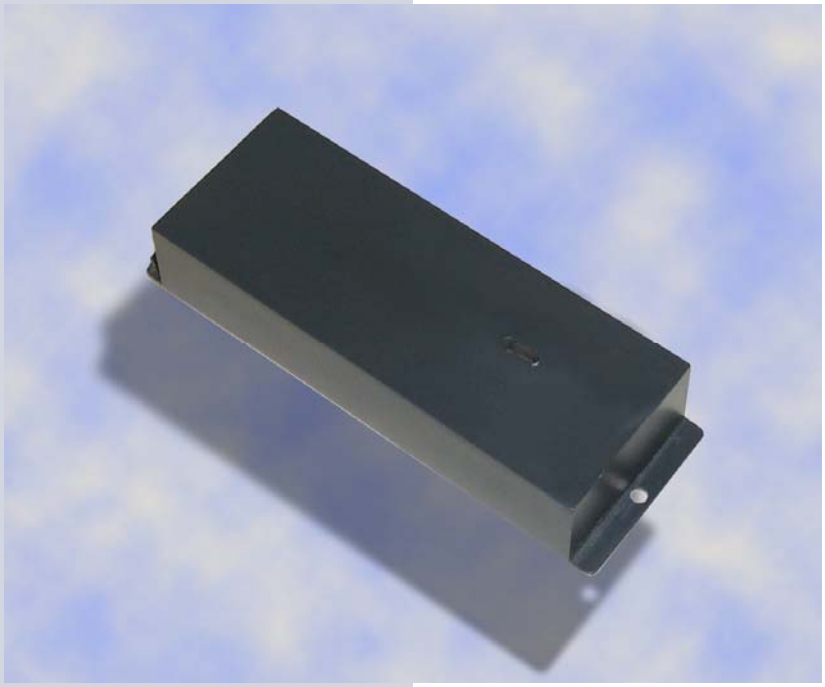
MR50
Industrial Reader RFID

Product Manual

Version 1.2



This manual covers the following items:

- MR50 Industrial Reader with external antenna

Last version date:

March 2009

Manual versions:

Version 1.0: first version

Version 1.1: external antenna added

Version 1.2: FCC approval

Table Of Contents

1 Introduction

The MR50 Industrial Reader is a general purpose 13.56 MHz RFID reader. The MR50 Industrial Reader is fully sealed in epoxy to protect the electronics from a harsh environment. There are no user serviceable parts inside the reader.

The MR50 Industrial Reader communicates via the RS232/EIA-232 interface. The use of this standard communication interface makes it easy to connect the MR50 Industrial Reader to a host system. The MR50 Industrial Reader also contains a bi-color LED which can be hardware-controlled by means of two inputs.

Controlling the MR50 Industrial Reader is done by the T=0 protocol which is not a part of this manual. For more information about the T=0 protocol we refer to the Inside Contactless manual M220H.

Remark: the T=0 protocol is a worldwide standardized protocol. Although, it is possible that Inside Contactless also integrated custom made commands into this T=0 protocol. When T=0 protocol is written in this manual, the Inside Contactless T=0 protocol is meant.

See also: http://www.insidecontactless.com

Attention

This manual describes the MR50 Industrial Reader with external reader.

The MR51 Industrial Reader has the same functionality and specification but comes with an internal antenna. Ask your dealer for more information.

2 Regulatory information

2.1 FCC Information to User

This product does not contain any user serviceable components and is to be used with approved antennas only. Any product changes or modifications will invalidate all applicable regulatory certifications and approvals

2.2 FCC Electronic Emission Notices

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

2. This device must accept any interference received, including interference that may cause undesired operation.

2.3 FCC Radio Frequency Interference statement

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 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 instructions, may cause harmful interference to radio communications.

Operation of this equipment in a residential area may cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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

3 Installation guide

3.1 Mounting

The MR50 Industrial Reader can be mounted on a flat surface with two 4 mm screws.

Metal constructions close to the reader-antenna can absorb energy from the reader excite field and can detune the antenna. The read range of the internal antenna will therefore be reduced if the reader-antenna is located on metal surfaces or in close vicinity of metal objects. The amount of reduction will be a factor of the amount of metal and the distance the reader-antenna is from the metal. Please check carefully if metal constructions in your operational environment allow for enough margin to guarantee proper operation of the reader.

3.2 External antenna mounting

The external antenna can be mounted on a flat surface with five 3 mm screws and five 3 mm nylon spacers (not supplied). Do not over tighten the screws!

As mentioned in chapter 3.1, the read range of the internal antenna will therefore be reduced if the reader-antenna is located on metal surfaces or in close vicinity of metal objects.

