myAXXESS

FEIG ELECTRONIC

INSTALLATION

ID MAX.U500i

(EU: 5118.001.00; FCC: 5118.001.10)

Note

Contents

1 Safety Instructions

► The device may only be used for the intended purpose designed by the manufacturer.

► The manual must be read thoroughly and kept safe and accessible for all users.

► Unauthorized changes and the use of spare parts and additional devices which have not been sold or recommended by the manufacturer may cause fire, electric shocks or injuries. Such unauthorized measures shall exclude any liability by the manufacturer.

► The liability-prescriptions of the manufacturer in the issue valid at the time of purchase are valid for the device. The manufacturer shall not be held legally responsible for inaccuracies, errors, or omissions in the manual or automatically set parameters for a device or for an incorrect application of a device.

► Repairs may only be executed by the manufacturer.

► Installation, operation and maintenance procedures should only be carried out by qualified personnel.

► Use of the device and its installation must be in accordance with national legal requirements and local electrical codes.

► When working on devices the valid safety regulations must be observed.

► Prevent children and unauthorized persons from accessing the device.

► Equipment is intended for use only in restricted access area.

► Special advice for carriers of cardiac pacemakers:
Although this device doesn't exceed the valid limits for electromagnetic fields you should keep a minimum distance of 25 cm between the device or the antenna and your cardiac pacemaker.

2 Performance Features of ID MAX.U500i

2.1 Performance Features

With its compact size, its weather-resistant housing, a read range of 8 to 10 m and the circular-polarized antenna supporting any transponder orientation, the UHF Vehicle Access Control Reader ID MAX.U500i is ideally suited to provide efficient and secure vehicle access control. Up to 9000 users and vehicles can be stored in the internal storage of the ID MAX.U500i.

The vehicle access control reader can be easily installed on a VESA mount next to a barrier, gate or bollard due to its mechanical construction. To install the compact reader one cable is required for each interface and power supply; for PoE only the network cable is required.

2.2 USB Driver

To ensure proper operation of the reader when using the USB interface, the latest USB drivers must be downloaded from the FEIG download area.

2.3 Access Control Software „myAXXESS Manager"

With the help of the software myAXXESS Manager user data and access rights can be easily handled via PC. After programming the access rights into the vehicle access control reader via a temporary USB or network connection the reader is working offline as a standalone system.

The Windows software is suitable for network based vehicle and door access control systems and is based on a SQL database. The myAXXESS Manager is available in the FEIG download area.

In small applications without any time restrictions for the access rights new transponders can be added to the reader by the Teach-In Mode without above mentioned software (See chapter 7.2.1 Teach-In Mode on page 25.).

https://www.feig.de/en/login

Username: myAXXESS
Password: max_reader

2.4 Available Reader Types

The following readers are available:

Order Number	Reader Type	Description
5118.001.00	ID MAX.U500i-EU	Device version for Europe
5118.001.10	ID MAX.U500i-FCC	Device version for North America

3 Scope of Delivery

The scope of delivery includes following components:

	1 x ID MAX.U500i
	1 x M25 slotted reduction sealing insert for 1 cable; cable ∅ 4–6.5 mm
	1 x M20 cable gland; cable ∅ 6–13 mm; for USB
	1 x M20 reduction sealing insert; cable ∅ 4–8 mm
	1 x M20 multiple sealing insert for 2 cables; cable ∅ 2–4 mm
	1 x M20 multiple sealing insert for 4 cables; cable ∅ 2–4 mm
	1 x M16 multiple sealing insert for 2 cables; cable ∅ 2–4 mm
	2 x UHF windshield transponder ID CTF-U

4 Required Tools

- Slotted screwdriver big

- Slotted screwdriver small (mounting of the plug-in terminals)

- Hex key size 5

5 Installation

The ID MAX.U500i is designed to be mounted outdoors on a VESA bracket. The reader should be mounted with the connections facing downwards to ensure tightness as shown below. Four holes for M5 screws are provided on the backside of the housing for mounting on the VESA bracket. The screws used should have a screw-in depth of maximum 8 mm. The housing can be opened by means of a hinge Therefore loosen the screws marked blue in Fig. 1 and swing away the front part of the reader. During installation, the dimensions of the reader when opened should be taken into account (see Fig. 3). For secondary protection the reader should be secured by means of an eye bolt (see Fig. 4), that should be fixed with screw locking varnish, and e.g. a wire rope. The suitable accessory ID ANT.UEB-A can be purchased from FEIG ELECTRONIC.
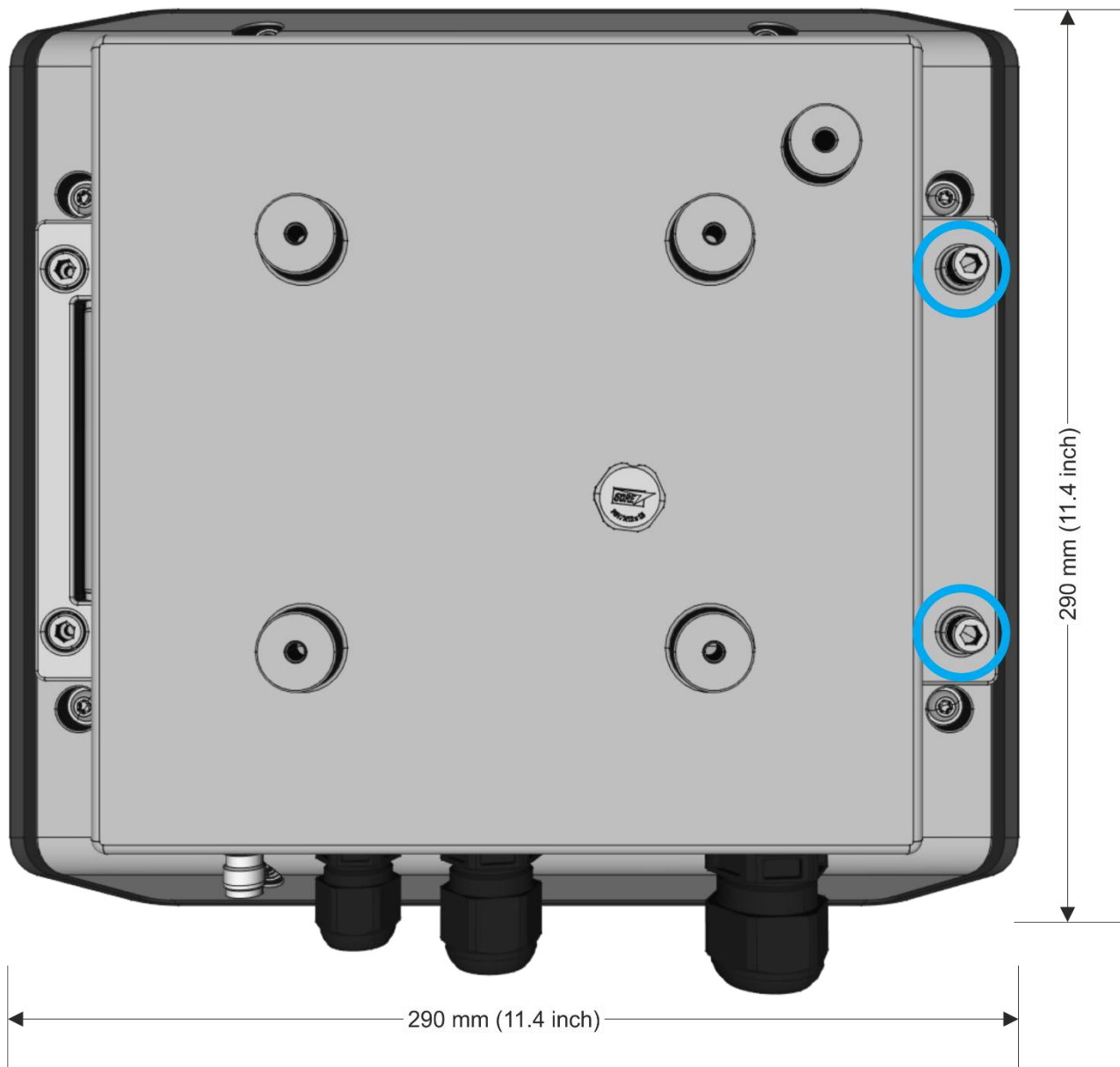
Fig. 1: Dimensional drawing – back view

