OBID®

i-*scan*®

FEIG ELECTRONIC

Installation Instructions

ID ISC.LRM200-A/B

Contents:

1. Safety Instructions / Warning

Read before startup !

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

- The Installation Instruction should be kept in an accessible location and handed out to every user and maintenance person.

- Non-approved modifications and the use of replacement parts and accessories which have not been purchased or recommended by the manufacturer of the device may cause fires, electrical shocks and injury. This will furthermore result in exclusion of liability and loss of warranty on the part of the manufacturer.

- The warranty conditions in effect at the time of purchase shall be considered valid. No liability is assumed for inappropriate, improper manual or automatic setting of parameters for a device or for improper use of a device.

- Repairs are to be performed only by the manufacturer.

- Hookup, startup, maintenance, measuring and calibration work on the device must be performed only by electrical specialists who have received the relevant accident prevention training.

- When operating devices with probably live wires, respect the valid security regulations.

- Before opening the device always turn off the supply voltage and use a test instrument to verify that the device is unpowered.

- The fact that the indicator lamp is off does not necessarily mean that the device has been disconnected from the power supply or that it is without power.

- All work on the device including installation must be in conformance with national electrical regulations as well as with local code.

- The device must be installed and electrically connected in accordance with the recognized technical regulations in the country where it is being installed and according to other regional codes..

- The base plate and the attached heat dissipater may become quite hot during operation.

2. Features of the ID ISC.LRM200-A/B Reader Module

2.1. Features

The ID ISC.LRM200-A/B Reader Module has been developed for reading passive data tags, so-called „Smart Labels", at an operating frequency of 13.56 MHz. It is suitable for all applications in which long reading distances are required. Depending on the specific Reader Module used, a basic antenna (ID ISC.LRM200-A) or a basic antenna plus complementary antenna (ID ISC.LRM200-B) may be connected to the Reader.

An anti-collision function allows reading of up to 30 transponders at a time.

The Reader Module electronics is mounted on a rigid, 6 mm thick aluminum base plate. The module has two digital inputs, two digital outputs, a relay output and an asynchronous interface which can be configured as RS232 or RS485.

The configurability of the interfaces also allows the module to be operated on an RS485 data bus. The address can be assigned either through software or hardware (3 DIP switches).

2.2. Available modules

The following models are available:

Model	Description
ID ISC.LRM200-A	For use with a basic antenna
ID ISC.LRM200-B	For use with a basic/complementary antenna combination

3. Installation and wiring

The Reader Module is designed for installation on a heat sink. Mounting is accomplished using the $\varnothing$ 4.5 mm holes located in each corner of the base plate (see Fig. 3-1).

To fully exploit the performance of the Reader Module, the heat sink should have a thermal resistance R_{ThK} of max. 0.8 K/W. When attaching the Reader Module to the heat sink you should strive for a little heat transfer resistance between the base plate and the heat sink as possible. The use of heat sink compound is recommended.

If the antenna is properly tuned and there is sufficient air convection along the mounting plate, the ID ISC.LRM200 can be operated without an additional heat sink at up to 4W of power. Note here however that detuning of the antenna can result in additional heating of the Reader. In such cases the Reader regulates its output power down until the upper temperature limit of its final stage is reached again.
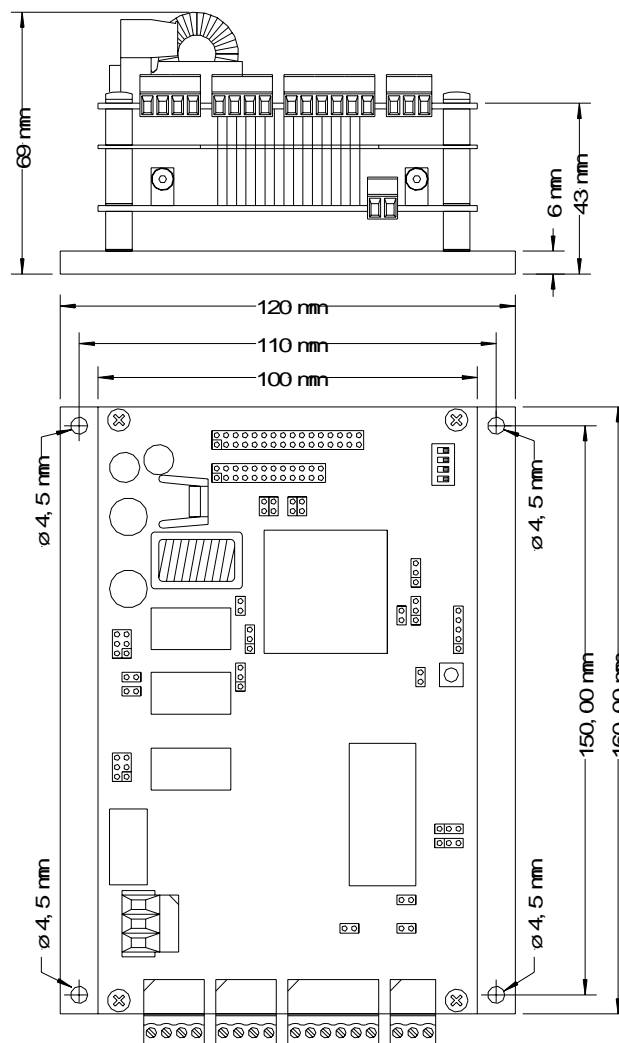
Fig. 3-1: Dimensional drawing of the ID ISC.LRM200-A/B Reader

