Mühlbauer
HighTech International

Integration Manual

MB RFID 1301 Reader Rev.1
TN: 60516284 + 6000008874

Revision: 0.1
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1 Important Notice

Due to the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the Muehlbauer GmbH&Co.KG RFID reader are used in a normal manner with a well-constructed network, the Muehlbauer GmbH&Co.KG RFID reader should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. Muehlbauer GmbH&Co.KG accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the Muehlbauer GmbH&Co.KG RFID reader, or for failure of the Muehlbauer GmbH&Co.KG RFID reader to transmit or receive such data.

2 Safety and Hazards

Do not operate the Muehlbauer GmbH&Co.KG RFID reader in areas where blasting is in progress, where explosive atmospheres may be present, near medical equipment, near life support equipment, or any equipment which may be susceptible to any form of radio interference. In such areas, the Muehlbauer GmbH&Co.KG RFID reader MUST BE POWERED OFF. The Muehlbauer GmbH&Co.KG RFID reader can transmit signals that could interfere with this equipment.

3 Limitations of Liability

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4 General Descripion

The MB RFID 1301 READER is a highly integrated reader developed by Muehlbauer. Working at 13,56 MHz the Reader supports multiple protocols and is designed to fulfil several requirements.
The MB RFID 1301 READER is a combination of mainboard and RF modul and can work in the following features is fulfilled in this configuration only.

4.1 FEATURES

- contactless smart card reader
- contactless operating frequency 13.56MHz
- Supports multiple protocolls
  - ISO14443A/B
  - ISO15693
  - MIFARE®
- FCC compliant
- Control over Ethernet
- 24 VDC power supply

4.2 ELECTRICAL CHARACTERISTICS

4.2.1 Operating Condition Range

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
T_{amb}	Ambient Temperature	-	-10	25	70	°C
VDD	DC Supply Voltage	DVSS = 0V	22,8	24	26,2	V

Tabelle 1: Operating Condition Range

4.2.2 Current Consumption

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
I_{DVDD}	Supply Current	Idle, RF off	-	130	-	mA
I_{DVDD}	Supply Current	Idle, RF on	-	240	400	mA

Tabelle 2: Current Consumption

4.2.3 Ethernet Interface Characteristics

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITL
LAN	Ethernet Connection	-	-	10 / 100	-	MBit

Tabelle 3: Ethernet Characteristics

Note: The FCC certification are only valid when the Ethernet Cable is equipped with the shielding components (Cat.5 and above).

4.3 ANTENNA GUIDELINES

4.3.1 Choosing the Correct Antenna and Cabling

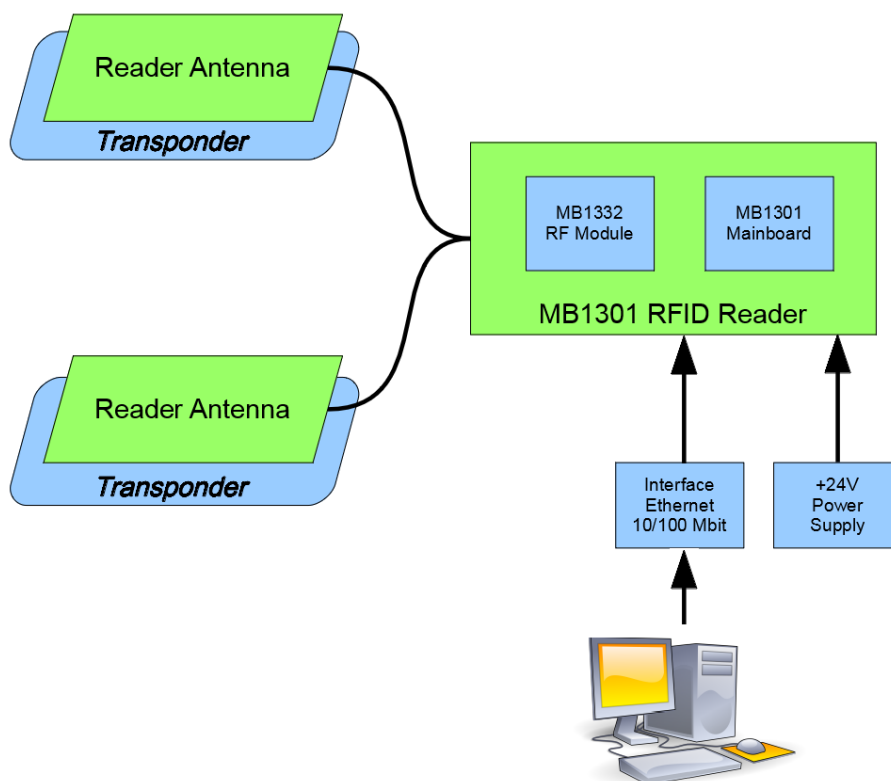Consider the following points for appropriate antenna selection:

