



Safety Guidelines

&

Installation Manual

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1 Indications for Use

It is essential to read the operating instructions carefully and completely before using the first time the equipment and software. They contain important information on safety, installation and use. Keep these instructions in a safe place.

1.1 Symbols

	Warning of dangerous situations that can cause injury and damage to the devices.
	Warning of non-ionising electromagnetic radiation.
	Important notes and tips are a sign Info provided. Follow these guidelines.
	Never put in your household waste bin.

1.2 Safety



The operating and maintenance personnel must read the instructions carefully before using the equipment. Knowing all the information contained therein - in particular the warning and safety instructions - is needed to safely operate the equipment, and to protect yourself and others against possible dangers. Ignoring the warning, safety and operating instructions can result in injury, damage, or a considerable shortening of the equipment life time. Do not make any changes or alterations to our products.

The ALPHA contains a rechargeable battery. The battery/cells must not be removed from the ALPHA, must not be short-circuited, physically damaged or exposed to heat, fire or water. Follow the transport stipulations of the carrier (IATA-DGR, IMDG-Code, ADR, RID) when returning an ALPHA to Gutermann. To protect the battery, the ALPHA must be recharged every 6 months. For questions concerning replacing the battery, please contact your Gutermann distributor.

When using the software or the equipment, make sure you adhere to any applicable regulations, in particular traffic regulations.

1.3 Intended Use

ALPHA products, hardware, software, and accessories are exclusively intended for industrial use and exclusively intended for leak detection on water pipes of the public water supply. In particular, these products are not intended to be used on waste water and gas pipes. Gutermann is not liable for any damages caused by misuse, improper operation, and as a result of non-compliance with safety instructions and warnings.

2 Delivery Contents

The ALPHA System contains the following components:

ALPHA V2: Communication between loggers and repeaters

Solar panel: Recharges the battery of the ALPHA

Power cord: For the connection between the ALPHA and the solar panel

Fastening material: For fastening the ALPHA and the solar panel

External antenna (optional): For enhanced data transmission



3 Mechanical Installation

ZONESCAN ALPHA is the data gateway for HISCAN and ZONESCAN 820 permanent monitoring systems. Especially when in use in conjunction with ZONESCAN 820 system, which is spread out over a larger area, it is recommended to place the ALPHA at the highest position available in order to ensure the best radio connection possible.

3.1 Safety Precautions



You must ensure that there is adequate safety present when working at great heights.



Use additional safety to prevent tools, ALPHA or accessories from falling or create a safety area on the ground.



Use protective gloves to prevent cuts from sharp edges.

3.2 Directions for the ALPHA



The device may only be installed by trained personnel.



Cable connectors are sealed against water only if the cable is connected. Seal with a plug if unused. Tighten connectors correctly to ensure good contact and sealing. No tools necessary – finger-tight fastening is adequate.



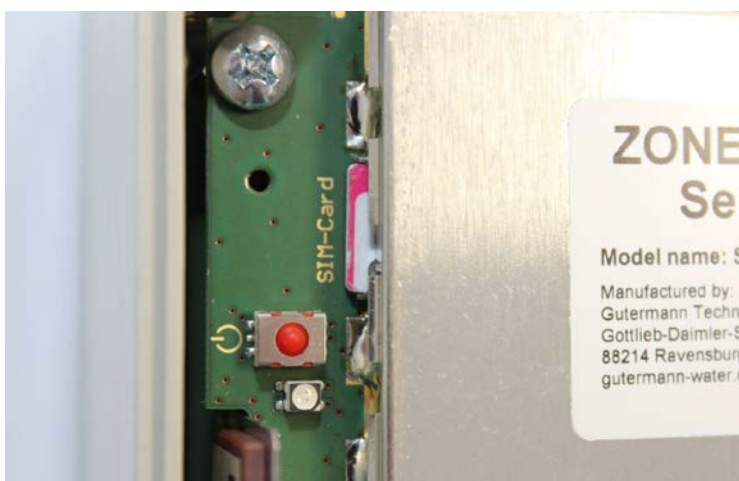
For your own convenience and to prevent ingress of moisture, open the ALPHA only in clean and dry conditions such as an office. Insert the SIM card and test internet connection to prevent necessity to re-open the ALPHA in the field.



