Kemro K2

XE 020/C RFID-Module

Internal Technical Documentation V 1.0

KEBA®

Automation by innovation.

List of changes

Version changed from / to	Date	Description	Modified by
1.0	10-2015	Created (derived from XE 020/A)	dbg

Contents

1 Introduction

1.1 Purpose of the document

This planning manual describes the structure, installation and connection of the XE 020/C RFID (Radio Frequency Identification) module.
The XE 020/C is only intended for use in conjunction with an operating panel from KEBA. The application and functionality of the RFID module is the same for each operating panel.

1.2 Audience and prerequisites

The planning manual is geared towards those who are using or intend to deploy an operating panel with RFID module.

Only electrical technicians who are qualified to the VDE 1000-10 standard are permitted to install and maintain the operating panel.

This means personnel who:

- can evaluate the work to be carried out and recognise the possible hazards based on their technical training, knowledge and experience plus their expertise in the applicable standards.
- have a level of knowledge equivalent to that obtained through professional training as a result of several years experience working in a similar field.

1.3 Intended use

The intended use of the XE 020/C module includes deployment in KEBA operating panels.

The XE 020/C module is used in conjunction with an RFID card for contactless logon and logoff (as per ISO 15693) and is employed for user identification. This replaces the login of a user with username and password.

The RFID module may not be used to fulfill protection requirements in the area of personal safety to prevent a malfunction compromising personal safety.

1.4 Notes on this document

1.4.1 Contents of document

- RFID module description
- Assembly and installation notes
- Description of the connections and wiring including EMC measures
- Description of the configuration
- Description of the status display
- Maintenance notes
- Accessories
- Technical specification

1.4.2 Not contained in this document

- Operating panel description
  (see “XE 020/C – RFID module – Project engineering manual V 1.00”)

1.5 Documentation for further reading

Description	Target group
Project engineering manual of the KEBA operating panel	● Project engineer ● Electrician ● Programmers ● Start-up operator ● Service technician

2 Safety notes

2.1 Representation

At various points in this manual you will see notes and precautionary warnings regarding possible hazards. The symbols used have the following meaning:

DANGER!

- **indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.**

WARNING!

- **indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury..**

CAUTION!

- **means that if the corresponding safety measures are not taken a potentially hazardous situation can occur which, if not avoided, may result in property damage or slight bodily injury.**

NOTICE

- **NOTICE used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.**

- **This symbol reminds you of the possible consequences of touching electrostatically sensitive components.**

Information

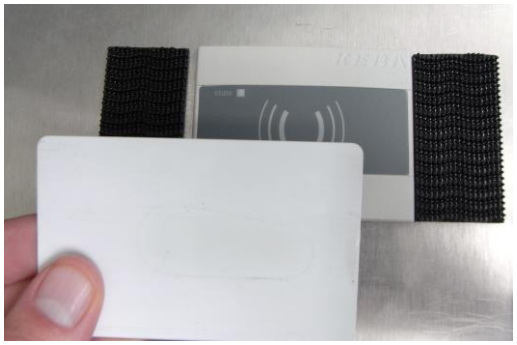
Information on use of equipment and useful practical tips are identified by the symbol "Information". "Information" do not contain any information that draws attention to potentially dangerous or harmful functions.

3 Product overview

3.1 Summary

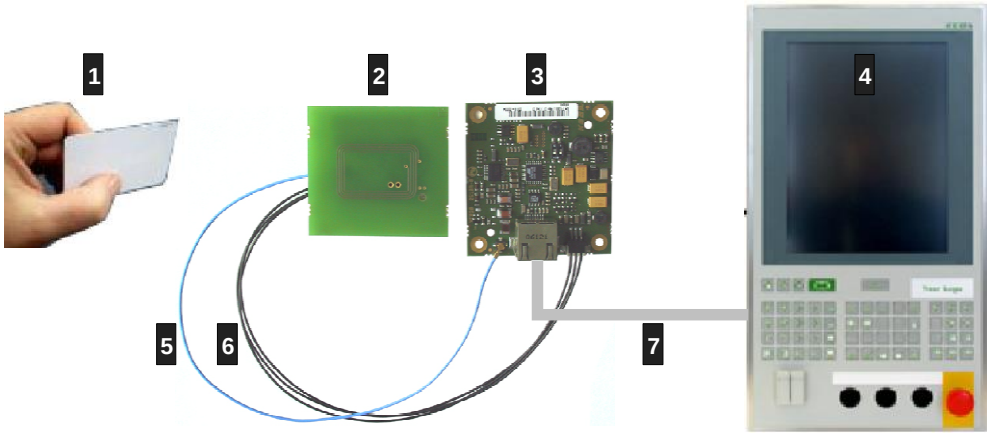
The RFID card user must hold the RFID card close to the RFID antenna on the front of the operating panel for identification.
If the user's RFID card was recognised, the LED on the front panel turns green.

