Supplementary information for EU Devices in the LoRaWAN® Showcase catalogue. Version 1.0

Version of Questionnaire form from the Customer/ Device Manufacturer

Version	Date	Author	Update
1.0			Initial release from manufacture

Supplementary Information on certified device

1 Supplementary information	
1.1 Manufacturer or Brand name	Milesight
1.2 Website	www.milesight-iot.com
1.3 Sales / Marketing contact person, email:	ivete@milesight.com
1.4 Technical contact person, email:	near_lxj@milesight.com
1.5 Commercial Product name	Indoor Ambience Monitoring Sensor
1.6 Product code used when ordering / article number	
1.7 Product Version : Hardware version: Firmware version:	V1 V1.1 V1.1
1.8 In what countries is the product available	worldwide
1.9 What date was / is the market introduction for this device / product?	2022/5
1.10 Is the device already working on a public LoRaWAN network. If yes specify at which public operator, country and number of deployed devices on that network:	☒ Yes: ☐ No
1.11 What functionality does the device provide and which sensor(s) does it contain?	Use case: AM103 is a compact indoor ambience monitoring device including humidity, temperature, and CO2 sensor for wireless LoRa network. It is equipped with NFC (Near Field Communication) and can easily be configured via a smartphone or a PC software. Short behavior description: Sensor data are transmitted in real-time using standard LoRaWAN protocol. LoRaWAN enables encrypted radio transmissions over long distance while consuming very little power. The user can obtain sensor data and view the trend of data change through Milesight IoT Cloud or thr ough the user's own Network Server.

1.12 Accuracy & resolution for every sensor or measurement made by the device	
Name: sensor accuracy (incl. unit): +/- resolution (incl. unit): measurement parameter: measurement range	Temperature Sensor ±0.3°C(0°C~70°C);±0.6°C(-20~0°C) 0.1°C Temperature -20°C ~ + 70°C
Name: sensor accuracy (incl. unit): +/- resolution (incl. unit): measurement parameter: measurement range	Humidity Sensor ±3%RH(10~90%RH);±5%RH(<10% or >90%RH) 0.5% RH Humidity 0% ~ 100% RH
Name: sensor accuracy (incl. unit): +/- resolution (incl. unit): measurement parameter: measurement range	Senseair Sunrise ±30 ppm or ±3 % of reading 1ppm CO2 concentration 400 - 5000 ppm
1.13 Uplinks are: Periodic: Period: Explanation: Keep alive message period: Event triggered how:	☒ 10min
1.14 Parameter configuration of device (e.g. transmission or measurement interval, threshold levels, etc.)	☒ Remotely: ☒ Over-the-air with LoRaWAN data downlinks ☐ Specify if other: ☒ Locally: ☐ Via CLI: specify type of connector: ☒ Via NFC: ☐ Specify if other:
1.15 Does the application server send downlinks to the devices?	☒ Yes: (why/how often/typical size) ☐ No
1.16 Operating temperature of device - x °C to + x °C	Minimum -20 °C Maximum +60 °C
1.17 Is the payload structure available for decoding?	☒ Yes: ☐ No Please attach the payload structure (+example of decoded payload)
1.18 Is there a decode-API available	☒ Yes: ☐ No Please attach the API documentation
1.19 Is the firmware upgradeable and how?	☒ Yes: (how) via PC Software; via APP
1.20 How can the device be reset to factory default settings?	Reset via PC Software;Reset via Button;Reset via APP

1.21 How can the device be forced to re-initiate the join procedure?	via Smartphone APP;via PC Software;via Button
1.22 Product certifications (IP rating, ATEX, ...)	1. IP rating: IP30 2. ATEX compliance: Other:
1.23 Which regulatory certifications are available (RED, CE, EMC)?	☒ RED ☒ CE ☒ EMC Attach proof of certification to the mail in which this document is sent to a public operator
1.24 Power Supply	☐ External power supply: connection: voltage: amperage: ☒ Internal battery: battery type: 2 × 2700 mAh Li-SoCl2 battery chemical composition: Li-SoCl2 Battery self-discharge (%/year): 1 Battery shelf life: 3year capacity: 5400 mAh weight: rechargeable: ☐ Yes: ☒ No
1.25 Powering device on and off How is the device turned ON ? How is the device turned OFF ?	Turn ON via Smartphone APP;Turn ON via PC Software;Turn ON via Button Turn OFF via Smartphone APP;Turn OFF via PC Software;Turn OFF via Button
1.26 Dimensions of device (Length x width x height)	6.8 × 6.5× 2.05cm
1.27 Weight of full device	g

