Easergy
CL110
Installation and Operation Manual

QGH40088 Rev A

05/2017

Schneider Electric

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Electrical equipment should be installed, operated, serviced and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.

Safety information

Important information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a "Danger" or "Warning" safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

This is the symbol used for wireless communication based on radio frequency technologies. It could be combined to the safety alert symbol when a minimum distance is required.

⚠ DANGER
DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING
WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION
CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE
NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this signal word.

Please note:

Electrical equipment should be installed, operated, serviced and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

Notices

FCC Part 15 Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception which can be determined by turning the equipment off and on, the user is encouraged to try to correct interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

Any change or modification of the product not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

IC

English: Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

French: Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Table of Contents

1   Safety Precautions

⚡⚠ **DANGER**
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH • Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462 or local applicable regulation. • This equipment must only be installed and serviced by qualified electrical personnel. • Turn off all power supplying this equipment before working on or inside equipment. • Always use a properly rated voltage sensing device to confirm power is off. • Read and understand this guide and the guides according to the switchgear and controlgear where the Easergy CL110 will be installed before performing any installation or maintenance operation. If the installation and user guides of the switchgear and controlgear do not cover the integration of the Easergy CL110, contact the manufacturer of the switchgear. • DO NOT replace the Easergy CL110 by any similar product not specified within this document. • DO NOT use the Easergy CL110 in a manner not specified by this document. • Check if the technical ratings of the Easergy sensor CL110 are adapted to the application (See §5 Installation & Operation manual). • Replace all devices, doors and covers before turning on power to the equipment. **Failure to follow these instructions will result in death or serious injury.**

2   Cautions

((🎵))⚠ **CAUTION**
EXPOSURE TO RADIO FREQUENCY
Read and understand this guide before performing any installation with the sensor Easergy CL110.
FCC: This device complies with FCC RF radiation exposure limits set forth for general population. This device must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.
IC: This device complies with Industry Canada RF radiation exposure limits set forth for general population. This device must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Le présent appareil est conforme aux niveaux limites d'exigences d'exposition RF aux personnes définies par Industrie Canada. L'appareil doit être installé afin d'offrir une distance de séparation d'au moins 20cm avec l'utilisateur, et ne doit pas être installé à proximité ou être utilisé en conjonction avec une autre antenne ou un autre émetteur.
Failure to follow these instructions can result in injury.

⚠ CAUTION
EXPOSURE TO CHEMICAL AGENT
DO NOT use chemical solvent or alcohol on the CL110 sensor.
Failure to follow these instructions can result in injury.

⚠ CAUTION
HOT SURFACES
As the sensor can measure temperatures above 50°C:
• Use appropriate PPE when working with the sensor.
• Allow surface to cool before servicing
Failure to follow these instructions can result in injury.

3   Installation

⚠ CAUTION
EXPOSURE TO HIGH TEMPERATURES
High temperature beyond the sensor rating may cause damage to the sensor.
Failure to follow these instructions can result in equipment damage.

The Easergy CL110 is a battery powered and wireless communication thermal and humidity sensor using ZigBee Green Power 2.4GHz protocol according to the IEEE 802.15.4. The Easergy CL110 is a mobile device as defined by FCC.
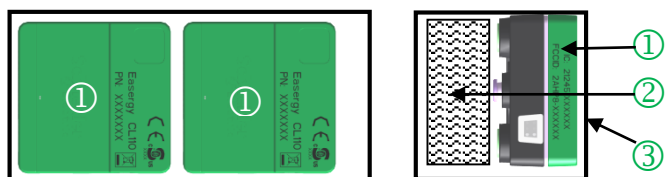
The purpose of this bulletin is to facilitate the Easergy CL110 sensors installation into validated equipment.

3.1   *Check the delivery of the Easergy CL110 sensors*

Check that the reference printed on the label matches with the delivery and is corresponding with the purchase order.

Remove the 2 Easergy CL110 sensors and the quick start guide from the packaging.