The RFID module can also supply the data captured from the RFID card, e.g. so that it can be further processed by the kemro.view.standard program on the KEBA control.



Contactless user identification with an RFID card (e.g. operating panel)

An RFID system comprises:



1 ..... RFID card
2 ..... Antenna
3 ..... RFID module (evaluation unit)
4 ..... Operating panel
5 ..... Coaxial antenna cable
6 ..... Connector cable for RFID status LED
7 ..... Connector cable for RFID module / OP 3xx

RFID system components

3.1.1 Range and detection

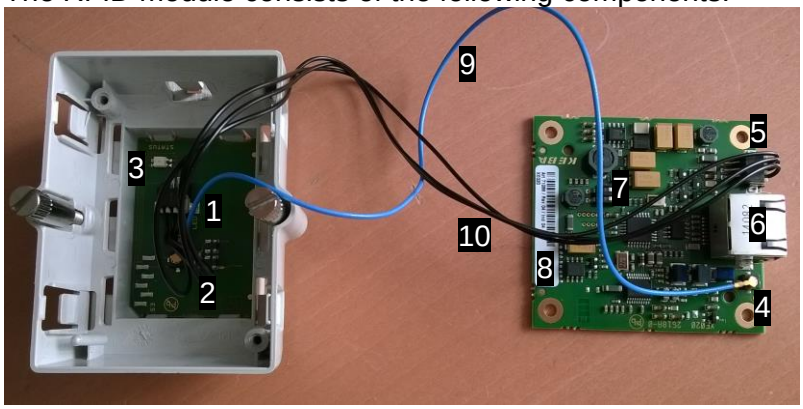
The typical range for RFID card to XE 020/C antenna module is 30 mm for the recommended RI-I02112A-03 RFID card (assuming an aluminium front panel).

The card is recognised when the RFID LED on the front of the operating panel turns green (for 3 secs) (refer to chapter “RFID status LED“).

There is no provision to detect multiple cards at the same time. If several RFID cards are within range, either only one will be detected or this will cause a detection error, in which case the RFID status LED will turn red.

3.2 RFID module before installation

The RFID module consists of the following components:



Antenna module	**RFID module**
1.....Connector for coaxial antenna cable	4 .....Connector for coaxial antenna cable
2.....Connector for LED cable	5 .....Connector for LED cable
3.....RFID status LED	6 .....RJ45 socket for shielded connection cable between RFID module and OP 3xx
Cables	7 .....DIP switch for address settings
9.....Coaxial antenna cable	8 .....Model identification label
10.....Connector cable for RFID status LED	

RFID module before installation

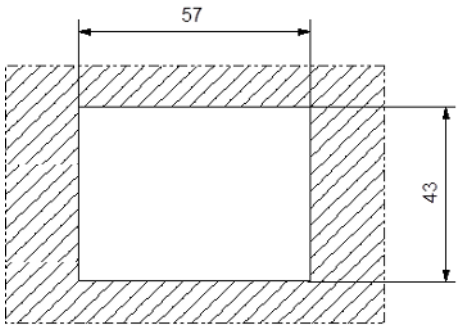
3.3 RFID module after installation

RFID module after installation

4 Assembly and installation notes

4.1 Space requirements

Please see the device dimensions for the space requirement to the rear (= installation depth). The following dimensions are recommended for the opening of the RFID module:

