Sigfox Access Station Micro

SMBS-T4

Product manual

July 2023

Contents

Issue

Issue	Date	Author	Changes
1.0	February 2020	Eric Nicolas	Initial Document
1.1	January 2023	Pierre-adrien SOLIGNAC	- Remove list of supported dongle - Add Spare parts
1.2	February 2023	Pierre-adrien SOLIGNAC	- Update of regulatory groups - Update connectivity ports
1.3	July 2023	Antoine BOURDEIL	Add reference to Connectivity Requirement document

Acronyms

Acronyms/abbreviations	Meanings
AC / DC	alternating / direct current
DC (radio access mode)	Duty Cycle
DL	Downlink
ETH	Ethernet
FH	Frequency hoping
ISM	Industrial, Scientific and Medical
LBT	Listen before talk
PoE	Power over internet
RF	Radio frequency
RX	Reception mode
SDR	Software-Defined Radio
TX	Emission mode
UL	Uplink

1. Product presentation

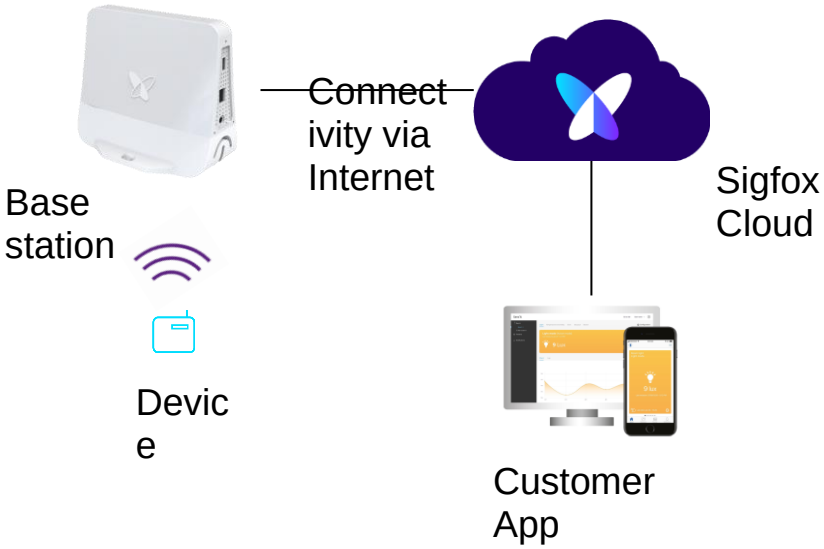
Sigfox Access Stations operate on a specific frequency bandwidth used by sigfox devices. They perform mainly receiving operations (uplink), but are also able to transmit information by doing downlink operations upon device request

The Access Stations Micro include a complete system described in the Network overview below.

Sigfox Access Station Micro series are ultra-wide range, high linearity transceivers units and feature first class performance radio and innovative software defined radio processing, for use in Ultra Narrow Band Machine-To-Machine wireless communication systems.

Sigfox Access Station Micro system has a pre-set receiver frequency depending on the radio regulation applicable in the region. This choice is made by a specific software configuration.

2. Network overview



3. Package contents

- Sigfox Access Station Micro SBMS-T4
- Mounting kits (2 ties and 2 set of screws and anchors)
- PoE DC injector
- Ethernet cable CAT6 1.5m
- Power adaptor 110/220V AC to 24V DC 18W
- Quick Start Guide / Safety Notice

Accessories available separately:

- Sealing cover
- Spare parts:
    - PoE DC injector
    - Power adaptor

4. Installation recommendation

Access Station Micro has been developed for indoor and outdoor operation.

For temporary location, the base station is perfectly stable sitting on a table, a desk or a shelf. For permanent installation, we recommend using the mounting kits for long-term fixation.

For outdoor operation, the adjunction of sealing cover is mandatory to ensure waterproofness (see §4.4).