Ref	Detail	Qty
①	Easergy CL110 sensor 40*40*20mm QGH39417	2
②	Quick start guide QGH40089	1
③	Packaging QGH40071	1

EMS59443   **x1**

1 set of 2 * CL 110 Wireless thermal
& Rh sensors - Battery powered sensors
Zigbee sensor -25°C +90°C   Made in Indonesia
FCCID: XXXXX-130729   RN-2017-W12
IC: XXXXX-130729   EMS59443
                                              130729   CE

Easergy
CL110

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3.2   *Installation of the sensor Easergy CL110*

By default, the sensor is in "Factory mode" (sleeping mode) to be paired with any open access point as soon as the button is pressed.

| ⚡ ⚠️ **DANGER** |
|---|
| **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**
• Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, CSA Z462, NOM-029-STPS-2011 or local applicable regulation.
• This equipment must only be installed and serviced by qualified electrical personnel.
• Turn off all power supplying this equipment before working on or inside equipment.
• Always use a properly rated voltage sensing device to confirm power is off.
• Replace all devices, doors and covers before turning on power to equipment.
Failure to follow these instructions will result in death or serious injury. |

3.3   *Pairing of the sensor Easergy CL110*

Before any installation in a restricted area and over non accessible surface, sensors must be paired with its associated ZigBee Green Power access point. To associate the sensor to the access point, refer to the "Operation modes" section of this document.

3.3.1   Product description & Human machine interface (HMI)
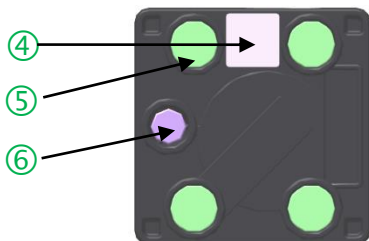


Ref	Detail	Qty
④	SN + ZigBee ID (QR Code or Text)	1
⑤	Magnets	4
⑥	Thermal sensor in contact with measured surface	1
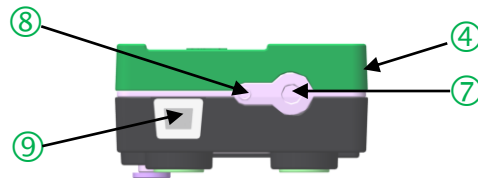
Ref	Detail	Qty
⑦	Push button for pairing	1
⑧	Green LED 💡 helping commissioning	1
⑨	Humidity sensor protection	1

1) *The QR code ④ enables access to the sensor number and the ZigBee ID associated to the layout of the sensor and to the electrical equipment or assembly (Functional unit number, Busway enclosure, LV assembly number…).*

2) *The ZigBee ID will be used to ensure proper pairing of the sensor and not with another access point device (e.g RF receiver).*

3) *Install the Easergy CL110 sensor over a cleaned surface, on the side or over the equipment where the temperature measurement is required following the preferred orientations as described (See Figure 1 below). Installation of the sensor under any equipment is not recommended as the cooling of the sensor is not optimized for a longer lifetime.*
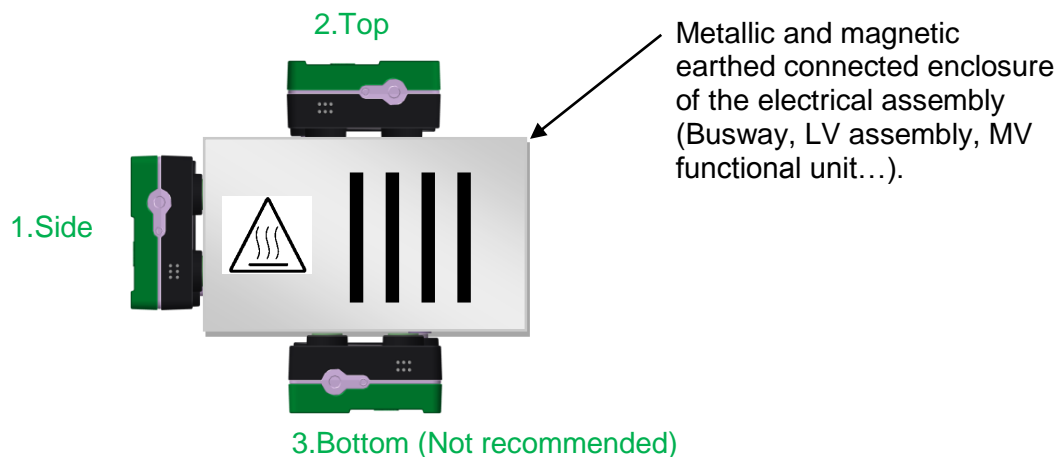
Figure 1: Installation of the CL110 sensor over a surface which is expected to become warm where the best use case is the N°1 for optimal battery lifespan and the worst is N°3.