1.28 Mounting of device 1. How to mount? 2. How to mount for best antenna propagation	Wall Mounting Fixed by Screws: 1. Remove the rear cover of the device, screw the wall plugs into the wall and fix the rear cover with screws on it, then install back the device. Fix the bottom of the device to the rear cover with the theft-deterring screw. Fixed by 3M Tape: 1.Fix the bottom of the device to the rear cover with the theft-deterring screw. 2. Paste 3M double-sided tape to the back of the device, then tear the other side and place it on a flat surface It is recommended to install at least 1.5m high from floor.

2 LoRaWAN Device Information

2.1 DevEUI Range (IEEE Compliance)	From :24E1240000000000 To : 24E124FFFFFFFFFF
2.2 LoRaWAN Class	☒ Class A ☐ Class B ☐ Class C
2.3 For Class C Device: Device Under Test restores previous RF settings at boot?	☐ Yes ☐ No
2.4 In what LoRaWAN region/frequency ranges is the product available	☒ EU863-870 ☐ US902-928 ☐ AS923 ☐ IN865-867 ☐ KR920-923 ☐ Other
2.5 Is the LoRaWAN test mode supported?	☒ Yes ☐ No, why not
2.6 Tested and certified against which LoRaWAN Specification(s)	☐ V1.0 ☐ V1.0.1 ☒ V1.0.2 revB ☐ V1.0.3 ☐ V1.1.x ☐ Other :
2.7 Link to document on the LoRa Alliance website	Link:
2.8 Which TX power is used in production devices by default? - if LW 1.0.2 rev A or older is used: - if LW 1.0.2 rev B or newer is used	 ☐ TXPower 0 (20dBm) ☐ TXPower 1 (14dBm) ☐ TXPower 2 (11dBm) ☐ TXPower 3 (8dBm) ☐ TXPower 4 (5dBm) ☐ TXPower 5 (2dBm) ☐ other TXPower (dBm) ☒ TXPower 0 (MaxEIRP) ☐ TXPower 1 (MaxEIRP-2dB) ☐ TXPower 2 (MaxEIRP-4dB) ☐ TXPower 3 (MaxEIRP-6dB) ☐ TXPower 4 (MaxEIRP-8dB) ☐ TXPower 5 (MaxEIRP-10dB) ☐ TXPower 6 (MaxEIRP-12dB) ☐ TXPower 7 (MaxEIRP-14dB) ☐ other TXPower (Max EIRP : 16 dB)

2.9 Which TX powers are supported by the device in production - if LW 1.0.2 rev A or older is used: - if LW 1.0.2 rev B or newer is used	☐ TXPower 0 (20dBm) ☐ TXPower 1 (14dBm) ☐ TXPower 2 (11dBm) ☐ TXPower 3 (8dBm) ☐ TXPower 4 (5dBm) ☐ TXPower 5 (2dBm) ☐other TXPower (dBm) ☒ TXPower 0 (MaxEIRP) ☒ TXPower 1 (MaxEIRP-2dB) ☒ TXPower 2 (MaxEIRP-4dB) ☒ TXPower 3 (MaxEIRP-6dB) ☒ TXPower 4 (MaxEIRP-8dB) ☒ TXPower 5 (MaxEIRP-10dB) ☒ TXPower 6 (MaxEIRP-12dB) ☒ TXPower 7 (MaxEIRP-14dB) (Max EIRP : 16 dB)
2.9 Which LoRaWAN Specification is currently supported on the production devices?	☐V1.0 ☐V1.0.1 ☐V1.0.2 revA ☒V1.0.2 revB ☐V1.0.4 ☐V1.1.x ☐Other:
2.10 Will you re-certify your device when a new major LoRaWAN specification version is released	☐Yes. ☒No, why :
2.11 Has Interoperability prequalification testing been done?	☒Yes. ☐No, why : Which Network Servers ☒Actility ☒Loriot ☒TTI ☐Other: Specify: Please attach all the test reports.
2.12 Is Activation Type OTAA the default	☒Yes. ☐No, why :
2.13 For OTAA, is AppKey unique for each device?	☐Yes. ☒No.