Fig. 2: Dimensional drawing – side view
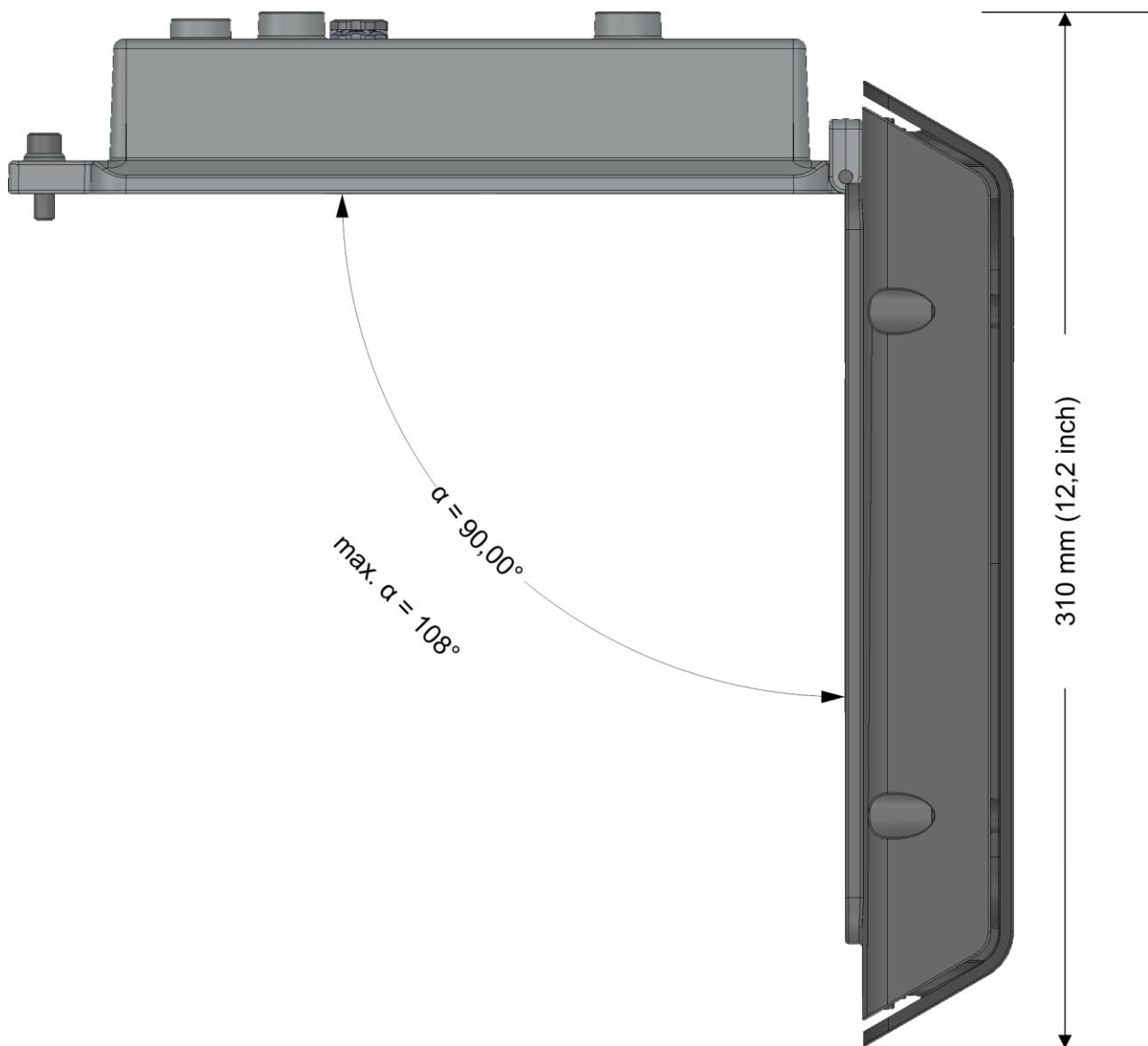
Fig. 3: Dimensional drawing – top view: opened housing

Fig. 4: Secondary protection via eye bolt

ⓘ *NOTE:*

FEIG ELECTRONIC GmbH strongly recommends to secure the reader against falling by means of an eye bolt to prevent damage.