⚡ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Check the installation according to the installation guide of the switchgear and controlgear.

Failure to follow these instructions will result in death or serious injury.

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4) Human Machine Interface (HMI)

The HMI is composed of a push button ⑦ and a green LED ⑧.

The push button ⑦ becomes active when pressed and starts the commissioning. Each recorded button press is signaled by two green LED flashes 🟢🟢.

Green LED *is visible on the side of the sensor through the gasket, beside the push button. Note the LED is off in "Normal" state in order to conserve the battery charge. It is only used to signal the following special events:*

Short button press:

1) 🟢🟢 *Confirms each button short press.*

2) *If in "Factory" mode, the commissioning process for first time use will start,*

3) *After approximately 20 seconds, if the pairing is not fulfilled, a third LED flash 🟢 confirms pairing was unsuccessful,*

4) *After approximately 20 seconds, if the pairing is fulfilled, three LED flashes 🟢🟢🟢 confirm successful pairing,*

5) *If commissioned, places the sensor in "Demo" mode (after 5 minutes the sensor will return to "Normal" mode).*

Long button press:

1) 🟢🟢 + 🟢 *Acknowledges long button press. Release the button within 2 seconds after the third flash to avoid any potential short button press detection by the sensor,*

2) *If the sensor is commissioned, the decommissioning procedure will start. A fourth LED flash 🟢 after approximately 20 seconds confirms the decommissioning procedure (device reset) is complete and the sensor returns to "Factory" mode.*

LED indicators without button press:

⊙ *Commissioning procedure unsuccessful. The sensor will then stay in "Factory" mode. A short press is required to start again a commissioning.*

⊙⊙⊙ *Commissioning procedure success. The sensor will enter in the "Demo" mode for 5 minutes then enter the "Normal" mode. Periodic transmission of measurements will now be sent to the Zigbee Green Power receiver, each 120 s.*

⊙ *In the "Demo" or "Normal" modes, after a long button press, then after few seconds (≈20 s) a 4th LED ⊙ confirms a complete decommissioning.*

⊙ *In the "Demo" mode, acknowledges a valid command from the Zigbee Green Power receiver to the sensor was received. While the acknowledge is received from the Schneider-Electric ZigBee concentrator the LED ⊙ flashes each 5s. This confirms the sensor is within the communication range.*

4   Operating modes

4.1   *General*

*The Easergy CL110 is a wireless thermal and humidity sensor. It is intended to be used within indoor high and low voltage electrical distribution products or assemblies to monitor temperature and humidity change over a de-energized surface. The sensor shall be used with a **Schneider-Electric** access point, which can be used for multiple sensors, using ZigBee Green Power wireless communication protocol.*

4.2   *Operating modes*
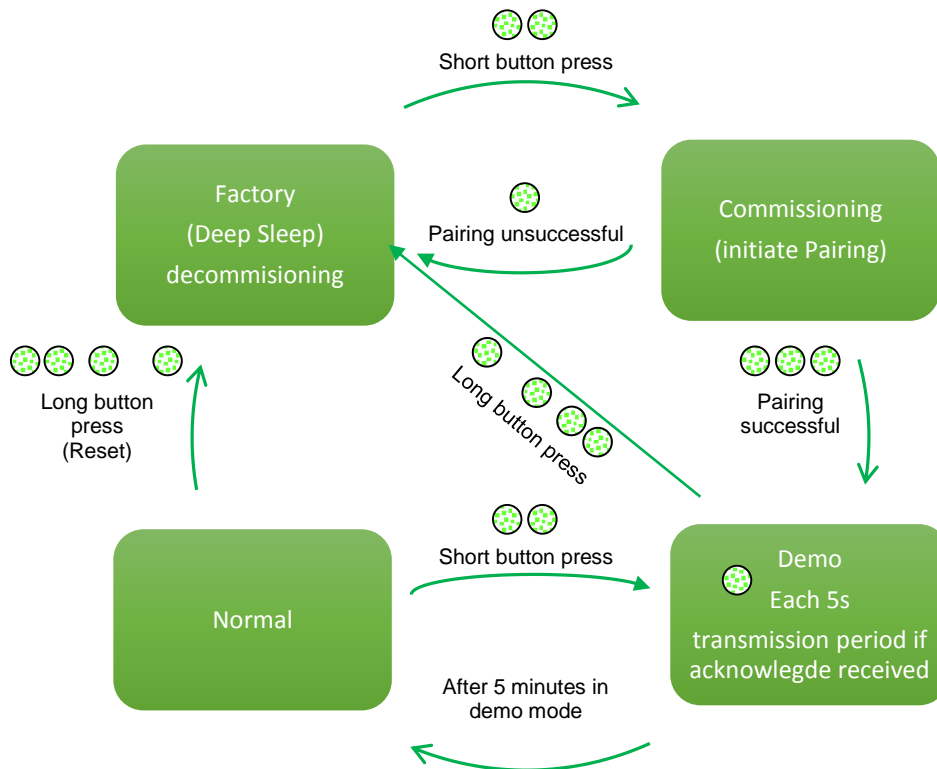
Figure 2: Operating modes and Green LED flash ⊙ indicators (flash interval is 500 milliseconds)

