amedo
SMART TRACKING SOLUTIONS

Medical UHF Reader PoE

INSTRUCTIONS FOR USE

Gebrauchsanweisung

CE

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CE	Information from the manufacturer: This product bears CE marking in compliance with the provisions of Directives 1999/5/EC (RTTE). CE marking applies exclusively to technical products that were put into circulation in recognition of the aforementioned, relevant EU directive in each case. The original language of this document is German.
	FCC Declaration 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. 2. This device must accept any interference received, including interference that may cause undesired operation. No changes shall be made to the equipment without the manufacturer's permission as this may void the user's authority to operate the equipment. This device must accept any interference received, including interference that may cause undesired operation This device complies with Part 2.1091 of the FCC Rules for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 24cm between the antenna and all personnel.
	Industry Canada Declaration 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. 2. This device must accept any interference, including interference that may cause undesired operation of the device. 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. 2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement. No changes shall be made to the equipment without the manufacturer's permission as this may void the user's authority to operate the equipment. Aucun changement ne sera apporté à l'équipement sans l'autorisation du fabricant car cela peut annuler le droit de l'utilisateur à utiliser l'équipement. This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 24 cm between the antenna and all personnel. Cet appareil est conforme aux RSS-102 des limites d'exposition aux rayonnements définies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à une distance minimum de 24 cm entre l'antenne et l'ensemble du personnel.

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1 Identification

1.1 Manufacturer

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1.2 Customer service

Please contact your local distributor or the manufacturer amedo.

1.3 Document

Document number:	100894-001/000
Revision date:	05.03.2012
Area of application:	Medical UHF Reader (Europe, USA, Canada)
Copyright:	amedo Smart Tracking Solutions GmbH

2 Information for the user

2.1 Purpose of the instructions for use

The present instructions for use

- describe the construction of RFID reader, the function and operation,
- provide important information for safe and efficient use of the system.
- are divided into several separate documents
  - → READER HOST PROTOCOL
  - → READER HOST PROTOCOL PASSIVE UHF READER – EXTENSION
  - → READER SUITE USER MANUAL
  - → READER SUITE ENGINEERING MODE

2.2 Markups and symbols

Instructions

Steps to be carried out by the operating staff are identified by a diamond. Several consecutive steps are shown in a numbered list. Additional explanations as well as the system's response to the respective operation are identified by a dash.

Example no. 1:

Instructions

Explanation or result

Example no. 2:

1. Instruction step no. 1

   Activity no. 1

   Activity no. 2

2. Instruction step no. 2

   System reaction to step no. 2

Enumerations

Enumerations without a mandatory sequence are shown as a list with square bullets or dashes.

Example:

- Feature

  Detail

Cross references

References to further text passages in the document are prefixed by an arrow:

→ "Cross reference" to page

Safety information

The following signal words are used for classification to identify warning notices:

Warning

Possibly an imminent threat to the life and health of individuals (serious injuries or death).

Warning

The source of the danger is mentioned first,
Reference is then made to possible consequences.

- Finally, you are given information on how you can avoid the hazard.

Caution

Possibly a dangerous situation (light injuries or property damage).

Caution

The source of the hazard is stated to begin with.

Reference is then made to possible consequences.

- Finally, you are given information on how you can avoid the hazard.

Warning symbols

The following symbols are used in the warning notices depending on the type of danger:

General warning of imminent or possible hazards

Hazard due to high electric voltage. High shock currents and burns are possible. Comply with preventive measures and safety regulations.

Danger of crushing. Safety information.

Risk of stumbling. Make sure cables are laid safely.

Hazard due to tilting equipment cart.

Observe safety information for handling.

Other symbols

Read the documentation.

Reference to the document title

Information

General information

Information refers to important information without a hazardous situation existing for individuals.

Information is marked by an exclamation mark ! and written in *italics*.

Information

Information refers to tips and further contents for ideal use of the product.

Information is marked with an “i” and written in *italics*.

Abbreviations

RFID	Radio Frequency Identification
PoE	Power over Ethernet
PUR	Passive UHF Reader
EMV	Electromagnetic Compatibility
MR	Magnetic Resonance Imaging
OP	Operating Range

2.3 Intended use

The medical UHF reader serves the programming and the readout of EPCglobal Class 1 Gen 2 compatible RFID UHF tags.

In connection with suitable application software the medical UHF reader is able to locate and identify objects that are fitted with RFID tags.

Type of device:	Stationary, fixed installation
Type of use:	Programming and readout of UHF RFID transponders via an air interface.
Place of use:	The medical UHF reader can be operated inside and outside buildings.
User group:	The medical UHF reader must be assembled by trained persons with adequate knowledge in the RFID sector and allowing for the RTTE Directive (1999/5/EC) or FCC part 15.