4.1. Coexistence with another RF equipment

As any radio equipment, Access station micro should be installed with proper decoupling precaution versus other radio transmitters. Should the quantified decoupling recommendation listed below be infringed, the access station micro would enter degraded operation, including coverage reduction.

Decoupling protection is usually expressed in dB, however for practical reasons, this guide presents decoupling recommendation in terms of physical separation.

Co-location of access station micro on Telco site or with third party SRD/ISM systems operating on the same band is forbidden.

Regardless the type of installation, the base station must be installed away from obstacles possibly altering the reception, and so that it must not receive more than -20dBm signals from 0 to 821MHz and from 925MHz to 2.5GHz.

General recommendation for outdoor installation would be to not place the Access Station Micro in direct line of sight of broadcasting equipment or cellular station.

For indoor installation, place the station in a different room as other RF equipment, when possible install the station on a different floor.

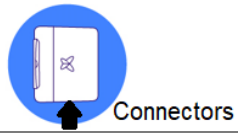
Use of cell phones in direct vicinity of the Access Station Micro will not affect neither its range, nor its quality of service.

In case of third party equipment in close proximity, with line of sight visibility and horizontal alignment, following physical separation is recommended:

System type	Minimum physical separation	
	indoor	outdoor
100KW Broadcast (FM or digital TV DBV-T)	1000m	3000m
Cellular macrocell (N x 2kW panel)	100m	300m
Cellular pico station	2m	N/A
868-925 MHz SRD / ISM equipment	100m	1000m
Wi-Fi	1m	1m

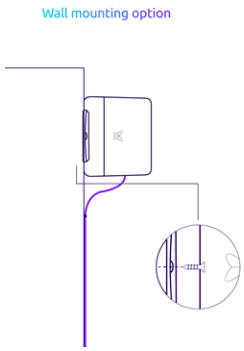
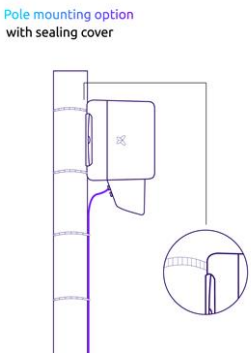
4.2. Access Station Orientation

The table below describes the preferred orientation to maximize the radio performances of the access station:

Preference order	Orientation	Illustration
1	Standing up	
2	Upside down	
3	Aside	

4.3. Access Station Mounting

The following table describes the different mounting options offered with the kit included in the package:

	Wall Mounting	*Pole Mounting*
Kit	• 2 screws 4.5x30mm & anchors for plaster wall • 2 screws 5 x 30mm & anchors for concrete wall	2 cable ties included
Illustration		
Requirements	A drill and/or a screwdriver	Pole or mast recommended diameter: • Minimum 20mm • Maximum 60mm

4.4. Sealing Cover

To install the Access station micro outside, or in an environment exposed to high humidity, dust, or even to prevent thief, you must use the sealing cover to protect the connectors and the USB dongle if used. The sealing cover provides an Ingress Protection IP65.

Note: Ethernet cabling must be Cat5e or above, suitable for outdoor use (with drain wire). For more details in cable types and maximum length see the power supply § 5.2

4.5. Site selection

Radio performance will depend on site configuration. Whatever the type of installation, the station should be clear of massive obstacles or metallic surface within 1m, since possibly altering operation.

4.5.1. Indoor:

If the station is to cover a building on several floors, it is recommended to place it mid-height of the building, but generally in the upper part of the room or area to cover. The station should not be used within a metallic closet or in a technical room with metallic door.

