

ID ISC.ANT.UMUX

8-times UHF Antenna Multiplexer



Note

© Copyright 2013 by
FEIG ELECTRONIC GmbH
Lange Strasse 4
D-35781 Weilburg
Tel.: +49 6471 3109-0
<http://www.feig.de>

With the edition of this document, all previous editions become void. Indications made in this manual may be changed without previous notice.

Copying of this document, and giving it to others and the use or communication of the contents thereof are forbidden without express authority. Offenders are liable to the payment of damages. All rights are reserved in the event of the grant of a patent or the registration of a utility model or design.

Composition of the information in this document has been done to the best of our knowledge. FEIG ELECTRONIC GmbH does not guarantee the correctness and completeness of the details given in this manual and may not be held liable for damages ensuing from incorrect or incomplete information. Since, despite all our efforts, errors may not be completely avoided, we are always grateful for your useful tips.

The instructions given in this manual are based on advantageous boundary conditions. FEIG ELECTRONIC GmbH does not give any guarantee promise for perfect function in cross environments and does not give any guaranty for the functionality of the complete system which incorporates the subject of this document.

FEIG ELECTRONIC call explicit attention that devices which are subject of this document are not designed with components and testing methods for a level of reliability suitable for use in or in connection with surgical implants or as critical components in any life support systems whose failure to perform can reasonably be expected to cause significant injury to a human. To avoid damage, injury, or death, the user or application designer must take reasonably prudent steps to protect against system failures.

Use Exclusion in Transportation Market: Devices which are subject of this document may NOT be sold, used, leased, offer for sale, or otherwise transferred, exported, and imported by anyone in the Transportation Market. "Transportation Market" means (i) Electronic Toll and Traffic Management (ETTM), (ii) Public Sector Vehicle Registration, Inspection and Licensing Programs, (iii) Railroad Locomotive and Wagon tracking, (iv) airport based ground transportation management systems (GTMS) and taxi dispatch, (v) revenue based parking, and (vi) vehicle initiated mobile payment applications, where the RFID sticker/tag is initially attached to the vehicle but not incorporated at the point of vehicle manufacture.

FEIG ELECTRONIC GmbH assumes no responsibility for the use of any information contained in this document and makes no representation that they free of patent infringement. FEIG ELECTRONIC GmbH does not convey any license under its patent rights nor the rights of others.

OBID® and OBID i-scan® are registered trademarks of FEIG ELECTRONIC GmbH.

General information's regarding this document

- The sign "☞" indicates extensions or changes of this manual compared with the former issue.
- If bits within one byte are filled with "-", these bit spaces are reserved for future extensions or for internal testing- and manufacturing-functions. These bit spaces must not be changed, as this may cause faulty operation of the reader.
- The following figure formats are used:
 - 0...9: for decimal figures
 - 0x00...0xFF: for hexadecimal figures,
 - b0...1 for binary figures.
- The hexadecimal value in brackets "[]" marks a control byte (command).

Contents

1. Safety Instructions / Warning - Read before start-up !	6
2. Performance Features of the ID ISC.ANT.UMUX 8 times UHF Antenna Multiplexer	7
2.1. Performance Features.....	7
2.2. Scope of Delivery	7
2.3. Available Multiplexer Types.....	7
3. Wiring and Installation	8
3.1. Dimensions	8
3.2. Terminals and Jacks	9
3.2.1. Supply Voltage.....	9
3.2.2. Reader Connection - IN	10
3.2.3. Antenna Connection – OUT 1 - 8.....	10
3.2.4. Boot Loader Interface – X2	10
4. Operating and Display Elements	11
4.1. LEDs.....	11
4.2. Reset Button T1	11
4.3. DIP Switch S1	12
4.3.1. Hardware Address setting.....	12
4.3.2. DC Coupling	12
5. Troubleshooting	13
6. Technical Data	14
7. Radio Approvals	16
7.1. Europe (CE).....	16
7.2. Declaration of Conformity (Directive 1999/5/EC - R&TTE).....	17

ANNEX	18
ANNEX A - Accessories	18
ANNEX A1 – Wall Mount Kit ID ISC.MS.MR/PR-A.....	19

1. Safety Instructions / Warning - Read before start-up !

- The device may only be used for the intended purpose designed by for the manufacturer.
- The operation manual should be conveniently kept available at all times for each user.
- 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.
- 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 and your cardiac pacemaker and not stay in an immediate proximity of the device respective the antenna for some time.