Prerequisites for use in Europe.
The system must be professionally integrated and installed to ensure compliance with the *RTTE* directive 1999/5/EC in Europe. It is the responsibility of the operator and professional installer to ensure that only compliant systems are deployed in Europe.

Prerequisites for use in the USA.
The system must be professionally integrated and installed to ensure compliance with FCC part 15 rules in the United States. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States.

2.4 General warning notices

Warning

CLASS I ME EQUIPMENT: To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth!

Warning

Do not perform unauthorized modifications to the ME equipment. This can cause the following hazards:

- Electric strike due to damaged external cables
- Interference with other electric systems
- Injury to individuals due to the system falling down
- Breach of personal rights and data protection acts

Warning

Use of the system in the case of damage or failure malfunction.

Incorrect data can be transmitted!

- Before using the system, the user must assure himself of the functional reliability and proper condition of the system.

Warning

Working when the housing of one of the system components is open.

Danger to life due to an electric strike or an electric shock!

- Never open the housing of one of the components.
- Leave necessary repairs and maintenance exclusively to the local customer service. There are no electronic components inside the device that can be replaced by the user.

Warning

Leakage currents that are too high for humans can occur following contact of the user with parts conducting extra-low voltage (< 25 V AC and < 60 V DC).

Risk of injury for the operator or persons involved!

- Connect the medical UHF reader with suitable protective earth. There is a screw connection marked GND on the antenna housing that is intended for this.
- Do not touch the antenna housing and other persons at the same time.

Warning

Caution: radio waves. Failure malfunctions can occur on electric devices.

Maximum performance 2 watt ERP (33 dBm) for Europe

Maximum performance 4 watt EIRP (36 dBm) for USA

- Mount the reader in a distance of at least 24 cm from operators, patients or personal. If this is not possible apply a clearly visible warning label according IEC 60601-1.

- Check whether there is interference to the electric devices by the system.

Warning

Slackly laid cables carry a stumbling risk.

Injuries and damage to property are possible.

- Lay cables carefully and fasten to the ground, for example, if necessary.

Warning

Caution: danger of crushing when adjusting the alignment of the antenna.

Only use the medical UHF reader for the purpose stated in the instructions for use.

The medical UHF reader must only be used in connection with accessories approved by amedo Smart Tracking Solutions GmbH.

No additional components must be fitted to the mounting kit. Overloading can lead to mechanical damage.

The medical UHF reader must not be operated:

- in a defective or incomplete condition
- at a transmission power of more than 2 watt ERP (33 dBm) for Europe or 4 watt EIRP (36 dBm) for USA (the maximum transmission power for each reader version cannot be altered above these limits)
- at frequencies other than those permitted in the country of operation.

Avoid hazards by:

- using exclusively as intended,
- observing the warning notices in the instructions for use, regular maintenance and
- cautious operation of the system.

Please pay attention to the following warning notices when using the reader:

- Avoid the use of aggressive cleaning agents and disinfectants, as these agents can damage the surfaces of the system. Clean the system components with a dry cloth or a cloth that has been moistened with soap suds.

- Please observe the following warning notices when using the medical UHF reader:

- Liquids must not be able to get into the interior of the devices.
- Never submerge the device, not even in idle mode.
- During assembly and before putting the medical UHF reader into service as a component in a medical device, please observe the information on installation, operation, use and maintenance of medical devices in the Medical Devices Act (MDA) or in the Medical Devices Operator Ordinance.
- Before connection to PoE voltage, please check whether the voltage stated on the type plate complies with the in-house voltage.
- Please use the LAN plug provided to connect a LAN cable to the system.
- Connect the medical UHF reader with suitable protective earth. There is a screw connection marked GND on the antenna housing that is intended for this.
- Please ensure that the connecting cable does not have any pinch points, bare points or other damages. The connecting cable must be replaced immediately if you determine any damages.
- Disconnect the LAN plug every time before cleaning and maintenance of the device. Do not remove the plug from the plughole by pulling on the cable.

Risks due to devices that have been connected additionally

The medical UHF reader complies with the requirements of system standard IEC 60601-1.

- Only connect devices to the open interfaces that have been approved by amedo Smart Tracking Solutions GmbH.
- Do not connect any additional devices to the system.
- Use the LAN plug provided to connect a LAN cable to the system.

Additional equipment that is connected to the LAN interface of the device must comply with its corresponding EN specifications, (e.g. IEC/EN 60950 for date processing devices and IEC/EN 60601 for electromedical devices). In addition, all configurations must comply with the valid version of system standard IEC 60601-1 or IEC 60601-1-1.