2.14 Is ADR implemented? Recommendation: ADR should always be activated. Exceptions can be made for moving devices but will need to be explained.	☒Activated ☐Deactivated, why : ☐Configurable by user (recommendation: Activated by default) ☐Mixed, explain:
2.15 What values did you implement for: - ADR_ACK_LIMIT: - ADR_ACK_DELAY:	64recommended value: 64 32recommended value: 32
2.16 Do you use unconfirmed and/or confirmed uplinks and what is the data rate, timing and power back off algorithm? Upon reception of a confirmed downlink message, is the next uplink sent immediately after the downlink ?Answers (radio buttons)	☐unconfirmed ☐confirmed, when and why: ☒Both, which is used when and why: When confirmed mode is enabled Data rate, timing and power back-off algorithm (only if you use confirmed uplinks): ☐Yes. ☒No, why :
2.17 Is the device doing a periodical rejoin? (only for OTAA)	☐Yes (frequency): ☒No. Why? How to trigger a rejoin? Use the restart button
2.18 Is the first join request sent on SF12?	☐Yes. ☒No, why: Because of the duty cycle Explain the JoinRequest sequence if no JoinAccept is received - data rate, timing and power back-off algorithm.
2.19 On what SF and power setting is the first uplink (after join procedure) done?	SF: SF10 TXPower: TXPower0
2.20 Are you doing periodically reset of Uplink frame counter?	☐Yes (frequency/why): ☒No.
2.21 If LoRaWAN 1.0.x, DevNonce behaviour :	☒ Based on a random value ☐ Monotonically increasing never-wrapping counter
2.22 Uplink DataRate (0-7 supported)	Min: 0 Max: 5
2.23 RX1 Data Rate Offset	☒Default LoRaWAN in regards of ISM band ☐Other:
2.24 RX1 Delay	☒Default LoRaWAN in regards of ISM band ☐Other:
2.25 RX2 Data Rate	☒Default LoRaWAN in regards of ISM band ☐Other:

2.26 RX2 Frequency	☒Default LoRaWAN in regards of ISM band ☐Other:
2.27 RX1 Delay on JoinRequest (OTAA devices only)	☒Default LoRaWAN in regards of ISM band ☐Other:
2.28 Mobility Profile (how your device moves)	☒Near static ☐Walking speed ☐Vehicle speed ☐Random
2.29 Frame Counters Up To 32-bits	☒Frame counter-up ☒Frame counter-down
2.30 Which MAC commands does the device support	☒LinkCheckReq / LinkCheckAns ☒TXParamSetupReq / TXParamSetupAns ☒LinkADRReq / LinkADRAns ☒DutyCycleReq / DutyCycleAns ☒RXParamSetupReq /RXParamSetupAns ☒DevStatusReq / DevStatusAns ☒NewChannelReq / NewChannelAns ☒TXTimingSetupReq / TXTimingSetupAns
2.31 LoRaWAN Stack Type (optional)	☒Semtech/Stackforce ☐Semtech/Stackforce with modifications ☐IBM ☐IBM with modifications ☐Proprietary- Other, name it:
2.32 LoRaWAN Stack Version (optional)	V1.0.2
2.33 LoRa Radio Hardware (optional)	☒Proprietary: SX chip used: SX1262 ☐LoRaWAN Modem/Module: Manufacturer: Part Number: Firmware revision:
2.34 Multicast support (optional)	☐Yes: Multicast DevAddr: Multicast AppSKey: Multicast NwkSKey: Payload: Port: ☒No.