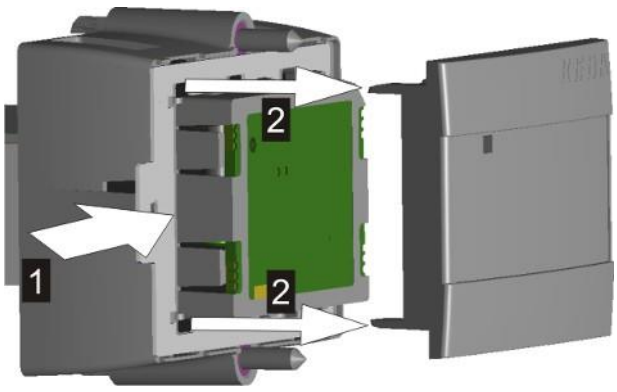


Recommended opening

4.2 Installing the RFID module

Prerequisites:
To mount the XE 020/C, proceed as follows:

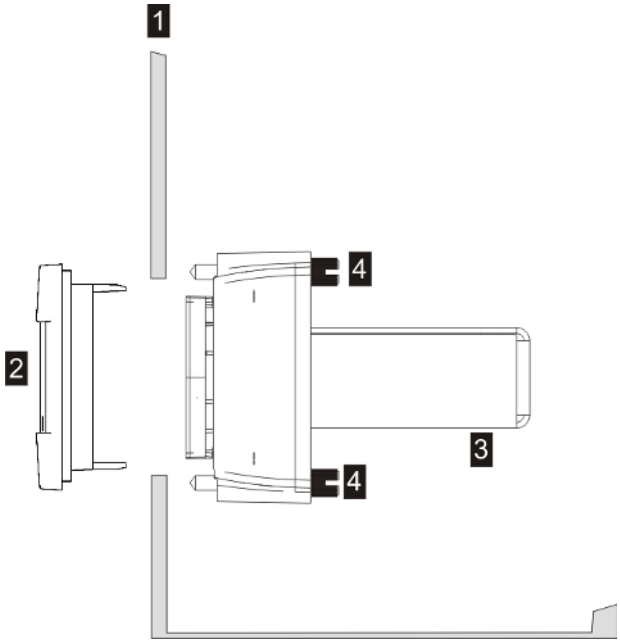
1) Remove the front cover by pressing the clip (1) and remove the cover (2).



Removing the front cover

2) Fit the module (without the front cover) into the opening.

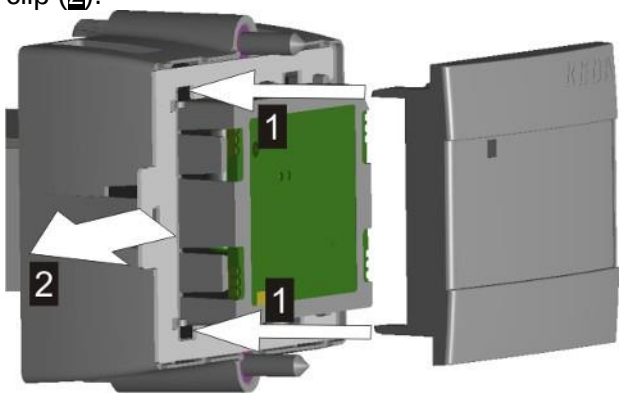
The clip for securing the front cover must be on the left-hand side when viewed from the front.



1 ..... Mounting wall (wall thickness between 1.5mm and 6mm 2 ..... Front panel	3 ..... RFID module 4 ..... Mounting screws

Mounting the RFID module

3) Stick the front cover onto the module again (1) and secure with the clip (2).



Securing the front cover

4) Secure the RFID module to the wall using the mounting screws.

5 Connections and wiring

5.1 EMC and wiring guidelines

5.1.1 Personal safety

Safety extra-low voltage

All operating panels are powered by safety extra-low voltage.

5.1.2 Why EMC-aware wiring?

The immunity of an electrical system depends essentially on wiring and shielding that is designed to overcome any EMC problems. Servicing experience has shown that inadequate wiring and shielding is a common cause of system interference and failure.