Whoever connects additional devices to the signal input or signal output part is a system configurator and hence responsible that the valid version of system standard IEC 60601-1 Rev. 3 or IEC 60601-1-2 is complied with. Please contact amedo customer service if you should have any queries.

Risks due to bidirectional, electromagnetic disturbances:

The medical UHF reader complies with the requirements of

- EN 60601-1-2: medical electric devices such as medical UHF readers are subject to special precautionary measures in respect of electromagnetic compatibility and must therefore only be installed and put into service by skilled personnel.
- As a result, electromagnetic disturbances by devices are possible that demand stricter requirements.

Please note: portable and mobile HF communication equipment could influence the medical UHF reader.

Protection in the case of defibrillation:

The medical UHF reader does not have defibrillation protection.

Information for the use of flammable gases:

The medical UHF reader does not have any protection against explosive or flammable gases.

- Switch the medical UHF reader off before using explosive or flammable gases.

2.5 Risks in dealing with the system

The following list presents possible risks in dealing with the medical UHF reader:

- Electric strike due to damaged external cables
- Interference with other electric systems
- Injury to individuals due to the system falling down
- Breach of personal rights and data protection acts

2.6 Duty of the operating company

The operating company commits to only allow persons to work with the system, who

- have received training from persons who are familiar with handling,
- have read and understood these instructions for use and
- comply with the training requirements.

Moreover, the operating company commits

- to adhere to all legal regulations for the operation of the product and
- to only use the product in accordance with the assigned purpose and
- to observe all data protection regulations and
- to examine the function of the device at regular intervals and check for safety-related defects.

2.7 Personnel training

The system must only be used for operations by qualified personnel with the following training:

- special system training and
- basic knowledge of handling PCs.

2.8 Labelling on the system

Please note!

Pay attention to accompanying documents

GND or

earth symbol

Recycling information for electric devices in accordance with Article 7 ElektroG (Electrical and Electronic Equipment Act) and DIN EN 50419 (VDE 004210 / VDE = Association for Electrical, Electronic and Information Technologies). Only dispose of the devices at suitable places of collection and not with household waste.

IP67 Indicates the environmental protection according IEC *60529*

2.9 Type plate

The type plate can be found on the rear side of the housing.

2.10 Limitation of liability

The manufacturer shall not be responsible for damages that are a result of:

- any use that is not as intended,
- incorrect operation due to non-observance of these instructions for use,
- the use of accessories that are not approved by the manufacturer,
- unauthorised amendments and conversions,
- inadequate maintenance by the operating company,
- connecting devices that have not been approved to open interfaces,
- the breach of personal rights and data protection directives

2.11 Product monitoring

In the future we also want to be able to offer safe, state-of-the-art systems.

Please inform us immediately about:

- malfunctions in the safety and monitoring equipment
- problems in dealing with the system
- hazardous situations or accidents with the system

We will get in touch with you in order to discuss the safety and the function of the system on site.

3 Description of the system and use

The medical UHF RFID reader from amedo offers maximum use for RFID implementation in medical and industrial applications.

As a stand-alone device or as a component for medical devices, the medical UHF reader supports all relevant medical and industrial standards and regulations such as IEC 60601 (3rd edition), the RTTE Directive (1999/5/EC) and FCC part 15.
The medical UHF reader serves the programming and the readout of EPCglobal Class 1 Gen 2 compatible RFID UHF tags.

In connection with suitable application software the medical UHF reader is able to locate and identify objects that are fitted with RFID tags.

