

Command line interface

Electrical connection

You can use a commercially available USB-to-serial adapter cable to connect a PC to the sensor device. **CAUTION: Use adapters with 3 V (max. 3.3 V) TTL logic levels!** Recommended cable: “TTL-232R-RPi Debug Cable for Raspberry Pi” by FTDI chip. Connect 3 wires to the device connector (female pin header socket, 2.54 mm pitch):

Cable	Device
	TCK
RXD	TXD
TXD	RXD
	RST
GND	GND

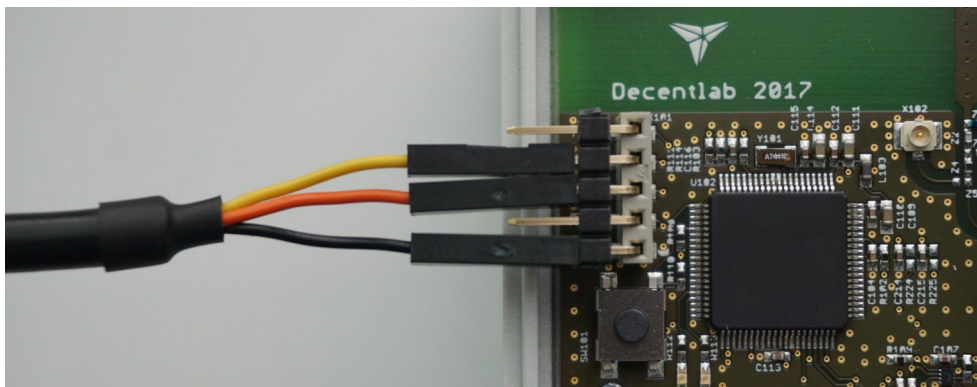


Illustration 1: Serial interface connection (3.3 V TTL levels).

General remarks

- The ASCII command line interface is active only for 10 min after device reset / power-up. Entering any character restarts the 10 min timeout period.
- Connect using a serial terminal program with settings 115200, 8, N, 1.
- Characters are not echoed. Enable local echoing in your terminal program if needed.
- Terminate each command with CR ('\r', 0x0D), LF ('\n', 0x0A) or both.
- set and get commands operate on parameters in the device software, not directly on the radio module.
- Some commands only take effect after reset (e.g. set deveui).
- Parameter changes (set ...) are lost when the device is reset, except when save is issued.
- save permanently stores current parameter settings in flash.

Command list

reset	Reset; un-saved parameter changes are lost.
version	Get device software version.
save	Save current parameter set in flash.
factory reset	Erase settings in flash and reset.
get period	Get sampling period in seconds.
set period <p>	Set sampling period in seconds (1...65535).
get send_period	Get send period relative to sampling period (default: 1).
set send_period <p>	Set send period. Examples: p = 0 or 1: send after every sampling; p = 4: send after every fourth sampling.
get mode	Get LoRaWAN activation mode.
set mode otaa	Select OTAA (over-the-air activation).
set mode abp	Select ABP (activation by personalization).
get dr	Get default Tx data rate. Actual data rate may vary, if ADR is enabled.
set dr <p>	Set default Tx data rate. Used for next Tx. Actual data rate for following Tx may vary, if ADR is enabled.
get adr	0: ADR disabled, 1: ADR enabled.
set adr on	Enable ADR.
set adr off	Disable ADR.
get pwridx	Get default Tx power index. Actual power index may vary, if ADR is enabled.
set pwridx <p>	Set default Tx power index. Used for next Tx. Actual power index for following Tx may vary, if ADR is enabled.
get deveui	Get DevEUI: 8 bytes in hex (16 hex characters).
set deveui <p>	Set DevEUI. Issue save and reset afterwards.
get appeui	Get AppEUI: 8 bytes in hex (16 hex characters).
set appeui <p>	Set AppEUI. Issue save and reset afterwards.
set appkey <p>	Set AppKey: 16 bytes in hex (32 hex characters). Issue save and reset afterwards.
get devaddr	Get DevAddr: 4 bytes in hex (8 hex characters).
set devaddr <p>	Set DevAddr. Issue save and reset afterwards.
set nwkskey <p>	Set NwksKey: 16 bytes in hex (32 hex characters). Issue save and reset afterwards.
set appskey <p>	Set AppSKey: 16 bytes in hex (32 hex characters). Issue save and reset afterwards.