6 Terminals

The cable connections are located on the lower side of the reader. Fig. *5* shows the arrangement of the connectors and Table *1* gives an overview on the available connectors and interfaces. Table *2* lists the available operating and display elements.
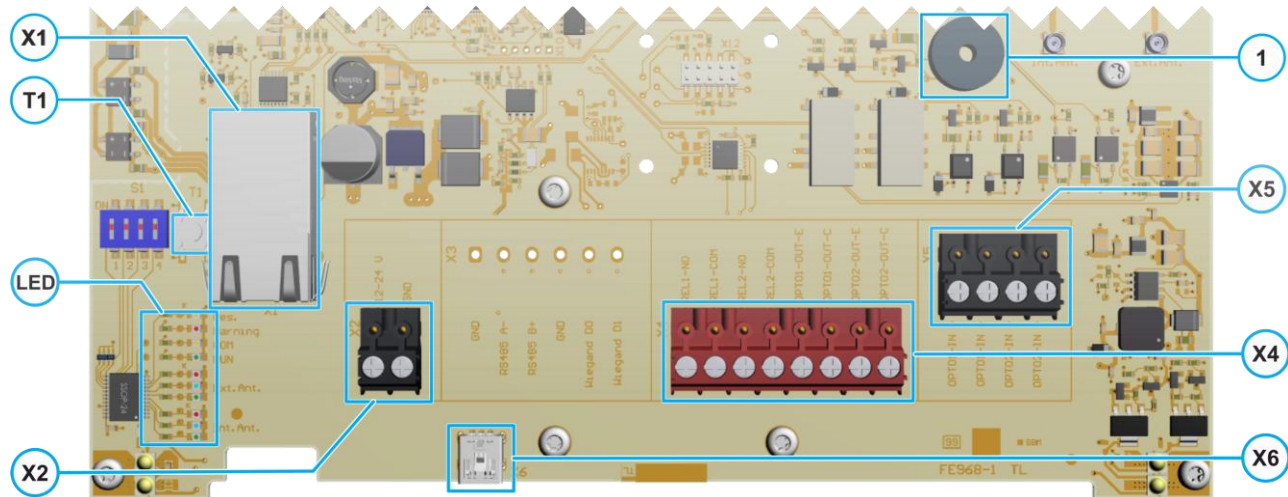
Fig. 5: Connection Overview

Connector	Description
X1	10/100 Base-T Ethernet with RJ45
X2	Power Supply 12–24 V DC ±10 %
X4	Relay Outputs & Digital Outputs
X5	Digital Inputs
X6	USB Mini Interface

Table 1: Connection Terminals

Operating / Display Element	Description
T1	Push Button for configuration reset or Teach-In Mode
LED	Status LEDs for service & maintenance
1	Buzzer

Table 2: Operating and Display Elements

ⓘ *NOTE:*

The plug-in terminals can be removed from the PCB to install the cables.

6.1   Antenna Connection

The TNC socket for connecting the external antenna is located on the lower side of the reader.

The maximum tightening torque for the TNC sockets is 0.69 Nm (6.11 lbf in).

Fig. 6: External antenna connection

⚠ *CAUTION:*

Exceeding the tightening torque will destroy the antenna connection.

6.2 Power Supply

6.2.1 Power Supply via Connector X2

The supply voltage of 12–24 V DC has to be connected to terminal X2.
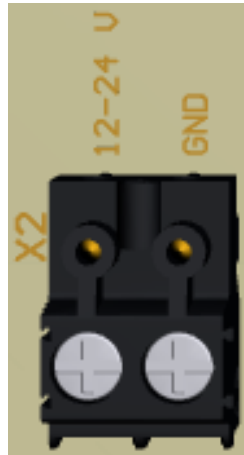
Fig. 7: Connector X2 pin assignment for power supply

Abbreviation	Description
12–24 V	Supply voltage 12–24 V DC ±10 %
GND	Ground

Table 3: Pin assignment for power supply

⚠ *CAUTION:*

- *The reader has to be supplied by a limited power supply according EN 62368-1 Chapter Q.1, or with a NEC Class 2/LPS certified power supply.*

- *Each reader has to be supplied by a separate external power supply.*

- *Reversing the polarity of the supply voltage on X2 may destroy the device.*

- *External wiring for the power supply must fulfil the following norms/validation procedures:*

Conductor Cross Section	Validation Procedure
from 0,5 mm² or bigger	IEC 60332-1-2 and IEC 60332-1-3
smaller than 0,5 mm²	IEC 60332-2-1 and IEC 60332-2-2

Table 4: Validation procedures for external wiring of the power supply

6.2.2 Power Supply via PoE (Power over Ethernet)

Optional the reader can be powered via the Ethernet interface on X1 with the use of a PoE „Power over Ethernet" power supply according to IEEE802.3at*, Class4 (30/25,5Watt). The DC supply can be achieved via the free pins 4, 5 and 7, 8 (Midspan-Power). Also a "Phantom Powering" (Inline-Power) via the signal pins 1, 2, 3 and 6 is possible. Depending on the conductor cross-section the following cable distances can be used:

Conductor Cross Section (CAT5…7)	Max. Cable Length for PoE
0,4 mm²	~ 30 m
0,6 mm²	~ 70 m

Table 5: Max. cable length depending on the conductor cross section

* For detailed technical information regarding the 802.3at standard, please refer to the most recent edition of the corresponding IEEE specification.
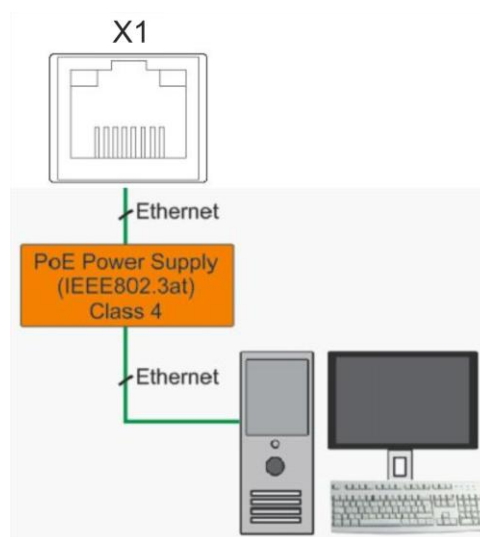
Fig. 8: LAN and PoE Connection

ⓘ *NOTE:*

- *It must be ensured that the reader is supplied with 42.5 V (48 V DC – cable losses) at least.*
- *An operation of an ID MAX.U500i via an external power supply and PoE at the same time is not recommended and can cause interferences during operation.*
- *If the reader is supplied via PoE, no DC voltage can be provided at the connection for the external antenna.*

6.3   Ethernet Interface on Connector X1

The reader has an integrated 10/100 base-T network port for an RJ-45. Connection is made on X1 and has an automatic "Crossover Detection" according to the 100BASE-T Standard.

With structured cabling STP CAT5 cables should be used. This ensures a reliable operation at 10 Mbps or 100 Mbps. The prerequisite for using TCP/IP protocol is that each device has a unique IP address on the network. All readers have a factory set IP address. The transmission parameters can be configured as required.
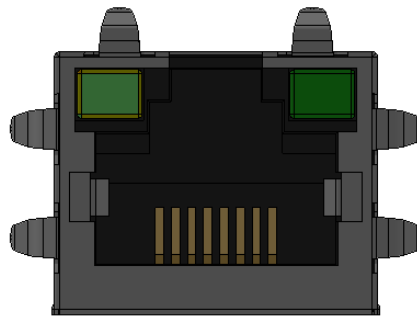
Fig. 9: Ethernet connector

Network	Address
IP Address	192.168.10.10
Subnet Mask	255.255.0.0
Port	10001
DHCP	OFF

Table 6: Standard factory configuration of the Ethernet connection

ⓘ *NOTE*

The reader is equipped with a DHCP ready Ethernet interface.