Note

The trimmer (C5) on the external antenna is factory adjusted; please do not touch this trimmer.

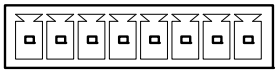
If the operational situation requires large metal constructions close to the antenna, part of the detuning can be compensated for by readjusting C5. In that case please contact Dialoc ID for more instructions.

3.3 Power supply

The recommended power supply for the MR50 Industrial Reader is 13,8Vdc up to 24Vdc. The maximum power consumption at 13,8Vdc is 120mA.

3.4 Connections

The MR50 Industrial Reader has one connector for power connection, serial communication and led-control. The layout of the connector is as follows:



Pin number	Function
1	Ground (GND)
2	TX (transmit data)
3	RX (receive data)
4	Led A
5	Not connected
6	Not connected
7	Led B
8	Power (+13,8 – 24Vdc)

3.5 Led control

The MR50 Industrial Reader has a bi-color LED which can be controlled from the inputs of the reader. The following table shows how the colors are generated:

Led A	Led B	Color	Remarks
Low	High	Green	High level equals +13,8 – 24Vdc
High	Low	Red	Low level equals GND
High	High	Orange	

Appendix A Reader specifications

A.1 Power

Input voltage	13,8 - 24Vdc +/-5%
Current consumption	max. 120 mA @ 13,8V dc
Power down option	Coupler power down (via software)
Overvoltage protection	No
Polarity protection	Yes

A.2 Connection

Connector type	8 way Wieland PCB connector
Contra part	Supplied
Antenna connection	400 mm lead with a MCX connector

A.3 Hardware

Read distance	Up to 15 cm (depending on the type of tag)
Labels	See the Inside Contactless manual M220H for more details
Operating temperature	-20 / +50° C

A.4 In/outputs

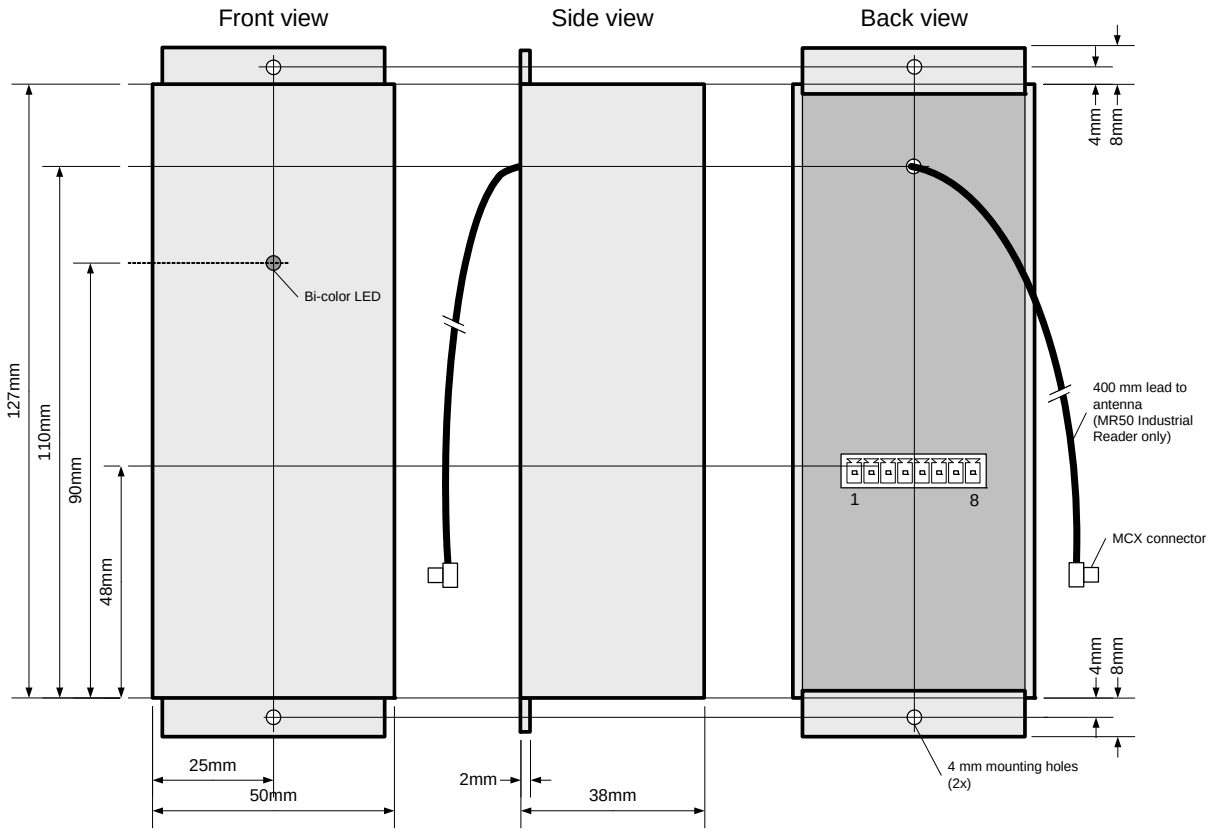
Led A and B input voltage	13,8 - 24V dc (current consumption max. 25 mA @ 24V dc)