3.1. Terminals, sockets and switches
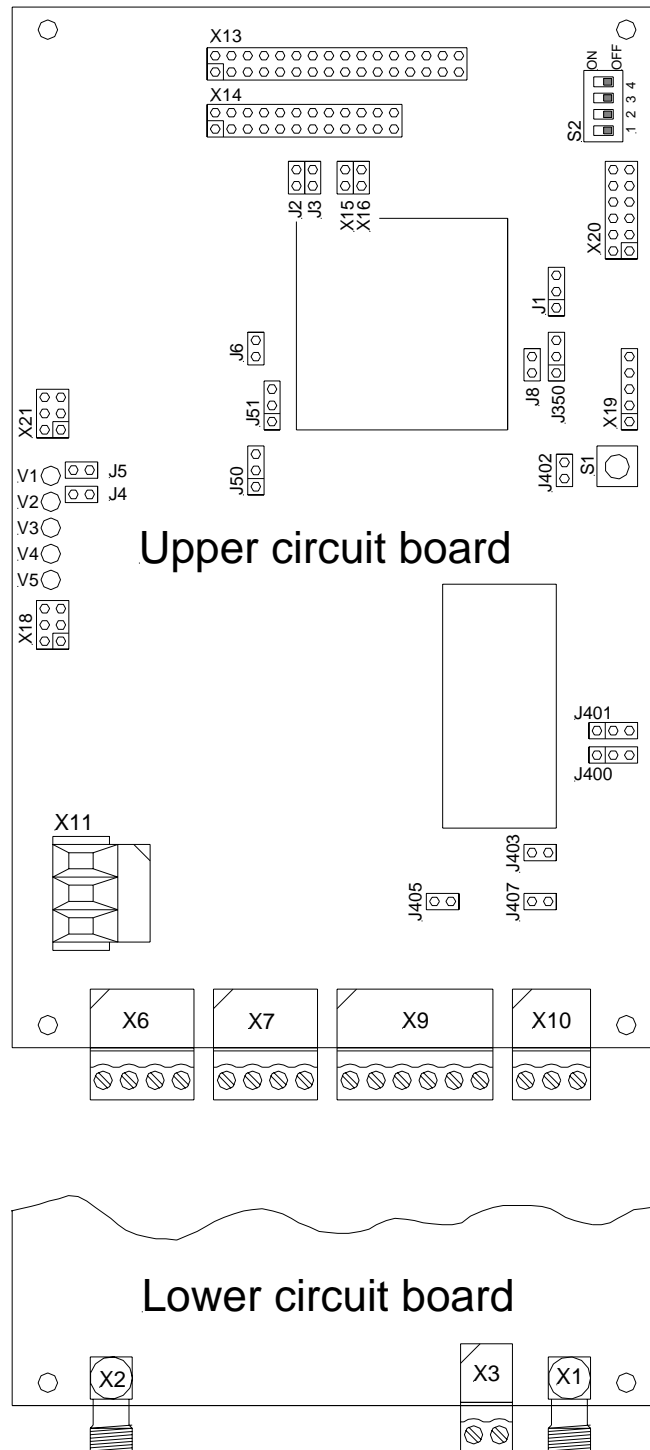
Fig. 3.1-1: Top view: Upper and lower circuit board

3.2. Antenna connection

Two SMA sockets are provided on the lower circuit board for connecting the basic antenna or, in the case of ID ISC.LRM200-B, the basic/complementary antenna combination. The maximum tightening torque for the SMA socket is 0.45 Nm.