6.4   Relay Outputs on Connector X4

There are 2 relay outputs (type LRU500i-BD only 1) available at terminal X4 as normally open contacts. With the LRU500i-PoE, each output is fixed with an antenna. Reading a valid transponder on the internal antenna affects the relay REL1, reading a valid transponder on the external antenna affects the relay REL2.
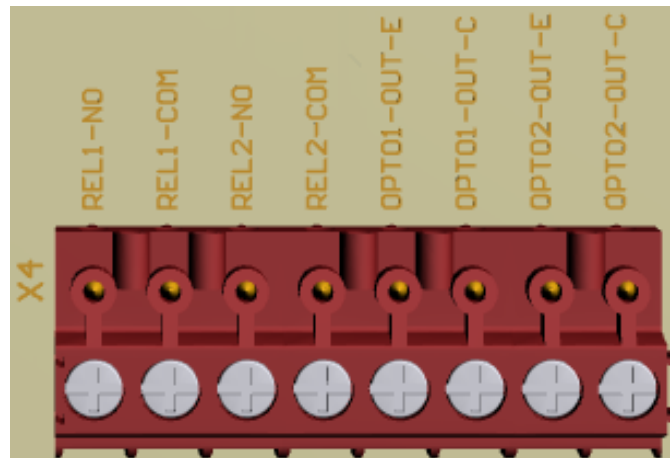
Fig. 10: Connector X4 pin assignment for relay outputs

Abbreviation	Description
REL1-NO	Normally open contact relay 1
REL1-COM	Changeover contact relay 1
REL2-NO	Normally open contact relay 2
REL2-COM	Changeover contact relay 2

Table 7: Pin Assignment Relay Outputs REL1/REL2
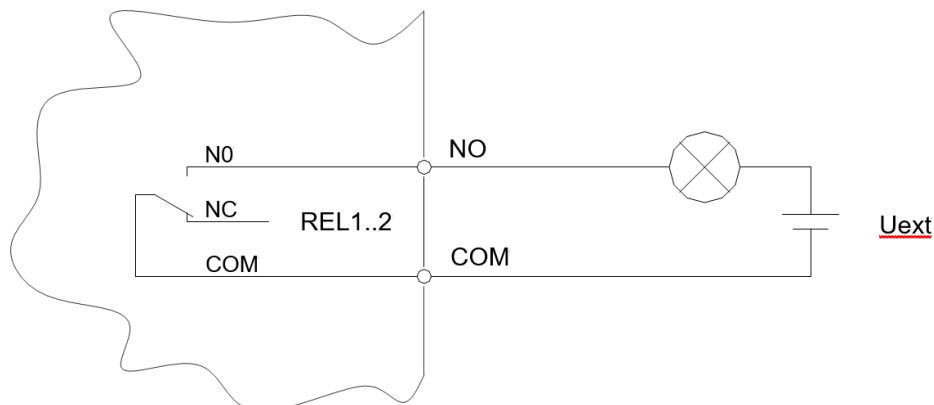
Fig. 11: External wiring of the relay outputs

⚠ *CAUTION:*

- *The relay outputs are designed for max. 24 V DC / 2 A continuous load.*

- *The maximum switching current must not exceed 1 A.*

- *The relay outputs are intended for switching resistive loads only. In case an inductive load is connected, the relay contacts must be protected by an external protective circuit.*

6.5 Digital Outputs on Connector X4

There are 2 digital outputs available on terminal X4. The transistor connection, collector and emitter, of the optocoupler output is galvanically isolated from the reader electronic and routed to the outside at terminal X4 without internal additional circuitry. The output must therefore be supplied with an external voltage. Each output is linked fixed with an antenna. Reading of a valid transponder on the internal antenna will affect the digital output OPTO1-OUT, a valid reading on the external antenna will affect the digital output OPTO2-OUT.
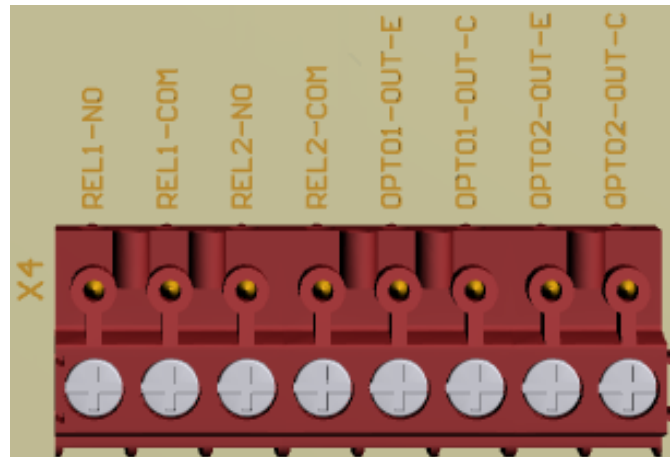
Fig. 12: Connector X4 pin assignment for digital outputs

Abbreviation	Description
OPTO1-OUT-C	Digital Output 1 Emitter (–)
OPTO1-OUT-E	Digital Output 1 Collector (+)
OPTO2-OUT-C	Digital Output 2 Emitter (–)
OPTO2-OUT-E	Digital Output 2 Collector (+)

Table 8: Pin Assignment X4 (Digital Outputs)
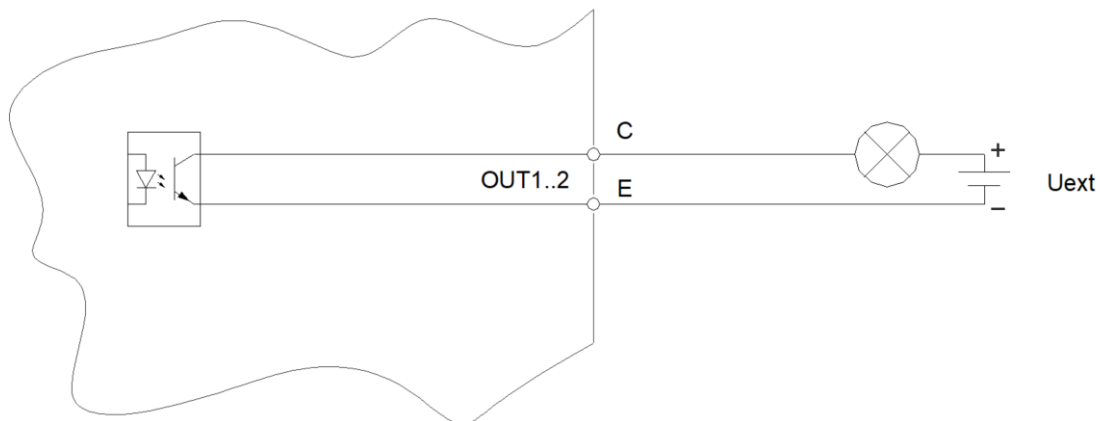
Fig. 13: internal and external wiring of the digital outputs