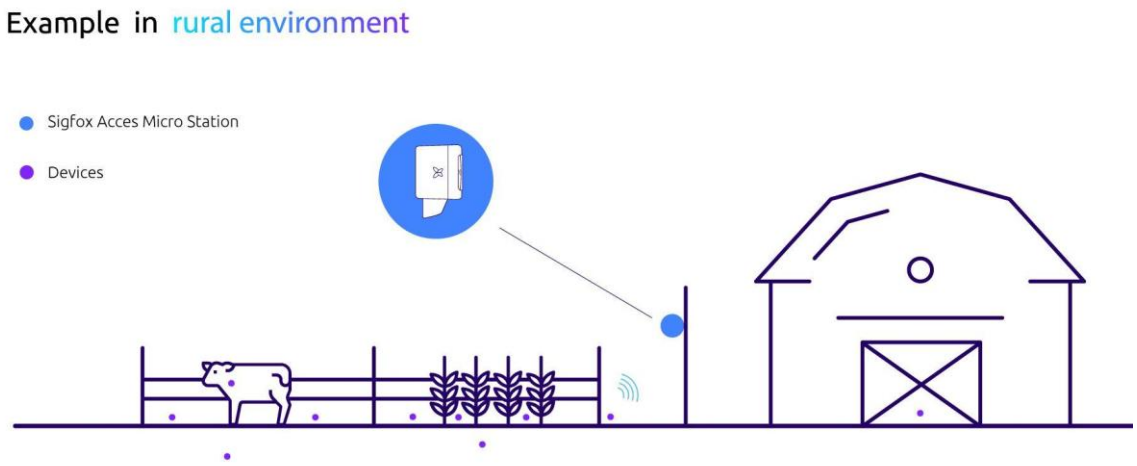
To ensure a maximum of performance, you must ensure to:

- Avoid placing the Sigfox devices in the same room as the station.
- Avoid installation on the last floor in case of cellular BS on the roof and away from windows to reduce RF interferers from cellular/broadcasters”

Note: When installed vertically on a wall, the connector must be facing downward.

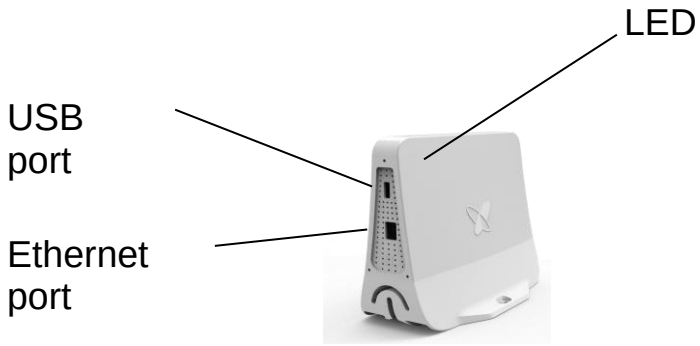
4.5.2. Outdoor:

For outdoor deployment, it is recommended to place the Access Station Micro **above**, **facing and in the periphery of** the connected devices for best result.



5. Connection and commissioning

5.5. Interface



5.6. Power supply

The station is powered with a passive PoE. The PoE splitter is integrated in the station. The power is conveyed from the AC/DC adapter through the DC injector and the ETH cable (all provided in the box).

Customers may need to re-confirm that the whole system complies with the EMC directives.

5.6.1. Input requirement

Power supply: PoE (passive) 24V DC and 0.75A

Nominal voltage range: 11V DC to 26V DC from the supplied PoE injector
Station minimum input voltage: 10V DC
Max input current: 1A
Injector DC connector: 5.5mm x 2.1mm

