





General Information

Notice: This device complies with part 15 of the FCC Rules and with RSS-210 of Industry Canada. 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.

Notice: Changes or modifications made to this equipment not expressly approved by E-Senza Technologies may void the FCC authorization to operate this equipment. This includes but is not limited to modifications of the antenna or use of an antenna not approved by E-Senza Technologies.

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 instructions, 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 the 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 a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Radiofrequency radiation exposure Information:

The radiated output power of the device is far below the FCC radio frequency exposure limits. Nevertheless, the device shall be used in such a manner that the potential for human contact during normal operation is minimized.



Safety Information

In order to ensure the safe use of the product described, you have to read and understand this manual. The following notes provide information on how to use this manual.

Explanation of symbols used and signal words

The following types of messages provide information about possible property damage and general information concerning proper operation and ease-of-use.



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.

The following types of messages provide information about possible property damage and general information concerning proper operation and ease-of-use.



This symbol and the accompanying text alerts the reader to a situation which may cause damage or malfunction to the device, either hardware or software, or surrounding property.



This symbol and the accompanying text provide additional information to the reader. It is also used as a reference to other sources of information (manuals, data sheets) on the subject matter, product, etc.

SenzaBlock is ESD sensitive !

- Prevent SenzaBlock OEM module or PCB inside the enclosure from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Wear a grounded wrist strap against your skin to eliminate static on your body
- Hold SenzaBlock by its enclosure or its edge. If you are removing a pluggable module, use the correct tool.

User group of this manual

The use of products described in this manual is oriented exclusively to

- qualified electricians or persons instructed by them, who are familiar with applicable standards and other regulations regarding electrical engineering and, in particular, the relevant safety concepts.
- qualified application programmers and software engineers, who are familiar with the safety concepts of automation technology and applicable standards.

E-Senza Technologies accepts no liability for erroneous handling or damage to products from E-Senza Technologies or third-party products resulting from disregard of information contained in this manual.

Battery Handling Guidelines

- Insert the battery correctly (+/-).
- Do not recharge
- Do not open or dispose in fire
- Do not heat above 100°C
- Do not expose contents to water
- Do not mix with used batteries or other battery types

Not considering the above steps may lead to explosion, leaking of battery and can cause damage!



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1 SenzaNET

SenzaBlock is always operated as part of a wireless device network running the SenzaNET protocol. This chapter gives a basic overview of SenzaNET, the devices involved, terminology and features. Please refer to your SenzaWMS manual for more detailed information.

1.1 Communication in SenzaNET

The gateway (SenzaCoordinator/SenzaGate) is the network master, responsible for all communication to/from the wireless network.

Hence, all communication to any network node is done through the gateway. This is possible either via the SenzaWMS, the SenzaNET programming interface or through Field-Bus interfaces.



Fig. 1 SenzaNET System Overview



1.2 Network Elements

1.2.1 SenzaBlock

SenzaBlock represents the basic component of SenzaNET. SenzaBlock has mesh networking capabilities and can interface with devices (e.g. sensors, actuators) at the same time.

SenzaBlocks are available from E-Senza Technologies in different variations for a multitude of applications.

As adapter-devices or built-in modules, they enable all kinds of sensor and actuator devices to be controlled wirelessly and exchange data through a self-organizing wireless mesh network with ultra-low power consumption.

1.2.2 Gateway

SenzaNET supports integration of the Wireless Network with existing systems or products through the gateway. You always need a network master to communicate to or from the SenzaBlock. It can be a SenzaCoordinator or a SenzaGate. They not only support Network Layer functionality but also provide interfacing to upper layers.

The gateways are available for a multitude of industrial interfaces: Ethernet, Serial, Modbus, Profibus etc.

1.2.3 SenzaWMS

SenzaWMS is the software-suite accompanying SenzaNET. It provides a very friendly user-interface for a comfortable administration of the wireless network and monitoring of each individual node. With SenzaWMS, multiple networks can be managed in parallel, networked devices can be reconfigured, alarm messaging and data acquisition are automated. Comprehensive software-APIs and data-export options allow seamless integration into existing IT-infrastructures.