2. Performance Features of the ID ISC.ANT.UMUX 8x UHF Antenna Multiplexer

2.1. Performance Features

The ID ISC.ANT.UMUX 8x UHF antenna multiplexer is designed for switching RFID antennas having an operating frequency of 860 MHz – 960 MHz. An ID ISC.ANT.UMUX allows multiple individual antennas to be operated with just a single reader antenna output.

It is possible to cascade several ID ISC.ANT.UMUX to increase the number of possible antenna connections. Here the antenna multiplexers are addressed using DIP switch settings.

2.2. Scope of Delivery

The following components are included in the scope of delivery:

- 1 x ID ISC.ANT.UMUX 8x UHF antenna multiplexer
- 1 x Installation Guide

2.3. Available Multiplexer Types

The following Multiplexers are currently available:

Table 1: Multiplexer types

Multiplexer type	Description
ID ISC.ANT.UMUX-A	UHF Multiplexer in IP30 case

3. Wiring and Installation

3.1. Dimensions

The antenna multiplexer is designed for an indoor environment. It can be wall-mounted, in this case the wall mounting kit should be ordered separately. (see ANNEX A - Accessories and ANNEX A1 – Wall Mount Kit ID ISC.MS.MR/PR-A)

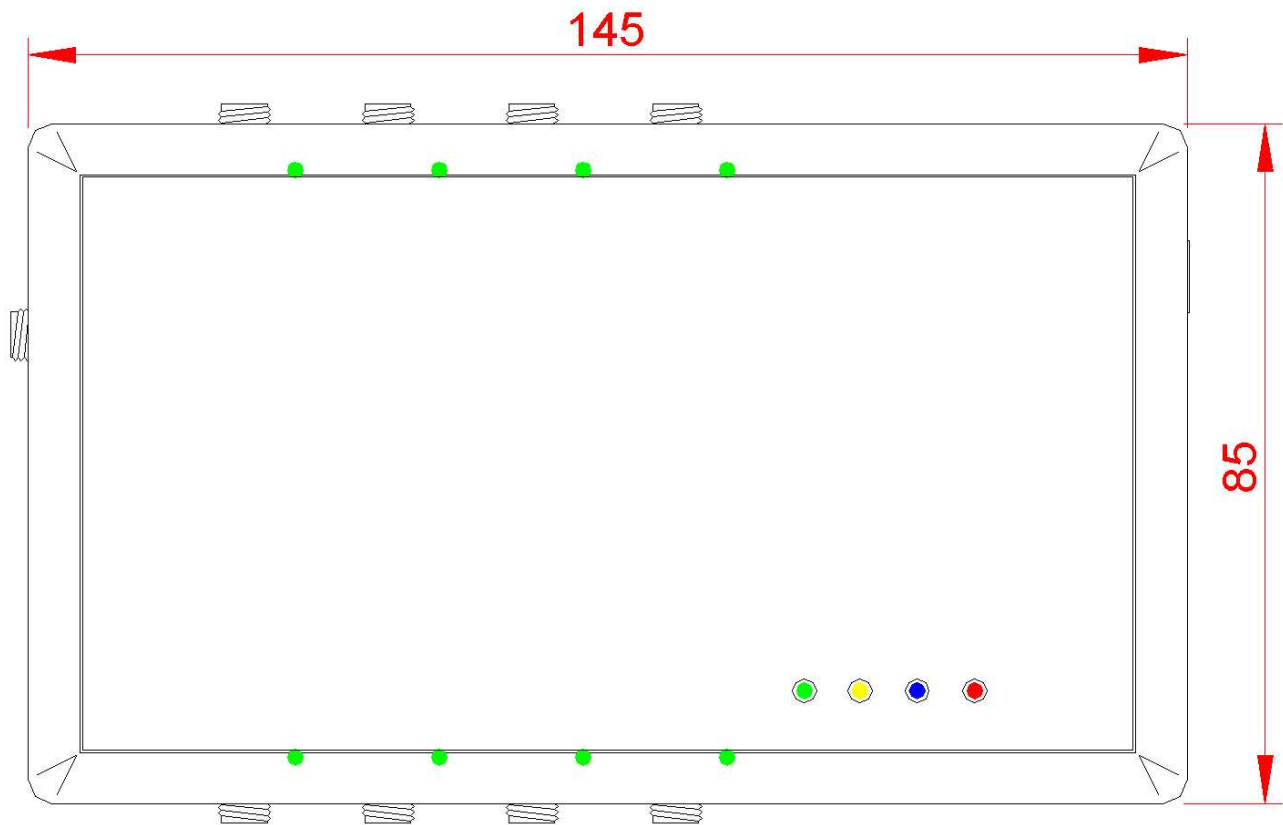


Figure 1: Enclosure (all dimensions in mm)

3.2. Terminals and Jacks

Figure 2 shows the terminals, jacks, DIP switches and LED indicators.