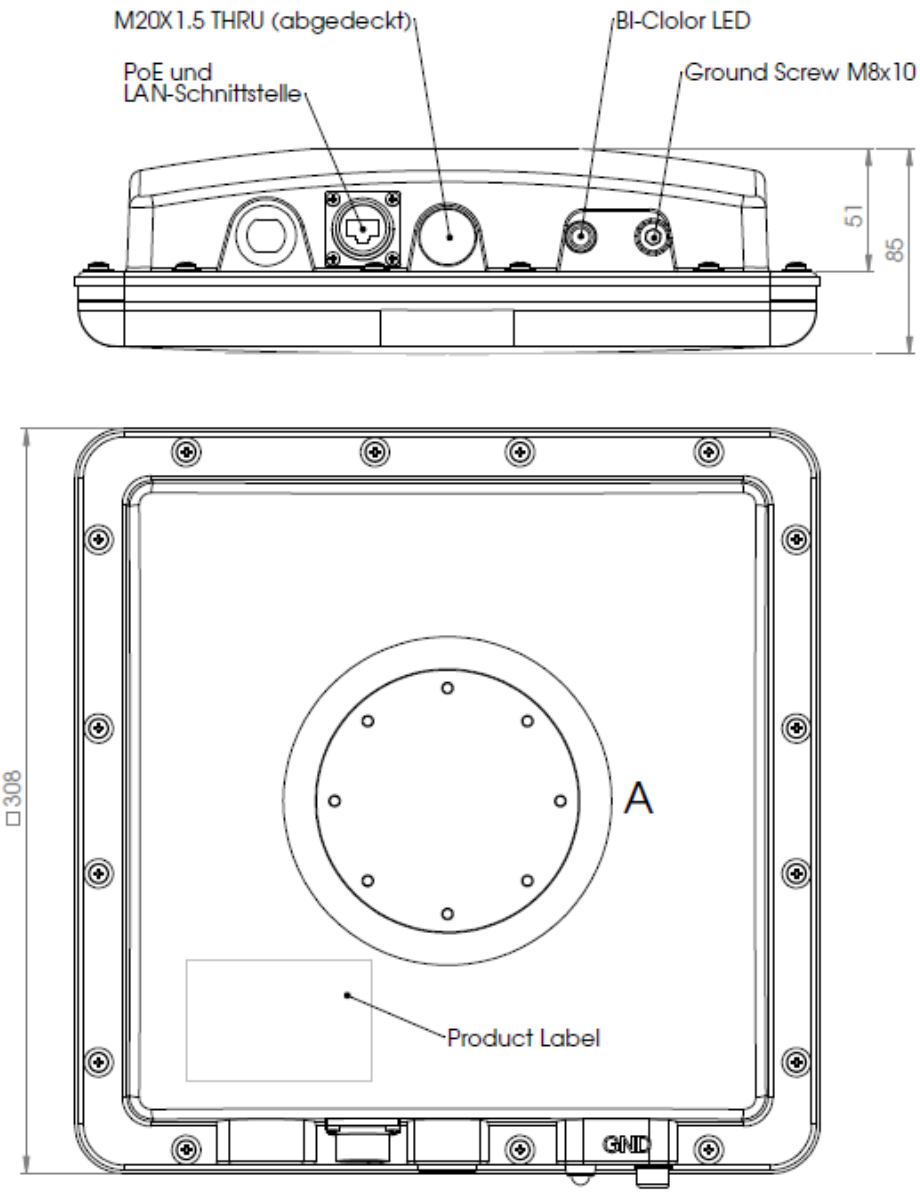
The medical UHF reader can easily be connected to an Ethernet by using a Reader Host Protocol.
Power consumption under 5 watts allows an electric power supply via PoE. Readers can virtually be installed and operated without limit in a correspondingly equipped network.

The sturdy design and environmental sealing also allow the reader to be used in rough environmental conditions.

3.1 Contents of the packaging

100890-002	Medical UHF reader
100873-001	Mounting kit MT – 120018/A
100879-001	Ethernet plug RFJ 544-6
100894-000	Instructions for use
	Reader Suite software

3.2 Description

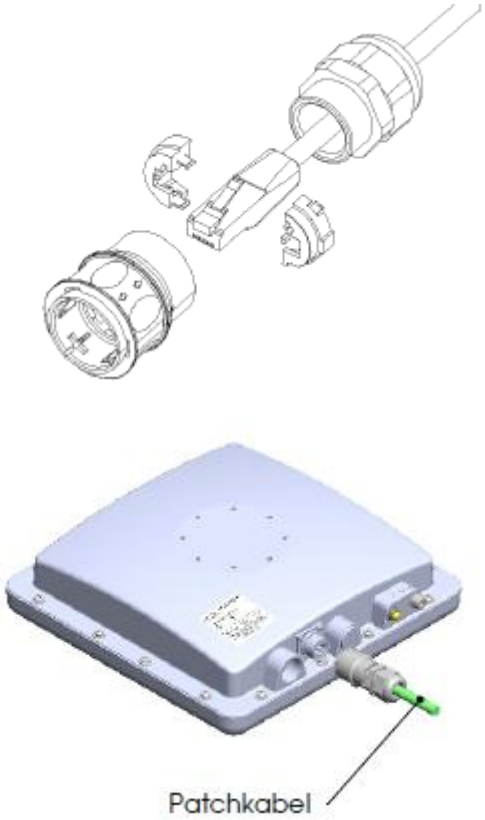


abgedeckt	covered
PoE und LAN-Schnittstelle	PoE and LAN interface

3.3 Connections

The medical reader is suitable for connection to an Ethernet with a PoE electric power supply in accordance with Industrial Standard IEEE 802.3af (electric power supply is not included in the scope of delivery).