⚠ *CAUTION:*

- *The outputs are designed for an input voltage of 12-24 V DC and an input current of max. 20 mA.*

- *Polarity reversal or overload of the outputs leads to their destruction!*

- *The output is only intended for switching resistive loads.*

6.6   Digital Inputs on Connector X5

There are 2 digital inputs available on X5. The optocouplers on X5 are galvanically isolated from the reader electronics and must therefore be supplied with an external voltage.
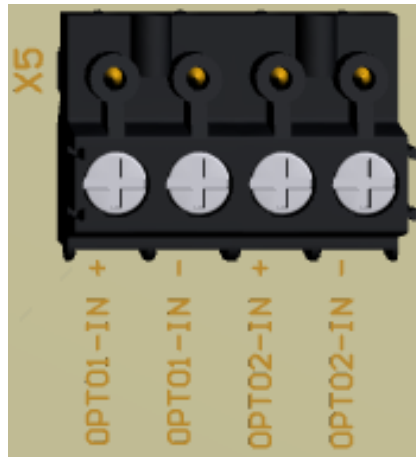
Fig. 14: Connector X5 pin assignment for digital inputs

Abbreviation	Description
OPTO1-IN +	Digital input 1 (+)
OPTO1-IN –	Digital input 1 (–)
OPTO2-IN +	Digital input 2 (+)
OPTO2-IN –	Digital input 2 (–)

Table 9: Pin Assignment X5 (digital inputs)
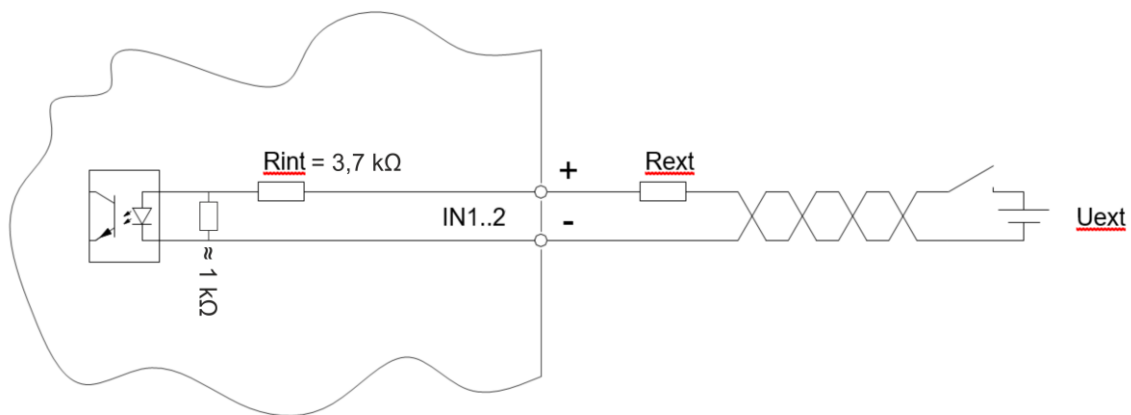
Fig. 15: External wiring of the digital inputs

The external resistor Rext is optional. When wiring the reader, make sure that the input voltage is at least 10.5 V.

⚠ *CAUTION:*

- *The inputs are designed for an input voltage of 12-24 V DC and an input current of max. 20 mA.*

- *Polarity reversal or overload of the inputs leads to their destruction!*

6.7 USB Mini Interface on Connector X6

The reader is equipped with an integrated USB on-the-go interface. This can be used either to connect the reader to a host system or, by means of a special on-the-go adapter cable, for connection of a USB memory stick to the reader. In both cases, the connection is carried out via terminal X6. For this purpose, the blind sealing insert must be removed and can be replaced by the M20 cable gland included in the scope of delivery. Use a slotted screwdriver to unscrew the blind sealing insert.
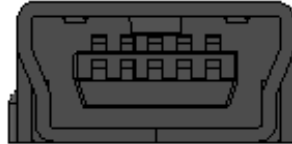
Fig. 16: USB Mini interface for host communication

A standard shielded USB cable can be used to connect the reader to a host system. The data rate of the reader is limited to 12 Mbit (USB full speed).

ⓘ *NOTE:*

The length of the USB cable must not exceed 5 m (200 inch). It is not allowed to use longer cables.

6.7.1 USB Flash Drive Service Functions

Via an optionally available USB On-The-Go adapter cable, the interface can be converted to a USB host interface. The adapter cable allows the connection of a USB memory stick to the reader. The USB memory stick can be used to carry out various service functions, such as reading log and service data and uploading a configuration file.

6.7.2 Reading of Log and Service Data

Fig. 17: USB On-The-Go adapter cable

When connecting the USB flash drive during a running operation, the reader will create a subdirectory in the root directory named after the device ID of the connected reader (see label on the back side of the reader) and store device information such as firmware status and IP address in the INFO.LOG file within this directory. If a corresponding file already exists for this reader the file will be updated with the new information and the current date and time.

In addition, the files ACTION.LOG and SERVICE.LOG with further information for service and maintenance for the devices will be generated and stored on the USB flash drive. The function of the CONFIG.INI is described in the following chapter.

As vehicle access control reader the ID MAX.U500i stores the event table in the same subdirectory. This table contains the last recorded access control events and is stored as file EVENT.LOG in CSV format. An existing file will be overwritten.

After plugging in the USB flash drive the green and red status LEDs will light up permanently. After successful completion of the USB actions the red LED will go out and the green LED will start flashing again. The USB flash drive can be disconnected from the device after the red status LED goes out. In case of an error, the red status LED will start flashing until the USB flash drive is removed.

ⓘ *NOTE:*

- *After plugging in the USB flash drive the status LEDs of the reader should be observed.*
- *The USB flash drive may only be disconnected from the reader if the USB actions have been completed!*
- *The USB on-the-go adapter cable may only be used in conjunction with a USB flash drive. When used for a PC connection the reader may be destroyed or work with strange behavior!*

6.7.3   Storing the Reader Configuration on a USB Flash Drive

When connecting the USB flash drive during running operation, the reader will store the readable configuration as an editable and readable CSV file (CONFIG.INI) on the USB flash drive. This file will be stored in the root directory of the USB flash drive for easy copying of the configuration (See chapter 6.7.4 Copying the Configuration onto a Reader (Config-Cloning) on page 23.). In addition, the same file will be stored in a subdirectory named after the according device ID (see label on the back side of the reader). Thereby it is possible to save the configuration files of several readers e.g. from one system/installation to the same USB flash drive.