get nodeid	Get Decentlab device ID (0...65535).
set nodeid <p>	Set Decentlab device ID (0...65535).
get hweui	Get radio module hardware EUI.
read	Read sensors now (and send, if send_period has elapsed).
get dr_min	Get minimum data rate (overrides ADR settings).
set dr_min <p>	Set minimum data rate (overrides ADR settings).
get dr_max	Get maximum data rate (overrides ADR settings).
set dr_max <p>	Set maximum data rate (overrides ADR settings).
get pwridx_min	Get minimum Tx power index (overrides ADR settings).
set pwridx_min <p>	Set minimum Tx power index (overrides ADR settings).
get pwridx_max	Get maximum Tx power index (overrides ADR settings).
set pwridx_max <p>	Set maximum Tx power index (overrides ADR settings).
get param <i>	Get parameter i, i = 0...15.
set param <i> <p>	Set parameter i, i = 0...15, p = 0...65534 (65535: invalid).
get chmask	Get LoRaWAN channel mask: 9 bytes in hex (18 hex characters).
set chmask <p>	Set LoRaWAN channel mask. Issue save and reset afterwards. See examples (below).
get join_period	Get re-join period in hours.
set join_period <p>	Set re-join period in hours (0...1000). Examples: 24: re-join network every 24 hours. 0: never re-join.
<others>	Invalid command. Answer: unknown command.

Examples (EU868 band)

set dr 3	Set default data rate: SF9 / 125 kHz. Used for next Tx. Actual data rate for following Tx may vary, if ADR is enabled.
set pwridx 1	Set default Tx power index: 14 dBm. Used for next Tx. Actual power index for following Tx may vary, if ADR is enabled.
set adr on	Enable ADR from now on.
set mode abp save reset	Set ABP mode; save; reset. Make sure DevAddr, NwkSKey and AppSKey are valid!

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set mode otaa      Set OTAA mode; save; reset. Make sure DevEUI, AppEUI and AppKey
save              are valid!
reset

set dr_min 2      Use only SF10...SF7, overriding ADR settings.

set dr_max 2      Use only SF12...SF10, overriding ADR settings.

set pwridx_min 2  Use maximum 11 dBm, overriding ADR settings.

set pwridx_max 1  Use minimum 14 dBm, overriding ADR settings.

set param 0 1000  Set parameter 0 to 1000.

set param 1 2000  Set parameter 1 to 2000.

set deveui 0123456789ABCDEF
set appeui 000ABC394380221F
set appkey 0123456789ABCDEF0123456789ABCDEF
save
reset

```

Device customization: Set DevEUI; set AppEUI; set AppKey; save to flash; reset device.

Examples (US915 band)

Note: The examples for EU868 (above) also apply to US915 devices, only that the values for data rates and power indexes differ.

```

set chmask FF0000000000000000  Set LoRaWAN channel mask: Enable channels 0...7, disable
save                          channels 8...71.
reset

set chmask 00FF00000000000002  Set LoRaWAN channel mask: Enable channels 8...15 and
save                          65, disable all others.
reset

set chmask 010000000000000000  Set LoRaWAN channel mask: Enable channel 0, disable all
save                          others.
reset

set chmask 030000000000000000  Set LoRaWAN channel mask: Enable channels 0 and 1,
save                          disable all others.
reset

```

```
set chmask FFFFFFFFFFFFFFFF Set LoRaWAN channel mask: Enable all channels (0...71).
save
reset
```

Data rate and power index (EU868 band)

Data rate	Configuration	Bit rate	Power idx	Tx Power
0	SF12 / 125 kHz	250 bit/s	1	14 dBm
1	SF11 / 125 kHz	440 bit/s	2	11 dBm
2	SF10 / 125 kHz	980 bit/s	3	8 dBm
3	SF9 / 125 kHz	1760 bit/s	4	5 dBm
4	SF8 / 125 kHz	3125 bit/s	5	2 dBm
5	SF7 / 125 kHz	5470 bit/s		

Data rate and power index (US915 band)

Data rate	Configuration	Bit rate	Power idx	Tx Power
0	SF10 / 125 kHz	980 bit/s	5	20 dBm
1	SF9 / 125 kHz	1760 bit/s	7	16 dBm
2	SF8 / 125 kHz	3125 bit/s	8	14 dBm
3	SF7 / 125 kHz	5470 bit/s	9	12 dBm
4	SF8 / 500 kHz	12500 bit/s	10	10 dBm