In order to connect the reader to the network, please use the RFJ 544-6 Ethernet plug provided and a RJ45 CAT-5e Ethernet patch cable.



Patchkabel = Patch cable

3.4 Indications

The medical UHF reader has a bi-colour LED on the backside to indicate the operating modes.

- Green: the reader is “Ready for use”. One or more RFID tags are within the reception range and can be read.
- Orange: the reader is in transmission mode. There are no RFID tags within the reception range.

4 Putting into service and operation

This chapter provides an overview of the possibilities of putting into service and use of the system:

Working with the system is made possible by means of the

following steps:

- Putting into service
- Connecting the reader with the reader suite
- READER HOST PROTOCOL
- READER HOST PROTOCOL PUR – EXTENSION
- READER SUITE USER MANUAL
- READER SUITE ENGINEERING MODE

4.1 Putting into service

1. Mounting: The reader can be mounted on walls, ceilings or other objects. The installation personal or system integrator is responsible for secure fastening

Fasten the reader in the desired position before putting into service. A MT – 120018/1A mounting kit is included in the scope of delivery in order to guarantee secure fastening. The instructions how to use the mounting kit can be found inside the package box.

Please note: safeguard the reader against the risk of falling down. Please observe the general safety information.

2. Connect the reader to a network as described in chapter "3.3 Connections". To this end, use the RFJ 544-6 Ethernet plug provided and the desired length of a RJ45 CAT-5e Ethernet patch cable.

Please pay attention to environmental conditions for transport and operation.

If the transport conditions of the system in respect of temperature and/or humidity differ greatly from those of the place of operation, please wait at least 1 hour before putting the system into service.

4.2 Connecting the reader to the reader suite

1. Install the "Reader Suite" program on a PC that is connected to the same network as the reader.

2. After you have connected the reader with the help of the Ethernet patch cable, the bi-colour LED will be illuminated orange. Putting into service has been successful and the reader can be used.

3. The reader is delivered with the following standard settings:

IP address: 192.168.0.100

Subnet: 255.255.255.0

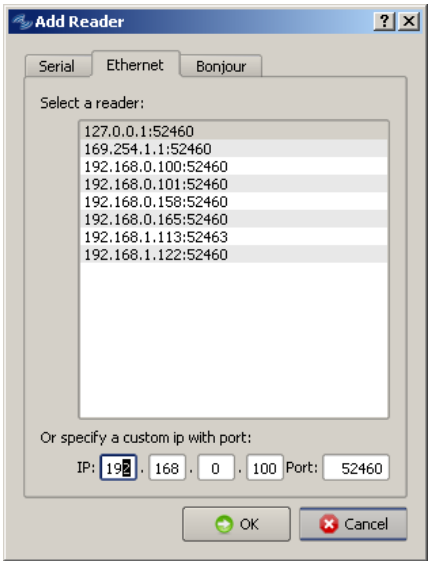
TCP port: 52460

These settings can be changed at any time, also if they are outside their own IP range, by means of the "Device Installer" software provided by Lantronix. This software and corresponding documentation on the module can be found at www.lantronix.com.

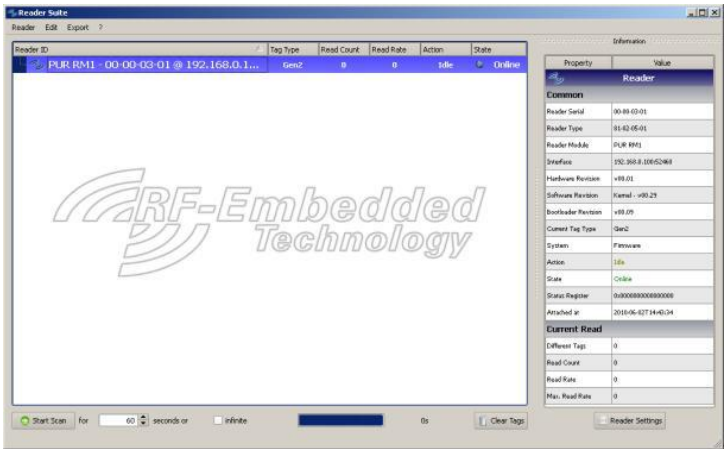
The type designation of the module used is XPORT.

If you are not able to set up a connection between the reader and the "Device Installer" software, connect the reader directly to the Ethernet interface of your computer in order to enter the desired IP address.

4. During the next step the reader has to be added to the reader suite. To do this, the Ethernet tab is selected in the "Add Reader" dialogue. The IP address of the reader must then be entered there. Die IP is "192.168.0.100" and the port "52460".