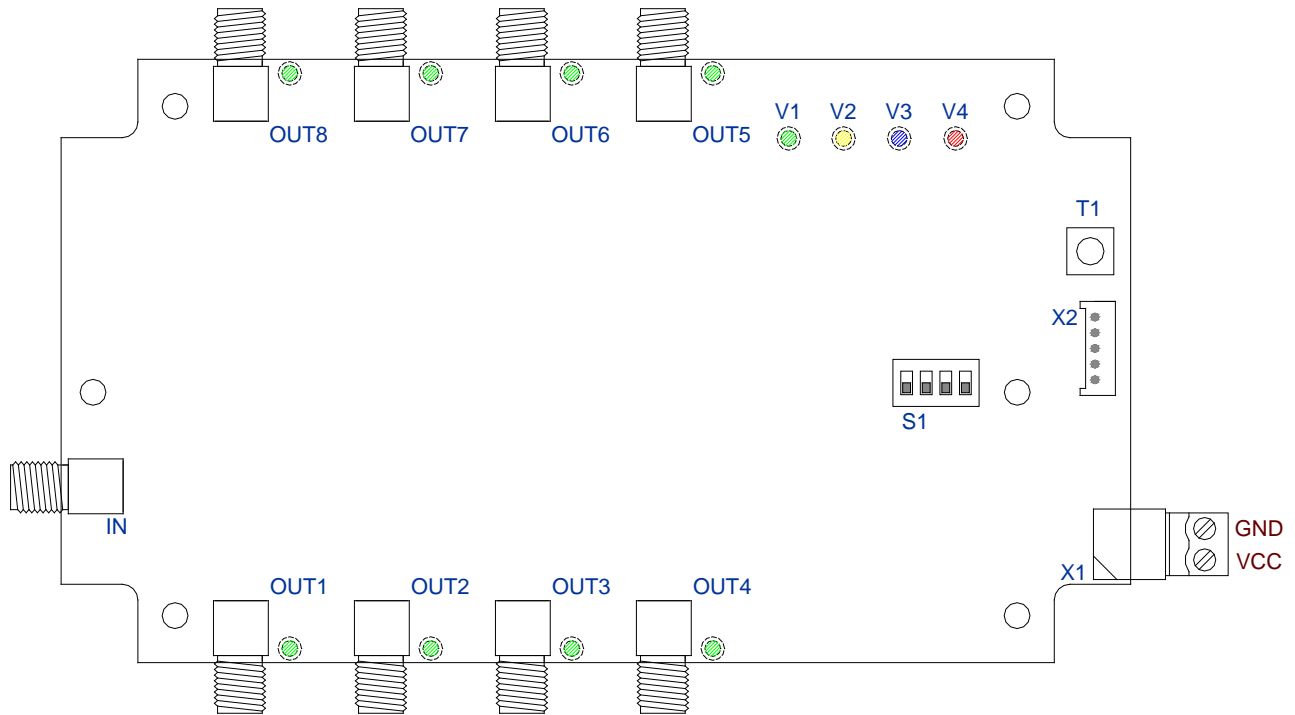


Figure 2: Terminals, jacks and operating elements

3.2.1. Supply Voltage

The supply voltage is connected to X1 or directly to the Reader Connection IN. Configure the polarity for X1 as shown in Figure 2. The antenna multiplexer operates with a DC voltage of 12 V DC to 24 V DC. In a configuration with cascaded multiplexers you could supply the connected multiplexers directly over the antenna cable. In this case only the first multiplexer has to be connect to an power supply unit.

NOTE:

If connected to the UHF Long Range Reader ID ISC.LRU3500 the supply voltage for a multiplexer in the first cascade level could also be provided from the reader via the antenna cable. The use of an additional external power supply is only necessary if several multiplexers should be cascaded after each other.

3.2.2. Reader Connection - IN

The connection to a reader is made using coaxial cable to the SMA jack IN. The maximum tightening torque of the SMA jack is 0,45 Nm (4.0 lbf in).

The transmitting power at reader connection IN must be at least 85 mW.

3.2.3. Antenna Connection – OUT 1 - 8

The antennas or further multiplexers are connected using coaxial cable to the SMA jacks OUT1-8. The maximum tightening torque of the SMA jacks is 0,45 Nm (4.0 lbf in).

3.2.4. Boot Loader Interface – X2

To perform a firmware update you have to connect the update cable ID CAB.RS-B with X2 as shown in Fig. 3. The tuning board must be powered through the antenna cable on IN or through the terminal X1 as it is done in the normal operation mode. See also 3.2.1. Supply Voltage