Before reclosing the ALPHA the seal and the seal face has to be cleaned and checked for damages. Damaged seals must be replaced in order to ensure tightness.

3.2.1 SIM Card

Open the ALPHA carefully. The SIM card slot is located at the top of the device. Place the SIM card as shown and insert it into the slot:

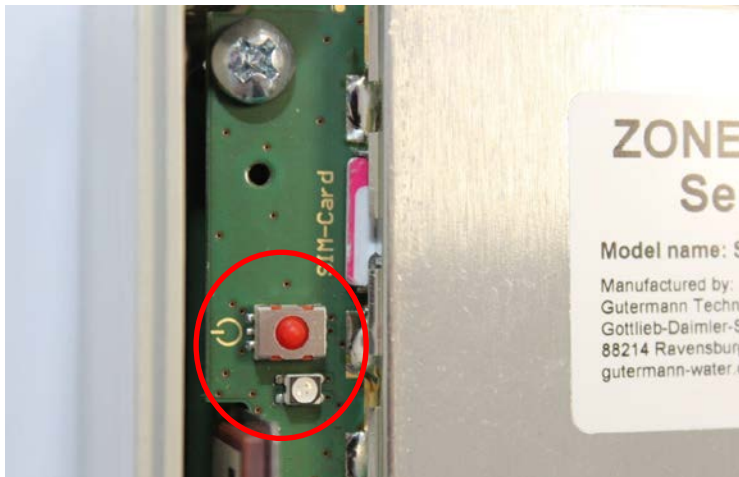


Before closing the ALPHA, check the seal. Remove any dirt and exchange it if damaged.

Close the lid and fasten the screws tightly.

3.2.2 Tool setting via pushbutton and LED indication

The device is equipped with a push button and one LED that can indicate red and green. This allows to enforce some fundamental settings.



- **Switch the device into the sleep mode and wake it up from the sleep mode:**

In the sleep mode nearly all functions of the device are disabled and the power consumption is reduced to the minimum. This mode is designated for longer periods of non-usage. The only available function is to be prepared for a wake-up.

To enforce the device to go into the sleep mode press the push button for more than two seconds. The LED will indicate the transition by flashing five times in red.

If the device is in the sleep mode and you intend to wake it up also push the button for at least 2 seconds. The LED will indicate the transition by flashing five times in green.

See also chapter 5 Storage and transportation

- **Sending a test e-mail:**

To enforce the sending of a test e-mail push the button two times less than one second. The LED will continuously be red during this test. Thereafter it will flash five times red when the test failed or five times green when the test was successful.



The LED will go off and on in between the test (without flashing), therefore wait for at least 2 minutes before trying another test!

3.2.3 Mounting the ALPHA

On the back side of the ALPHA there is a metal mounting plate which enables secure installation also to round objects.



Make sure to use mounting material suitable for the environment. To ensure redundancy, it is mandatory to use always two fastening elements for the ALPHA housing.



Do not use the ALPHA if it is damaged.



Mount the ALPHA with its connectors oriented towards the bottom.



No metal parts on or near the front, the top or the sides of the housing – they would interfere with the various antennas.



When using stickers, make sure to use non-metallic materials and colours only, in order to avoid interference with radio- or mobile connection.



GPS antenna location

Internal on the top

GPS antenna provision

Free line of sight to the satellites in the sky is optimal

 A photograph of the internal components of a device, showing a white rectangular antenna shield. Two red arrows point from the text on the right to the top corners of the shield, indicating the location of the modem antenna.	Modem antenna location Internal on both sides Modem antenna provision Free line of sight to the base station is optimal
 A photograph of the internal components of a device, showing a white rectangular antenna shield. A red arrow points from the text on the right to the center of the shield, indicating the location of the internal radio antenna.	Internal radio antenna location Internal antenna below the lid Internal radio antenna provision Free line of sight to the repeater is optimal

3.3 Directions for the Power Supply

The main power supply for the ALPHA is a solar panel which is used to charge the internal battery.



If an alternative power supply ($12V_{DC} \pm 10\%$ / 4W) is used, it must be installed by a skilled electrician in compliance with local regulations.