2 SenzaBlock SB110-NTC

SenzaBlocks of the SB1x0 product family are integrated measurement transducers and wireless data transmitters. They provide interfaces to standard sensors and field devices allowing them to communicate wirelessly using SenzaNET.

2.1 Features

SenzaBlock SB110-NTC is designed for Temperature measurements using a Thermistor sensor.

2.2 Installation

2.2.1 Mechanical Installation

SenzaBlock's standard enclosure can be wall-mounted using two screws of 4 mm diameter. See photo and drawings below to locate the screw holes. After mounting SenzaBlock and completion of electrical installation, make sure the cable gland is properly closed and the front cover is fixed firmly using its four screws.



<u>Important:</u> Check cable gland, front screws and proper sealing of enclosure to ensure adequate closure !

If no cable is used out of the SenzaBlock, the cable gland will not close properly. Therefore a blanking plug MUST be fitted into the Cable Gland to obtain ingress protection !



Leveraging Power of Wireless®

Top view

Side view





All dimensions in mm.



2.2.1.1 Sensor Temperature Grade

The attached sensor & cable can support a temperature of -30 to 70° C.





2.2.2 Electrical Installation

2.2.2.1 Connecting Sensor and Power-supply

SB110-NTC must be powered with 2 x 1,5V "AA"-type batteries. Battery holder and sensor are connected to SenzaBlocks pins as in table below. Sensor connection cables have to be lead through the enclosures cable glands before being connected.

Pin No	Pin Name	Pin Type	Description	Comments
1	GND	GND	Battery Ground	
2	Batt_In	Battery Input	Battery Supply Positive (+3V).	Battery Voltage must not exceed 3V
3	Sensor - VCC	Output	VCC for Sensor	Red strand of sensor cable
4	Data	Input	NTC Input	Brown strand of sensor- cable
5	GND - Sensor	Output	GND for Sensor	Black strand of sensor- cable

Table 1 Connector Details

2.2.2 Antenna Connection

2.2.2.2.1 SB110-NTC OEM-module (order-code SB110-NTC-O)



An Antenna cable (not included) is connected to the onboard U.FL connector located on radio board. Avoid mechanical stress to the cable connection, since RF-performance will be affected in case connector is not fixed properly.

2.2.2.2 SB110-NTC with IP54-enclosure (order-code SB110-NTC-E54)



SenzaBlock's IP54-enclosure comes with a reverse-SMA antenna connector ("male") and an applicable IP54 Antenna. Just plug antenna onto connector and turn it in clockwise direction until it is fixed tightly. Loose fixing of the Antenna might affect RF-performance of SenzaBlock.



2.2.2.3 SB110-NTC with IP65-enclosure (order-code SB110-NTC-E65)

Additionally to the installation of an IP54-Antenna, SenzaBlock's IP65-enclosure requires to add a sealing-washer and a sealing-rubber before putting antenna onto connector. Refer to pictures below to follow the sequence of installing these parts.



2.2.2.2.4 SB110-NTC with internal antenna (order-code SB110-NTC-I)



Please note that whenever you open and close the enclosure, do not forget to check the antenna cable which is connected to the onboard U.FL connector located on radio board and to the internal antenna inside the cover of the enclosure.

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For best RF performance SenzaBlock has to be kept or mounted at the highest possible place (2m height is ideal) with the external antenna pointing to ceiling or sky.

When using the internal antenna, optimal performance is reached when axis of antenna is oriented horizontally and the antennas surface is in upright position. See following picture:





2.2.2.3 Software Configuration

SenzaBlock's must be authenticated in SenzaNET and software-configured before data is transmitted. All configuration change are done remotely through SenzaNET.

Such configuration is done through the networks' gateway. You can either use the SenzaWMS software-suite to do this or send AT-commands to the gateway.

Please refer to the SenzaWMS Manual and/or the SenzaNET Programming Manual.