4.2.1 Factory mode

The sensor is not commissioned and is in deep sleep mode. No measurement or radio transmissions are performed. A short button press will start the "Commissioning" procedure.

4.2.2 Commissioning Mode

During commissioning the sensor will automatically find and pair with the nearest open, compatible ZigBee Green Power receiver. ZigBee parameters (e.g. operational channel, Src-ID, PAN-ID, security level and key) are exchanged between the sensor and receiver in order to establish a reliable and secure link between the sensor and the receiver.

During commissioning the CL110 sensor is identified as GP_TEMPERATURE_SENSOR_DEVICE (GP ModelID = 0x30) with the GP Product ID = 17302 (0x4396) and its unique source ID (SrcID). Note: The SrcID of each sensor is marked on its side. The receiver should be ZigBee 3.0 compliant.

Commissioning procedure:

Note: The commission procedure can only be initiated from the "Factory" mode. (A short button press for first time use, or long button press to reset sensor to "Factory" mode)

1. *Set a ZigBee operational channel (11 - 26) and PAN-ID of your network (0xFFFF by default) on your ZigBee 3.0 compliant receiver.*

2. *Place the Zigbee Green Power receiver into the automatic commissioning mode (open for commissioning and accepting the commissioning with GP ModelID = 0x30 and GP Product ID = 17302 devices).*

3. *In "Factory" mode, short button press once on the sensor to start the bidirectional Zigbee Green Power commissioning. Confirmation is indicated by two (2) Green LED flashes ⬤⬤ . Then sensor automatically scans all ZigBee channels (channel 11-26) in order to find the nearest ZGP Proxy device (Zigbee Green Power receiver in commissioning mode) and to initiate pairing.*

4. *Wait approximately 30 seconds. Commissioning success is indicated by three (3) Green LED flashes ⬤⬤⬤. Measurement data reported from the sensor to the receiver can now be checked.*

5. *If the commissioning is unsuccessful (indicated by one (1) green LED flash ⬤), ensure the sensor is in "Factory" mode and in proximity of the receiver, then repeat steps 3 and 4.*

4.2.3 Demo mode

"Demo" mode can be entered either after successful Commissioning or by a short button press in "Normal" mode. In this mode, a temperature transmission is submitted every 5 seconds, independently of a set transmission period. The green led will flash once every 5 seconds to confirm transmission to the receiver. This is useful to check if the device is in reception range just after the installation. The sensor automatically enters "Normal" mode after a 5-minute timeout has elapsed or if a new transmission period is configured.

4.2.4 Normal mode

The sensor periodically measures temperature and reports the measured value to the receiver. By default, the nominal measurement and transmission period is 2 minutes (120 seconds). Note: This parameter can be edited by a ZigBee command. The sensor is in sleep mode in between data measurements and transmission. It can be woken at any time by a short button press.

4.2.5 Sensor not installed in operating area

For restricted areas and over non accessible surfaces, sensors must be paired with its associated ZigBee Green Power access point before its installation. If the sensor is not yet installed at the final position, please refer to the "Installation" section of this manual.

5   Maintenance

5.1   *General*

⚡⚠ **DANGER**
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5.2   *Periodic maintenance*

It is recommended (approximately every 2 years) to conduct several operating cycles on the switchgear and controlgear, and confirm attachment and positioning of the Easergy CL110 sensor.