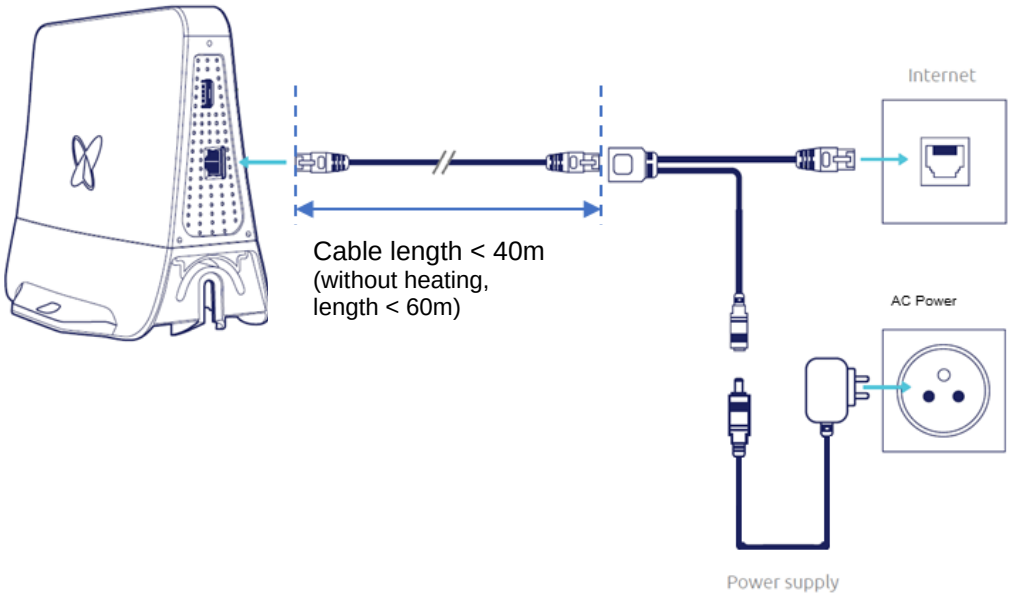
Note : The station cannot be powered with IEEE 802.3x active PoE routers/injectors.

5.6.2. Cable length

If using another ethernet cable than the one provided, select a cable CAT5e or above, shielded F/FTP, SF/UTP, SF/FTP.
Ethernet cable length depends on the gauge size and station consumption.
For guidance (AWG22 to AWG26):

Conditions	Output power supply	max length
All	20Vdc < V < 26Vdc	40m
Temp always > 0°C (no heating required)	20Vdc < V < 26Vdc	60m

Standard installation (24v):



5.6.3. Power consumption

The power consumption depends on the station mode, use of cellular dongle and external temperatures.

Typical: 2.3W (RX mode) or 4W (TX mode) with Ethernet connection.
Average power consumption with warm up mode: 4.8W

Peak consumption: 7.5W with heating mode

Heating mode: 6.3W (temperature <0°C)

Use of cellular dongle for connectivity: 5W (max)

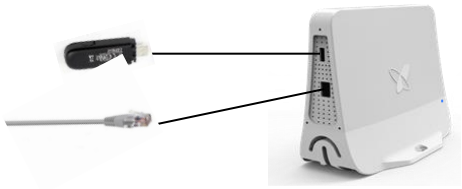
Maximum: 12.5W (cellular + warm up mode + TX mode)

5.7. Connectivity

The Access Station Micro needs Internet access to operate.

It can be connected via Ethernet cable (RJ45 port on PoE injector) or Cellular USB dongle (USB port on station).

When both connections are used to improve link robustness, the Ethernet one is automatically set as primary and Cellular is set as secondary backup.



Requirements applicable to connectivity and defining minimum throughput, list of required communication ports and data traffic projection are described in document “Connectivity requirements for SIGFOX base station” available on https://support.sigfox.com/

5.7.1. Ethernet connectivity

Ethernet connection of the PoE injector can be provided by DSL modem, satellite modem, any kind of backhaul connection or private LAN.
In case of private LAN or direct Backhaul connection, the host network should receive proper configuration to allow the IP communication between Sigfox Access station and Sigfox Cloud.

For more details, please contact your Sigfox Operator.

5.7.2. Cellular connectivity

As an alternative or backup, connectivity can be provided with a **compatible** 3G or 4G USB dongle and SIM card.

Before the first connection, the cellular connectivity must be configured locally with the **Access Station Utility** application according to your SIM card subscription parameters.

For more details on cellular compatible dongles, please contact your Sigfox Operator.

5.8. Commissioning

Commissioning of the station is done online by the Sigfox Operator via the Backend interface.

Pre-commissioning, modification of network settings and registering site location can be done with the **Access Station Utility** application.

Access Station Utility in available for download from Google Pay to suitable phones or tablets.
https://play.google.com/store/apps/details?id=com.sigfox.accessstation.utility

Once installed, connect the device to the Sigfox Access Station Micro (powered) with a USB cable and provide the required information.