3 Radio Frequency Information

3.1 Type of Antenna	☐Wire ☒PCB ☐External ☐Other: (which type)
3.2 Antenna gain [dBi or dBd]	0dBi or dBd
3.3 Did you measure and take into account the loss between the modem and the antenna?	☐Yes, dB loss ☒No, why: We have match the impedance between the moderm and the antenna.
3.4 For LW 1.0.2 rev A or older devices: which TXPower setting should be used on the network for your device*:	☐ TXPower 0 (20dBm) ☐ TXPower 1 (14dBm) ☐ TXPower 2 (11dBm) ☐ TXPower 3 (8dBm) ☐ TXPower 4 (5dBm) ☐ TXPower 5 (2dBm) ☒other txpower 0 (16dBm)
3.5 Did you calibrate your device with the antenna gain and measured loss in between the chipset and antenna? This so that your device emits with maximal power when using TXPower 1 for LW 1.0.2 rev A or older devices (= 14dBm) and TXPower 0 for LW 1.0.2 rev B or newer devices (= MaxEIRP or 16.15dBm EIRP)*.	☒Yes, 0 dB loss ☐No, why:

4 Battery and TX Power Information

Please indicate if you do not want Section 4 displayed on the LoRa Alliance Website ☐Yes
If yes please supply contact details for the operators to request the information for Section 4

4.1 Battery consumption of the device (including modem, sensors and all other electronics	TX current: 103mA RX current: 6.5 mA Idle time current: 0.034mA
4.2 Estimated battery life in years based on the number of transmissions (including sensor readings) at SF7, SF10 & SF12 with your battery self-discharge and aging over time taken into account. **Assumptions:** - Product shelf life before use: Maximum 1 year. - At an environment temperature of 20°C. - LoRaWAN specification used for battery life calculation: - TX power setting (txpower) used for battery life calculation: - Payload size used for battery life calculation (should be average payload size of production device): - Additional assumptions or comments on battery life (Typical usage	Battery life in years Transmission Periodicity (transmissions/day) 144 SF7 3.63 SF10 2.62 SF12 1.31 96 SF7 3.76 SF10 2.97 SF12 1.69 48 SF7 3.90 SF10 3.42 SF12 2.38 24 SF7 3.97 SF10 3.71 SF12 3.00 12 SF7 4.00 SF10 3.87 SF12 3.44 4 SF7 3.82 SF10 3.98 SF12 3.82 1 SF7 4.04 SF10 4.03 SF12 3.98 ☐LW1.0.1 ☐LW1.0.2 revA ☒LW1.0.2 revB ☐Other : ☐LW1.0.1 ☐LW1.0.2 revA ☒LW1.0.2 revB ☐Other : 11 bytes Swipe the screen every half an hour,consumption of 6.6uAh.

4.3 Which TX power setting (TXPower) was used in the RF test? - If LW 1.0.2 rev A or older device: - If LW 1.0.2 rev B or newer device:	☐ TXPower 0 (20dBm) ☐ TXPower 1 (14dBm) ☐ TXPower 2 (11dBm) ☐ TXPower 3 (8dBm) ☐ TXPower 4 (5dBm) ☐ TXPower 5 (2dBm) ☐other TXPower (dBm) ☐ TXPower 0 (MaxEIRP) ☐ TXPower 1 (MaxEIRP-2dB) ☐ TXPower 2 (MaxEIRP-4dB) ☐ TXPower 3 (MaxEIRP-6dB) ☐ TXPower 4 (MaxEIRP-8dB) ☐ TXPower 5 (MaxEIRP-10dB) ☐ TXPower 6 (MaxEIRP-12dB) ☐ TXPower 7 (MaxEIRP-14dB) ☒other TXPower 16 (MaxEIRP- dBdBm)
4.4 Is this the same TX power setting (TXPower) used by default in production devices (before network ADR)?	☒Yes, Txpower0 ☐No, why:
4.5 Maximum ERP measured: (ERP = EIRP - 2.15 dB; LoRaWAN allows 14 dBm ERP)	16 dBm
4.6 TRP measured: (TRP is based on EIRP) This gives an idea about the directivity of the antenna.	16 dBm
3.10 TIS measured on RX1:	For RX1-SF12BW125 on 868.3MHz -146 dBm
3.11 TIS measured on RX2	For RX2-SF12BW125 on 869.525 MHz: -146 dBm