A.5 Communication interface / protocol

ISO standards	14443 A/B, 15693, FeliCa™
Interface	RS232 / EIA-232
Baud rate	Default 9600 bps (up to 115.2 kbps)
Coupler	M220-G2 of Inside Contactless
Protocol	T=0 of Inside Contactless

A.6 Housing

Type, color	PVC casing, light gray
Waterproof	Front side IP67, back side open connector
Dimensions	see below


Front view
Side view
Back view
Bi-color LED
127mm
110mm
90mm
48mm
25mm
50mm
2mm
38mm
4mm
8mm
400 mm lead to antenna (MR50 Industrial Reader only)
MCX connector
1
8
4 mm mounting holes (2x)

Appendix B External antenna specifications

B.1 Power

Impedance	50 ohm @ 13.56 MHz
Over voltage protection	No
Polarity protection	No

B.2 Connection

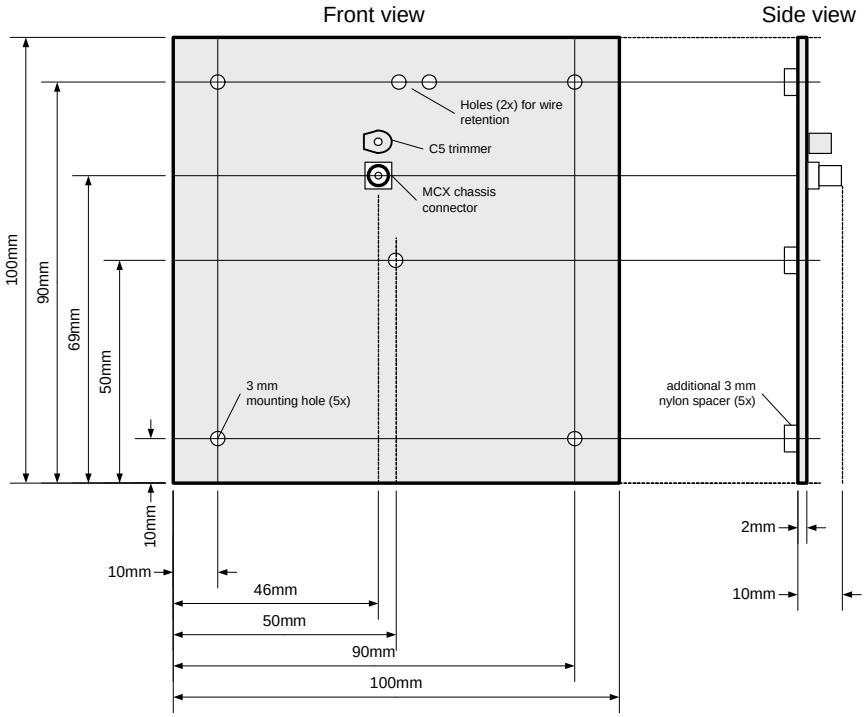
Connector type	MCX connector

B.3 Hardware

Read distance	Up to 15 cm (depending on the type of tag)
Operating temperature	-20 / +50° C

B.4 Antenna housing

Type	Printed circuit board
Waterproof	No
Dimensions	see below



Appendix C Declaration of Conformity

FCC

FEDERAL COMMUNICATIONS COMMISSION

DECLARATION OF CONFORMITY (DoC)

Equipment:	**Industrial Reader RFID**
Trademark(s) and Model(s):	**MR50**
Manufacturer:	**Dialoc ID, the Netherlands**
FCC ID in case other parts of this equipment are subject to certification:	**KX2MR50-0001**

This device complies with Part 15B 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.

The following test reports are subject to this declaration:

Test report number:	Issue date:
20083675300	**March, 6 2009**

The following manufacturer/importer/entity (located in the USA) is responsible for this declaration:

Company name:	**Siemens Energy & Automation inc.** **Infrastructure Logistics Division**
Name/Title (legal representative):	x Chris Layton
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E-mail:	x chris.layton@siemens.com
Date:	x 6 Mar. 2009
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NOTES

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