An attempt is made to open the reader by clicking on OK. If this is successful, the reader will be displayed in the main window as usual:



The reader can be used with the reader suite as from this point in time.

Information:

If you should change the module settings, please keep in mind that the following parameters stay the same.

Serial settings:

Baud rate: 115200

Protocol: RS232

Flow Control: None

Data Bits: 8

Parity: None

Stop Bits: 1

Connection:

Protocol: TCP

Local Port: 52460

4.3 READER HOST PROTOCOL

The Reader Host Protocol allows communication between application software and the reader.

→ The Reader Host Protocol is described in a separate document.

4.4 READER HOST PROTOCOL PUR EXTENSION

The Reader Host Protocol PUR Extension allows additional functions for communication between application software and the reader.

→ The Reader Host Protocol PUR Extension is described in a separate document.

4.5 READER SUITE USER MANUAL

The reader suite allows access to the basic functions of the medical UHF reader.

→ Operation of the reader suite programme is described in a separate document.

4.6 READER SUITE ENGINEERING MODE

The reader suite engineering mode is an extension of the reader suite and allows the specialist to analyse different set-ups.

→ Operation of the reader suite engineering mode is described in a separate document.

5 Cleaning, disinfection, sterilisation

Caution

The medical UHF reader is not intended for sterilisation.

- Clean components in accordance with the cleaning instructions.

Warning

In the event that the medical reader is operated as a component with a medical product that is located in a medical treatment environment, please use sterile gloves to avoid physical contact with the system. Risk of infection.

5.1 Cleaning components

Clean the medical UHF reader using a cloth that has been lightly moistened with soap suds.

If disinfection should be necessary, please do not use any disinfectants that release chlorine or contain acidic ingredients.

Disinfectants can contain materials that are harmful to health or aggressive.

Bodily injuries and damage to property are possible due to disinfectants.

All care products used must be biologically safe.

Mechanical or EDP components can be damaged by excessive moisture or the wrong cleaning agents or procedures.

Do not use acids or acidic cleaning agents for cleaning.

Do not allow liquids to get into the housing.

6 Maintenance and disposal

Warning

High electric voltages can be incurred during work on electric systems.

This can lead to perilous shock currents and burns.

♦ Before work on the electric system: remove the mains plug.

Make sure it cannot be plugged in again by accident.

Maintenance is divided into 3 tasks:

Inspection	Serves to identify variations in the current actual condition from the nominal condition of the system.
Maintenance	Serves to maintain the nominal condition of the system.
Repair	Serves to re-establish the nominal condition of the system.

Please contact customer service in case of technical problems and questions regarding the repair of the system.

6.1 Inspection

By the operating company

Check the completeness of the system.

The following are required:

- LAN cable and PoE supply
- Mounting kit

Check all components

- No mechanical damage or deformation
- No contamination
- Cables and plug connections

6.2 Maintenance

The system is maintenance-free.

6.3 Repair

Please contact amedo customer service in the case of system failures or damage to components.

6.4 Disposal

The manufacturer will take back the system free of charge at the end of the service life of the device for environmentally friendly disposal. The customer shall bear the costs of carriage to the manufacturer.

Please address questions regarding disposal to the manufacturer.

Course of action

1. If you dispose of the system yourself, please pay attention to environmental compatibility, health risks, disposal directives and valid national regulations during disposal.

2. Please separate the component parts of the devices correctly according to:

- metals
- plastics
- compound materials
- electrotechnical component parts

7 Emergency measures

7.1 System failure

Cause General system failure – operation not possible. Hardware defect or software error.

Remedy

- Reboot the system.
- In case of a repeated error: identify the reader as defective and inform customer service.

7.2 Error during start-up

Symptoms Reader is started up and does not read out any UHF tags in the transmission range.

Possible causes Communication error, transmission power too weak.

Error messages None

Remedy

- Reboot the system. Check LAN cable, adapt transmission power.
- In case of a repeated error: identify the reader as defective and inform customer service.

8 Addendum

8.1 Technical data

Physical Characteristics	
Dimensions:	30cm L x 30cm W x 8.6cm H (11.8 in. L x 11.8 in. W x 3.3 in. H)
Weight:	3.4 kg/7.5 lbs
Base Material:	Die-cast aluminum
Color	RAL 9002

Connectivity	
Network:	10/100 BaseT Ethernet RJ45 CAT-5e
Power Supply:	Power over Ethernet (IEEE 802.3af) 48VDC @ 0.17 A (ETSI); 48VDC @ 0.18 A (FCC)
PoE power sourcing (optional)	Input: 100-240 VAC 50/60Hz 0.4 A Output: 48 VDC 15 W (max)