5.9. LED status

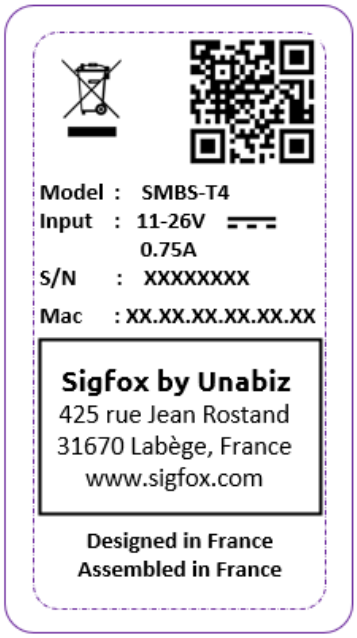
LED	Meaning	Troubleshooting
Off	No power	Check power supply, injector and Ethernet cable
Red (for ≈30 secs) Red – Solid (> 1 minute)	Power on Hardware issue	If the light remains red after 2 minutes, try to unplug and plug again the station. If the problem persists, contact your support.
Green – Flashing (30 s to 1 min)	Boot up	If the light remains flashing green after 1 minute, try to unplug and plug again the station. If the problem persists, contact your support.
Orange – Flashing	Establishing connectivity IP not allocated	If the light remains flashing orange after 1 minute, check network connection. Check DHCP server and IT configuration
Orange	Establishing VPN connection	If the light remains orange after 1 minute, check DNS servers and policy. Check ICMP policy /NTP resolution or remove proxy settings. Check HTTPS connection policy or certificate. Authorise VPN/IPSec policy
Green – solid	All OK	
Purple – solid	Warming up (temp < 1°) – not in service (max 10 min) Cooling down (temp > 70°C)	

If a cellular USB dongle is used, the led on the USB dongle should be lit or flashing. Please refer to the USB dongle guide.

6. Annexes

6.5. Labels

6.5.1. Product ID



GTIN/EAN : 3665306000207

6.5.2. Compliances

Certifications for other countries or regions are ongoing. New certifications will be added over time, without product modification.
Once the certification has been validated for a country, the product will be compliant, and the label will be updated if necessary.
Check the lasted version of the **Safety notice & Product certifications** available online for up to date information.
https://support.sigfox.com/docs/smbs-t4-notice

6.6. Specifications

RADIO CHARACTERISTICS	
Standard	Sigfox Ultra Narrow Band Protocol for M2M and IoT
Max range of operating frequencies *	865 to 928 MHz
Receiver Sensitivity	-132dBm @ 100bps / -124dBm @ 600bps
Data Rate and Modulation	100 bps D-BPSK (UL) 600 bps GFSK (DL)
Max Transmit Power * (EIRP)	23 dBm ± 1dB
Antenna	Integrated. Typ. 0dBi, max 3dBi.

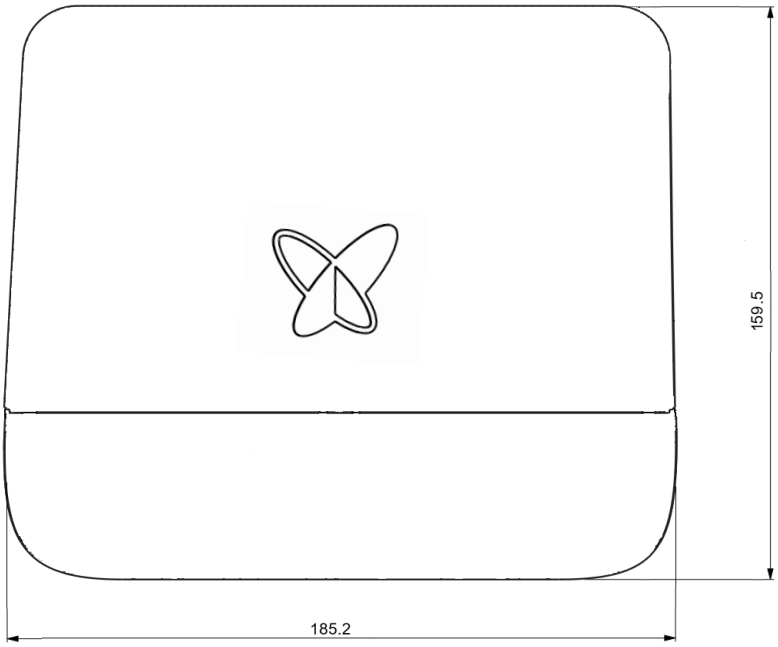
(*)Note: The maximum frequency range and power setting will vary by channel and according to country regulations. Refer to the regulatory groups table for more details.

