n"
p<xx.x>  - datalogging period
  xx.x = a floating point number for the datalogging period in seconds
s         - save config to EEPROM
t0 <y>   - turn temperature measurement on or off:
  - y = 0 for OFF, y = 1 for ON
t<x> <yy> <yy> <yy> <yy> <yy> <yy> <yy>
- change a temperature sensor's address or position:
  - x = a single numeral: the position of the sensor in the list
    (1-based)
  - yy = 8 hexadecimal bytes representing the sensor's address
    e.g.  28 81 43 31 07 00 00 D9
    N.B. Sensors CANNOT be added
?         - show this text again
```

Note: The sketch might not make use of all of the options listed here.

When RFM wireless data is turned off, the serial output in a format suitable for the ESP8266 WiFi module is automatically turned on, and on-line calibration & configuration is therefore not available.

For the RF configuration commands changed during start-up, if you change one or more of the settings, the change will take effect when you exit and continue (option 'x'). Take care that the correct frequency is selected to match your hardware. Operating the transmitter at high power on the wrong frequency can destroy the RFM module.

For the settings you change when running, the command will be acknowledged and you will see the displayed values change. You will also see confirmation when you save the changes. When you change one or more of the settings, the change will take effect immediately.

Option ('s') will save all the changes. If you do not do this, the settings will revert to the previous values at the next restart. After you save ('s') the changes, the new settings will be used forever, or until changed again.

If you restore the sketch default values ('r' during start-up), all the EEPROM data is erased completely and the sketch restarts immediately, using the values set in the sketch. There is then no means of recovering the EEPROM data.

If the sketch starts and all the calibration values are zero, which will necessarily make all the output values zero, then it is possible that the EEPROM has been used previously and has had zero values written. In that case, restart the sketch, enter configuration mode and choose 'r' - this will erase the EEPROM to the manufacturing default values and the sketch will restart using its own set values.