Environmental	
Operational Temperature:	-10° to +50° C/+14° to +122° F
Storage Temperature:	-20° to +70° C -4° to +158° F
Humidity:	5-95% non-condensing
Environmental Sealing:	IP67

Compliance	
Safety:	IEC 60601-1 / EN 60950-01 IEC 60601-1-2 / ETSI EN 301489 1/3 UL 94 V0
Regulatory:	ETSI EN 302-208 (for EU version) FCC Part 15.207 / 15.247 (for USA version) ROHS compliant

Antenna/Hardware	
Frequency:	ETSI: 865.7– 867.5 MHz EU (Channel 4, 7, 10, 13) FCC: 902– 928 MHz USA
Polarization:	RHCP

3 dB Beam width Azimuth/ Elevation	65° EU 63 ° USA
Antenna gain	ETSI: 9.5 dBic; 6.5 dBi FCC: 10 dBic; 7 dBi dBic describes gain compared to reference isotropic circular polarized antenna dBi describes gain compared to isotropic reference antenna
Read distance	Up to 8 m (TAG dependent)
Write distance	70% of read distance
Tag Protocol:	EPC Gen 2 ISO 1800-6
Power Output:	configurable attenuation up to 2 Watt ERP for EU version (ETSI) up to 4W EIRP for USA version (FCC) the power output cannot be altered beyond these limits
Reader Operation mode	Monostatic, Bistatic (optional)

Software	
Firmware	Update and upgradable
Air Link Protocol:	EPC Gen 2; No LBT
IP addressing:	Static and dynamic (DHCP) password protected
Amedo OS:	Reader is delivered with easy to start reader operating system

Ordering Information	
Medical UHF Reader PoE North America (FCC)	100890-001
Medical UHF Reader PoE Europe (ETSI)	100890-002

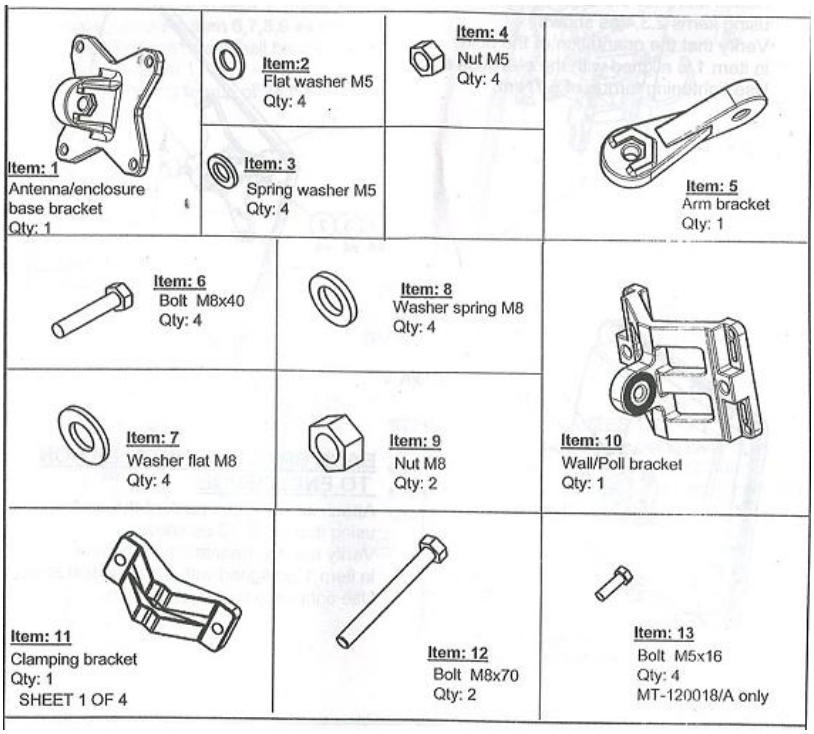
Warranty:	The amedo medical reader is warranted against defects in workmanship and materials for a period of one year (12 months) from date of shipment provided the product remains unmodified and is operated under normal and proper conditions.
Recommended Services	The amedo medical reader does not require service when operated under normal and proper conditions.

8.2 Fuses and preventive measures

- Fuses inside the system must only be replaced by persons authorized by amedo.
- Connect the medical UHF reader with suitable protective earth. There is a screw connection marked GND on the antenna housing that is intended for this.