Electromagnetic interference is far more troublesome than "conventional" faults:

- It is not normally recognised as such from the symptoms displayed and can often be mistaken for a fault in an assembly, which is basically sound.
- They mainly occur sporadically and are difficult to duplicate.

As a consequence fault-finding is time-consuming and expensive.

Therefore ensure from the start that the wiring and shielding conforms to the guidelines documented below.

5.1.3 Which EMC measures must be taken?

The EMC measures for the RFID module concentrate on shielding the connecting cable of the RFID module and the operating panel.

5.2 Power supply

The power to the RFID module is supplied via the operating panel (refer to chapter “XE 020/C module RJ45 socket“).

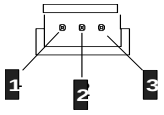
5.3 XE 020/C module interfaces

5.3.1 Internal Connector for coaxial antenna cable

The antenna module and the XE 020 RFID module both have connectors for the coaxial antenna cable.

5.3.2 Internal Connector for status LED

The pin assignment is defined for the status LED connector as follows:



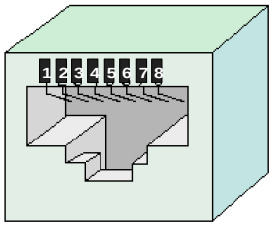
1...LED red
2...GND
3...LED green

Status LED connector on the antenna module and XE 020 RFID module: pin assignment

5.3.3 XE 020/C module RJ45 socket

The RJ45 socket on the XE 020/C module is the counterpart to the "EXT0 external interface" on the operating panel. The interface comprises the serial signals and the power for the XE 020/C module supplied by the operating panel.

1…n.c.
2…n.c.
3…n.c.
4…Data-
5…Data+
6…n.c.
7…+12V
8… GND



RJ45 socket on the XE 020/C module: pin assignment

Plug specification

Refer to the KEBA manual, "RJ45 cable connections, General Guidelines".

5.4 Cables

5.4.1 Coaxial antenna cable

The maximum permitted length of the coaxial antenna cable is 300 mm.

5.4.2 Connector cable for RFID status LED

Three unshielded cores are sufficient for the RFID status LED connection cable.

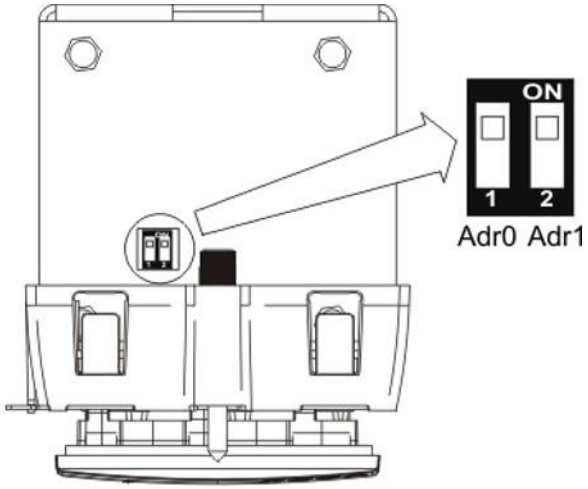
5.4.3 Connector cable for RFID module / OP 3xx

The connection cable for the RFID module / OP 3xx must be shielded and no longer than 3 m.

6 Configuration

6.1 RFID module DIP switch

If the overall system contains multiple RFID modules, the HW addressing must be configured using the DIP switch.
The required DIP switch is located directly on the RFID module. A maximum of 4 addresses can be configured (factory setting: 14H):



DIP switch location and factory setting

DIP switch		Address
Adr0	Adr1	
0	0	17H
0	1	16H
1	0	15H
1	1	14H

7 Status display

7.1 RFID status LED

The RFID status LED is located on the front of the operating panel and indicates the status of RFID card recognition:

RFID status LED	Meaning	Cause of fault / solution
red	RFID card not recognised or no authorisation	● RFID card is defective ● Wrong information recorded on RFID card
green for ca. 3 sec.	RFID card has been recognised	-
permanent red	No firmware, hardware does not boot	● Contact the manufacturer
permanent orange	Not connected to the control	● Check the wiring
LED off	Connection is OK	-

7.1.1 Boot-time behaviour

If a connection is established, the status LED is red for a short interval and then becomes permanent orange. The firmware has failed to boot if the LED does not change to the permanent orange state and indicates there is a firmware fault. After connecting successfully the LED goes out.