Terminal	Description
X1	For connecting the complementary antenna (only ID ISC.LRM200-B)
X2	For connecting the basic antenna (Input impedance 50Ω)

Notes:

- **The input impedance of the basic antenna should be calibrated to a value of 50 $\Omega \pm$ (3 Ω $\angle$ 3°).**

- **To achieve optimum read distances the length of the antenna lead-in cables should be 3.6 m $\pm$0.1 m.**

- **When connecting an antenna, ensure that it does not exceed the limit values allowed by the national regulations for radio emissions.**

3.3. Supply voltage

The supply voltage of 24 VDC is connected on Terminal X3 on the lower circuit board.

The cable length between the power supply and the Reader Module must not exceed 3 m.

Note:

- **Reversing the power supply wires may destroy the device.**

Terminal	Name	Description
X3 / Pin 1	+24V	+ 24 V DC supply voltage
X3 / Pin 2	GND	Supply voltage ground
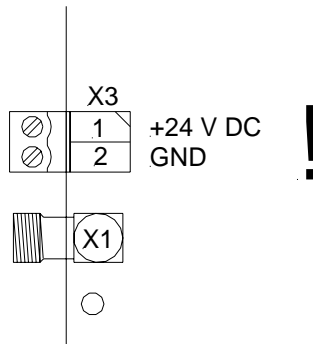
Fig. 3.3-1 : Connecting the supply voltage

Power supply recommendations :

To exploit the full performance of the Reader Module, you should select a sufficiently regulated and noise-filtered power supply (ripple = max. 20 mV). When using switching power supplies be sure that the internal switching frequency is below 300 kHz.

Model	Manufacturer
DRP-60-I	LAMBDA Electronics GmbH Josef-Hund-Str. 1 D-77855 Achern Tel.: +49 (0) 7841 50 00
SilverLine SL 2.5	PULS GmbH Arabellastraße 15 D-81925 München Tel.: +49 (0) 89 9278 0

3.4. X7: Inputs (optocoupler isolated)

The optocoupler inputs on Terminal X7 are galvanically isolated from the Reader electronics and must therefore be powered by a separate external DC supply. The input LED's on the optocouplers have an internal input series resistor of 500 Ω. For supply voltages above 10V the input current must be limited to max. 20 mA by an additional external dropping resistor (see Table 3.4-1).

Terminal	Name	Description
1	IN1+	+ Input 1
2	IN1-	- Input 1
3	IN2+	+ Input 2
4	IN2-	- Input 2

For cable lengths greater than 3 m use shielded cable.

Notes:
- **The inputs are designed for a maximum input voltage of 24 V DC and an input current of maximum 20 mA**
- **Reversing the polarity or overloading the inputs will destroy the unit**
- **The supply voltage of the Reader may not be used for driving the inputs, since the added noise may result in reduced effective reading distances.**

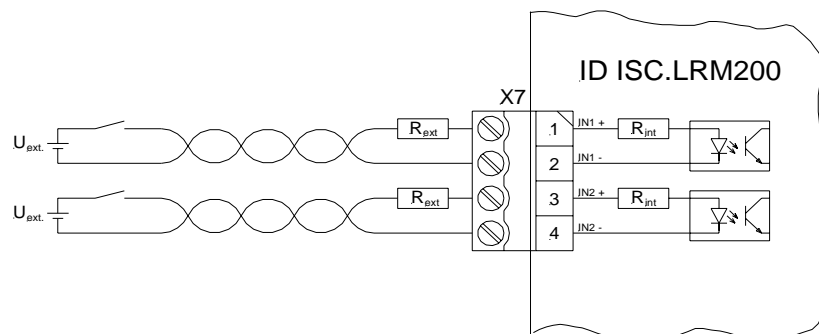

Fig. 3.4-1: Internal and possible external wiring of the optocoupler inputs

External voltage U_{ext}	Required external dropping resistor R_{ext}
5 V ... 10 V	---
11 V ... 15 V	270 Ω
16 V ... 20 V	560 Ω
21 V ... 24 V	820 Ω

Table 3.4-1: Required external dropping resistor R_{ext}

3.5. X6: Output (optocoupler isolated)

The transistor connections, collector and emitter, of the two optocoupler outputs are galvanically isolated from the Reader electronics and brought out on Terminal X8 without any additional circuitry. The outputs must therefore be supplied externally.

Terminal	Name	Description
1	O1-C	Collector – Output 1
2	O1-E	Emitter – Output 1
3	O2-C	Collector – Output 2
4	O2-E	Emitter – Output 2

For cable lengths greater than 3 m use shielded cable.