- The antenna should have a nominal impedance of 50Ω.

- The system gain value affects both radiated power and regulatory (FCC, IC, CE, etc.) test results.

4.3.2 Determining the Antenna's Location

Consider the following points when deciding where to place the antenna:

- Antenna location may affect RF performance. Although the module is shielded to prevent interference in most applications, the placement of the antenna is still very important—if the host device is insufficiently shielded, high levels of broadband or spurious noise can degrade the module's performance.

- Connecting cables between the module and the antenna must have 50Ω impedance. If the impedance of the module is mismatched, RF performance is reduced significantly.

- Antenna cables should be routed, if possible, away from noise sources (switching power supplies, LCD assemblies, etc.). If the cables are near the noise sources, the noise may be coupled into the RF cable and into the antenna.

4.4 FUNCTIONAL OVERVIEW

5 Compliance Information for North American Users

The MB RFID 1301 001 RFID reader has been granted modular approval for industrial applications. Integrators may use the MB RFID 1301 001 RFID reader in their final products without additional FCC/IC (Industry Canada) certification if they meet the following conditions. Otherwise, additional FCC/IC approvals must be obtained.

1. At least 20 cm separation distance between the antenna and the user's body must be maintained at all times.

2. Connecting cables between the module and the antenna must have 50Ω impedance.

3. Product manual must contain FCC/IC statements of the RFID reader system

4. Final product must fulfill the FCC Part 15B Compliance test. Measurement and verification of final product is necessary

5.1 FCC COMPLIANCE STATEMENT

NOTE:

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Caution!

The Federal Communications Commission (FCC) warns the users that changes or modifications to the unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

5.2 COMPLIANCE INFORMATION ACCORDING TO 47CFR 2.1077

We,

Muehlbauer GmbH & Co. KG

Josef-Muehlbauer-Platz 1

93426 Roding, GERMANY

Telephone +49 9461 9520

declare that the product

MB RFID 1301 READER

FCC ID XJBMBRFID1301001

is in conformity with Part 15 of the FCC Rules.

Operation of this product is subject to the following 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.

FCC §15.105 (b):

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

--Reorient or relocate the receiving antenna.

--Increase the separation between the equipment and receiver.

--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

--Consult the dealer or an experienced radio/TV technician for help.

5.3 RSS COMPLIANCE STATEMENT

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:
(1) This device may not cause interference; and
(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.

5.4 EXAMPLE OF COMPLIANCE LABEL

Use a label to show that a FCC compatible device is inside the final application. This label is only necessary if the device is mounted in an invisible place.

Example of this Label:

Mühlbauer
High Tech International   Made in Germany

Type: MB RFID Reader Offline Place

Serial Number:

Supply Voltage: 24VDC / 1A

Contains TX FCC ID: XJPMBRFID1301001

Contains IC: 21616-MBRFID13011
HVIN: MB1301 Rev.3

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, and (2)
this device must accept any interference received,
including interference that may cause undesired operation

6   Document History

Date	Revision	Description	Autor
18.10.2016	0.1	Document Draft	Robert Janich

Tabelle 4: Document Revision History