Ubiqisense

Health & Provisioning
LED States - UC2

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Table of contents

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Introduction

An important debugging tool for Ubiqisense edge devices are LED states. On the one hand, the LEDs are on the back of the sensors, so following their states needs physical access to the device and unmounting from their wall-mount. On the other hand, LEDs have higher availability compared to wifi/bluetooth broadcasts.
This document defines health monitoring and provisioning LED states for both UC1 and UC2 sensor types.

This document overrules all preceding LED documentations, including:

- NanoPi H5 LEDs
- UC1 LED signals
- UC2 led states

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LED Signals Emitted in the Native OS

Color patterns shown in the “LED Behaviour” column are for 8 seconds.
The narrowest bar approximates 100 ms, e.g. in UB_RB.

The following table presents LED states in **init daemon scripts**:

Num	State	Description	LED Behaviour
1	LED0	Zero State!	Turn all LEDs OFF 
2	-	Board Reset / Booting	low BLUE blink 
	S5_FL	Flashing Software (development UC2 devices) *	Heartbeat Green+Blue
	S10_F	Config Error! Most probably a problem with partitions. Contact support to replace this device!	One 0.2s Red blink, 3.6s OFF 
	S30_F	Camera Error! Contact support to replace this device!	Two 0.2s Red blinks, 3.2s OFF 
	S30_P	WPA_supplicant Started! - Entering primary QR detection for all un-provisioned IoT sensors - Entering secondary QR detection for un-provisioned BLE sensors - Entering net-boot for fully-provisioned BLE sensors - Waiting for WiFi connection for provisioned IoT sensors	One 0.2s Blue blink, 3.6s OFF 

* Directly call led_control__ to set LEDs in init.d services before S10-config starts (guest-config not mounted yet)

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The following table presents LED states common to **provisioning and network link status**:

Num	State	Description	LED Behaviour
4	QR_P	QR-code Detection OK! - For factory software, this means the QR text is detected! - For patched software, this means the detected QR text follows a predefined pattern: Line1 is SSID, Line2 is Pass-phrase, Line3 is GW, Line4 includes mandatory Boot-args fields, 'c', 'l', 's', 't', 'k'	Three 0.2s Blue blinks, 2.8s OFF 
	WF_SQ	WiFi Scan Failed, Scanning for QR - Wrong SSID, Misconfigured Hidden-net, AP is Off, etc.	Three 0.2s Red blinks, One 0.2s Blue blink, 2.6s OFF 
	WF_AQ	WiFi Association Failed, Scanning for QR - Device MAC-address is ACL Blocked, etc.	Four 0.2s Red blinks, One 0.2s Blue blink, 2.0s OFF 
	WF_HQ	WiFi Hand-shake Failed, Scanning for QR - Wrong Passphrase, Incompatible Key-management, etc.	Five 0.2s Red blinks, One 0.2s Blue blink, 1.6s OFF 
	WF_SF	WiFi Scan Failed, Non-recoverable! - Wrong SSID, Misconfigured Hidden-net, AP is Off, etc.	Three 0.2s Red blinks, 2.8s OFF 
	WF_AF	WiFi Association Failed, Non-recoverable! - Device MAC-address is ACL Blocked, etc.	Four 0.2s Red blinks, 2.4s OFF 
	WF_HF	WiFi Hand-shake Failed, Non-recoverable! - Wrong Passphrase, Incompatible Key-management, etc.	Five 0.2s Red blinks, 2.0s OFF 
	LC_F	Ethernet Link-check Failed (UC2 POE), Non-recoverable!	Six 0.2s Red blinks, 1.6s OFF 
	LC_FQ	Ethernet Link-check Failed (UC2 POE), Non-recoverable, Scanning for QR.	Six 0.2s Red blinks, 1.6s OFF 

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	IF_UP	If-plug Daemon Up DHCP Started! - This state lasts until DHCP is resolved!	Five Alt. 0.2s Red/Blue blinks, 2.0s OFF 
5	IF_P	If-plug Daemon Up DHCP OK!	Five 0.2s Blue blinks, 2.4s OFF 
	NB_ST	Net-boot Online Service OK!	0.4s Blue blinks 

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The following table presents LED states common to **software checks and updates**:

Num	State	Description	LED Behaviour
	UB_ST	Ubi-boot Started! (This is only used for the transition software)	0.4s Blue blinks (same as NB_ST)
6	UB_DL	Ubi-boot Downloading Firmware…	0.2s Blue blinks 
7	UB_FL	Ubi-boot Flashing Firmware…	Alt. 0.2s Red/Blue blinks 
	UB_CP	Ubi-boot Checking FW Partition…	Two Alt. 0.2s Red/Blue blinks, 0.8s OFF 
	UB_RB	Ubi-boot Rebooting in 2s! - On some occasions, un-mounting partitions fails until a longer timeout force-reboots the device!	Alternating 0.1s Red/Blue blinks 

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BLE Specific LED Signals

The following table presents LED states that are only applicable to **BLE sensors during the pre-provisioning stage** (when the device gets its full software update). During the follow-up boots, the device can run without WiFi availability (the sensor can also connect to the predefined maintenance WiFi in the background for support and software updates).

Num	State	Description	LED Behaviour
	`UB_CL`	Ubi-boot BLE Checking lvl Files… *	Two 0.1s Green+Blue blinks, 0.6s OFF 
	`UB_CF`	Ubi-boot BLE lvl Check Failed!	Seven 0.2s Red blinks, 1.2s OFF 
	`UB_QR`	Ubi-boot BLE QR-config Started! *	solid Green+Blue 

* LEDs are ON together, which may seem as a Cyan light on UC2!

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LED Signals Emitted in the Runtime Container

The following table presents LED states that are periodically updated inside the **RT-container's scheduler script**.

Num	State	Description	LED Behaviour
8	SC_P	Scheduler Healthy Container (BLUE HEARTBEAT) - Loading the DNN model may take 2-minutes after this state starts.	Two 0.1s Blue blinks, 0.6s OFF 
	SC_SC	Scheduler SoS Carrier (WiFi / Ethernet)	4x(Two 0.1s Red blinks, 0.6s OFF) 4x(Two 0.1s Green blinks, 0.6s OFF) 
	SC_ST	Scheduler SoS Tunnel	4x(One 0.8s Red blinks, 0.2s OFF) 4x(Two 0.1s Green blinks, 0.6s OFF) 
	SC_F		

LED Signals Emitted from the Sensor application

The following table presents LED states that are updated inside the Sensor application (UBSensor.py)

Num	State	Description	LED Behaviour
	PY_P	Sensor application has started (GREEN HEARTBEAT) - Set right after API call to signal that `sensor_started`	Two 0.1s Green blinks, 0.6s OFF