Notes:

- **The outputs are configured for max. 24 V DC / 30 mA.**

- **Reversing the polarity or overloading the outputs will destroy the unit.**

- **The outputs are designed to switch resistive loads only.**
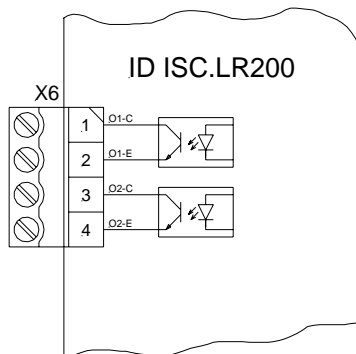
Fig. 3.5-1: Internal wiring of the optocoupler outputs

3.6. X11: Relay

The relay output is a change-over contact.

Terminal	Name	Description
1	COM	Working contact
2	NC	Normally closed contact
3	NO	Normally open contact

Notes:

- **The relay outputs are configured for max. 24 V DC / 60 W.**

- **The relay outputs are designed to switch resistive loads only. If using an inductive load, the relay contacts must be protected by means of an external protection circuit.**

3.7. X9: RS485 interface

The asynchronous interface can be configured for RS485 or RS232 (see Section 5.1: Interface configuration using jumpers).

The RS485 interface is configured on X9.

The transmission parameters can be software configured.

Configuration for X9 (RS485 interface):

Terminal	Name	Description
1	4xxB	RS485 – (B +)
2	4xxA	RS485 - (A -)
3	4xxG	RS485 – GND
4	422Y	n.c.
5	422Z	n.c.
6	422G	n.c.
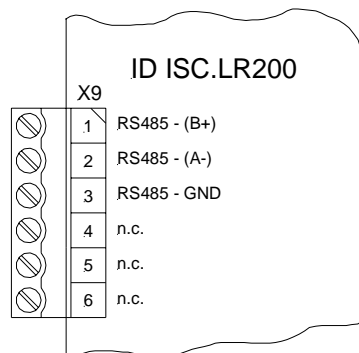
Fig. 3.7-1 : Configuring the RS485 interface

3.8. X10: RS232 interface

The asynchronous interface can be configured for RS485 or RS232 (see Section 5.1: Interface configuration using jumpers).

The RS232 interface is configured on X10.

The transmission parameters can be software configured.

Configuration for X10 (RS232 interface):

Terminal	Name	Description
1	GND	RS232 – GND
2	RxD	RS232 - RxD
3	TxD	RS232 - TxD

Fig. 3.8-1 : Wiring example for connecting the RS232 interface

4. Control and display elements

4.1. LED´s

Table 4.1-1 shows the configuration of the LED´s.

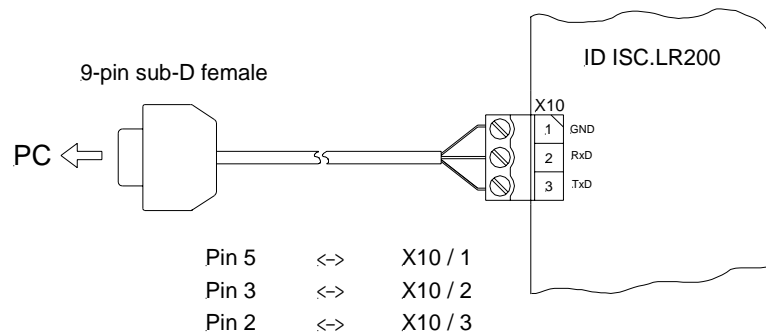| Name	Description
LED V1 (green)	"RUN-LED" - Indicates proper running of the internal Reader software - Flashing rate ca. 1 Hz
LED V2 (red)	Diagnostic 1: RF communication / EEPROM status - Short flashing indicates error-free communication with a transponder on the RF interface - Flashes alternating with V1 after Reset following a software update - Flashes alternating with V1 in case a data error while reading the parameters occurred following a Reset
LED V3 (red)	Diagnostic 2: Host communication - Short flashing indicates a protocol is being sent to the host on the RS232/RS485 interface
LED V4 (red)	Diagnostic 3: Reserved
LED V5 (red)	Diagnostic 4: Reader initialization / RF error - Comes on during Reader initialization after power-up or after a reset. - Comes on to indicate an error in the RF section of the Reader. The error type can be read out via software on the RS232/RS485 interface

Table 4.1-1: LED configuration

4.2. Buttons / switches

Name	Description
S1	Reset button
S2	1 - 3: Setting data bus addresses (0 ... 7) 4: not used

Note :

To set the bus address using S2, the Reader must be set to software address „0" (factory setting).