All non-locked configuration pages (CFG pages) including the interface parameters of a device will be copied onto the USB flash drive. Password protected configuration pages will not be copied.

As vehicle access control reader the ID MAX.U500i stores the access control data (list of access rights, time zone list and holiday table) within the file ACCESS.INI in the root directory of the USB flash drive. An existing file will be overwritten.

After plugging in the USB flash drive the green and red status LEDs will light up permanently. After successful completion of the USB actions the red LED will go out and the green LED will start flashing again. The USB flash drive can be disconnected after the red status LED goes out.

In case of an error the red status LED will start flashing until the USB flash drive is removed.

ⓘ *NOTE:*

- *If a configuration file CONFIG.IN already exists in the main directory of the USB memory stick, the old file will be overwritten.*
- *Password-protected configuration pages (see CFG 0) are not written to the USB memory stick. No error message appears.*
- *After connecting the USB memory stick to the reader, the reader LEDs should be observed.*
- *The USB memory sticks may only be disconnected from the reader after the USB actions have been completed.*

6.7.4 Copying the Configuration onto a Reader (Config-Cloning)

In order to copy the configurations and access control data stored in a USB flash drive to a reader, the reader must be switched off before connecting the USB flash drive. After switching on the reader, the reader will search for a USB flash drive during the boot process and copy the configuration and access control data from the root directory to its memory.

It must be ensured that no configuration page (CFG page) is password protected in the reader. If configuration pages are password protected, the configuration file will not be copied onto the reader. This also applies if individual configuration parameters contain values out of the permissible range.

After successful completion of the USB actions the red status LED will go out and the green status LED will start flashing again. After the red status LED went out the USB flash drive can be disconnected. In case of an error the red status LED will start flashing until the USB flash drive is removed.

ⓘ *NOTE:*

Connecting a USB flash drive during a running operation of the reader may overwrite an existing configuration file stored on the USB memory stick (See chapter 6.7.4 Copying the Configuration onto a Reader (Config-Cloning) on page 23.).

7 Operating and Display Elements

7.1 Status LEDs

The status LEDs are located under the push button T1 and the DIP switches S1.

Fig. 18: Position of the LEDs on the PCB

Reader status LEDs

Res. (yellow)	Warning (red)	COM (yellow)	RUN (green)	Description
FLASH	-	-	-	While T1 is pushed and hold for 5 s to initiate a reset.
-	ON (for 1 s)	ON (for 1 s)	ON (for 1 s)	Reader performs a reset (after pushing T1 for 5 s).
ON	-	-	-	Reader is in Teach-In Mode.
-	-	-	FLASH	Reader operates normally.
-	-	FLASH	FLASH	Reader receives a valid protocol from host.
-	ON	-	FLASH	RF Warning [0x84]
-	FLASH (alternating)	-	FLASH (alternating)	Hardware warning; perform Reader Diagnostic [0x6E] for further information.
-	FLASH	FLASH (sequentially)	FLASH	Firmware transfer from host to reader. Do not switch off the reader or disconnect the interface cable during firmware transfer!

Table 10: Reader status LED overview

Antenna status LEDs

green	blue	red	Description
ON	-	-	UHF power switched on
-	FLASH 1 x	-	Valid transponder detected
-	FLASH 1 x	FLASH 1 x	Invalid transponder detected
-	-	FLASH 1 x	Transponder not supported (e.g. EPC > 96 bits)
-	-	ON	Antenna impedance error (unequal 50 Ω)

Table 11: Antenna status LED overview

7.2 Push Button T1

By means of the push button T1 the reader can be switched to Teach-In mode or a complete configuration reset can be performed. The push button is located between the DIP switches and connector X1 on the circuit board. Fig. X shows the position of the push button. To press the button T1 it is necessary to open the housing by means of the hinge after loosening the screws.

7.2.1 Teach-In Mode

The Teach-In Mode can be used for easy programming of new authorized transponders if the configuration software myAXXESS Manager is not or cannot be used. In Teach-In Mode it is not possible to configure time restrictions for the different users. This means transponders registered via Teach-In Mode are valid and have access 24/7.

Activation of the Teach-In Mode:

- Activate the Teach-In Mode by briefly pressing the push button T1 twice within a short time

- As long as the Teach-In Mode is active, the yellow LED ("Res.") is switched on. Access will be granted immediately to all transponders which are read and stored in the reader during this time.

- At first the new authorizations will be stored temporarily in the reader. If the Teach-In Mode is disabled again by pressing the push button T1 briefly twice again, all new authorizations will be stored permanently in the reader. These transponders will now have permanent access. Authorizations stored permanently in the reader will still be available if the system was powered off, while temporarily stored authorizations will be lost in the event of a power loss.

ⓘ *NOTE:*
- *In case of power down during activated Teach-In Mode all temporarily stored authorizations are lost and have to be read again.*
- *In case of power down during deactivation of the Teach-In Mode (after pressing the push button T1 twice within short time the second time) all authorizations stored in the reader may be lost. A stable power supply must be ensured!*
- *The use of the Teach-In Mode is only recommended for small systems with a manageable number of authorized transponders and users.*
- *It is possible to import access control data to the reader by connecting a USB flash drive.*
- *Please note that in some vehicles RFID transponders may already be installed by the manufacturer or other system provider. These transponders could also be detected by the reader in Teach-In Mode.*

7.2.2 Configuration Reset

By means of the push button T1 a complete configuration reset can be performed. Push the button for at least 5 s until the reset LED below the button is switched on continuously. After releasing the push button the reader performs a restart.

During a complete configuration reset all parameters of the reader will be reset back to factory default and need to be configured again. Access authorizations stored in the access control reader are not affected.

7.3 Buzzer
The buzzer is located above the digital inputs on terminal X5. It is used to notify the service personnel of events during maintenance and service.

7.4 Reader Power Adjustment

In order to achieve high reading ranges, it is necessary to set the reader output power to the highest allowed level. This depends on the reader type used (EU/FCC) and the applicable radio regulations at the installation site. The output power is adjustable in 100 mW steps from 0.1 W to 1 W.

ⓘ *NOTE:*

- *Both in the EU version and in the FCC version of the reader the output power of the internal antenna must not exceed 0.8 W.*
- *The admissible max. output power is 2 W e.r.p. for EU versions and 4 W e.i.r.p. for FCC versions. The output power depends on the antenna gain. For calculating the reader output power the Excel file "Calc-RF-Power.xls" is available from FEIG ELECTRONIC GmbH. If a circular polarized antenna is used the antenna gain [dBic] can be reduced by 3 dB. If using a linear polarized antenna the max. antenna gain [dBi] must be used.*

8 Positioning of the Antenna

It is recommended to mount the antenna at the side of the roadway on a mast. The mounting height depends on the type of vehicle that should be detected.