If the service condition is such that the outer membrane protecting the humidity sensor is contaminated (e.g. dust), clean with a dry, soft cloth. This will improve the dynamic response of this sensor. In harsh conditions (aggressive atmosphere, excessive dust, temperature greater than 40°C), please consult the nearest **Schneider Electric** *services center.*

Contact the nearest **Schneider Electric** *services center for additional help and information regarding periodic maintenance.*

6   Troubleshooting

Issue	Solution
Sensor is not visible by the Zigbee Green Power receiver	Confirm if other sensors are experiencing the same issue.
	Check if the sensor was previously visible by the Zigbee Green Power Receiver by confirming if data was collected by the sensor.
	Check for low battery on the sensor with a short button press. Two LED flashes will confirm battery has a charge.
	Check if the sensor is visible to any other access point (receiver).
	Check the distance between the sensor and the Zigbee Green Power Receiver according to the number of enclosure layers. How? _If the sensor can be moved, move it closer to the receiver to verify communication. If the data is transferred to the Zigbee Green Power Receiver, move the sensor to its original location and check the Received Signal Strength Indication (RSSI) value using the interface software
Measurement is not received by the Zigbee Green Power receiver.	Check if the sensor is paired with the access point. Use short button press to enter "Demo" mode (data should transfer every 5 seconds for a 5-minute duration)
Measurement is abnormal compared to other measurements.	With the sensor mounted, check if the there is a gap between the thermal sensor on the device and the measured surface.
	Check if the sensor located in the correct position for measurements. If it is not possible to check please, call the nearest **Schneider Electric** center.
Measurement is above the limits.	Check if the ambient temperature of the operating room is lower than the upper limit of the service conditions.
	Check if the load of the equipment is lower than the rated current of the monitored equipment.
	Use an infrared thermal measuring device to measure the surface near the sensor, following safety work practices.

7   Environmental Impacts

7.1   Product environmental profile

The EIME (Environmental Impact and Management Explorer) software, version V3, and its database, version 5.4 were used to assess the product environmental profile (PEP). The assumed service life of the product is 20 years with a utilization rate based on the mission profile of the Easergy CL110 and the electrical power model used is European.

The scope of the analysis was limited to the Easergy CL110 sensor and its accessories to be supplied and installed.

The environmental impacts were analyzed for the Manufacturing (M) phases, including the processing of raw materials, and for the Distribution (D) and Utilization (U) phases.

Easergy CL110 is compliant with the RoHS directive. RoHS restricts the use of six hazardous materials in the manufacture of various types of electronic and electrical equipment.

7.2   Product Overview

The Easergy CL110 product is designed in accordance, and is compliant, with the RoHS Directive (European Directive 2002/95/EC of 27 January 2003).

The Easergy CL110 uses an extended temperature range coin cell battery which complies with the battery Directive (European directive 2013/56/EU of 20 November 2013).

The Easergy CL110 is designed to protect the battery by housing having a high degree of protection and able to withstand against mechanical impacts. The CL110 requires a continuity of power supply by a permanent connection with the battery and deals its sleep mode to optimize its energy consumption.

This product can be incorporated without any restriction within an assembly or an installation.

7.3   End of Life & Recycling

At end of life, the products of the Easergy CL110 sensor shall be dismantled to facilitate the recovery of the various constituent materials. Easergy CL110 can be processed, recycled and its materials recovered in conformity with the draft European regulations on the end-of-life of electronic and electrical products.

Schneider Electric is committed to a long term environmental approach. As part of this, the Easergy CL110 sensor has been designed to be environmentally friendly, notably in terms of the product's recyclability. The materials used are identified in product environmental profile (PEP) analysis and easily separable. It has been carried out in conformity with ISO 14040 "Environmental management: life cycle assessment - principle and framework".