5. Startup

5.1. Interface configuration using jumpers

Jumpers J400 – J401 are used to configure the asynchronous interface for RS232 or RS485.

Jumper	RS232	RS485
400	1 - 2	2 - 3
401	1 - 2	2 - 3

Jumpers J403, J405 and J407 can be used to insert the termination resistors which may be required for the RS485 interface.

Jumper	In	Out
405	Pull-Up on RS485 - B	**No** Pull-Up on RS485 - B
407	Pull-Down on RS485 - A	**No** Pull-Down on RS485 - A
403	Termination resistor RS485 - A ⇔ RS485 - B	**No** termination resistor RS485 - A ⇔ RS485 - B

Note:

It is <u>not</u> possible to operate both RS232 and RS485 at the same time.
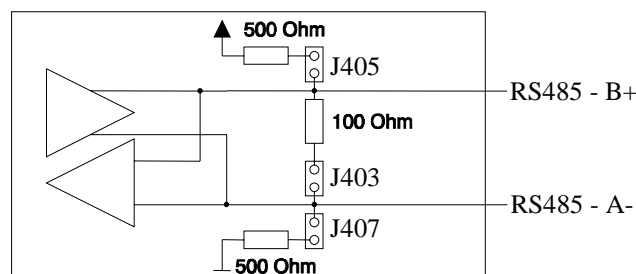
Jumpers for RS485 interface

5.2. Setting addresses for bus operation

For bus operation the Reader allows you to set the required bus address either using DIP switch S2 or through the software.

a) Setting the bus address on S2 :

Addresses „0" to „7" can be set on S2.

To set the bus address using S2, the Reader must be set to software address „0" (factory setting).

Address	Switch 1	Switch 2	Switch 3
0	OFF	OFF	OFF
1	OFF	OFF	**ON**
2	OFF	**ON**	OFF
3	OFF	**ON**	**ON**
4	**ON**	OFF	OFF
5	**ON**	OFF	**ON**
6	**ON**	**ON**	OFF
7	**ON**	**ON**	**ON**

b) Setting the bus address through software

Addresses are assigned through the host computer. The software is used to assign addresses "0" to "253" to the Reader.

Note:

Since all Readers are factory set to Address 0, they must be connected and configured one after the other.

6. Technical Data for ID ISC.LRM200-A/B

Mechanical Data

- **Dimensions (W x H x D)**   120 x 160 x 69 mm

- **Weight**   650 g

Electrical Data

- **Supply voltage**   24 V DC +5%/-1%
  Ripple : max. 20 mV

- **Power consumption**   max. 60 W

- **Operating frequency**   13.56 MHz

- **Transmitting power**   0.5 to 10 W*
  (software settable in 0.25W steps)

- **Modulation**   8% - 100%
  (software settable)

- **Antenna connection**
  - Basic antenna   1 x SMA socket (50Ω)
  - Complementary antenna (Model - B)   1 x SMA socket (50Ω)

- **Outputs:**
  - 2 optocoupler   24 V DC / 30 mA (galvanically isolated)
  - 1 relay (1 x change-over)   24 V DC / 60 W

- **Inputs**
  – 2 optocoupler   max. 24 V DC/ 20 mA

- **Interfaces**   RS232 and RS485 (internally selectable)

* Depending on the output power an additional heat sink may be necessary

Functional characteristics

- **EEPROM (for parameters)**   1 kB
  (10,000 write cycles)

- **RAM**   256 kB

- **FLASH**   512 kB
  (software update on interface possible)

- **Supported transponders**   I•Code, Tag-it
  (ISO transponder requires software update)

- **Address setting for interface**   Optional :
  - 3-position DIP switch (up to 8 addresses)
  - Software (up to 254 addresses)

- **Optical indicators**   5 LED´s for status diagnostics

- **Multi-Reader mode**   Protocol synchronization through use of the existing in- and outputs

Ambient

- **Temperature range**
  - **Operating**   -20°C to +65°C
  - **Storage**   -25°C to +70°C

- **Vibration**   EN60068-2-6
  10 Hz to 150 Hz : 0.075 mm / 1 g

- **Shock**   EN60068-2-27
  Acceleration   : 30 g

Applicable norms

- **Radio approval**
  - **Europe**   EN 300 330
  - **USA**   FCC 47 CFR Part 15

- **EMC**   EN 300 683

- **Safety**
  - **Europe**   EN 60950
  - **USA**   UL 1950