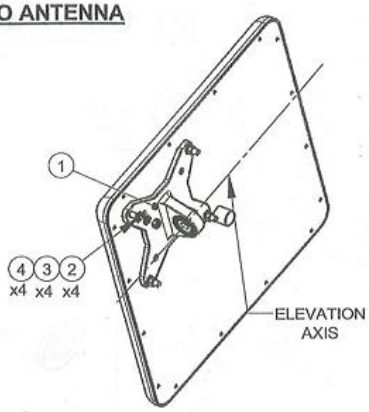
8.3 Installation manual

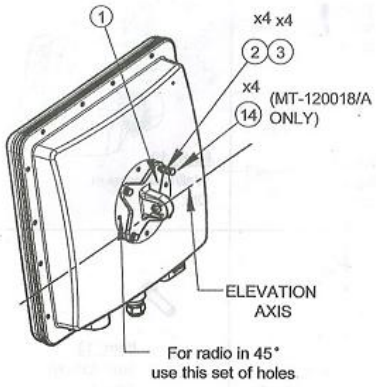
- The Medical UHF Reader is to be professionally installed. Please refer to the following installation instructions.



BASE BRACKET INSTALLATION TO ANTENNA

Attach item 1 to the back of the antenna
using items 2,3,4 as shown.
Verify that the oriantation of the hole
in item 1 is aligned with the elevation axis.
Use tightening torque of 5.7N/m.



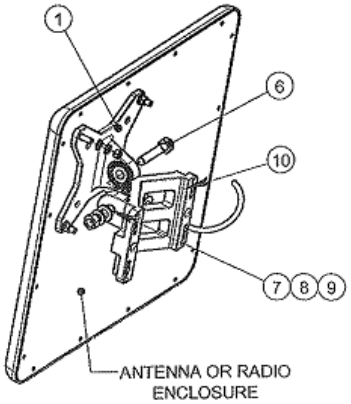


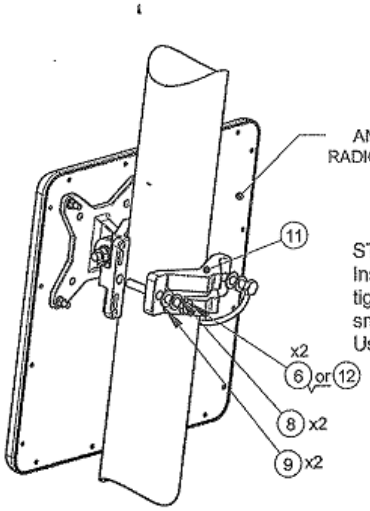
BASE BRACKET INSTALLATION TO ENCLOSURE

Attach item 1 to the back of the enclosure
using items2, 3, 13 as shown.
Verify that the oriantation of the hole
in item 1 is aligned with the elevation axis.
Use tightening torque of 5.7N/m.

INSTALLATION ON A POLE

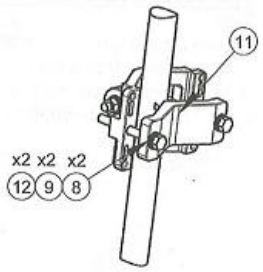
Step 1
Connect the base bracket as shown on page 2.
Connect item 10 to item 1 (mate knurled
surfaces) using item 6,7,8,9 as shown.
Note: The bolt head shall be positioned in the
socket on item 1.
Use tightening torque of 24 N/m.

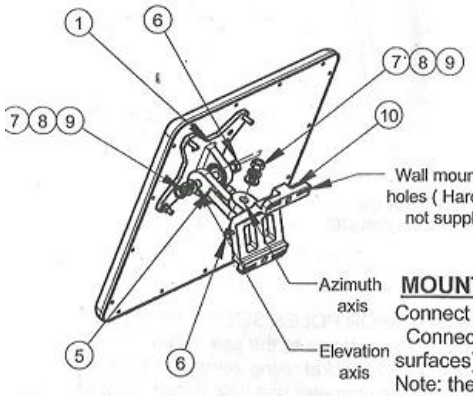




STEP 2 (FOR POLES SIZES 1.75"-3")
Install the antenna to the pole using item 11,
tighten the bracket using items 8,9,12 (for
small pole diameter use item 6 instead of item 12).
Use tightening torque of 14N/m.

STEP 2 (FOR POLES SIZES 1"-1.75")
Install the antenna to the pole using item 11 as shown, tighten the bracket using items 8,9,12.
Use tightening torque of 14N/m.





MOUNTING ON A WALL

Connect base bracket as shown on page 2
Connect item 5 to item 1 (mate the knurled surfaces) using items 6,7,8,9 as shown.
Note: the bolt head shall be positioned in the socket of item 1.
mount item 10 on the wall on the desired position. (note the azimuth axis oriantation)
Attach item 5 to the arm bracket item 10 (mate the knureld surfaces) using items 6,7,8,9 as shown. Note the bolt head shall be positioned in the socket of item 5.
Use tightening torque of 24 N/m to the azimuth and elevation hardware.