At the back side of the solar panel there is a metal mounting plate similar to that of the ALPHA.



Make sure to use mounting material suitable for the environment. To ensure redundancy, it is mandatory to use always two fastening elements for the solar panel.



Panel orientation should be chosen so that it gets as much sun as possible especially under bad conditions like in winter. Also take shadows of buildings, trees etc. into consideration.



Slightly incline the panel so that rain can clean it and there is the lowest accumulation of dirt or snow.



Cable connector should be at the bottom.

3.4 Directions for External Antennas

3.4.1 Directional Antenna YA9-11

This Yagi type antenna is a directional antenna with a main horizontal distribution at $\pm 30^\circ$ of the direction it is pointed to. It is best used, if the ALPHA is placed outside the installation area of loggers that should be covered.



Mounting clamp fits poles up to 50 mm. Always use both clamps and securely tighten the screws.



The little staves should be oriented vertically for correct polarisation.



Sample installation with solar panel and Yagi

3.4.2 Omnidirectional Antenna XL-900-3LW

This 70 cm rod antenna is an omnidirectional antenna. It is best used, if the ALPHA is placed within the installation area of loggers which should be covered.



Mounting clamp fits poles up to 50 mm. Always use both clamps and securely tighten the screws.



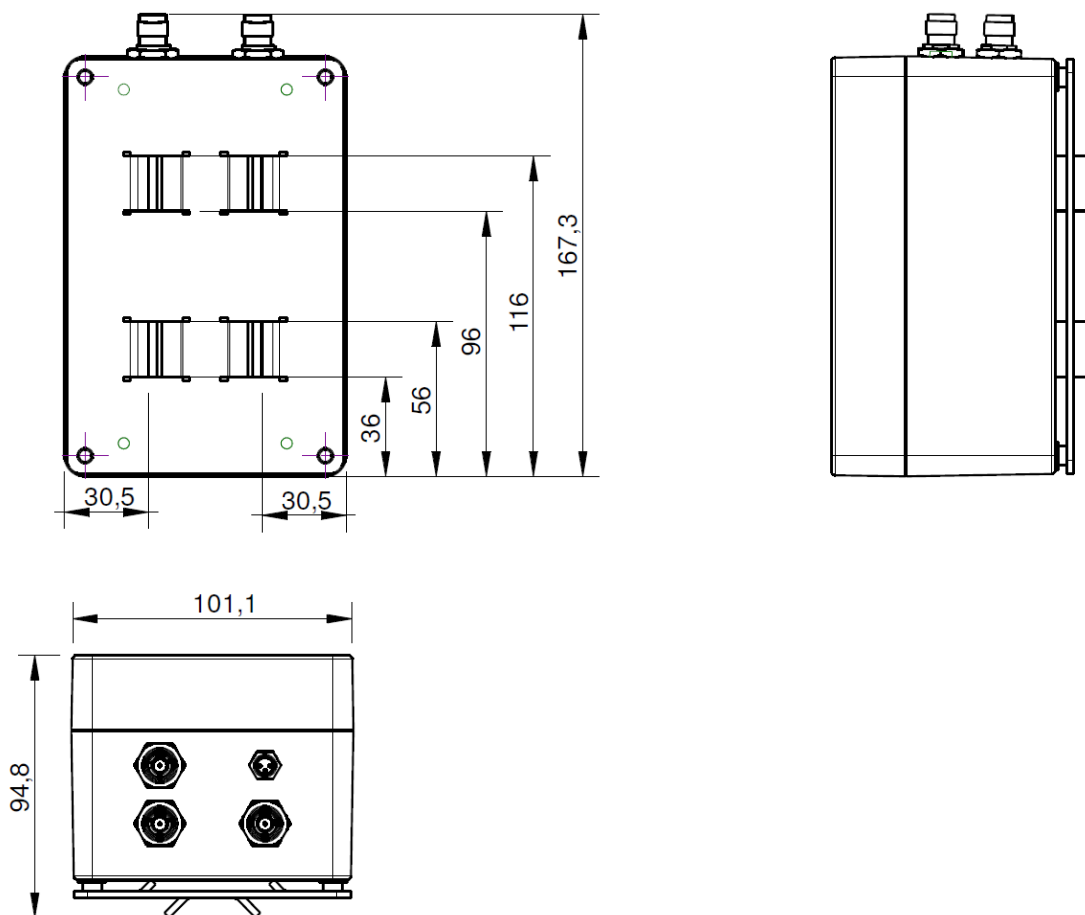
The rod should be oriented vertically for correct polarisation.