Vehicle Type	Recommended Mounting Height
cars only	approx. 2.0 m
lorries and busses only	approx. 2.5 m
cars, lorries & busses	approx. 2.0 m

Table 12: Recommended mounting height depending on vehicle type

The antenna should be mounted at an angle of approx. 45° to the roadway.
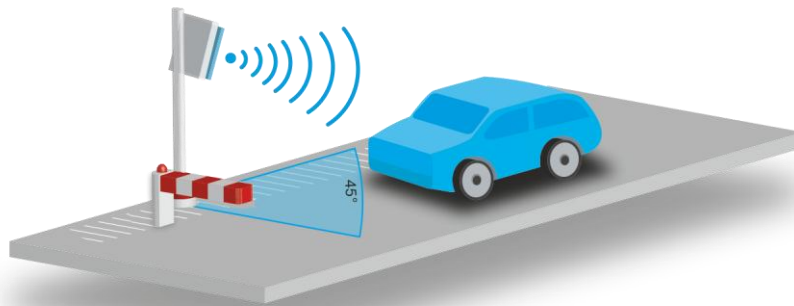

Fig. 19: Angle of the antenna to the roadway

If the vehicle access control reader is used to control a barrier, the antenna should be mounted at a sufficient distance in front of the barrier. The distance depends on the permitted or desired speed of the vehicles. In this way, it is possible for the individual vehicles to access the respective area smoothly and without delay.

In case an access from two different directions is possible, or in case of difficult environmental conditions at the point of installation, a second additional antenna can be installed and connected to the reader.

Fig. 20: Typical vehicle access control application

Fig. 21: Positioning of the antenna

9 Mounting of the Transponder

Passive UHF transponders operating at a frequency of 865–928 MHz are used for identification of vehicles with the vehicle access control reader. To ensure a reliable identification of the transponder and to reduce interfering environmental influences such as metal, it is recommended to mount the transponder label in the middle of the windshield behind the interior mirror. The transponders optionally available from FEIG ELECTRONIC GmbH are self-adhesive labels. To mount these transponders, simply remove the protective foil on the back and attach the transponder to the windshield.

Before mounting the transponder the windshield should be thoroughly cleaned to ensure optimum adhesion of the self-adhesive labels.

Vehicles with integrated windshield heating require special mounting of the transponder. In this case the transponder should be mounted in an area of the windshield where no wires of the windshield heating run. Usually corresponding information can be found in the manual of the vehicle. Otherwise, the information can be obtained from the manufacturer.

Vehicles with tinted, vaporized or metallized windshields may occasionally experience problems identifying the transponder. These vehicles usually also have an area in the windshield where no coating has been applied to enable radio systems to communicate with the exterior. If possible the transponder should be mounted at such an uncoated position. The position of the uncoated area can usually be found in the manual of the vehicle or can be obtained from the manufacturer.
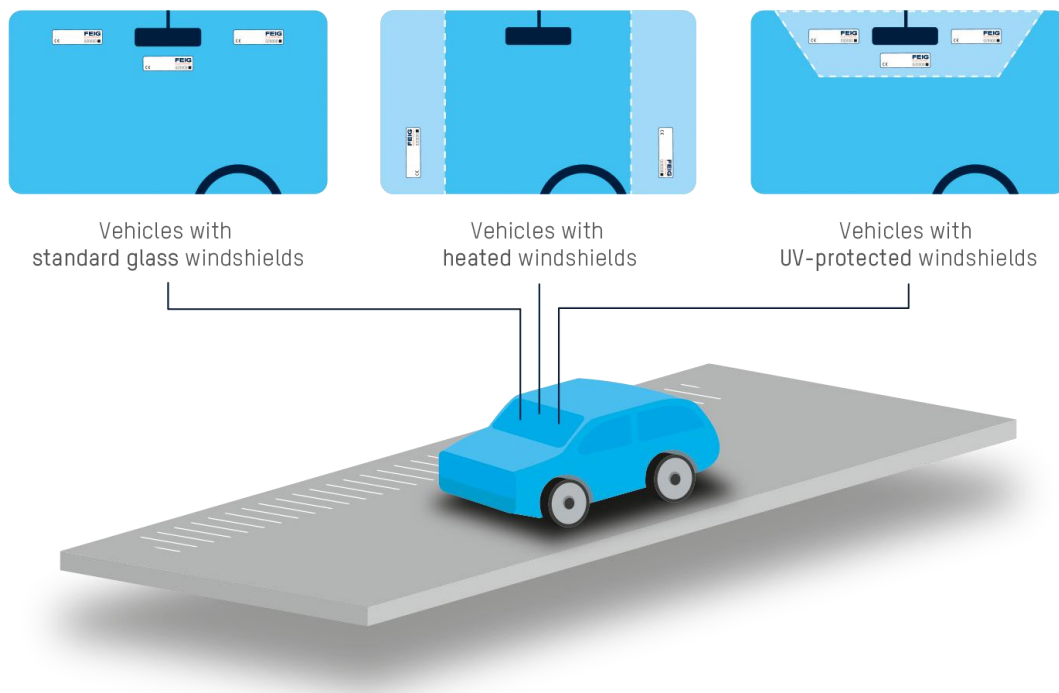

Fig. 22: Positioning of transponders on different windshield types

10 Technical Data

Mechanical Data	
Housing	Plastic (ASA-PC) Aluminum
Dimension (W x H x D)	290 mm x 290 mm x 100 mm (11.4" x 11.4" x 3.9")
Weight	2800 g
Mounting	VESA FDMI MIS-D 100 mm x 100 mm
Protection Class	IP 65
Colour	Anthracite, translucent
Electrical Data	
Power Supply	12–24 V DC (± 10 %), PoE+
Current Consumption	typical 16 W (22 W with PoE+)
Operating Frequency	
• EU Reader	865 MHz to 868 MHz
• FCC Reader	902 MHz to 928 MHz
Output Power	100 mW to max. 1 W configurable in steps of 100 mW
Antenna Connection	1 x R-TNC jack (50 Ω) (Reverse-TNC)
RF Diagnostic	RF channel monitoring, Antenna SWR control, Internal Overheating Protection
Outputs	
• 2 x Optocoupler	max. 24 V DC / 20 mA
• 2 x Relay	max. 24 V DC / 1 A switching current, 2 A permanent current
Inputs	
• 2 x Optocoupler	max. 24 V DC / 20 mA

⚠ *CAUTION:*

Overheating of the device may result in performance losses. It is recommended to activate the RF field of the reader only if there is a transponder in the detection range of an antenna.