8   Product Technical Datasheet

(2017-03 Draft – Final version after certification 2017-06)

Main

Range of product	Easergy
Product or component type	Indoor thermal and humidity sensor for wireless access point
Rated supply	3V (battery)

Complementary

|	
Measured surfaces	Flat area wider than 50 mm x 100 mm
Power consumption	20mA during radio transmission mode
	2μA max in sleeping mode
Wireless communication protocol	ZigBee Green Power at 2.4 GHz according to IEEE 802.15.4
Transmission period	120s
Connection type	See associated ZigBee concentrator (e-access ZBRN32 ...)
Marking	CE (cf applicable Directives)
Height	20 mm
Depth	40 mm
Width	40 mm
Product weight	0.030 kg

Environment

Product certifications - compliance	CB IECEE ID: FRXXXXXX (In progress)
	cBVus ID: XXXX (In progress)
	FCC ID: 2AHP8-130729 (In progress)
	IC : 21245-130729 (In progress)
	LV Directive 2014/35/EU
	EU RoHS directive
	EU REACH directive
	EU EMC directive 2004/108/EC
	EU RED directive 2014/53/EU
	EU WEEE directive 2012/19//EU
	EU Battery directive 2013/56//EU
Main standards	EN / IEC 61010-1 2010
	UL 61010 -1 2012
	ETSI EN 300238 2012 V1.9.1
	IEEE 802.15.4 2013
Power emission	EIRP= +5dBm
Resistance to electrostatic discharge	2-4-8kV (Direct & Indirect contact) according to EN/IEC 61000-4-2
	2-4-8kV (in air) according to EN/IEC 61000-4-2
Resistance to electromagnetic fields	25V/m (80MHz...5.9 GHz) according to EN/IEC 61000-4-3
Resistance to conducted disturbances, induced by radio frequency fields	20 V (0.15...80 MHz) according to EN/IEC 61000-4-6
Power frequency magnetic field immunity	1000A/m Pulse EN/IEC 61000-4-8
	300A/m Continue EN/IEC 61000-4-8
Pulse magnetic field immunity	1000A/m Pulse EN/IEC 61000-4-9
Damped oscillatory magnetic field immunity	30A/m (0.1 & 1 MHz) EN/IEC 61000-4-10
Electrical fast transient/burst immunity	4kV 1 min EN/IEC 61000-4-4
	2kV 5min (Marine) EN/IEC 61000-4-4
Damped oscillatory wave immunity	3kV (CM - 100kHz & 1MHz) EN/IEC 61000-4-18
	2.5kV (CM - 3MHz, 10MHz, 30MHz) EN/IEC 61000-4-18
Surge immunity	0.5-1-2-4kV (Common mode) EN/IEC 61000-4-5
	0.5-1-2-4kV (Differential mode) EN/IEC 61000-4-5
Immunity to conducted RF disturbances	30V Continuous (0 – 150kHz) EN/IEC 61000-4-16

	300V Short duration (0 – 150kHz) EN/IEC 61000-4-16
Ambient air temperature for operation	-25...40°C
Accuracy within ambient air temperature for operation	+/-1°C
Measured temperature for operation	-25...90°C at 35°C Any measured part shall be lower than IEC limits (75°C if the surface is accessible and expected to be touched in normal operation during short duration) (50°C - IEC Guide 117 if the surface is accessible and expected to be touched for long duration)
	110°C max (limited time)
Ambient air temperature for storage	-40...35°C
Relative humidity measured	10...98% (Accuracy 2%)
Relative humidity for use	10...95 % over a period of 24h condensation may occasionally occur in operation
	10...90 % over a period of one month condensation may occasionally occur in operation
IP degree of protection	IP54 EN/IEC 60529
Mechanical impact	IK07 EN/IEC 62262 (Exposed side vs Measuring side)
Pollution degree	2 IEC 61010-1
Operating altitude	0...2000 m
Storage altitude	0...3000 m
Vibrations sinusoidal during transport	5-200Hz 2g 200-500Hz 4g 20 cycles 7.5mm Test Fc according to IEC 60068-2-6 (2M3 according to IEC 60721-3-2)
Vibrations random during transport	10-2000Hz 0,1g/Hz 30 min/axe according to IEC 60068-2-64
Shocks	3 shocks 3 directions 40g 6ms (Ea)according to IEC 60068-2-27 (2M3)
	1000 shocks 3 direction 20g 16ms (Ea)according to IEC 60068-2-27
Free falls	2m 2 free falls according to IEC 60068-2-31
Vibrations sinusoidal in operation (Installed on bar)	5-500Hz 1g 1cycle (13min) 3mm Test Fc according to IEC 60068-2-6 (3M5 according to IEC 60721-3-3)
Shocks in operation (Installed on bar)	3 shocks 3 directions 10g 11ms (Ea)according to IEC 60068-2-27 (3M5 according to IEC 60721-3-3)
Glow-wire flammability withstand	650°C
Maximum distance between sensor and the access point	100m in free field unobstructed
	25m when the components are separated by one layer of metal
	10m when the components are separated by two layers of metal