Sample installation with solar panel and rod antenna

4 Technical Data

4.1 Mechanical Dimensions



Parameter	Comment	min.	typ.	max.	Unit
Size					
Length	Without connector		152		mm
Width			102		mm
Height	With mounting plate		95		mm
Others					
Weight			1.3		kg
Operating temperature		-30		70	°C
Protective class	Connector inserted		IP67		

4.2 Used Radio Frequencies

System	Frequency	Emitting Power
Gutermann Radio (internal)	869.525 MHz	20 mW
Gutermann Radio (external)	869.525 MHz	Up to 500 mW (*)
UMTS	Band I	250 mW
UMTS	Band II	250 mW
UMTS	Band V	250 mW
UMTS	Band VI	250 mW
UMTS	Band VIII	250 mW
GSM	Band 850	2 W
GSM	Band 900	2 W
GSM	Band 1800	1 W
GSM	Band 1900	1 W
LTE	1	200 mW
LTE	2	200 mW
LTE	3	200 mW
LTE	4	200 mW
LTE	5	200 mW
LTE	7	200 mW
LTE	8	200 mW
LTE	12	200 mW
LTE	18	200 mW
LTE	19	200 mW
LTE	20	200 mW
LTE	28	200 mW

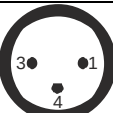
(*) Depending on antenna gain

4.3 Battery

Type	LiFePO ₄
Number of cells	4
Voltage	3.3 V / 3.6 V (nominal / charge)
Capacity	33 Wh / 10 Ah
Charging temperature	-30 °C – 55 °C

4.4 Pin Assignment

4.4.1 Power Connector

M8 Connector	Pin	Signal
	1	+12V _{DC} / 4W Input
	3	NC
	4	Ground

4.4.2 Antenna Connector 1 to 3

Connector: RP-TNC; Plug (IP67 connected)

RP-TNC Connector	Pin	Signal
	1	Signal
	case	Ground

4.5 External Antenna



Impedance: 50Ω

Antenna gain:	11dBi max.
Polarisation:	linear; vertical
Minimum safe distance:	0.2 m

5 Storage and Transport

In order to avoid unwanted radio transmissions and prevent battery depletion, the ALPHA must be set to sleep mode for storage and transportation.

In sleep mode, the ALPHA will listen on the Gutermann radio every 30 seconds, but not transmit. The modem will also stay switched off.

In order to enter sleep mode, open the ALPHA, press the button at the top and keep it pressed for 2 seconds. The LED will confirm entering sleep mode with 5 red flashes.

The ALPHA will enter sleep mode on its own if over the course of two days there is no power supply connected and no SIM card inserted.

6 Disposal



Never put electrical appliances in a household waste bin. Always collect them separately and perform an environmentally friendly recycling. When disposing of electrical appliances always comply with national and regional waste disposal regulations. If an orderly disposal of our products is not possible, send the unit to us. We dispose of our products environmentally friendly. Address see below.

7 Imprint

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Subject to changes

8 Conformity

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique 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;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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 switching the equipment to sleep mode and wake it up from sleep mode , 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.
- Consult the dealer or an experienced radio/TV technician for help.

FCC NOTICE: To comply with FCC part 15 rules in the United States, the system must be professionally installed to ensure compliance with the Part 15 certification.

It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States.

FCC / ISED RF Exposure: To comply with the RF exposure requirements for General Use/ Uncontrolled Exposure this device with it's antenna(s) must be fixed mounted.

Changes or modifications to this equipment not expressly approved may void the user's authority to operate this equipment.

9 Important Information

Please draw your attention to all warnings and information in the manual and on the products. By using this product, you acknowledge that you are aware of and have read the warnings and information provided in the manual.



Always clean the sensors and mechanical accessories with a clean towel after use before stowing them away in the carry case.