Interfaces	Ethernet, USB (OTG)
Protocol Modes	ISO Host Mode, Access Mode
Functional Properties	
Supported Transponder Types	EPC Class 1 Gen 2 EPC Class 1 Gen 2 V2 ISO 18000-6-C ISO 18000-63
Indicators	Signal light with red/green/blue 10 LEDs to indicate operation and antenna state Buzzer
Further Features	Anti-Collision, output of RSSI values and phase angle, battery-assisted Real Time Clock, supports encrypted transponder communication, Secure Key Storage, Config Cloning Function

Environmental Conditions	
Temperature Range	
• Operation	-25 °C to 55 °C
• Storage	-25 °C to 85 °C
Humidity	5 % to 95 % (non-condensing)
Vibration	EN 60068-2-6
	10 Hz to 150 Hz: 0,075 mm / 1 g
Shock	EN 60068-2-27
	Acceleration: 30 g
Applicable Standards	
Radio Regulation	
• Europe	EN 302 208
• USA	FCC 47 CFR Part 15
• Canada	IC RSS-GEN, RSS-210
• India	BIS IS 13252 Part 1
EMC	EN 301 489
Safety	
• Low Voltage	EN 62368
• Human Exposure	EN 50364
Others	RoHS, WEEE

11 Radio Approvals

11.1 Europe (CE)

Hereby FEIG ELECTRONIC GmbH declares that the radio equipment type ID MAX.U500i is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:

http://www.feig.de/en/downloads-support/declarations-of-conformity.html

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Performance Classification according to ETSI EN 301 489: Class 2

11.2 USA (FCC) and Canada (IC)

11.2.1 USA (FCC) and Canada (IC) Warning Notices

Product name:	ID MAX.U500i-FCC
FCC ID: IC:	PJMLRU500i 6633A-LRU500i
Notice for USA and Canada	This device complies with Part 15 of the FCC Rules and with ISED licence-exempt RSS standard(s). 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. Unauthorized modifications may void the authority granted under Federal communications Commission Rules permitting the operation of this device. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. 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.

ⓘ *NOTE:*

Changes or modifications made to this equipment not expressly approved by
FEIG ELECTRONIC GmbH may void the FCC authorization to operate this equipment.

11.2.2 Installation with FCC/IC Approval

To comply with FCC Part 15 Rules in the United States / IC Radio Standards in Canada, the system must be professionally installed to ensure compliance with the FCC Part 15 certification / IC certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States / Canada.

The system is intended for industrial and commercial use and requires professional installation. The device and the software required for commissioning and operation are only available from FEIG ELECTRONIC or its distributors.

Installation, commissioning, configuration and operation require qualified knowledge of high-frequency and RFID technology due to its complexity. The connections used are from the industrial sector.

11.2.3 Label Information

The following information must be placed at the outer side of the housing in which the reader is mounted.

Contains FCC ID: PJMLRU500i

Contains IC: 6633A-LRU500i

11.2.4 Antennas Approved in the USA (FCC) and Canada (IC)

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with maximum permission gain and required antenna impedance for each antenna type indicated. Antenna types, not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

The antennas used for this transmitter must be installed to provide a separation distance of at least 23 cm from all persons and must not be located or operating in conjunction with any other antenna or transmitter, except as listed for this product's certification.

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne 'énoncé ci-dessus et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Les antennes utilisées pour cet émetteur doit être installé pour fournir une distance de séparation d'au moins 23 cm de toutes les personnes et ne doit pas être situé ou opérant en conjonction avec une autre antenne ou un autre émetteur, sauf dans les cas énumérés à la certification de ce produit.

Following antennas are approved by FCC according FCC Part 15 and IC Canada according RS210:

* ID ISC.ANT.U290/290 (8.5 dBic)

* ID ISC.ANR.U580/290 (11.5 dBic)

In order not to exceed the limit value of 4 W EIRP (Effective Isotropic Radiated Power), the cable attenuation must be sufficiently high at 1 W transmission power at the antenna connection, according to the following table:

Antenna	Lin. Gain	Cable Attenuation	Cable Length*
	[dB]	[dB]	[m]
ID ANT.U290/290	6.6	0.6	2
ID ANT.U580/290	9.5	3.5	12

*   **For cables of the type H155 with an attenuation of 0.3 dB per meter.**

In general, the required cable attenuation for a given output power P of e.g. 30 dBm, corresponding 1 W, is calculated as follows:

Cable Attenuation [dB] = P [dB] - 36 + Lin. Gain [dB]

Annex A: Accessories

For the ID MAX.U500i following optional accessories are available:

Order Number	Article	Description
2557.000.00	ID NET.24V-B	24 V Power Supply Unit; Supply Cable available separately for EU, GB and US (not included)
2558.000.00	ID CAB.NET.24V-B-EU	Power Supply Unit Cable with continental Europe plug
2559.000.000	ID CAB.NET.24V-B-GB	Power Supply Unit Cable with UK plug
2560.000.00	ID CAB.NET.24V-B-US	Power Supply Unit Cable with US plug
5255.000.00	ID MS.VESA100-A Mounting Set	Mast and wall mounting set with VESA100 receptacle for pipe diameters of 1" - 3" (approx. 2.5 cm to 7.6 cm)
5243.001.00	ID ANT.C2-C UHF Antenna Cable R-TNC/TNC 2 m	H155 Coaxial cable for UHF antennas with TNC socket and UHF reader with R-TNC connector Connection type: Connector R-TNC / Connector TNC Length: 2 m
5243.002.00	ID ANT.C6-C UHF Antenna Cable R-TNC/TNC 6 m	H155 Coaxial cable for UHF antennas with TNC socket and UHF reader with R-TNC connector Connection type: Connector R-TNC / Connector TNC Length: 6 m
5335.000.00	ID ANT.C6-x UHF Antenna Extension Cable TNC/TNC 6 m	H155 Coaxial extension cable for UHF antennas with TNC socket Connection type: TNC female / TNC male Length: ca. 6 m
EU: 5236.000.00 FCC: 5236.000.10	ID ANT.U290/290 UHF wide-range antenna 65° circular	Robust UHF antenna for connection to stationary UHF readers Connection: TNC socket
EU: 5238.000.00 FCC: 5238.000.10	ID ANT.U580/290 UHF wide-range antenna 30° circular	Robust UHF antenna for connection to stationary UHF readers Optimized beam angle, increased antenna gain Connection: TNC socket
5254.000.00	ID ANT.UEB-A Eye Bolt	M6 eye bolt for fall protection/secondary protection, PU: 10 pieces
4104.000.00	ID CPR.USB/OTG	4 GB USB memory stick with OTG adapter cable (USB mini to USB A)
3271.000.00	ID CTF-U Windshield Transponder	Self-adhesive, passive UHF transponder for mounting in windshield, PU: 10 pieces

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