3 Troubleshooting

Problem	Possible Reason	Possible cause	Remarks
SenzaBlock not powered	Low Battery	Check Battery Voltage	Nominal battery voltage is 3V, minimal battery voltage is 2,4V. In case of empty battery use Energizer L91 1.5V AA Batteries for best performance.
	SenzaBlock or Reverse Polarity or Connections at the Wrong Pins	Table 1	supply at the wrong Pins can damage the SenzaBlock!!
Battery level	SenzaBlock not in	Check network connection	SenzaBlock will consume
dropping very fast	Network	Check network connection	battery faster, if it has to scan for the Network. See Below to section SenzaBlock not connecting to Coordinator
	1		
No Sensor Value	No Sensor Connected	Check the Sensor Connection as per Table 1	
	Wrong software- configuration	Select the right Sensor Type for the SenzaBlock from the Edit Window in the Status Tab of SenzaWMS or re-send AT- Command (AT+1)	
Canas Dia ala mat	Automa	Charles antenna sourcestion	
connecting to Coordinator	Antenna Connection not proper	Check antenna connection	
	No power or low Battery Voltage	Check Battery	
	SenzaBlock is denied to access the network.	The user has denied the access of that specific block into one specific network (for one gateway) via SenzaWMS or with AT Commands.	Delete SenzaBlock from the network, then re-try



4 Technical Support and Training

Send your technical questions directly to our team of product specialists.

Email: support@e-senza.de Phone: +49 7531 365 99 - 19 9am - 5pm Central European Time

Trainings are available on a regular basis and can be arranged on request as well. Visit our website for the latest training schedule: http://www.e-senza.de/en/sales/training.html

or get in touch with our team in case of questions or specific training needs: training@e-senza.de

5 Warranty

E-Senza Technologies warrants that its product will at the time of shipment be free and clear of all liens and encumbrances and will be free from defects in material and workmanship and will conform to specifications. If products sold are not as warranted, E-Senza shall, at its option, refund the purchase price, repair or replace the product, provided proof of purchase and written notice of nonconformance is received within one year from date of initial shipment, and provided said nonconforming products are, with E-Senza's written authorization, returned FOB E-Senza's plant or authorized repair center within 30 days from expiration of said 1-year period. Upon verification that the product does not conform to this warranty, E-Senza will pay the cost of transporting such replacement or repaired goods to Buyers plant within Germany. This warranty shall not apply to any products E-Senza determines have been, by Buyer or otherwise, subjected to testing for other than specified electrical characteristics or to operating and/or environmental conditions in excess of the maximum values established in applicable specifications, or have been subject to mishandling, misuse, neglect, improper testing, repair, alteration, damage, assembly or processing that alters physical or electrical properties. This warranty excludes all costs of shipping, customs clearance and related charges outside Germany.

In no event will E-Senza be liable for any incidental or consequential damages. This warranty extends to Buyer only and not to buyers customers or users of buyers products and is in lieu of all other warranties whether express, implied or statutory including implied warranties of merchantability or fitness.

6 Environmental Compliance

All products from E-Senza are RoHS compliant.

Dispose off SenzaBlock and batteries in accordance with WEEE regulations of your country.





7 CE conformity

SenzaBlock SB110-NTC is authorized for use in Europe.

CE Declaration of Conformity In accordance with EN 45014:1998					
	We Of	E-Senza Tech Bücklestrasse D-78467 Kon	hnologies GmbH e 82b stanz		
	Declare und	er our sole res	sponsibility that the following products:		
	SenzaBlock Series: SenzaCoordinator Series: SenzaHub: SenzaGate Series: Test Kits:		SB100, SB110, SB130, SB140 SC130 SH140 SG150, SG131, SG132 SK801 , SK802, SK803, SK804		
	Has been tes	sted and confe	orms to the following standard(s) and specifications:		
	 EN300 440-2 V1.1.1(2001-2009) - Electromagnetic compatibility and Radio spectrum Matters (ERM); Short range devices; Radio equipment to be used in the 1GHz to 40GHz frequency range; Part 2: Harmonised EN under article 3.2 of the R&TTE Directive 				
	 ETSI EN301 489-03 V1.4.1 - Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; 				
	EN60950-1:2001+A11:2004 – Electrical Product Safety Standards				
	• EN50371:2002				
	I hereby declare that the equipment named above has been tested and found to comply with the relevant sections of the above referenced specifications. The unit/module complies with all essential requirements of the Directives.				
	Signed by: Name Position On 15 Janu	Mrs Mihaela Head - Deve ary 2009	Homana Hopment		