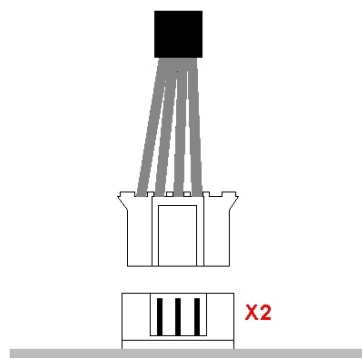


Figure 3: Connection of the Update Cable

The procedure of the firmware update is described in Application Note *ID ISC.ANT.UMUX – Firmware Update* (N80301-xe-ID-B).

4. Operating and Display Elements

4.1. LEDs

The LEDs, located on the SMA jacks OUT1-8, indicate which antenna connection is switched through. Table 2 shows the configuration of LEDs V1-4.

Table 2: LED configuration

Abbreviation	Description
LED V1 (green)	"RUN-LED" - Indicates proper running of the internal software.
LED V2 (yellow)	Diagnostic 1: Communication-LED - Short flashing indicates when the multiplexer has received a valid protocol from the reader.
LED V3 (blue)	Diagnostic 2: HF-LED - Comes on when an HF-signal is present on SMA jack IN.
LED V4 (red)	Diagnostic 3: Warning - Comes on when there is a false adaption at the activated antenna port. - Flashes when there is a bypass or overload of the DC coupling.

4.2. Reset Button T1

Pressing the button T1 resets the multiplexer.

4.3. DIP Switch S1

4.3.1. Hardware Address setting

DIP switches 1 and 2 are used for setting the hardware address. Table 3 summarizes the settings for the levels.

Table 3: Address setting

DIP switch S1				Level
1	2	3	4	
-	-			not assigned (default)
-	ON			Level 1
ON	-			Level 2
ON	ON			Level 3

For further information see the corresponding manual *Communication FU UHF* (H80302-xe-ID-B).

NOTE:

Changed settings become valid only after pressing the reset button T1 or interrupting the supply voltage.