8 Maintenance and repair notes

8.1 Maintenance

This device does not require regular maintenance.

8.2 Repair

Only KEBA technicians may repair faulty devices, otherwise the warranty becomes void.

8.2.1 Packaging and shipping

The module is placed in protective packing for shipping. Please return the packaging since KEBA tries to reuse it to minimise the environmental impact.
This protective packaging is not transport packaging and as such it is unsuitable for transport by carrier or air. Suitable, extra transport packaging must be used for this purpose.

8.3 Waste disposal

Comply with your national regulations for the disposal of electronic components!

9 Accessories and spares

Component	Order number
XE 020/C RFID module	96634
Connector cable for RFID module / OP 3xx 0.4m	58033
Connector cable for RFID module / OP 3xx 1.5m	62590
RFID card XC 140/A	74665

10 Technical specification

General

Reading distance:	30 mm from the front panel
Antenna installation:	permanently installed in the front panel
Communication protocol:	according to ISO 15693 or ISO 18000-3, and suitable for Euromap 65
Evaluation unit protection class:	IP 20
Signalling:	3-colour LED on the printed antenna

Interfaces

Data interface:	serial
Supply voltage:	12 V DC (+/- 5%)
Connector plug:	RJ45

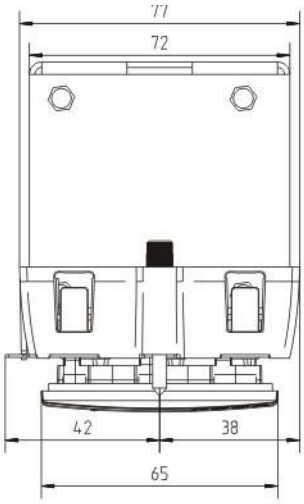
RF signal

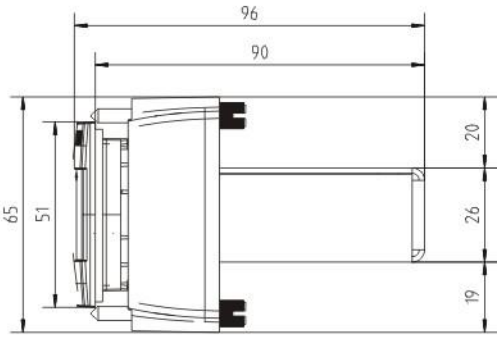
Frequency response:	13.56 MHz
Transmission power:	200 mW (max. 250 mW)
Sampling rate:	configurable (default: 10 samples / sec)

Environmental conditions

Operating temperature:	+5 °C to +55 °C
Storage temperature:	-30 °C to +70 °C
Relative humidity:	5 to 95% (non-condensing)
Vibration resistance:	as per IEC 61131
Shock resistance:	as per IEC 61131

Dimensions





11 Relevant EC directives and applicable standards

11.1 EC directives

99/5/EG	R&TTE directive

11.2 Standards

The following non-legally binding European standards are used to validate the RFID module's conformance to the directives.

11.2.1 Validating conformance to the R&TTE directive

Personal safety:	EN 50364
Radio sector:	EN 300330-2, Class 3 receiver, Class 1 as per 2000/299/EG
EMC sector:	EN 301489-3
Electrical safety:	EN 60950-1

11.2.2 Other standards

In addition the following non-legally binding standards provide advice in some areas:

Environmental conditions

EN 61131-2	Programmable logic controller - part 2 Equipment requirements and tests

11.2.3 USA standards

FCC Part 15	Radio Frequency Devices

The device complies with Part 15 of the FCC Rules. Operation in 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.

This device is labelled with an FCC ID number.
If this label is not visible when installed in an end device, the outside of the device MUST also display a label referring to the enclosed module.

e.g.

"Contains FCC ID: U870006"
(KEBA Product XE020/C)

Information
- No other antennas except the one provided by KEBA shall be used.
- Changes or modifications not expressly approved by KEBA could void the user's authority to operate the equipment.