Feature Guide

Wake Up

“Wake up” is the process of “deep battery saving sleep” to “normal operation”. The Sensor/Client PCB has a specifically designed power management to switch off the power of more of less all components on the PCB. During the wake up you have several parameters of the header file to choose from.

- By the parameter CLIENT_ALLOW_LED_FADING you can choose to **increase and decrease the RGB led brightness during wake** up and sleep as a fading effect, instead of a sudden on/off. Looks nice and shows you, what is going on, but it takes a little bit of time. If wake up time is critical, disable this feature (by default it is enabled).
- With CLIENT_RGB_FADE_SPEED you choose the desired LED **fading speed for wake up and going to sleep**. The default value for the speed is 100.
- By the define SHOW_STATE_COLORS you can also choose to **show each state color** (Power, WLAN, Bat Low, Transmission Error etc.) during wake-up (this is disabled by default).
- CLIENT_RGB_BRIGHTNESS determines the **brightness of the led during normal operation** (this is always a compromise between battery consumption and bright LED)

Wake by Touch

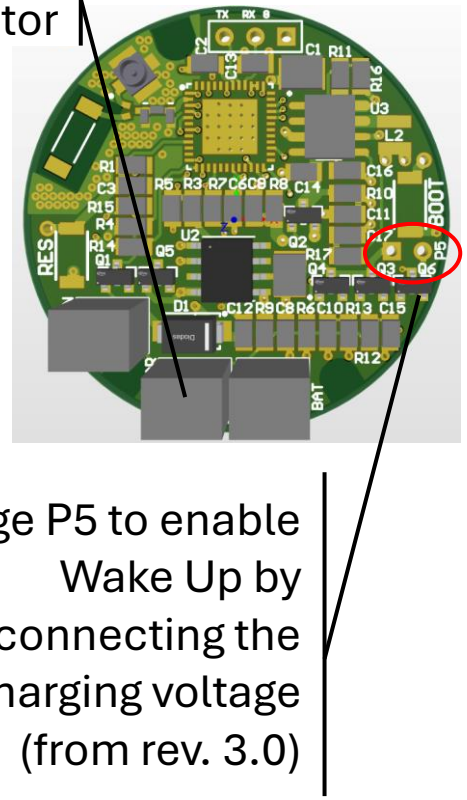
- The easiest way to wake up the Sensor is by **touching anything in X, Y or Z or to tip the sensor by hand**. Be careful to not break the Sensor while CNC traveling during automatic touching, because the wake up takes a bit of time (3-4 seconds depending on fading on/off and fading speed) and your CNC controller might not detect early enough, that something was touched. So, prepare a suitable spot for a wake-up touch, travel to the spot, wait for a few seconds and the Client is alive.

Feature Guide (continued)

Wake Up (continued)

Wake Up by disconnecting the charging unit

- A typical use case is to have the wireless Sensor/Client in a tool magazine that charges the Sensor battery (LiPo) while it is not used in the machine. By detecting the presence and the absence of the **charging voltage the Sensor can full automatically wake up and sleep**, without any manual or CNC controller interaction.
- This feature is supported by **Sensor/Client PCB version 3.0 or later**, but the version 2.0 can be upgraded with a soldering job (contact me for further information).
- Especially the wake up process is a pure electronic procedure without the microcontroller involved. Therefore, the enable/disable of the wake up when charging voltage is interrupted (Sensor leaving the magazine and the charger) is realized by a **0 Ohm resistor/shot circuit of P5**. When P5 is short circuit, the Sensor wakes up, as soon as the charging voltage is disconnected. Be aware, that the sensor will not go to sleep in this setup until you re-attach a charger.
- To send the Sensor asleep you can use the parameter SLEEP_DURING_CHARGING. This means as the **Sensor detects a charging voltage, the system goes to sleep**. Other sleep options are still available (e.g. Basestation send a sleep command). Make sure that the parameter NO_SLEEP_WHILE_CHARGING is not set at the same time.



Wake up by WIFI command

- This is intentionally not supported, because the power consumption of the microcontroller in deep sleep and especially all the necessary peripherals is too high.

Feature Guide (continued)

Sleep

“Sleep” is simply the opposite process to “Wake up” (from “normal operation” to “deep battery saving sleep”).
You have several options for sleep that can be chosen of in the header file.

Sleep by CNC controller interaction

The most common sleep use case is, that the CNC controller sends the Sensor via an electrical input of the Basestation to sleep. The Basestation detects the CNC command and informs the Sensor by a UDP message. The Basestation input is protected by a through hole transistor and the polarity can be chosen by the parameter SERVER_SLEEP_IN_POLARITY. The voltage range of the input is the same as for the supply voltage and can be 0V up to 5-24V. There are parameter settings that prevent sleeping (see following chapters).

Sleep if Basestation is not available

Another Use Case is, that the CNC machine is switched off, while Sensor is still on or that the sensor was accidently woken up with no connected Basestation. In this case the sensor automatically goes to sleep after a certain number of service interval without an “Alive” message from the Basestation. The number is represented by the parameter SERVER_ALIVE_CNT_DEAD but is also dependent on the service cycle length SERVICE_INTERVALL_ESP32 .

Sleep by watchdog (not used for a certain time)

Similar to the previous auto sleep option is the watchdog. The watchdog remembers the time since the sensor has detected the last object. If this time was too far in the past, the sensor can go to sleep automatically even if a Basestation is connected. The relevant parameters are AUTO_SLEEP_TIMER_ENABLE and AUTO_SLEEP_TIMER_CYCLES (dependent on the SERVICE_INTERVALL_ESP32 parameter)

Feature Guide (continued)

Sleep (continued)

Sleep by charging connected

As described in the section “Wake Up by disconnecting the charging unit” the last sleep option is to enable that the Sensor goes to sleep, as soon as the Sensor detects a charging voltage. The power of the Sensor is disabled, but the charging still takes place. The parameter is SLEEP_DURING_CHARGING and the use case is that you have a charging device in the tool magazine that automatically charges the sensor, when it is put back into the magazine.

No sleep conditions

Independent from the initial sleep event (watchdog, Basestation input/CNC controller or charging voltage) there are conditions, that prevent the sensor to go to sleep. These are:

- Sensor is open (blue color on RBG)
- NO_SLEEP_WHILE_CHARGING parameter is set