4.3.2. DC Coupling

A DC-Offset can be supported on the antenna outputs OUT1 – OUT8. By default is this the supply voltage. For future uses it is also possible to switch on a DC-Offset of +7 V. The maximum current for all outputs is 150 mA.

DIP switch 3 is used for setting the DC offset for the antenna connections. Table 4 summarizes the settings.

Table 4: DC offset

DIP switch S1				DC offset
1	2	3	4	
		-		12...24 V (supply voltage)
		ON		7 V

NOTE:

Changed settings become valid only after pressing the reset button T1 or interrupting the supply voltage.

5. Troubleshooting

Error conditions that could appear at the multiplexer and their clear conditions are summarized in table 5.

Table 5: Error Conditions

Error Condition	Error	Trouble Shooting
No function	Interruption of the power supply	- Check power supply
No communication	Transmitting power to low	- Check output power of the reader
LED V4 comes on	False adaption at the activated antenne port	- Check antenna cable - Check antenna matching
LED V4 flashes	Bypass or overload of the DC coupling	- Check antenna cable - Check antenna

6. Technical Data

MECHANICAL DATA

Housing	Plastic, ABS
Dimension (W x H x D)	85 mm x 145 mm x 27 mm 3.35 inch x 4.72 inch x 1.77 inch
Weight	170 g (0.37 lbs)
Protection Class	IP 30
Color	black, transparent

ELECTRICAL DATA

Power Supply	12 V DC to 24 V DC \pm 10 %
Power Consumption	max. 5 W
Operating Frequency	860 MHz to 960 MHz
Insertion Loss	max. 2.2 dB
Isolation	min. 28 dB
min. Input Power	85 mW
max. Input Power	4 W
Antenna Connection	
• 1 x Reader	SMA female (50 Ω)
• 8 x Antenna	SMA female (50 Ω)

FUNCTIONAL PROPERTIES

Optical Indicators	4 x LED for operating status and diagnostics 8 x LED for indication of active antenna output
DC Offset	7 V DC / 150 mA or 24 V DC / 150 mA

AMBIENT CONDITIONS

Temperature Range

- Operation -25 °C to +55 °C / -13 °F to + 131 °F
- Storage -25 °C to +85 °C / -13 °F to + 185 °F

Humidity 5 % to 95 % non-condensing

APPLICABLE STANDARDS

EMC EN 301 489

Safety

- Low Voltage EN 60950

7. Radio Approvals

7.1. Europe (CE)

When properly used this radio equipment conforms to the essential requirements of Article 3 and the other relevant provisions of the R&TTE Directive 1999/5/EC of March 99.



Performance Classification according to ETSI EN 301 489: Class 2

7.2. Declaration of Conformity (Directive 1999/5/EC - R&TTE)


Declaration of Conformity		FEIG ELECTRONIC
in accordance with the Electromagnetic Compatibility (EMC) Directive 89/336/EEC		
Product Manufacturer	: FEIG ELECTRONIC GmbH Lange Strasse 4 D-35781 Weilburg Germany Phone +49 6471 3109 0	
Product Designation	: ID ISC.ANT.UMUX	
Product Description	: UHF Antenna Multiplexer	
FEIG ELECTRONIC GmbH herewith declares the conformity of the product with applicable regulations below.		
Standards applied :		
Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz	ETSI EN 301 489-3 V1.4.1	
Information technology equipment - Safety - Part 1: General requirements	EN 60950-1:2001	
Weilburg, 19.08.2008	Eldor Walk 	
Place & date of issue	Name and signature	
This declaration attests to conformity with the named Directives but does not represent assurance of properties. The safety guidelines in the accompanying product documentation must be observed.		

Figure 4: Declaration of Conformity

ANNEX

ANNEX A - Accessories

The following accessories are available for the multiplexer:

Table 6: Accessories

Article No.	Part No.	Description
2557.000.00	ID NET.24V-B	24 V DC/--- power supply with suitable connector; Input voltage 100 - 240V AC
1691.000.01	ID ISC.MS.MR/PR-A	Wall mounting kit
1690.000.00	ID CAB.RS-B	Serial data cable for update
1962.000.00	ID CO.RS232/TTL-A	External RS232/TTL Converter for update

ANNEX A1 – Wall Mount Kit ID ISC.MS.MR/PR-A

The wall mounting kit can be used to attach the Multiplexer to a flat surface.

- Remove the screws from the back side of the Multiplexer.
- Attach the individual wall hangers using the screws supplied with the mounting kit.

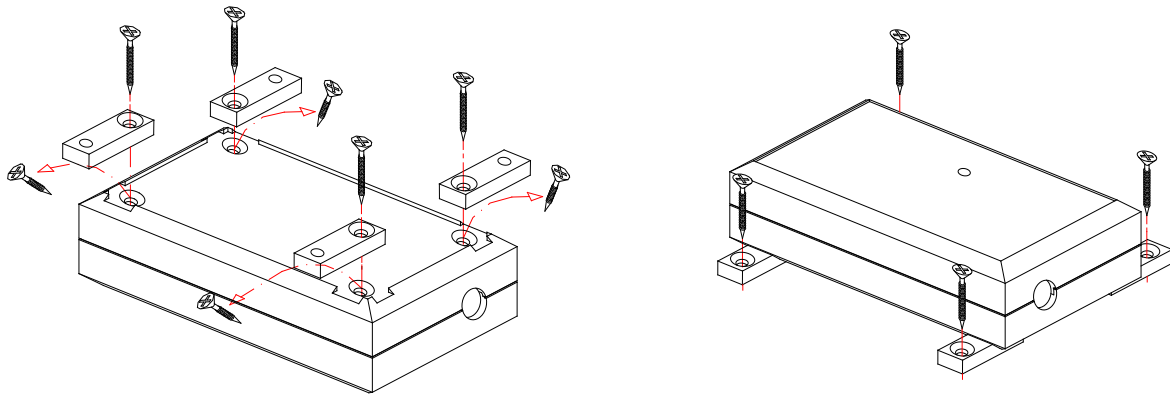


Figure 5: Mounting wall hangers

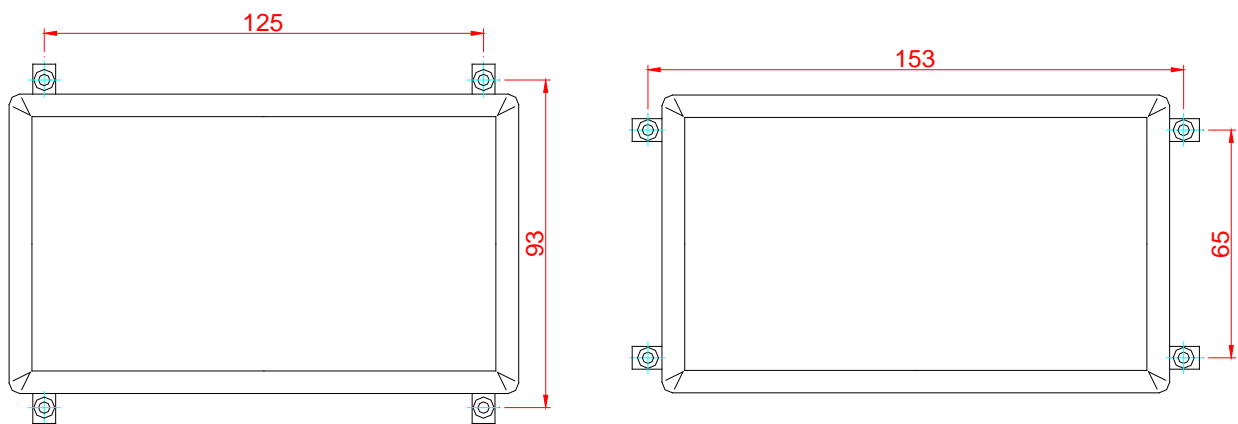


Figure 6: Mounting drill dimensioning (all dimensions in mm)