Offer Sustainability

Sustainable offer status	
RoHS	
REACH	Reference not containing SVHC above the threshold Candidate list January 2017
Product environmental profile	ISO 14025
Product end of life instructions	WEEE
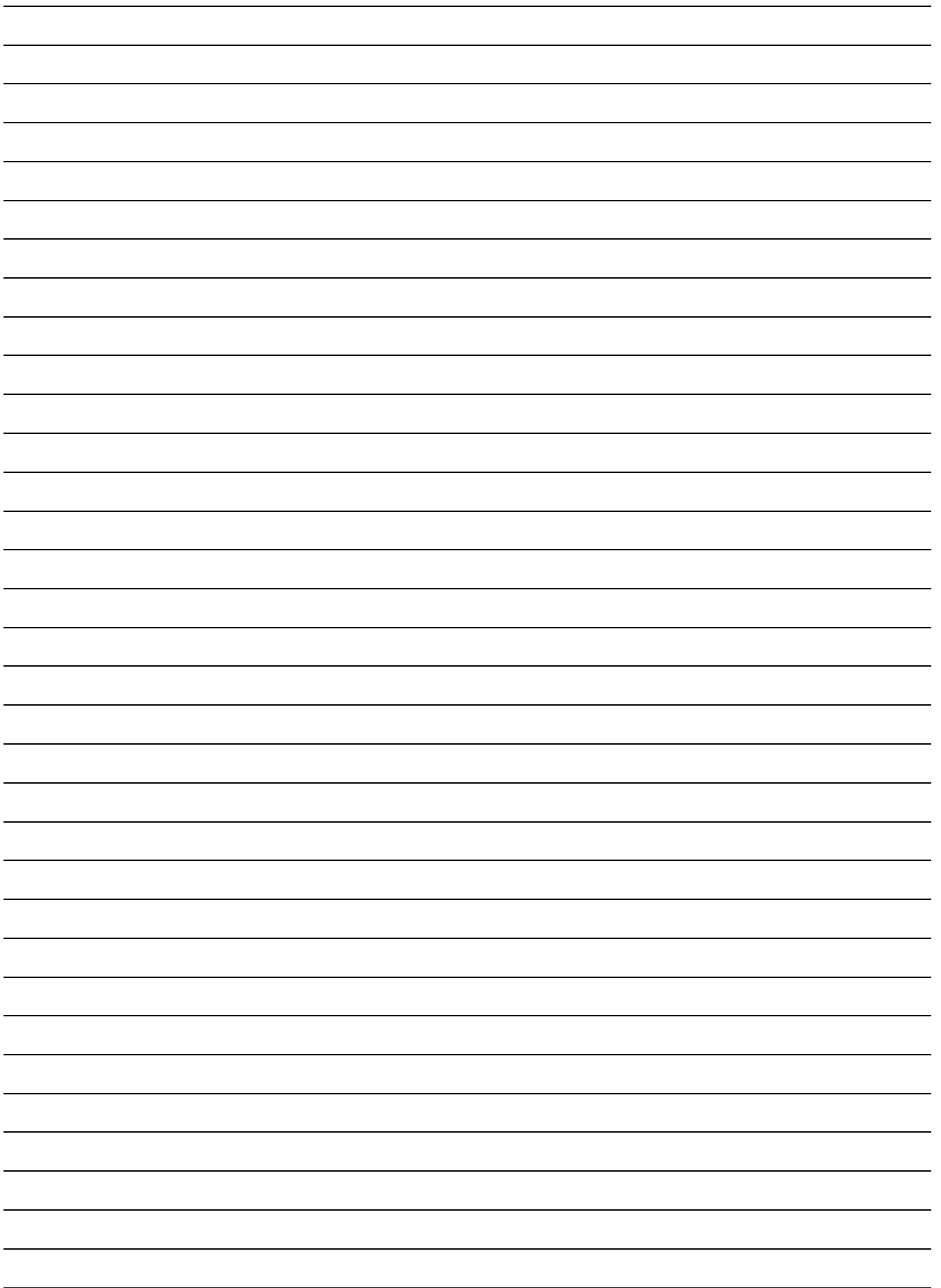
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to time, please ask for confirmation of the information given
in this publication.

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