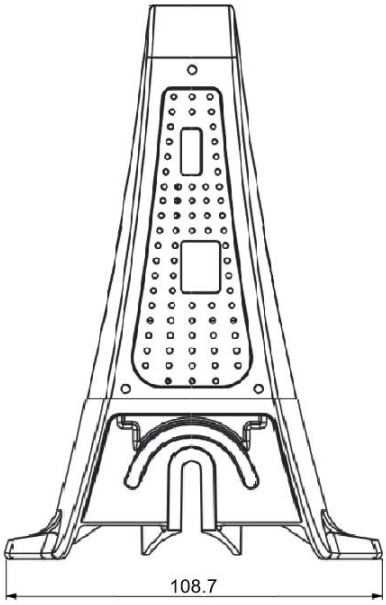
MECHANICAL AND ENVIRONMENTAL	
Product weight	450g (1 lb)
Operating temperatures	-20°C to +55°C
Storage temperatures	-30°C to +85°C
Robustness	MTBF 92,000 hours
Casing material	Plastic ASA/PC

Regulatory groups for SMBS-T4

REGULATORY GROUP / COUNTRY	RADIO ACCESS MODE	OPERATING BAND	MAX OUTPUT RADIATED POWER (EIRP)
E : EUROPE (EU) BAHRAIN BOTSWANA ESWATINI GEORGIA KENYA KOWEIT MAURITIUS NAMIBIA NIGERIA OMAN SERBIA SOUTH AFRICA TURKEY UAE UK	DC 10%	869.4 - 869.65MHz	23dBm
U : USA CANADA ARGENTINA GUATEMALA HONDURAS MEXICO PANAMA PUERTO RICO TRINIDAD & TOBAGO	FH	902 - 928MHz	23dBm
AUSTRALIA	FH	915 - 928MHz	23dBm
BRAZIL	FH	902 - 907.5 & 915 - 928MHz	23dBm
CHILE	FH	920.5 - 923.2	23dBm
COLOMBIA	FH	915 - 928MHz	23dBm
COSTA RICA	FH	920.5 – 928MHz	23dBm
ECUADOR	FH	915 - 928MHz	23dBm
EL SALVADOR	FH	915 - 928MHz	23dBm
HONG KONG	FH	920 - 925MHz	23dBm
INDIA	DC 10%	865 - 867MHz	23dBm
JAPAN	LBT	920.6 - 922.2MHz	23dBm
MALAYSIA	FH	919 - 923MHz	23dBm
NEW ZEALAND	FH	920 - 928MHz	23dBm
PARAGUAY	FH	918 - 928MHz	23dBm
PERU	FH	916 - 928MHz	23dBm
SINGAPORE	FH	920 - 925MHz	23dBm
SOUTH KOREA	LBT	922.1 - 923.4MHz	14dBm
TAIWAN	FH	920 - 925MHz	23dBm
THAILAND	DC 10%	920 - 925MHz	23dBm
URUGUAY	FH	915 - 928MHz	23dBm
UKRAINE	UL ONLY	869.4 - 869.65MHz	N/A
VIETNAM	UL ONLY	920 - 923MHz	N/A

Dimensions (in mm):





Sealing cover: