# Leuze

**Original operating instructions**

# DCR 108i
## Stationary 2D-code reader

# 1 About this document

Tab. 1.1: Warning symbols and signal words

|  | |
|---|---|
| ⚠️ | Symbol indicating dangers to persons |
| ❶ | Symbol indicating possible property damage |
| **NOTICE** | Signal word for property damage<br>Indicates dangers that may result in property damage if the measures for danger avoidance are not followed. |
| **CAUTION** | Signal word for minor injuries<br>Indicates dangers that may result in minor injury if the measures for danger avoidance are not followed. |

Tab. 1.2: Other symbols

|  | |
|---|---|
| ℹ️ | Symbol for tips<br>Text passages with this symbol provide you with further information. |
| ⇨ | Symbol for action steps<br>Text passages with this symbol instruct you to perform actions. |
| ⇨ | Symbol for action results<br>Text passages with this symbol describe the result of the preceding action. |

Tab. 1.3: Terms and abbreviations

| | |
|---|---|
| CMOS | Semiconductor process for implementing integrated circuits<br>(**C**omplementary **M**etal-**O**xide-**S**emiconductor) |
| DCR | Camera-based code reader<br>(**D**ual **C**ode **R**eader) |
| DHCP | Network configuration protocol (**D**ynamic **H**ost **C**onfiguration **P**rotocol) |
| DPM code | Code directly applied on a part, not with a label<br>(**D**irect **P**art **M**arking) |
| EN | European standard |
| FE | Functional earth |
| FOV | Reading field of the code reader (**F**ield **o**f **V**iew) |
| IO or I/O | **I**nput/**O**utput |
| IP address | Network address, which is based on the Internet Protocol (IP) |
| LED | LED<br>(**L**ight **E**mitting **D**iode) |
| MAC address | Hardware address of a device in the network<br>(**M**edia **A**ccess **C**ontrol address) |
| ROI | Region of interest of the code reader (**R**egion **o**f **I**nterest) |
| TCP/IP | Internet protocol family (**T**ransmission **C**ontrol **P**rotocol/**I**nternet **P**rotocol) |
| UDP | Network transmission protocol (**U**ser **D**atagram **P**rotocol) |

# 2 Safety

This code reader was developed, manufactured and tested in accordance with the applicable safety standards. It corresponds to the state of the art.

## 2.1 Intended use

The code readers of the DCR 100i series are camera-based code readers for all commonly used bar codes, stacked codes and Data Matrix codes.

**Areas of application**

The code readers of the DCR 100i series are especially designed for the following areas of application:

- Secondary packaging systems
- Electronics industry

| ⚠ CAUTION |
|---|
| **Observe intended use!** |
| The protection of personnel and the device cannot be guaranteed if the device is operated in a manner not complying with its intended use. |
| ↳ Only operate the device in accordance with its intended use. |
| ↳ Leuze electronic GmbH + Co. KG is not liable for damages caused by improper use. |
| ↳ Read these operating instructions before commissioning the device. Knowledge of the operating instructions is an element of proper use. |

| *NOTICE* |
|---|
| **Integrated illumination!** |
| The code readers of the DCR 100i series correspond to the following classification with respect to the integrated illumination: |
| ↳ Red illumination: Exempt group in acc. with EN 62471 |

| *NOTICE* |
|---|
| **Comply with conditions and regulations!** |
| ↳ Observe the locally applicable legal regulations and the rules of the employer's liability insurance association. |

## 2.2 Forseeable misuse

Any use other than that defined under "Intended use" or which goes beyond that use is considered improper use.

In particular, use of the device is not permitted in the following cases:

- in rooms with explosive atmospheres
- in circuits which are relevant to safety
- in food processing
- for medical purposes

| *NOTICE* |
|---|
| **Do not modify or otherwise interfere with the device!** |
| ↳ Do not carry out modifications or otherwise interfere with the device. The device must not be tampered with and must not be changed in any way. |
| ↳ The device's housing must not be opened. |
| ↳ There are no user-serviceable parts inside the device. |
| ↳ Repairs must only be performed by Leuze electronic GmbH + Co. KG. |

## 2.3 Competent persons

Connection, mounting, commissioning and adjustment of the device must only be carried out by competent persons.

Prerequisites for competent persons:

- They have a suitable technical education.
- They are familiar with the rules and regulations for occupational safety and safety at work.
- They are familiar with the operating instructions for the device.
- They have been instructed by the responsible person on the mounting and operation of the device.

**Certified electricians**

Electrical work must be carried out by a certified electrician.

Due to their technical training, knowledge and experience as well as their familiarity with relevant standards and regulations, certified electricians are able to perform work on electrical systems and independently detect possible dangers.

In Germany, certified electricians must fulfill the requirements of accident-prevention regulations DGUV (German Social Accident Insurance) provision 3 (e.g. electrician foreman). In other countries, there are respective regulations that must be observed.

## 2.4 Disclaimer

Leuze electronic GmbH + Co. KG is not liable in the following cases:

- The device is not being used properly.
- Reasonably foreseeable misuse is not taken into account.
- Mounting and electrical connection are not properly performed.
- Changes (e.g., constructional) are made to the device.

## 3 Device description

### 3.1 Device overview

The code readers of the DCR 100i series are camera-based code readers for all commonly used bar codes, stacked codes, Data Matrix codes and DPM codes (e.g. Code 39/128, EAN 8/13, QR etc.).

The extensive options for device configuration via trigger buttons, configuration codes or software enable adaptation to a multitude of reading tasks.

Code readers of the DCR 100i series perform numerous tasks in industrial code reading such as:

- Omnidirectional code reading
- Reading of codes while at a standstill or in motion
- Multiple code reading
- In secondary packaging machines
- In automatic handling and testing machines

The DCR 1xxi code readers are operated as a "stand-alone" single device with individual IP address.

Information on technical data and characteristics: see chapter 13 "Technical data".

### 3.2 Performance characteristics

| | **NOTICE** |
|---|---|
| **i** | Failure to read an F-grade code does not imply that the code reader is faulty or underperforming.<br><br>Do **not** use F-grade codes for acceptance testing and operation. Make sure that barcodes are printed in compliance with the relevant ISO or industry quality standard. |

- Decoding of 1D-, stacked code, 2D-codes and DPM codes
- Manually adjustable focus for flexible working distance within the reading field
- Maximum depth of field and reading distance of approx. 40 mm … 550 mm
- Reference code comparison
- Integrated process interfaces RS 232, Ethernet TCP/IP and Modbus TCP.
- 1 switching input
- 2 switching outputs
- Integrated red LED illumination
- Green feedback LED for direct acknowledgment of whether the read process was successful
- A trigger button for intuitive operation without PC
- Industrial design: degree of protection IP64
- Mounting with threads on bottom surfaces
- Variously coded M12 connections for unique assignment of the connections
- Integrated teach functions for automatic adjustment of the exposure and gain

### 3.3 Accessories

Special accessories are available for the code reader (see chapter 14 "Order guide and accessories").

## 3.4    Device construction



| 1 | Lens |
|---|---|
| 2 | Control panel with indicator LEDs, control buttons |
| 3 | LEDs for illumination (red) |
| 4 | M3 mounting thread |
| 5 | Device housing |
| 6 | Connection technology |
| 7 | Feedback LED (green) |
| 8 | Locking screw for focus adjustment (1.27 mm Hex) |
| 9 | Screw for focus adjustment |

Fig. 3.1:      Device construction

## 3.5    Indicators and operational controls

The device is equipped with the following indicators and operational controls:
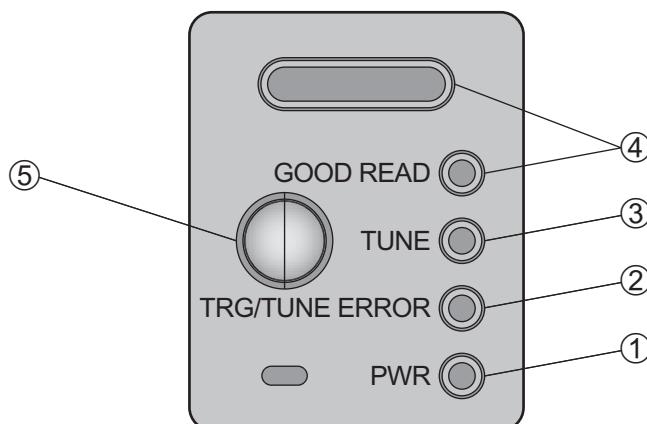


| 1 | PWR | LED indicator POWER | Indicates Power ON/OFF and hardware errors. |
|---|---|---|---|
| 2 | ERROR | Feedback LED ERROR (no read) | Indicates whether a read was unsuccessful. |
| 3 | TUNE | LED indicator TUNE | Indicates the code reader in tuning mode. |
| 4 | GOOD READ | Feedback LED GOOD READ | Indicates whether a read was successful. |
| 5 | TRG/TUNE | Trigger button | Control button |

Fig. 3.2:      Layout of indicator and control panel

**PWR LED**

Tab. 3.1:     Status of PWR LED

| Color | Status | Description |
| --- | --- | --- |
| Orange | OFF | • Device off<br>• No supply voltage |
|  | ON (continuous light) | Device ok, code reading possible |

**ERROR LED**

Tab. 3.2:     Status of ERROR LED

| Color | Status | Description |
| --- | --- | --- |
| Red | Flashing | Reading unsuccessful |
|  | ON (continuous light) | • Device error<br>• Tuning unsuccessful |

**TUNE LED**

Tab. 3.3:     Status of TUNE LED

| Color | Status | Description |
| --- | --- | --- |
| Blue | Flashing | Device in tuning mode |

**GOOD READ LED**

Tab. 3.4:     Status of GOOD READ LED

| Color | Status | Description |
| --- | --- | --- |
| Green | ON (continuous light) | Reading successful |

**Trigger button**

Tab. 3.5:     Functions of trigger button

| Function | Description | Action |
| --- | --- | --- |
| Manual trigger | Start code reading in trigger mode | Press the trigger button once. |
| Enter tuning mode | Enable tuning mode | Press and hold the trigger button more than 3 seconds. |
| Restore to factory default settings | Restore the device to factory default settings | Press and hold the trigger button more than 15 seconds. |

# 4 Functions

Functions of the code reader:

- Camera operating modes
- Reference code comparison
- Configuration tool Ident Studio V2

## 4.1 Camera operating modes

The camera operating mode defines how the code reader starts a read process and decodes the code if a code is located in the read field.

**Trigger mode**

In the "Trigger mode", the code reader captures one image and attempts to decode it. Under uniform conditions, this camera operating mode makes fast decoding possible.

**Image sense mode**

In the "Presentation mode", the code reader is in the idle state.

In the event of a change in the image area, e.g., by holding up a code, the code reader captures images with illumination (as previously configured) until a code is read successfully. The code reader then switches back to the "wait mode" and the illumination switches off after a few seconds.

**Reading the same code multiple times**

To prevent the same code from being read and output repeatedly in the "Presentation mode", a delay time can be defined that must elapse before a code can be read again.

The delay time is set or deactivated with the configuration tool Ident Studio V2.

**Continuous read mode**

In the "Continuous mode", the code reader operates continuously in process mode. In this mode, image acquisition is started again immediately after an image has been processed. An external trigger signal is not required.

| *NOTICE* |
|---|
| For optimum heat dissipation, the sensor should be mounted on metal bracket and use low or medium illumination. |

## 4.2 Reference code comparison

With the reference code comparison, the code reader compares the actual decoding result with a stored reference code – the exact code content is compared.

Set the options for teaching-in a new reference code in the configuration tool Ident Studio V2 under **Settings > Barcode comparison.**

## 4.3 Ident Studio V2

The configuration tool Ident Studio V2 offers a graphical user interface for the configuration of the code reader via a PC. It can be used to easily configure the code reader in just a few steps (see chapter 8 "Starting up the device – Ident Studio V2 tool").

# 5 Mounting

The code reader can be mounted in the following ways:

- Mounting using two M3 mounting threads on the bottom of the device
- Mounting on the BT DCR 100 mounting bracket

## 5.1 Determining the mounting position of the code

### 5.1.1 Selecting a mounting location

| | *NOTICE* |
|---|---|
| ⓘ | The size of the code module influences the maximum reading distance and the width of the reading field. Therefore, when selecting a mounting location and/or the suitable code label, take into account the different reading characteristics of the code reader with various code modules. |

| | *NOTICE* |
|---|---|
| ⓘ | **Observe when choosing the mounting location!** <br> ↳ Make certain that the required environmental conditions (humidity, temperature) are maintained. <br> ↳ Avoid possible soiling of the reading window due to liquids, abrasion by boxes, or packaging material residues. <br> ↳ Ensure the lowest possible chance of damage to the code reader through mechanical collision or jammed parts. <br> ↳ Avoid possible ambient light influence (no direct sunlight). |

Take the following factors into account when selecting the correct mounting location:

- Size, orientation, and position tolerance of the bar codes or Data Matrix codes on the objects to be scanned.
- The reading distance resulting from the code size and code type.
- Time of data output.
  Position the device in such a way that, taking into consideration the time required for data processing and the conveyor belt speed, there is sufficient time to e.g. initiate sorting operations on the basis of the read data.
- The permissible line lengths between code reader and host system depending on which interface is used.
- Visibility of the control panel and access to the trigger buttons and focus adjustment.
- No direct sunlight and/or no strong ambient light on the code that is to be read.

Observe the following criteria for the best read results:

- The reading distance is located in the middle part of the read field.
- There is no direct sunlight and protect against ambient light effects.
- The code labels are of good print quality and have good contrast ratios.
- Do not use glossy labels.
- The bar code or Data Matrix code is moved past the reading window with a tilt angle or angle of inclination of 10° … 20°.

### 5.1.2 Avoiding total reflection

If the illumination light of the code reader is directly incident on the surface of the code at an angle of 90°, total reflection occurs. The illumination light directly reflected by the code label may overload the code reader and thereby result in non-reading of the code.

↳ Mount the code reader with a recommended tilt angle or angle of inclination of ±10° … 20° from vertical.

### 5.1.3 Reading distance

In general, the reading field of the code reader becomes larger with increasing reading distance. This also results in a decrease in the resolution.

The following graphics show typical reading distances for the individual optics models of the code reader.

| ℹ️ | **NOTICE** |
|---|---|
| | Code reading while in motion is dependent on the code type, code size, cell or modulus size of the code and the position of the code in the reading field of the code reader. |

| ℹ️ | **NOTICE** |
|---|---|
| | Please note that the actual reading distances are also influenced by factors such as labeling material, printing quality, reading angle, printing contrast etc., and may thus deviate from the reading distances specified here. |



| | | | |
|---|---|---|---|
| A | 0.254 mm (10 mil) / 2D codes | LR | Long range |
| B | 0.33 mm (13 mil) / 1D codes | | |
| C | 0.127 mm (5 mil) / 1D codes | | |
| D | 0.18 mm (7 mil) / 2D codes | SR | Standard range |
| E | 0.33 mm (13 mil) / 1D codes | | |
| F | 0.127 mm (5 mil) / 1D codes | | |
| G | 0.18 mm (7 mil) / 2D codes | HD | High density |
| H | 0.33 mm (13 mil) / 1D codes | | |
| I | 0.08 mm (3 mil) / 1D codes | | |
| K | 0.18 mm (7 mil) / 2D codes | HHD | Hyper high density |
| L | 0.08 mm (3 mil) / 1D codes | | |
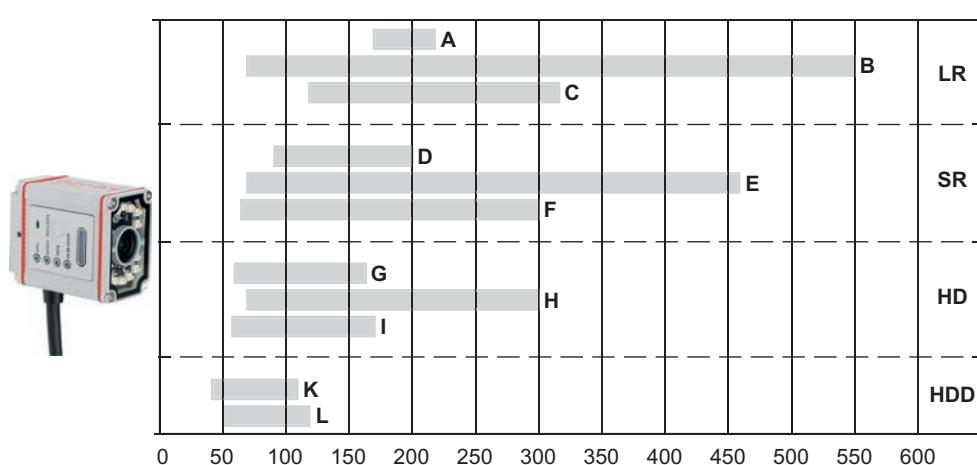
Fig. 5.1: Typical reading distances

**Adjusting the focus**

Adjust the focus mode to achieve optimal image clarity.

ꙮ Release the locking screw (2).

ꙮ Adjust the focus with the adjustment screw (1) using a screwdriver.

ꙮ Once the desired focus is set, tighten the locking screw (2) using a 1.27 mm hex wrench. The maximum tightening torque is 0.05 Nm.

1       Screw for focus adjustment
2       Locking screw for focus adjustment

Fig. 5.2:       Adjusting the focus

| ⓘ | **NOTICE** |
|---|---|
| | **Risk of property damage due to improper adjustment!** |
| | Improper adjustment might result in damage of the screws or the focus mechanism. |
| | ↳ Make sure the locking screw is released before adjusting the focus to prevent damage to the focus mechanism. |
| | ↳ Do not apply excessive force to the adjustment screw when it reaches its mechanical limit, as this may damage the screw or the mechanism. |

### 5.1.4   Field of view

The following table shows the relationship between the working distance and the resulting field of view for the optics models of the sensor. The working distance is the path from the front edge of the sensor to the code. Use the data to calculate the typical field of view (FOV) for your application.
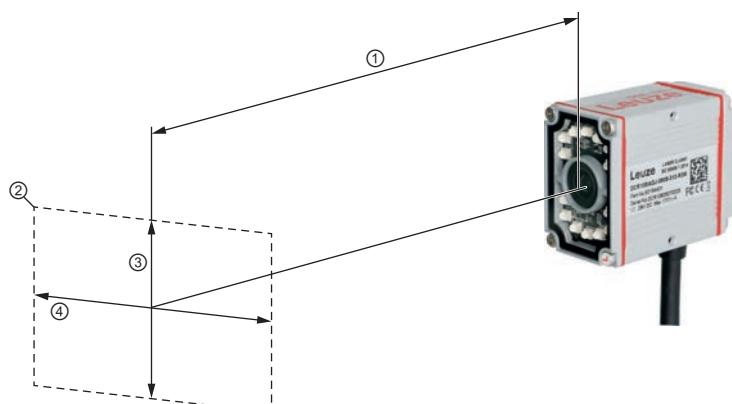


1       Code reader distance [mm]
2       Reading field
3       Reading field height [mm]
4       Reading field width [mm]

Fig. 5.3:       Field of view

Tab. 5.1:      Typical field of view size

| Code reader distance [mm] | Reading field height [mm] | Reading field width [mm] |
|---|---|---|
| 100 | 52 | 61 |
| 200 | 103 | 122 |
| 300 | 155 | 183 |
| 400 | 206 | 244 |
| 500 | 257 | 306 |

## 5.2      Mounting the code reader

### 5.2.1      Mounting with M3 fastening screws

     ↳ Mount the device on the system with M3 fastening screws (not included in scope of delivery).
Max. tightening torque of the fastening screws: 0.6 Nm

### 5.2.2      Mounting with the BT DCR 100 mounting bracket

Mounting with a BT DCR 100 mounting bracket is intended for wall mounting.

     ↳ Mount the device to the mounting bracket with M3 fastening screws (not included in the scope of delivery).
Max. tightening torque of the fastening screws: 0.6 Nm

Location and thread depth of the mounting thread: see chapter 13.4 "Dimensioned drawing".

# 6 Electrical connection

| | ⚠ **CAUTION** |
|---|---|
| ⚠ | **Safety notices!**<br>✦ Before connecting the device, be sure that the supply voltage agrees with the value printed on the name plate.<br>✦ Only allow competent persons to perform the electrical connection.<br>✦ Make sure that the functional earth (FE) is connected correctly. Fault-free operation is only guaranteed if the functional earth is connected properly.<br>✦ If faults cannot be rectified, take the device out of operation. Protect the device from accidentally being started. |

| | *NOTICE* |
|---|---|
| ! | **Shielding connection!**<br>The shielding is connected via the M12 connector housing. |

| | *NOTICE* |
|---|---|
| i | Make sure all cable connections are connected strictly according to the specified pinout.<br>Leuze electronic GmbH & Co. KG is not liable for any damage to the product resulting from improper wiring, installation, or use. |

| | *NOTICE* |
|---|---|
| i | Ready-made cables are available for all connections. |

## 6.1 Overview

There are two types of connection for DCR 100i series:

- Single connector (DCR1xxiADJ-0608-**3**12-R3M)
- Dual connectors (DCR1xxiADJ-0608-**4**12-R3M)

### 6.1.1 Single connector type

Connector DCR1xxiADJ-0608-**3**12-R3M
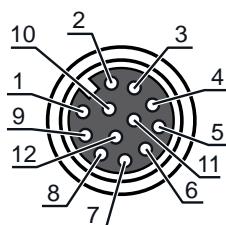


Fig. 6.1:     PWR / SWIO / HOST

12-pin M12 female connector (A-coded) for:

- Supply voltage
- Switching inputs/outputs
- RS 232 interface and Ethernet connection

**Voltage supply, RS 232 interface, switching inputs/outputs and Ethernet network**

The power supply (12 V–28 V DC) is connected via the PWR / SWIO M12 plug.

The RS 232 and Ethernet interfaces share the same M12 cable on the PWR / SWIO / HOST connector.

Tab. 6.1:    PWR / SWIO / HOST pin assignment

| Pin | Designation | Assignment |
|---|---|---|
| 1 | RS232 TxD | RS 232: TxD signal |
| 2 | OUTPUT 1 | Digital switching output 1 (No read) |
| 3 | SHIELD GND | Functional earth |
| 4 | INPUT | Digital switching input 1 (Trigger) |
| 5 | OUTPUT 2 | Digital switching output 2 (Good read) |
| 6 | GND | Negative supply voltage (0 V DC) |
| 7 | RS232 RxD | RS 232: RxD signal |
| 8 | TX+ | TX+ signal |
| 9 | TX- | TX- signal |
| 10 | V+ | +12 … +28 V DC supply voltage |
| 11 | RX- | RX- signal |
| 12 | RX+ | RX+ signal |
| Thread (M12 connector) | FE (functional earth) | Connection cable shield.<br><br>The shield of the connection cable is on the thread of the M12 connector. |

| *NOTICE* |
|---|
| This type must be used only with the KY DCR 108 interconnection cable (Part. no. 50154484) recommended in the accessories (see chapter 14.3 "Cables accessories"). |

| *NOTICE* |
|---|
| Make sure all cable connections are connected strictly according to the specified pinout.<br><br>Leuze electronic GmbH & Co. KG is not liable for any damage to the product resulting from improper wiring, installation, or use. |

**Switching input/output**

The code reader features three switching inputs/outputs: Input, Output 1 and Output 2

| *NOTICE* |
|---|
| The function of switching input or switching output is set by default and not programmable. |

The three switching inputs/outputs are set by default as follows:

- Input
  Trigger switching input
- Output 1
  NO READ switching output
- Output 2
  GOOD READ switching output
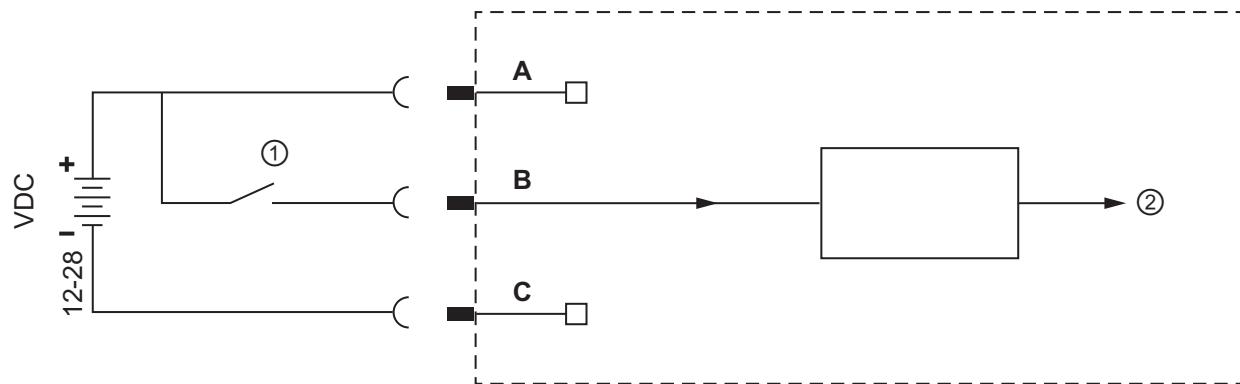
### Function as switching input (PNP, relay)



1    Switching input max. 15 mA
2    Switching input to controller
A    VIN (Red)
B    Trigger (White)
C    GNDIN (Black)

Fig. 6.2:        Switching input PNP connection

> **NOTICE**
>
> **Maximum input current!**
> The input current of the respective switching input is maximum 15 mA.

### Function as switching input (NPN)
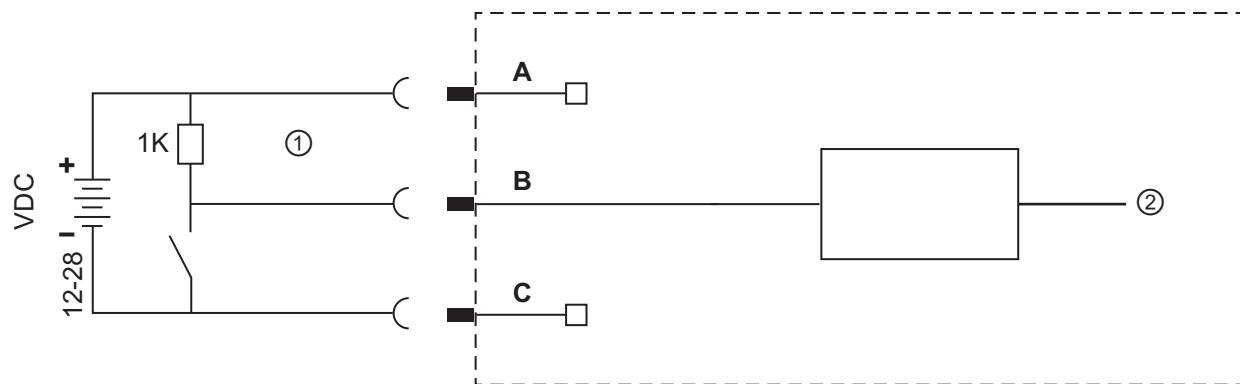


1    Switching input max. 10 mA
2    Switching input to controller
A    VIN (Red)
B    Trigger (White)
C    GNDIN (Black)

Fig. 6.3:        Switching input NPN connection

> **NOTICE**
>
> **Maximum input current!**
> The input current of the respective switching input is maximum 10 mA.

**Function as switching output (NPN)**
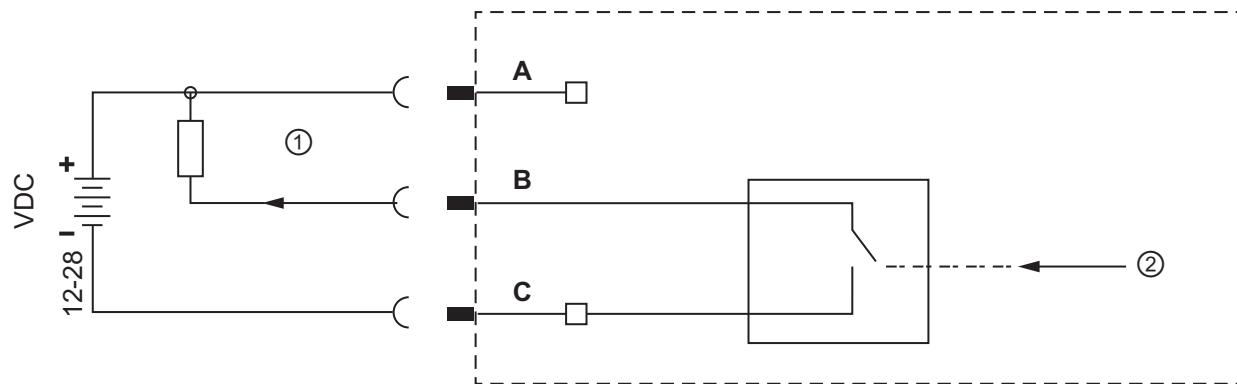


1      Switching output max. 50 mA

2      Switching output from controller

A      VIN (Red)

B      Good read (Gray) / No read (Brown)

C      GNDIN (Black)

Fig. 6.4:      Switching outputs

| | *NOTICE* |
|---|---|
| ! | **Maximum loading of the switching outputs!** |
| | Do not load the respective switching output of the code reader with more than 50 mA at +12 V … +28 V DC in normal operation. |
| | Each switching output is not short-circuit proof and not protected against polarity reversal. |

### 6.1.2 Dual connectors type

Dual connectors DCR1xxiADJ-0608-**4**12-R3M
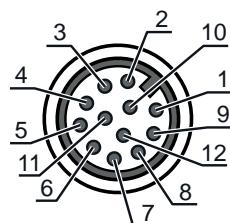


Fig. 6.5:      PWR / SWIO

12-pin M12 male connector (A-coded) for:

• Supply voltage

• Switching inputs/outputs
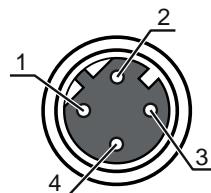
• RS 232 interface



Fig. 6.6:      HOST

4-pin M12 female connector (D-coded) for:

• Ethernet connection

**Voltage supply, RS 232 interface, switching inputs/outputs**

The power supply (12 V–28 V DC) is connected via the PWR / SWIO M12 plug.

The RS 232 interfaces share the same M12 cable on the PWR / SWIO connector.

Tab. 6.2:    PWR / SWIO pin assignment

| Pin | Designation | Assignment |
|---|---|---|
| 1 | V+ | +12 … +28 V DC supply voltage |
| 2 | GND | Negative supply voltage (0 V DC) |
| 3 | INPUT | Digital switching input 1 (Trigger) |
| 4 | OUTPUT 1 | Digital switching output 1 (Good read) |
| 5 | SHIELD GND | Functional earth |
| 6 | n.c. | Not connected |
| 7 | n.c. | Not connected |
| 8 | n.c. | Not connected |
| 9 | RS232 RxD | RS 232: RxD signal |
| 10 | RS232 TxD | RS 232: TxD signal |
| 11 | OUTPUT 2 | Digital switching output 2 (No read) |
| 12 | n.c. | Not connected |
| Thread (M12 connector) | FE (functional earth) | Connection cable shield. The shield of the connection cable is on the thread of the M12 connector. |

| | ***NOTICE*** |
|---|---|
| **i** | Make sure all cable connections are connected strictly according to the specified pinout. Leuze electronic GmbH & Co. KG is not liable for any damage to the product resulting from improper wiring, installation, or use. |

**Switching input/output**

The code reader features three switching inputs/outputs: Input, Output 1 and Output 2

| | ***NOTICE*** |
|---|---|
| **i** | The function of switching input or switching output is set by default and not programmable. |

The three switching inputs/outputs are set by default as follows:

- Input
  Trigger switching input
- Output 1
  GOOD READ switching output
- Output 2
  NO READ switching output
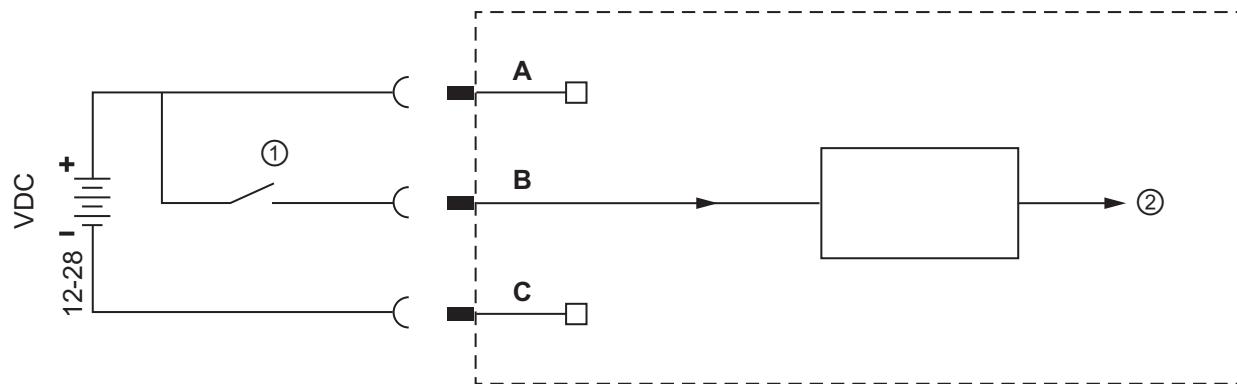
## Function as switching input (PNP, relay)



1    Switching input max. 15 mA
2    Switching input to controller
A    VIN (Brown)
B    Trigger (White)
C    GNDIN (Blue)

Fig. 6.7:      Switching input PNP connection

| NOTICE |
| --- |
| **Maximum input current!** |
| The input current of the respective switching input is maximum 15 mA. |

## Function as switching input (NPN)
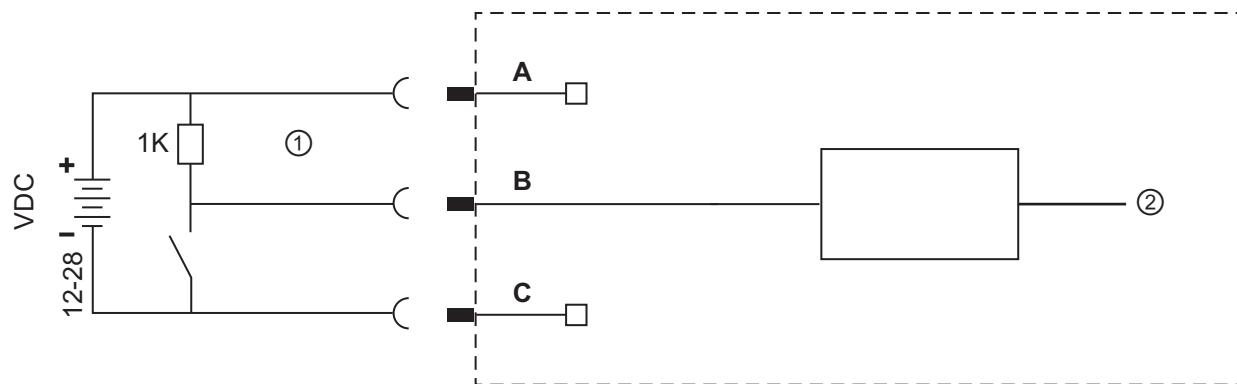


1    Switching input max. 10 mA
2    Switching input to controller
A    VIN (Brown)
B    Trigger (White)
C    GNDIN (Blue)

Fig. 6.8:      Switching input NPN connection

| NOTICE |
| --- |
| **Maximum input current!** |
| The input current of the respective switching input is maximum 10 mA. |

### Function as switching output (Output)
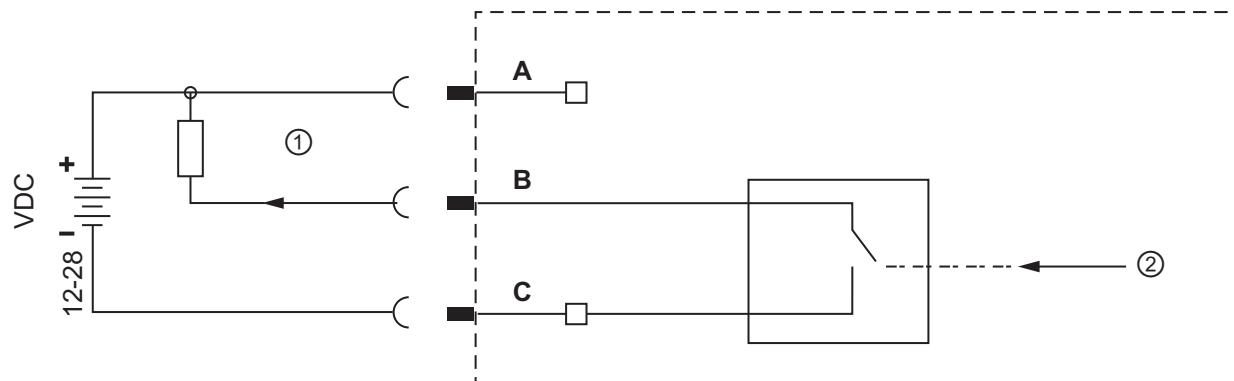


1     Switching output max. 50 mA
2     Switching output from controller
A     VIN (Brown)
B     Good read (Green) / No read (Gray/pink)
C     GNDIN (Blue)

Fig. 6.9:     Switching outputs

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**NOTICE**

**Maximum loading of the switching outputs!**

Do not load the respective switching output of the code reader with more than 50 mA at +12 V … +28 V DC in normal operation.

Each switching output is not short-circuit proof.

---

### Stand-alone operation in Ethernet network

The code reader is operated as a "stand-alone" single device in an Ethernet star topology with individual IP address. The host interface of the superior system is connected to the HOST M12 socket.

HOST – Host input / Ethernet 4-pin M12 socket (D-coded) for connecting to HOST
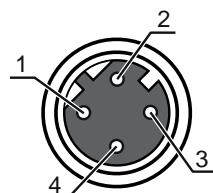


Fig. 6.10:     HOST connection

Tab. 6.3:     HOST pin assignment

| Pin/terminal | Designation | Assignment |
|---|---|---|
| 1 | TD+ | Transmit Data + |
| 2 | RD+ | Receive Data + |
| 3 | TD- | Transmit Data - |
| 4 | RD- | Receive Data - |
| Thread (M12 socket) | FE (functional earth) | Connection cable shield. The shield of the connection cable is on the thread of the M12 socket. |

---

**NOTICE**

**Use ready-made cables!**

Ready-made cables are available for all connections (see chapter 14.3 "Cables accessories").

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## 6.2 Ethernet star topology

The code reader is operated as a "stand-alone" single device in an Ethernet star topology with individual IP address.

- The code reader is designed as an Ethernet device with a standard baud rate of 10/100 Mbit.
- A fixed MAC address is assigned to each device by the manufacturer; this address cannot be changed.
- The device automatically supports the transmission rates of 10 Mbit/s (10BASE T) and 100 Mbit/s (10BASE TX), as well as auto-negotiation and auto-crossover.
- The device supports the following protocols and services:
  - TCP/IP (client/server)
  - UDP
  - DHCP
  - PING
- For communication with the superior host system, the corresponding TCP/IP protocol (client/server mode) must be selected.
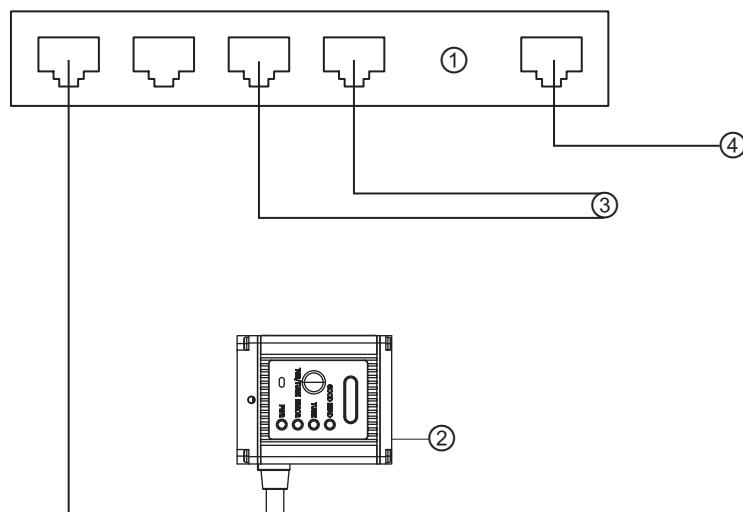


| 1 | Ethernet switch |
|---|---|
| 2 | Code reader of the DCR 100i series |
| 3 | Other network participants |
| 4 | Host interface – PC/control |

Fig. 6.11:     Ethernet star topology

**Ethernet cable assignment**
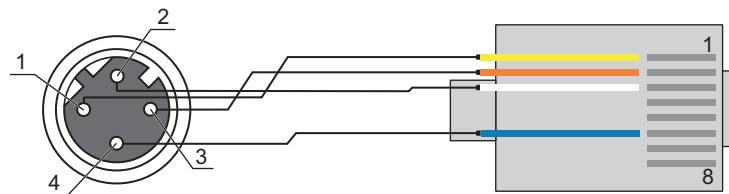


Fig. 6.12:      HOST to RJ45 cable assignments

Designed as shielded cable, max. 100 m

Tab. 6.4:      Pin to cable assignment RJ45

| Pin (M12) | Designation | Pin/core color (RJ45) |
|---|---|---|
| 1 | TD+ | 1/yellow |
| 2 | RD+ | 3/white |
| 3 | TD- | 2/orange |
| 4 | RD- | 6/blue |

| | *NOTICE* |
|---|---|
| 🛈 | **Self-configured cables with Ethernet interface!**<br>↳ Ensure adequate shielding.<br>↳ The entire interconnection cable must be shielded and earthed.<br>↳ The RD+/RD- and TD+/TD- wires must be stranded in pairs.<br>↳ Use at least a CAT 5 cable for the connection. |

## 6.3    Cable lengths and shielding

Observe the maximum cable lengths and the shielding types:

| Connection | Interface | Max. cable length | Shielding |
|---|---|---|---|
| DCR 100i host | RS 232 | 10 m<br>1200 m<br>(dependent on baud rate) | Shielding absolutely necessary |
| Network from the first DCR 100i to the last network participant | Ethernet | Max. segment length: 100 m for 100BASE-TX twisted pair (min. CAT 5) | Shielding absolutely necessary |
| Switching input | | 10 m | Not necessary |
| Switching output | | 10 m | Not necessary |
| DCR 100i power supply unit | | 30 m | Not necessary |

# 7 Starting up the device – Basic configuration

## 7.1 Measures to be performed prior to the initial commissioning

| | *NOTICE* |
|---|---|
| | ✋ Observe the notices for device arrangement. |
| | ✋ If possible, always trigger the code reader with the aid of commands or an external signal transmitter (e.g. photoelectric sensor/diffuse sensor). |
| | ⇨ Only then can you be certain whether a code has been read (code contents are transmitted) or not (the "NO READ" character is transmitted at the end of the reading gate). |
| | ✋ Before commissioning, familiarize yourself with the operation and configuration of the device. |
| | ✋ Before connecting the supply voltage, recheck all connections and make sure that they have been properly made. |

| | *NOTICE* |
|---|---|
| | Make sure all cable connections are connected strictly according to the specified pinout. |
| | Leuze electronic GmbH & Co. KG is not liable for any damage to the product resulting from improper wiring, installation, or use. |

| | *NOTICE* |
|---|---|
| | Failure to read an F-grade code does not imply that the code reader is faulty or underperforming. |
| | Do **not** use F-grade codes for acceptance testing and operation. Make sure that barcodes are printed in compliance with the relevant ISO or industry quality standard. |

## 7.2 Starting the device

✋ Connect the 18 V … 28 V DC supply voltage.

⇨ After applying the supply voltage, the device operates with the factory settings:

✋ Start a reading by pressing the trigger button on the device.

⇨ The integrated illumination becomes visible.

If a code is detected, it is output via the interfaces.

Protocol of the RS 232 interface:

- **<Code data><CR><LF>**
  (9600 baud, 8 data bits, no parity, 1 stop bit)

With the factory settings, the device can decode commonly used 1D and 2D code types. Additional code types can be configured as required.

| | *NOTICE* |
|---|---|
| | Deviations from these settings must be set via the Ident Studio V2 tool. |

| | *NOTICE* |
|---|---|
| | For information on how to proceed in the event of problems during commissioning of the devices see chapter 11 "Diagnostics and troubleshooting". |
| | If a problem occurs that cannot be rectified even after checking all electrical connections and settings on the devices and on the host, contact your responsible Leuze subsidiary or Leuze customer service (see chapter 12 "Service and support"). |

## 7.3 Setting the communication parameters

With communication parameters, you determine how data is exchanged between device and host system, monitor PCs etc.

### 7.3.1 Manually setting the IP address

Set the IP address manually if your system does not include a DHCP server or if the IP addresses of the devices are to be set permanently.

Factory settings for the network address of the code readers of the DCR 100i series:

- IP address: 192.168.060.101
- Subnet mask: 255.255.255.0

**Setting the IP address with Ident Studio V2**

✤ Select the option to define the IP address in the Ident Studio V2 tool:
   **Connection > Local IP > Static IP**

| | *NOTICE* |
|---|---|
| **(!)** | **The device cannot be accessed if the IP address is incorrect!**<br><br>✤ Make sure that the correct IP address is entered. The device can otherwise no longer be accessed. |

| | *NOTICE* |
|---|---|
| **(!)** | **Loss of access!**<br><br>If the IP address is lost or forgotten, the device must be reset to factory settings to regain access.<br><br>✤ After changing the IP address, record the new IP address. |

### 7.3.2 Automatically setting the IP address

Set the IP address automatically if a DHCP server assigns the IP addresses in the system.

✤ Select the option to obtain the IP address automatically in the Ident Studio V2 tool:
   **Connection > Local IP > DHCP**

### 7.3.3 Ethernet host communication

You can configure the connections to an external host system via the Ethernet host communication.

You can use both the UDP protocol as well as the TCP/IP protocol – in either client or in server mode. Both protocols can be activated simultaneously and used in parallel.

- The connection-free UDP protocol is used primarily to transfer process data to the host (monitor operation).
- The connection-oriented TCP/IP protocol can also be used to transfer commands from the host to the device. With this connection, the data is backed up by the TCP/IP protocol itself.
- If you would like to use the TCP/IP protocol, you must also define whether the device is to operate as a TCP client or as a TCP server.

**TCP/IP**

✤ Activate the TCP/IP protocol.

✤ Set the TCP/IP mode of the device.

   ⇨ In TCP client mode, the device actively establishes the connection to the superior host system, e.g., PC/control as server. The device requires from the user the IP address of the server (host system) and the port number on which the server (host system) accepts a connection. In this case, the device determines when and with whom a connection is established.

   ⇨ In TCP server mode, the superior host system (PC/control) actively establishes the connection and the connected device waits for the connection to be set up.
   The TCP/IP stack must be informed by the user as to the local port of the device (port number) on which connection requests from a client application (host system) are to be received.
   If there is a connection request and a connection is established by the superior host system (PC/control as client), the device – in server mode – accepts the connection. Data can then be sent and received.

    ↳ With a device as TCP client, set the following values:

        ⇨ IP address of the TCP server, normally the IP address of the control or the host computer

        ⇨ Port number of the TCP server

        ⇨ Timeout for the wait time for an answer from the server

        ⇨ Repetition time for renewed communication attempt following a timeout

    ↳ With a device as TCP server, set the following values:

        ⇨ Port number for the communication of the device with the TCP clients

The corresponding adjustment options can be found in the Ident Studio V2 tool:
**Connection > Protocol**

### 7.3.4 RS 232 communication

The code reader can operate via RS 232 communication if the pins were connected.

The device operates as follows with the factory settings:

- Activation of reading via trigger button. The integrated illumination becomes visible.

- If a code is detected, it is output via the RS 232 interface according to the following protocol.
  **<Code data><CR><LF>**
  (9600 baud, 8 data bits, no parity, 1 stop bit)

## 7.4 Configuration via configuration codes

You can make configuration changes with the help of printed configuration codes (see chapter 16.3 "Configuration via configuration codes").

## 7.5 Performing further settings

### 7.5.1 Optimizing reading performance

Optimize the reading performance of the code reader using the following settings in the Ident Studio V2 tool:

- *Decoding table*
  Limiting of the code types being searched for and the number of digits
  The adjustment options can be found in the Ident Studio V2 tool: **Settings > Barcode**

- *Exposure time*
  A short exposure time enables high object speeds. Because the image brightness is thereby reduced, it may be necessary to adjust the signal gain. Image noise increases as a result, however.
  The adjustment options can be found in the Ident Studio V2 tool: **Image > Exposure**

- *Decoding area*
  Define a region of interest (ROI) to restrict coding to a single part of the image. If no region of interest is defined, the complete image is defined as the region of interest.
  The adjustment options can be found in the Ident Studio V2 tool: **Settings > Scan > Decode area X & Y**

- *Max. decoding time*
  Define the maximum decoding time to limit the execution time of the code search algorithm.
  The adjustment options can be found in the Ident Studio V2 tool: **Settings > Scan > Max. Decode Time**

- *Camera operating mode*
  Select the *Single trigger mode* camera operating mode for fast complete decoding.
  The adjustment options can be found in the Ident Studio V2 tool: **Settings > Scan > Scan mode**

# 8 Starting up the device – Ident Studio V2 tool

The code readers of the DCR 100i series can be operated and configured via the Ethernet service interface with the integrated Ident Studio V2 tool.

| | *NOTICE* |
|---|---|
| ℹ️ | The Ident Studio V2 tool is offered in the following languages: <br> English |

## 8.1 System requirements

To use the Ident Studio V2 tool, you need a PC or laptop with the following specifications:

Tab. 8.1: System requirements for the Ident Studio V2 tool

| MS Windows | • Win 7/8/10/11 (64 bit) |
|---|---|
| | • Win 7/8 (32 bit) |

| | *NOTICE* |
|---|---|
| ℹ️ | ↳ Regularly update the operating system. <br> ↳ Install the current Windows Service Packs. |

## 8.2 Start Ident Studio V2 tool

✓ Prerequisite: IP address and subnet mask for the LAN connection with the device are set correctly.

↳ Connect the supply voltage to the device.

↳ Connect the HOST interface of the device to the PC. The connection to the HOST interface of the device is made via the LAN port of the PC.

↳ Start the Ident Studio V2 tool:
**192.168.60.101** is the standard Leuze IP address for communication with code readers of the DCR 100i series.

The PC displays the Ident Studio V2 start page with the connected barcode IP address.

| | *NOTICE* |
|---|---|
| ℹ️ | The process information may be displayed with a time delay depending on the current processing speed. |
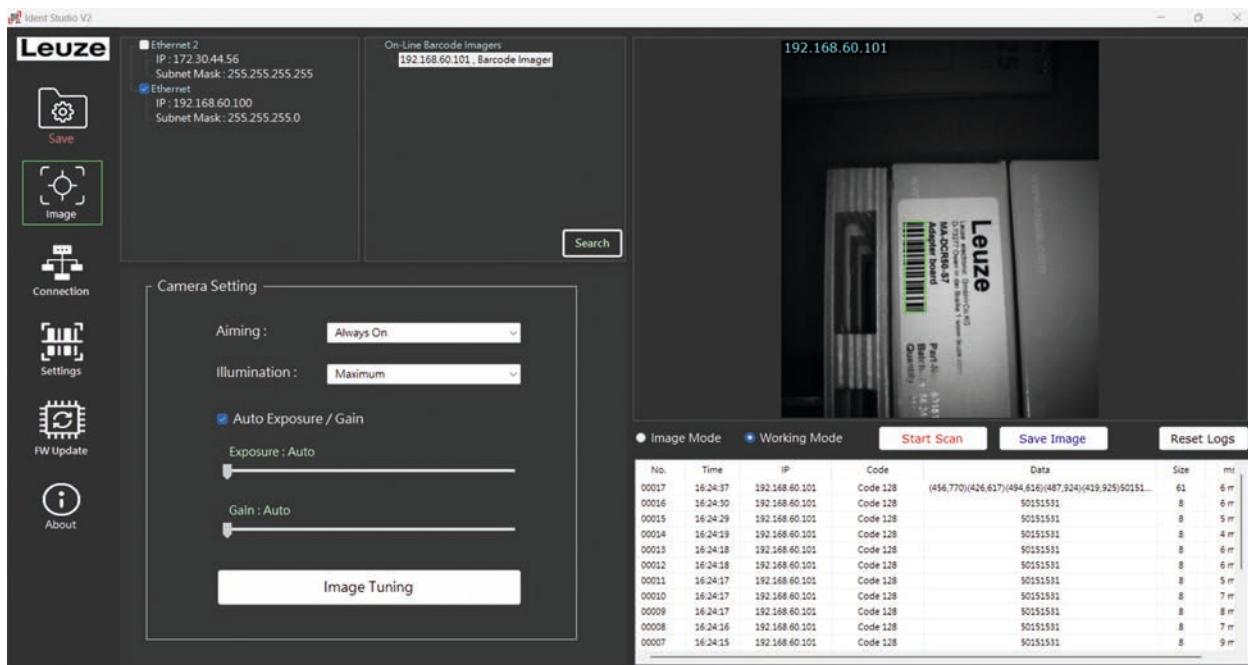
Fig. 8.1:       Start page of the Ident Studio V2 tool

## 8.3     Short description of the Ident Studio V2 tool

The menus and setting tab of the Ident Studio V2 tool are intuitive to operate. The start page of the Ident Studio V2 tool displays the current process information.

| | **NOTICE** |
|---|---|
| ⓘ | All configurations should be performed in the Ident Studio V2 tool first. Afterwards, use the hardware interface only to trigger general functions (e.g., "Start Read"). |

### 8.3.1     Menu options of the Ident Studio V2 tool

The Ident Studio V2 tool offers the following menu functions:

- **Save**
  - Save current configuration and apply to the code reader
- **Image**
  - Aiming laser
  - Illumination level
  - Illumination LED
  - Exposure and gain adjustment
- **Connection**
  - IP configuration
  - Protocol setting
  - RS 232
- **Settings**
  - Barcode selection
  - Code reading setting
  - Input and output setting
  - Barcode comparison function
- **FW Update**
  - Firmware update

- **About**
  - Information about the software

### 8.3.2 Device configuration mode

There are two configuration modes in the Ident Studio V2 tool. The mode selector is located at the bottom of the live-view window.

- Working mode
- Image mode
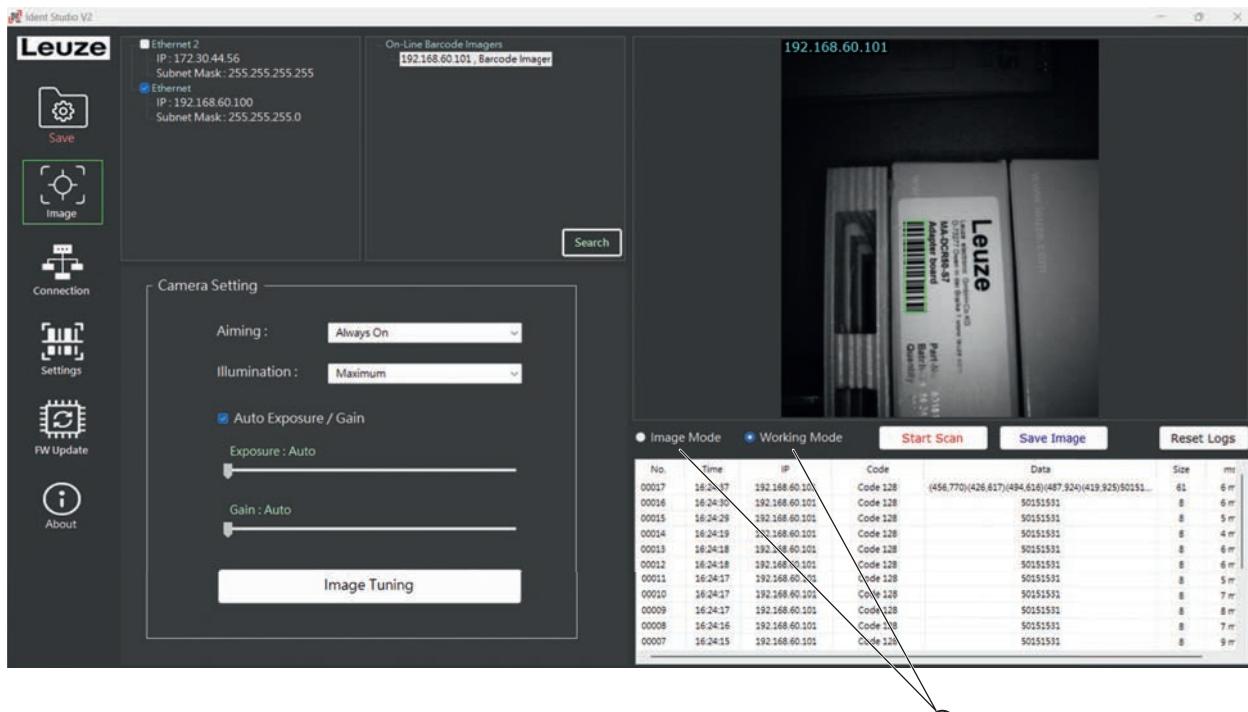


1      Selection of configuration mode

Fig. 8.2:      Selection of device configuration mode

**Working mode**

In working mode, it simulates the device's actual operational behavior. This includes actual trigger events, scan mode under conditions representative of how the reader will be used in actual application.

**Image mode**

Image mode is optimized for fine-tuning the camera settings – such as exposure, gain, illumination, focus and mounting angle without considering scanning triggers. This mode is ideal for adjusting image parameters before switching to working mode.

# 9 Interfaces – Communication

Commands can be used to send commands directly to the code reader for control and configuration. The following transmission options are available for the commands:

- Online commands via the RS 232 interface and Ethernet

> **NOTICE**
>
> All configurations should be performed in the Ident Studio V2 tool first. Afterwards, use the hardware interface only to trigger general functions (e.g., "Start Read").

## 9.1 Configuration command architecture

The device only accepts the configuration commands for changing and saving configuration settings in the following format.

Tab. 9.1: Command format

| Data length | Transmitting terminal | Identity code | Command | Data | High-byte checksum | Low-byte checksum |
|---|---|---|---|---|---|---|
| 1 byte | 1 byte | 1 byte | 1 byte | Max. 32 bytes | 1 byte | 1 byte |

Meaning/content of the command components:

| | |
|---|---|
| Data length | Without the checksum length<br><br>• Minimum: 5 bytes<br><br>• Maximum: 36 bytes |
| Transmitting terminal | • 57 (HEX): the end terminal transmits data to the decoding device.<br><br>• 52 (HEX): the decoding device transmits data to the end terminal. |
| Identity code | Command identity |
| Command | Setting / read command |
| Data | Configuration data |
| Checksum calculation | 0x10000 – [Data length] – [Transmitting terminal] – [Identity code] – [Command] – [D1 + D2 +D3 + …] |

## 9.2 Supported commands

### 9.2.1 Symbology

Tab. 9.2: Symbology

| Function | | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|---|
| | | | *1 Data length | | | | | *2 Refer to checksum calculation | |
| UPC/EAN add-on codes | Activate | | 05 | 57 | B0 | 02 | 0E | FE | E4 |
| | Deactivate | | 05 | 57 | B0 | 02 | 0D | FE | E5 |
| UPC-A | Activate | | 05 | 57 | B1 | 01 | 0E | FE | E4 |
| | Deactivate | | 05 | 57 | B1 | 01 | 0D | FE | E5 |
| | Transmit first character | Activate | 05 | 57 | B1 | 02 | 0E | FE | E3 |
| | | Deactivate | 05 | 57 | B1 | 02 | 0D | FE | E4 |
| | Check | Activate | 05 | 57 | B1 | 03 | 0E | FE | E2 |
| | | Deactivate | 05 | 57 | B1 | 03 | 0D | FE | E3 |
| | Convert EAN-13 | Activate | 05 | 57 | B1 | 04 | 0E | FE | E1 |
| | | Deactivate | 05 | 57 | B1 | 04 | 0D | FE | E2 |
| | 2-digit/5-digit add-on code | Activate | 05 | 57 | B1 | 05 | 0E | FE | E0 |
| | | Deactivate | 05 | 57 | B1 | 05 | 0D | FE | E1 |
| | Add-on code required | Activate | 05 | 57 | B1 | 06 | 0E | FE | DF |
| | | Deactivate | 05 | 57 | B1 | 06 | 0D | FE | E0 |
| | 2-digit add-on code | Activate | 05 | 57 | B1 | 07 | 0E | FE | DE |
| | | Deactivate | 05 | 57 | B1 | 07 | 0D | FE | DF |
| | 5-digit add-on code | Activate | 05 | 57 | B1 | 08 | 0E | FE | DD |
| | | Deactivate | 05 | 57 | B1 | 08 | 0D | FE | DE |
| | Prefix for UPC-A | | *1 | 57 | B1 | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for UPC-A | | *1 | 57 | B1 | 53 | 1 … 8 characters | *2 | *2 |

| Function | | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|---|
| | | | *1 Data length | | | | | *2 Refer to checksum cal-culation | |
| UPC-E | Activate | | 05 | 57 | B2 | 01 | 0E | FE | E3 |
| | Deactivate | | 05 | 57 | B2 | 01 | 0D | FE | E4 |
| | Transmit first char-acter | Activate | 05 | 57 | B2 | 02 | 0E | FE | E2 |
| | | Deactivate | 05 | 57 | B2 | 02 | 0D | FE | E3 |
| | Check | Activate | 05 | 57 | B2 | 03 | 0E | FE | E1 |
| | | Deactivate | 05 | 57 | B2 | 03 | 0D | FE | E2 |
| | Convert UPC-A | Activate | 05 | 57 | B2 | 04 | 0E | FE | E0 |
| | | Deactivate | 05 | 57 | B2 | 04 | 0D | FE | E1 |
| | 2-digit/5-digit add-on code | Activate | 05 | 57 | B2 | 05 | 0E | FE | DF |
| | | Deactivate | 05 | 57 | B2 | 05 | 0D | FE | E0 |
| | Add-on code re-quired | Activate | 05 | 57 | B2 | 06 | 0E | FE | DE |
| | | Deactivate | 05 | 57 | B2 | 06 | 0D | FE | DF |
| | 2-digit add-on code | Activate | 05 | 57 | B2 | 07 | 0E | FE | DD |
| | | Deactivate | 05 | 57 | B2 | 07 | 0D | FE | DE |
| | 5-digit add-on code | Activate | 05 | 57 | B2 | 08 | 0E | FE | DC |
| | | Deactivate | 05 | 57 | B2 | 08 | 0D | FE | DD |
| | Prefix for UPC-E | | *1 | 57 | B2 | 50 | 1 … 8 charac-ters | *2 | *2 |
| | Suffix for UPC-E | | *1 | 57 | B2 | 53 | 1 … 8 charac-ters | *2 | *2 |

| Function | | | Length (Hex) *1 Data length | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) *2 Refer to checksum cal-culation | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|---|
| EAN-8 | Activate | | 05 | 57 | B3 | 01 | 0E | FE | E2 |
| | Deactivate | | 05 | 57 | B3 | 01 | 0D | FE | E3 |
| | Transmit test data | Activate | 05 | 57 | B3 | 02 | 0E | FE | E1 |
| | | Deactivate | 05 | 57 | B3 | 02 | 0D | FE | E2 |
| | Convert EAN-13 | Activate | 05 | 57 | B3 | 03 | 0E | FE | E0 |
| | | Deactivate | 05 | 57 | B3 | 03 | 0D | FE | E1 |
| | 2-digit/5-digit add-on code | Activate | 05 | 57 | B3 | 04 | 0E | FE | DF |
| | | Deactivate | 05 | 57 | B3 | 04 | 0D | FE | E0 |
| | Add-on code re-quired | Activate | 05 | 57 | B3 | 05 | 0E | FE | DE |
| | | Deactivate | 05 | 57 | B3 | 05 | 0D | FE | DF |
| | 2-digit add-on code | Activate | 05 | 57 | B3 | 06 | 0E | FE | DD |
| | | Deactivate | 05 | 57 | B3 | 06 | 0D | FE | DE |
| | 5-digit add-on code | Activate | 05 | 57 | B3 | 07 | 0E | FE | DC |
| | | Deactivate | 05 | 57 | B3 | 07 | 0D | FE | DD |
| | Prefix for EAN-8 | | *1 | 57 | B3 | 50 | 1 … 8 charac-ters | *2 | *2 |
| | Suffix for EAN-8 | | *1 | 57 | B3 | 53 | 1 … 8 charac-ters | *2 | *2 |

| Function | | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|---|
| | | | *1 Data length | | | | | *2 Refer to checksum cal-culation | |
| EAN-13 | Activate | | 05 | 57 | B4 | 01 | 0E | FE | E1 |
| | Deactivate | | 05 | 57 | B4 | 01 | 0D | FE | E2 |
| | Transmit first char-acter | Activate | 05 | 57 | B4 | 02 | 0E | FE | E0 |
| | | Deactivate | 05 | 57 | B4 | 02 | 0D | FE | E1 |
| | Convert ISBN | Activate | 05 | 57 | B4 | 03 | 0E | FE | DF |
| | | Deactivate | 05 | 57 | B4 | 03 | 0D | FE | E0 |
| | Convert ISSN | Activate | 05 | 57 | B4 | 04 | 0E | FE | DE |
| | | Deactivate | 05 | 57 | B4 | 04 | 0D | FE | DF |
| | 2-digit/5-digit add-on code | Activate | 05 | 57 | B4 | 05 | 0E | FE | DD |
| | | Deactivate | 05 | 57 | B4 | 05 | 0D | FE | DE |
| | Add-on code re-quired | Activate | 05 | 57 | B4 | 06 | 0E | FE | DC |
| | | Deactivate | 05 | 57 | B4 | 06 | 0D | FE | DD |
| | 2-digit add-on code | Activate | 05 | 57 | B4 | 07 | 0E | FE | DB |
| | | Deactivate | 05 | 57 | B4 | 07 | 0D | FE | DC |
| | 5-digit add-on code | Activate | 05 | 57 | B4 | 08 | 0E | FE | DA |
| | | Deactivate | 05 | 57 | B4 | 08 | 0D | FE | DB |
| | Start with 979 und 192 re-quired | Activate | 05 | 57 | B4 | 09 | 0E | FE | D9 |
| | | Deactivate | 05 | 57 | B4 | 09 | 0D | FE | DA |
| | Prefix for EAN-13 | | *1 | 57 | B4 | 50 | 1 … 8 charac-ters | *2 | *2 |
| | Suffix for EAN-13 | | *1 | 57 | B4 | 53 | 1 … 8 charac-ters | *2 | *2 |

| Function | | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|---|
| | | | **\*1 Data length** | | | | | **\*2 Refer to checksum calculation** | |
| Code 128 | Activate | | 05 | 57 | B5 | 01 | 0E | FE | E0 |
| | Deactivate | | 05 | 57 | B5 | 01 | 0D | FE | E1 |
| | Read length | Each length | 05 | 57 | B5 | 10 | 00 | FE | DF |
| | | 1 discrete length | 05 | 57 | B5 | 11 | 1 byte of the length | \*2 | \*2 |
| | | 2 discrete lengths | 05 | 57 | B5 | 12 | 2 bytes of the length | \*2 | \*2 |
| | | Length in the field | 05 | 57 | B5 | 13 | 2 bytes of the length | \*2 | \*2 |
| | Prefix for Code 128 | | \*1 | 57 | B5 | 50 | 1 … 8 characters | \*2 | \*2 |
| | Suffix for Code 128 | | \*1 | 57 | B5 | 53 | 1 … 8 characters | \*2 | \*2 |

| Function | | Length (Hex) *1 Data length | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) *2 Refer to checksum calculation | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|
| Code 39 | Activate | 05 | 57 | B6 | 01 | 0E | FE | DF |
| | Deactivate | 05 | 57 | B6 | 01 | 0D | FE | E0 |
| | ASCII — Activate | 05 | 57 | B6 | 02 | 0E | FE | DE |
| | ASCII — Deactivate | 05 | 57 | B6 | 02 | 0D | FE | DF |
| | Transmit start / end character — Activate | 05 | 57 | B6 | 03 | 0E | FE | DD |
| | Transmit start / end character — Deactivate | 05 | 57 | B6 | 03 | 0D | FE | DE |
| | Do not check | 05 | 57 | B6 | 04 | 01 | FE | E9 |
| | Check and transmit | 05 | 57 | B6 | 04 | 02 | FE | E8 |
| | Check without transmitting | 05 | 57 | B6 | 04 | 03 | FE | E7 |
| | Prefix for Code 39 | 05 | 57 | B6 | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for Code 39 | 05 | 57 | B6 | 53 | 1 … 8 characters | *2 | *2 |
| | Read length — Each length | 05 | 57 | B6 | 10 | 00 | FE | DE |
| | Read length — 1 discrete length | 05 | 57 | B6 | 11 | 1 byte of the length | *2 | *2 |
| | Read length — 2 discrete lengths | 05 | 57 | B6 | 12 | 2 bytes of the length | *2 | *2 |
| | Read length — Length in the field | 05 | 57 | B6 | 13 | 2 bytes of the length | *2 | *2 |
| | Convert to Code 32 — Activate | 05 | 57 | B8 | 01 | 0E | FE | DD |
| | Convert to Code 32 — Deactivate | 05 | 57 | B8 | 01 | 0D | FE | DE |
| | Prefix for Code 32 | *1 | 57 | B8 | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for Code 32 | *1 | 57 | B8 | 53 | 1 … 8 characters | *2 | *2 |

| Function | | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|---|
| | | | *1 Data length | | | | | *2 Refer to checksum cal-culation | |
| Code 93 | Activate | | 05 | 57 | B7 | 01 | 0E | FE | DE |
| | Deactivate | | 05 | 57 | B7 | 01 | 0D | FE | DF |
| | Read length | Each length | 05 | 57 | B7 | 10 | 00 | FE | DD |
| | | 1 discrete length | 05 | 57 | B7 | 11 | 1 byte of the length | *2 | *2 |
| | | 2 discrete lengths | 06 | 57 | B7 | 12 | 2 bytes of the length | *2 | *2 |
| | | Length in the field | 06 | 57 | B7 | 13 | 2 bytes of the length | *2 | *2 |
| | Prefix for Code 93 | | *1 | 57 | B7 | 50 | 1 … 8 charac-ters | *2 | *2 |
| | Suffix for Code 93 | | *1 | 57 | B7 | 53 | 1 … 8 charac-ters | *2 | *2 |
| Code 32 | Activate | | 05 | 57 | B8 | 01 | 0E | FE | DD |
| | Deactivate | | 05 | 57 | B8 | 01 | 0D | FE | DE |

| Function | | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|---|
| | | | *1 Data length | | | | | *2 Refer to checksum cal-culation | |
| Code 11 | Activate | | 05 | 57 | B9 | 01 | 0E | FE | DC |
| | Deactivate | | 05 | 57 | B9 | 01 | 0D | FE | DD |
| | Verify check digit | Deactivate | 05 | 57 | B9 | 02 | 01 | FE | E8 |
| | | 1 check digit | 05 | 57 | B9 | 02 | 02 | FE | E7 |
| | | 2 check digits | 05 | 57 | B9 | 02 | 03 | FE | E6 |
| | Transmit check digit | Activate | 05 | 57 | B9 | 03 | 0E | FE | DA |
| | | Deactivate | 05 | 57 | B9 | 03 | 0D | FE | DB |
| | Read length | Each length | 05 | 57 | B9 | 10 | 00 | FE | DB |
| | | 1 discrete length | 05 | 57 | B9 | 11 | 1 byte of the length | *2 | *2 |
| | | 2 discrete lengths | 06 | 57 | B9 | 12 | 2 bytes of the length | *2 | *2 |
| | | Length in the field | 06 | 57 | B9 | 13 | 2 bytes of the length | *2 | *2 |
| | Prefix for Code 11 | | *1 | 57 | B9 | 50 | 1 … 8 charac-ters | *2 | *2 |
| | Suffix for Code 11 | | *1 | 57 | B9 | 53 | 1 … 8 charac-ters | *2 | *2 |

| Function | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|
| | | *1 Data length | | | | | *2 Refer to checksum calculation | |
| Codabar | Activate | 05 | 57 | BA | 01 | 0E | FE | DB |
| | Deactivate | 05 | 57 | BA | 01 | 0D | FE | DC |
| | Do not check | 05 | 57 | BA | 02 | 01 | FE | E7 |
| | Check and transmit | 05 | 57 | BA | 02 | 02 | FE | E6 |
| | Check without transmitting | 05 | 57 | BA | 02 | 03 | FE | E5 |
| | Transmit start / end character — Activate | 05 | 57 | BA | 03 | 0E | FE | D9 |
| | Transmit start / end character — Deactivate | 05 | 57 | BA | 03 | 0D | FE | DA |
| | Read length — Each length | 05 | 57 | BA | 10 | 00 | FE | DA |
| | Read length — 1 discrete length | 05 | 57 | BA | 11 | 1 byte of the length | *2 | *2 |
| | Read length — 2 discrete lengths | 06 | 57 | BA | 12 | 2 bytes of the length | *2 | *2 |
| | Read length — Length in the field | 06 | 57 | BA | 13 | 2 bytes of the length | *2 | *2 |
| | Prefix for Codabar | *1 | 57 | BA | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for Codabar | *1 | 57 | BA | 53 | 1 … 8 characters | *2 | *2 |

| Function | | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|---|
| | | | *1 Data length | | | | | *2 Refer to checksum calculation | |
| Plessey | Activate | | 05 | 57 | BB | 01 | 0E | FE | DA |
| | Deactivate | | 05 | 57 | BB | 01 | 0D | FE | DB |
| | Read length | Each length | 05 | 57 | BB | 10 | 00 | FE | D9 |
| | | 1 discrete length | 05 | 57 | BB | 11 | 1 byte of the length | *2 | *2 |
| | | 2 discrete lengths | 06 | 57 | BB | 12 | 2 bytes of the length | *2 | *2 |
| | | Length in the field | 06 | 57 | BB | 13 | 2 bytes of the length | *2 | *2 |
| | Prefix for Plessey | | *1 | 57 | BB | 50 | 1 … 8 charac-ters | *2 | *2 |
| | Suffix for Plessey | | *1 | 57 | BB | 53 | 1 … 8 charac-ters | *2 | *2 |

| Function | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|
| | | *1 Data length | | | | | *2 Refer to checksum calculation | |
| MSI Plessey | Activate | 05 | 57 | BC | 01 | 0E | FE | D9 |
| | Deactivate | 05 | 57 | BC | 01 | 0D | FE | DA |
| | Do not check | 05 | 57 | BC | 02 | 01 | FE | E5 |
| | Check Mod 10 | 05 | 57 | BC | 02 | 02 | FE | E4 |
| | Check Mod 10/10 | 05 | 57 | BC | 02 | 03 | FE | E3 |
| | Check Mod 11/10 | 05 | 57 | BC | 02 | 04 | FE | E2 |
| | Transmit test data — Activate | 05 | 57 | BC | 03 | 0E | FE | D7 |
| | Transmit test data — Deactivate | 05 | 57 | BC | 03 | 0D | FE | D8 |
| | Read length — Each length | 05 | 57 | BC | 10 | 00 | FE | D8 |
| | Read length — 1 discrete length | 05 | 57 | BC | 11 | 1 byte of the length | *2 | *2 |
| | Read length — 2 discrete lengths | 06 | 57 | BC | 12 | 2 bytes of the length | *2 | *2 |
| | Read length — Length in the field | 06 | 57 | BC | 13 | 2 bytes of the length | *2 | *2 |
| | Prefix for MSI Plessey | *1 | 57 | BC | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for MSI Plessey | *1 | 57 | BC | 53 | 1 … 8 characters | *2 | *2 |

| Function | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|
| | | *1 Data length | | | | | *2 Refer to checksum cal-culation | |
| 2/5 Inter-leaved | Activate | 05 | 57 | BD | 01 | 0E | FE | D8 |
| | Deactivate | 05 | 57 | BD | 01 | 0D | FE | D9 |
| | Do not check | 05 | 57 | BD | 02 | 01 | FE | E4 |
| | Check and transmit | 05 | 57 | BD | 02 | 02 | FE | E3 |
| | Check without transmit-ting | 05 | 57 | BD | 02 | 03 | FE | E2 |
| | Read length / Each length | 05 | 57 | BD | 10 | 00 | FE | D7 |
| | Read length / 1 discrete length | 05 | 57 | BD | 11 | 1 byte of the length | *2 | *2 |
| | Read length / 2 discrete lengths | 06 | 57 | BD | 12 | 2 bytes of the length | *2 | *2 |
| | Read length / Length in the field | 06 | 57 | BD | 13 | 2 bytes of the length | *2 | *2 |
| | Prefix for 2/5 Inter-leaved | *1 | 57 | BD | 50 | 1 … 8 charac-ters | *2 | *2 |
| | Suffix for 2/5 Inter-leaved | *1 | 57 | BD | 53 | 1 … 8 charac-ters | *2 | *2 |
| 2/5 IATA | Activate | 05 | 57 | BE | 01 | 0E | FE | D7 |
| | Deactivate | 05 | 57 | BE | 01 | 0D | FE | D8 |
| | Prefix for 2/5 IATA | *1 | 57 | BE | 50 | 0E | *2 | *2 |
| | Suffix for 2/5 IATA | *1 | 57 | BE | 53 | 0D | *2 | *2 |

| Function | | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|---|
| | | | *1 Data length | | | | | *2 Refer to checksum calculation | |
| 2/5 Hong Kong | Activate | | 05 | 57 | BF | 01 | 0E | FE | D6 |
| | Deactivate | | 05 | 57 | BF | 01 | 0D | FE | D7 |
| | Read length | Each length | 05 | 57 | BF | 10 | 00 | FE | D5 |
| | | 1 discrete length | 05 | 57 | BF | 11 | 1 byte of the length | *2 | *2 |
| | | 2 discrete lengths | 06 | 57 | BF | 12 | 2 bytes of the length | *2 | *2 |
| | | Length in the field | 06 | 57 | BF | 13 | 2 bytes of the length | *2 | *2 |
| | Prefix for 2/5 Hong Kong | | *1 | 57 | BF | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for 2/5 Hong Kong | | *1 | 57 | BF | 53 | 1 … 8 characters | *2 | *2 |
| 2/5 Straight | Activate | | 05 | 57 | D0 | 01 | 0E | FE | C5 |
| | Deactivate | | 05 | 57 | D0 | 01 | 0D | FE | C6 |
| | Prefix for 2/5 Straight | | *1 | 57 | D0 | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for 2/5 Straight | | *1 | 57 | D0 | 53 | 1 … 8 characters | *2 | *2 |
| Pharma Code | Activate | | 05 | 57 | D1 | 01 | 0E | FE | C4 |
| | Deactivate | | 05 | 57 | D1 | 01 | 0D | FE | C5 |
| | Prefix for Pharma Code | | *1 | 57 | D1 | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for Pharma Code | | *1 | 57 | D1 | 53 | 1 … 8 characters | *2 | *2 |

| Function | | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|---|
| | | | *1 Data length | | | | | *2 Refer to checksum calculation | |
| GS1 DataBar 14 | Activate | | 05 | 57 | D2 | 01 | 0E | FE | C3 |
| | Deactivate | | 05 | 57 | D2 | 01 | 0D | FE | C4 |
| | GS1 DataBar 14 Stacked | Activate | 05 | 57 | D2 | 02 | 0E | FE | C2 |
| | | Deactivate | 05 | 57 | D2 | 02 | 0D | FE | C3 |
| | AI (01) digit | Send | 05 | 57 | D2 | 03 | 0E | FE | C1 |
| | | Do not transmit | 05 | 57 | D2 | 03 | 0D | FE | C2 |
| | Prefix for GS1 DataBar 14 | | *1 | 57 | D2 | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for GS1 DataBar 14 | | *1 | 57 | D2 | 53 | 1 … 8 characters | *2 | *2 |
| GS1 DataBar Expanded | Activate | | 05 | 57 | D3 | 01 | 0E | FE | C2 |
| | Deactivate | | 05 | 57 | D3 | 01 | 0D | FE | C3 |
| | GS1 DataBar Expanded Stacked | Activate | 05 | 57 | D3 | 02 | 0E | FE | C1 |
| | | Deactivate | 05 | 57 | D3 | 02 | 0D | FE | C2 |
| | AI (01) digit | Send | 05 | 57 | D3 | 03 | 0E | FE | C0 |
| | | Do not transmit | 05 | 57 | D3 | 03 | 0D | FE | C1 |
| | Prefix for GS1 DataBar Expanded | | *1 | 57 | D3 | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for GS1 DataBar Expanded | | *1 | 57 | D3 | 53 | 1 … 8 characters | *2 | *2 |
| GS1 DataBar Limited | Activate | | 05 | 57 | D4 | 01 | 0E | FE | C1 |
| | Deactivate | | 05 | 57 | D4 | 01 | 0D | FE | C2 |
| | AI (01) digit | Send | 05 | 57 | D4 | 02 | 0E | FE | C0 |
| | | Do not transmit | 05 | 57 | D4 | 02 | 0D | FE | C1 |
| | Prefix for GS1 DataBar Limited | | *1 | 57 | D4 | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for GS1 DataBar Limited | | *1 | 57 | D4 | 53 | 1 … 8 characters | *2 | *2 |

| Function | | Length (Hex) *1 Data length | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) *2 Refer to checksum calculation | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|
| CC-A | Activate | 05 | 57 | D5 | 01 | 0E | FE | C0 |
| | Deactivate | 05 | 57 | D5 | 01 | 0D | FE | C1 |
| | Prefix for CC-A | *1 | 57 | D5 | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for CC-A | *1 | 57 | D5 | 53 | 1 … 8 characters | *2 | *2 |
| CC-B | Activate | 05 | 57 | D6 | 01 | 0E | FE | BF |
| | Deactivate | 05 | 57 | D6 | 01 | 0D | FE | C0 |
| | Prefix for CC-B | *1 | 57 | D6 | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for CC-B | *1 | 57 | D6 | 53 | 1 … 8 characters | *2 | *2 |
| CC-C | Activate | 05 | 57 | D7 | 01 | 0E | FE | BE |
| | Deactivate | 05 | 57 | D7 | 01 | 0D | FE | BF |
| | Prefix for CC-C | *1 | 57 | D7 | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for CC-C | *1 | 57 | D7 | 53 | 1 … 8 characters | *2 | *2 |
| PDF417 | Activate | 05 | 57 | D8 | 01 | 0E | FE | BD |
| | Deactivate | 05 | 57 | D8 | 01 | 0D | FE | BE |
| | Prefix for PDF417 | *1 | 57 | D8 | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for PDF417 | *1 | 57 | D8 | 53 | 1 … 8 characters | *2 | *2 |
| Micro PDF417 | Activate | 05 | 57 | D9 | 01 | 0E | FE | BC |
| | Deactivate | 05 | 57 | D9 | 01 | 0D | FE | BD |
| | Prefix for Micro PDF417 | *1 | 57 | D9 | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for Micro PDF417 | *1 | 57 | D9 | 53 | 1 … 8 characters | *2 | *2 |

| Function | | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|---|
| | | | *1 Data length | | | | | *2 Refer to checksum cal-culation | |
| Data Matrix | Activate | | 05 | 57 | DA | 01 | 0E | FE | BB |
| | Deactivate | | 05 | 57 | DA | 01 | 0D | FE | BC |
| | Mirror code | Activate | 05 | 57 | DA | 02 | 0E | FE | BA |
| | | Deactivate | 05 | 57 | DA | 02 | 0D | FE | BB |
| | Rectangu-lar Data Matrix | Activate | 05 | 57 | DA | 03 | 0E | FE | B9 |
| | | Deactivate | 05 | 57 | DA | 03 | 0D | FE | BA |
| | Prefix for Data Matrix | | *1 | 57 | DA | 50 | 1 … 8 charac-ters | *2 | *2 |
| | Suffix for Data Matrix | | *1 | 57 | DA | 53 | 1 … 8 charac-ters | *2 | *2 |
| QR | Activate | | 05 | 57 | DB | 01 | 0E | FE | BA |
| | Deactivate | | 05 | 57 | DB | 01 | 0D | FE | BB |
| | Mirror code | Activate | 05 | 57 | DB | 02 | 0E | FE | B9 |
| | | Deactivate | 05 | 57 | DB | 02 | 0D | FE | BA |
| | Prefix for QR | | *1 | 57 | DB | 50 | 1 … 8 charac-ters | *2 | *2 |
| | Suffix for QR | | *1 | 57 | DB | 53 | 1 … 8 charac-ters | *2 | *2 |
| Micro QR | Activate | | 05 | 57 | DC | 01 | 0E | FE | B9 |
| | Deactivate | | 05 | 57 | DC | 01 | 0D | FE | BA |
| | Prefix for Micro QR | | *1 | 57 | DC | 50 | 1 … 8 charac-ters | *2 | *2 |
| | Suffix for Micro QR | | *1 | 57 | DC | 53 | 1 … 8 charac-ters | *2 | *2 |
| Aztec | Activate | | 05 | 57 | DD | 01 | 0E | FE | B8 |
| | Deactivate | | 05 | 57 | DD | 01 | 0D | FE | B9 |
| | Mirror code | Activate | 05 | 57 | DD | 02 | 0E | FE | B7 |
| | | Deactivate | 05 | 57 | DD | 02 | 0D | FE | B8 |
| | Prefix for Aztec | | *1 | 57 | DD | 50 | 1 … 8 charac-ters | *2 | *2 |
| | Suffix for Aztec | | *1 | 57 | DD | 53 | 1 … 8 charac-ters | *2 | *2 |

| Function | | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|---|
| | | | *1 Data length | | | | | *2 Refer to checksum calculation | |
| MaxiCode | Activate | | 05 | 57 | DE | 01 | 0E | FE | B7 |
| | Deactivate | | 05 | 57 | DE | 01 | 0D | FE | B8 |
| | Mirror code | Activate | 05 | 57 | DE | 02 | 0E | FE | B6 |
| | | Deactivate | 05 | 57 | DE | 02 | 0D | FE | B7 |
| | Prefix for MaxiCode | | *1 | 57 | DE | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for MaxiCode | | *1 | 57 | DE | 53 | 1 … 8 characters | *2 | *2 |
| Han Xin | Activate | | 05 | 57 | E0 | 01 | 0E | FE | B5 |
| | Deactivate | | 05 | 57 | E0 | 01 | 0D | FE | B6 |
| | Prefix for Han Xin | | *1 | 57 | E0 | 50 | 1 … 8 characters | *2 | *2 |
| | Suffix for Han Xin | | *1 | 57 | E0 | 53 | 1 … 8 characters | *2 | *2 |

## 9.2.2 Decoder and general decoding parameters

Tab. 9.3: Decoding parameters

| Function | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|
| Activate all symbologies | | 05 | 57 | B0 | 01 | 0E | FE | E5 |
| 1D symbologies | Activate | 05 | 57 | B0 | 01 | 01 | FE | F2 |
| | Deactivate | 05 | 57 | B0 | 01 | 03 | FE | F0 |
| 2D symbologies | Activate | 05 | 57 | B0 | 01 | 02 | FE | F1 |
| | Deactivate | 05 | 57 | B0 | 01 | 04 | FE | EF |
| Decoding timeout | Deactivate | 05 | 57 | A1 | 06 | 00 | FE | FD |
| | 5 s | 05 | 57 | A1 | 06 | 01 | FE | FC |
| | 10 s | 05 | 57 | A1 | 06 | 02 | FE | FB |
| | 20 s | 05 | 57 | A1 | 06 | 03 | FE | FA |

| Function | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|
| Identical code-reading interval | Deactivate | 05 | 57 | A1 | 08 | 00 | FE | FB |
| | Do not read again | 05 | 57 | A1 | 08 | 01 | FE | FA |
| | 100 ms | 05 | 57 | A1 | 08 | 02 | FE | F9 |
| | 200 ms | 05 | 57 | A1 | 08 | 03 | FE | F8 |
| | 300 ms | 05 | 57 | A1 | 08 | 04 | FE | F7 |
| | 500 ms | 05 | 57 | A1 | 08 | 05 | FE | F6 |
| | 1 s | 05 | 57 | A1 | 08 | 06 | FE | F5 |
| | 2 s | 05 | 57 | A1 | 08 | 07 | FE | F4 |
| | 3 s | 05 | 57 | A1 | 08 | 08 | FE | F3 |
| | 4 s | 05 | 57 | A1 | 08 | 09 | FE | F2 |
| | 5 s | 05 | 57 | A1 | 08 | 0A | FE | F1 |
| Decoding redun-dancy | Deactivate | 05 | 57 | A1 | 0B | 01 | FE | F7 |
| | 2x | 05 | 57 | A1 | 0B | 02 | FE | F6 |
| | 3x | 05 | 57 | A1 | 0B | 03 | FE | F5 |
| Decoding informa-tion | Activate | 05 | 57 | A2 | 01 | 0E | FE | F3 |
| | Deactivate | 05 | 57 | A2 | 01 | 0D | FE | F4 |
| Barcode ID | Deactivate | 05 | 57 | A2 | 02 | 00 | FF | 00 |
| | AIM ID | 05 | 57 | A2 | 02 | 01 | FE | FF |
| Final character | None | 05 | 57 | A2 | 03 | 01 | FE | FE |
| | CR/LF | 05 | 57 | A2 | 03 | 02 | FE | FD |
| | CR | 05 | 57 | A2 | 03 | 03 | FE | FC |
| | TAB | 05 | 57 | A2 | 03 | 04 | FE | FB |
| Prefix (max. 4 characters) | Example = "LEUZ" | 08 | 57 | B0 | 50 | 4C 45 55 5A | FD | 61 |
| | Example = "L" | 05 | 57 | B0 | 50 | 4C | FE | 58 |
| | Deactivate | 05 | 57 | B0 | 50 | 00 | FE | A4 |
| Suffix (max. 4 characters) | Example = "LEUZ" | 08 | 57 | B0 | 53 | 4C 45 55 5A | FD | 5E |
| | Example = "L" | 05 | 57 | B0 | 53 | 4C | FE | 55 |
| | Deactivate | 05 | 57 | B0 | 53 | 00 | FE | A1 |

### 9.2.3 Scan operation

Tab. 9.4:     Scan operation

| Function | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|
| Scan control | Start scan | 05 | 57 | A0 | 01 | 01 | FF | 02 |
| | Stop scan | 05 | 57 | A0 | 01 | 00 | FF | 03 |

### 9.2.4 Acknowledgements

Tab. 9.5:     Acknowledgements

| Function | | Length (Hex) *1 Data length | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) *2 Refer to checksum calculation | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|
| ACK acknowledge-ment | Activate | 05 | 57 | A0 | 00 | 01 | FF | 03 |
| | Deactivate | 05 | 57 | A0 | 00 | 00 | FF | 04 |
| Error message | Activate | 05 | 57 | A1 | 0E | 01 | FE | F4 |
| | Deactivate | 05 | 57 | A1 | 0E | 00 | FE | F5 |
| | Configure No read message | *1 | 57 | A1 | 1E | Max. 9 charac-ters | *2 | *2 |
| | Example="BAD" | 07 | 57 | A1 | 1E | 42 41 44 | FE | 1C |

When a terminal transmits an instruction to a device, the device sends back the following message so that the terminal can determine whether the instruction was successful or failed.

If the command set is **successful**, the decoding device sends the following 5-byte data in hexadecimal (**ACK**) to the end terminal.

| 52 | A0 | EC | FE | 74 |
|---|---|---|---|---|

If the command set **fails**, the decoding device sends the following 5-byte data in hexadecimal (**NAK**) to the end terminal.

| 52 | A0 | E0 | FE | 80 |
|---|---|---|---|---|

### 9.2.5 Communication and output

Tab. 9.6: Communication and output

| Function | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|
| Confirm communication status | | 05 | 57 | 0E | 0D | 01 | FF | 88 |
| Baud rate | 9600 | 05 | 57 | A1 | 0C | 01 | FE | F6 |
| | 19200 | 05 | 57 | A1 | 0C | 02 | FE | F5 |
| | 38400 | 05 | 57 | A1 | 0C | 03 | FE | F4 |
| | 57600 | 05 | 57 | A1 | 0C | 04 | FE | F3 |
| | 115200 | 05 | 57 | A1 | 0C | 05 | FE | F2 |
| | 230400 | 05 | 57 | A1 | 0C | 06 | FE | F1 |

### 9.2.6 General information on the device

Tab. 9.7: General information

| Function | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|
| Get firmware information | 05 | 57 | 0E | 0D | 02 | FF | 87 |
| Check scan mode | 05 | 57 | 0E | 0D | 03 | FF | 86 |
| Read scan mode | 05 | 57 | 0E | 0D | 04 | FF | 85 |
| Read decoding results | 05 | 57 | 0E | 0D | 05 | FF | 84 |

### 9.2.7 Device configuration

Tab. 9.8: Configuration

| Function | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|
| Scan mode | Trigger mode | 05 | 57 | A1 | 02 | 01 | FF | 00 |
| | Sensor mode | 05 | 57 | A1 | 02 | 02 | FE | FF |
| | Continuous mode | 05 | 57 | A1 | 02 | 03 | FE | FE |
| | Pulse trigger | 05 | 57 | A1 | 02 | 04 | FE | FD |
| Scan mode sensitivity | Low sensitivity | 05 | 57 | A1 | 0A | 01 | FE | F8 |
| | Medium sensitivity | 05 | 57 | A1 | 0A | 02 | FE | F7 |
| | High sensitivity | 05 | 57 | A1 | 0A | 03 | FE | F6 |
| Target LED | Deactivate | 05 | 57 | A1 | 03 | 00 | FF | 00 |
| | Scan on | 05 | 57 | A1 | 03 | 01 | FE | FF |
| | Always on | 05 | 57 | A1 | 03 | 02 | FE | FE |

| Function | | Length (Hex) | Source (Hex) | ExID (Hex) | ExCMD (Hex) | Data (Hex) | High-byte check-sum (Hex) | Low-byte check-sum (Hex) |
|---|---|---|---|---|---|---|---|---|
| Illumination mode | Deactivate | 05 | 57 | A1 | 04 | 00 | FE | FF |
| | Scan on | 05 | 57 | A1 | 04 | 01 | FE | FE |
| | Always on | 05 | 57 | A1 | 04 | 02 | FE | FD |
| | Fade up | 05 | 57 | A1 | 04 | 03 | FE | FC |
| Illumination level | Minimum | 05 | 57 | A1 | 04 | 11 | FE | EE |
| | Medium | 05 | 57 | A1 | 04 | 12 | FE | ED |
| | Maximum | 05 | 57 | A1 | 04 | 13 | FE | EC |
| Good read buzzer | Activate | 05 | 57 | A1 | 05 | 0E | FE | F0 |
| | Deactivate | 05 | 57 | A1 | 05 | 0D | FE | F1 |
| Good read buzzer frequency | 800 Hz | 05 | 57 | A1 | 05 | 21 | FE | DD |
| | 1600 Hz | 05 | 57 | A1 | 05 | 22 | FE | DC |
| | 2730 Hz | 05 | 57 | A1 | 05 | 23 | FE | DB |
| | 4200 Hz | 05 | 57 | A1 | 05 | 24 | FE | DA |
| Save setup | | 05 | 57 | A0 | 08 | 01 | FE | FB |
| Factory reset | | 05 | 57 | A1 | 01 | 0F | FE | F3 |
| Reboot | | 05 | 57 | A0 | 08 | FF | FD | FD |

## 9.3 Modbus TCP

The code reader supports communication via Modbus TCP, and the table below lists the corresponding register addresses.

Tab. 9.9: Modbus TCP addresses

| Function code | | Address | Respond |
|---|---|---|---|
| 01 | Read coil | 0000 | Read scanning trigger state<br>1: On<br>0: Off |
| 05 | Write single coil | 0000 | Scanning trigger control<br>1: On<br>0: Off |
| 06 | Write single register | 0000 | Set scan mode<br>1: Level trigger<br>2: Image sense<br>3: Continuous<br>4: Plus trigger |
| 04 | Read input register | 0000 | Read scan mode<br>1: Level trigger<br>2: Image sense<br>3: Continuous<br>4: Plus trigger |
| | | 0001 | Bytes of barcode |
| 03 | Read holding register | 0000 | Data of barcode<br>Note: The bytes of barcode will be reset to 0 after reading the data. |

# 10    Care, maintenance and disposal

**Cleaning**

Clean the protective screen of the device with a soft cloth before mounting.

| ⚠ NOTICE |
|---|
| **Do not use aggressive cleaning agents!**<br>☞ Do not use aggressive cleaning agents such as thinner or acetone for cleaning the device. |

**Maintenance**

Usually, the device does not require any maintenance by the operator.

Repairs to the device must only be carried out by the manufacturer.

For repairs, contact your responsible Leuze subsidiary or Leuze customer service (see chapter 12 "Service and support").

**Disposing**

| NOTICE |
|---|
| For disposal observe the applicable national regulations regarding electronic components. |

# 11 Diagnostics and troubleshooting

**Error signaling via LED**

Tab. 11.1: Meaning of the LED indicators

| LED | Error | Possible error cause | Measures |
|---|---|---|---|
| PWR | Off | • No supply voltage connected to the device<br>• Hardware error | • Check supply voltage<br>• Contact Leuze customer service |
| ERROR | Red, continuous light | Device error | Reset the device |

## 12 Service and support

**Service hotline**

You can find the contact information for the hotline in your country on our website **www.leuze.com** under **Contact & Support**.

**Repair service and returns**

Defective devices are repaired in our service centers competently and quickly. We offer you an extensive service packet to keep any system downtimes to a minimum. Our service center requires the following information:

- Your customer number
- Product description or part description
- Serial number or batch number
- Reason for requesting support together with a description

Please register the merchandise concerned. Simply register return of the merchandise on our website **www.leuze.com** under **Contact & Support > Repair Service & Returns**.

To ensure quick and easy processing of your request, we will send you a returns order with the returns address in digital form.

**What to do should servicing be required?**

| | *NOTICE* |
|---|---|
| | **Please use this chapter as a master copy should servicing be required!** |
| | ✎ Enter the contact information and fax this form together with your service order to the fax number given below. |

**Customer data (please complete)**

| | |
|---|---|
| Device type: | |
| Serial number: | |
| Firmware: | |
| Status of LEDs: | |
| Error description: | |
| | |
| Company: | |
| Contact person/department: | |
| Phone (direct dial): | |
| Fax: | |
| Street/No: | |
| ZIP code/City: | |
| Country: | |

**Leuze Service fax number:**

+49 7021 573 - 199

## 13 Technical data

### 13.1 Optical data

| Integrated LED illumination | Red light illumination: Exempt group in acc. with EN 62471 |
|---|---|
| Integrated feedback LED | Green |
| Beam exit | Front |
| Image sensor | Global shutter CMOS Imager |
| Camera resolution | 1080 x 1280 px |

### 13.2 Code specifications

| Code type | 2/5 Hong Kong |
|---|---|
| | 2/5 IATA |
| | 2/5 Interleaved |
| | Aztec |
| | Codabar |
| | Code 32 |
| | Code 39 |
| | Code 93 |
| | Code 128 |
| | Composite Codes |
| | Data Matrix Code |
| | EAN 8/13 |
| | GS1 Databar Expanded |
| | GS1 Databar Expanded Stacked |
| | GS1 Databar Limited |
| | GS1 Databar RSS 14 |
| | GS1 Databar RSS 14 Stacked |
| | Maxicode |
| | Micro QR |
| | MSI Plessey |
| | PDF417 |
| | PDF417 Micro |
| | Pharma Code |
| | QR code |
| | UPC-A |
| | UPC-E |

## 13.3 General specifications

Tab. 13.1: Electrical equipment

| Supply voltage $U_B$ | 12 V … 28 V DC<br>• With overload protection<br>• Not short-circuit proof and no reverse-polarity protection |
|---|---|
| Average power consumption | 11 W |
| Switching input<br>Switching output | 12 V … 28 V DC, depending on supply voltage<br>$I_{max}$: 50 mA per switching output<br>Not short-circuit proof and no reverse-polarity protection |

| Process interface | RS 232, Ethernet 10/100 Mbit/s<br>RS 232 default:<br>• 9600 Bd, 8 data bits, no parity, 1 stop bit |
|---|---|

Tab. 13.2: Operating and display elements

| Button | 1 control button |
|---|---|
| LEDs | 1 LED (amber) for power (PWR)<br>1 LED (green) for Good read<br>1 LED (red) for error and reading unsuccessful<br>1 LED (blue) for tuning mode |

Tab. 13.3: Mechanical data

| Degree of protection | IP64 acc. to EN 60529<br>With screwed-on M12 connectors or mounted caps |
|---|---|
| VDE protection class | III (EN 61140) |
| Connection technology | M12 connectors |
| Weight | 150 g |
| Dimensions (H x W x D) | 44 x 29 x 53 mm |
| Fastening | 2 M3 threaded inserts on the bottom of device, 4 mm deep |
| Housing | Housing: aluminum |
| Optics cover | Glass |

Tab. 13.4: Environmental data

| Ambient temp. (operation/storage) | 0 °C … +50 °C/-30 °C … +70 °C |
|---|---|
| Air humidity | max. 95% rel. humidity, non-condensing |
| Ambient light | Max. 2000 Lux |
| Electromagnetic compatibility | EN 61000-4-2, EN 61000-4-3, EN 61000-4-8 |
| Conformity | CE, FCC |

## 13.4 Dimensioned drawing
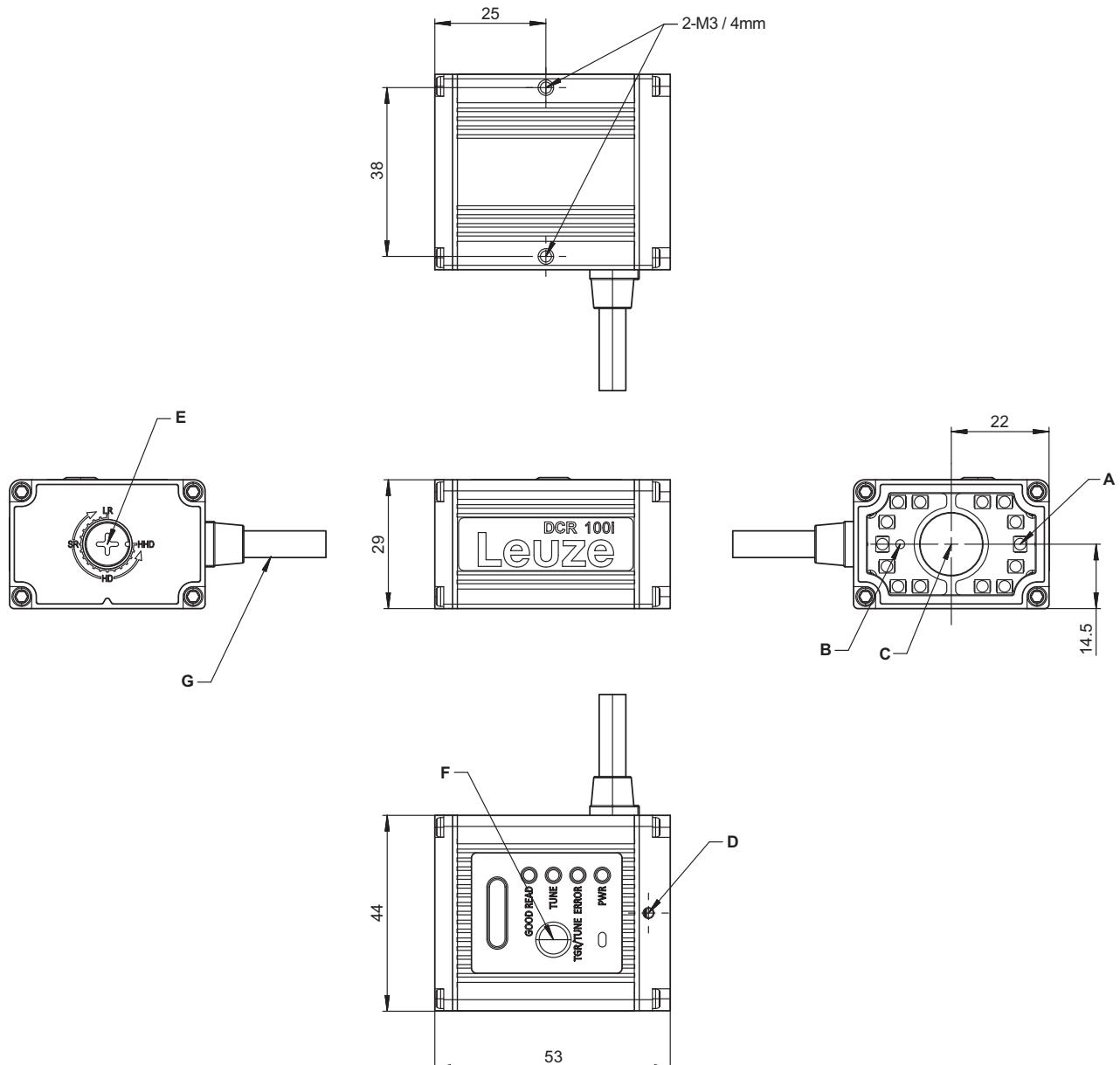


all dimensions in mm

A     Integrated LED for illumination (red light)
B     Integrated target laser diode (red)
C     Center of optical axis
D     Locking screw for focus adjustment (1.27 mm Hex)
E     Screw for focus adjustment

- LR: Long range
- SR: Standard range
- HD: High density
- HHD: Hyper High density

F     Trigger/Tune button

Fig. 13.1:     DCR 100i dimensioned drawing

# 14 Order guide and accessories

## 14.1 Nomenclature

Part designation: **DCR 1XXi YYY-ZZZZ-ABC-DEF-GGGG**

Tab. 14.1: Part number code

| DCR | Operating principle: Dual Code Reader |
|---|---|
| 1 | 1: DCR 100 series |
| XX | Host interface<br>08: RS 232, Ethernet TCP/IP, ModbusTCP<br>48: PROFINET-IO, Ethernet TCP/IP, RS 232<br>58: EtherNet/IP, Ethernet TCP/IP, RS 232 |
| i | Integrated fieldbus technology |
| YYY | Focus<br>ADJ: Manually adjustable |
| ZZZZ | Optics model:<br>0608: Focal length 6 mm and aperture f/8.0 |
| A | Connection<br>3: Cable with single industrial plug<br>4: Special cable with dual industrial plug |
| B | Cable length<br>1: 0.3 m |
| C | Beam exit<br>2: Front side |
| D | Illumination<br>R: Red |
| E | Resolution range<br>3: 1024x768 … 1280x1024 px |
| F | Imager type<br>M: Monochrome |
| GGGG | Special equipment<br>F001: NPN switching output |

> **NOTICE**
>
> A list with all available device types can be found on the Leuze website **www.leuze.com**.

## 14.2 Type overview

Tab. 14.2: Type overview

| Part no. | Designation | Description |
|---|---|---|
| 50154401 | DCR108iADJ-0608-312-R3M-F001 | Stationary 2D-code reader (Single connector) |
| 50154402 | DCR108iADJ-0608-412-R3M-F001 | Stationary 2D-code reader (Dual connectors) |

## 14.3   Cables accessories

### Cable for DCR1xxiADJ-0608-312-R3M-XXXX (Single connector type)

Tab. 14.3:      Connection cable

| Part no. | Designation | Description |
|---|---|---|
| 50154484 | KY DCR 108 | Interconnection cable |

### Cables for DCR1xxiADJ-0608-412-R3M-XXXX (Dual connectors type)

Tab. 14.4:      Power connection cables

| Part no. | Designation | Description |
|---|---|---|
| **M12 socket (12-pin, A-coded), axial connector, open cable end, shielded** | | |
| 50130281 | KD S-M12-CA-P1-020 | Connection cable, length 2 m |
| 50130282 | KD S-M12-CA-P1-050 | Connection cable, length 5 m |
| 50130283 | KD S-M12-CA-P1-100 | Connection cable, length 10 m |
| 50147677 | KD S-M12-CA-P1-150-V4A | Connection cable, length 15 m, V4A screw fitting |

Tab. 14.5:      Ethernet connection cables

| Part no. | Designation | Description |
|---|---|---|
| **M12 plug (4-pin, D-coded), axial connector, open cable end, shielded** | | |
| 50135073 | KS ET-M12-4A-P7-020 | Ethernet connection cable, length 2 m |
| 50135074 | KS ET-M12-4A-P7-050 | Ethernet connection cable, length 5 m |
| 50135075 | KS ET-M12-4A-P7-100 | Ethernet connection cable, length 10 m |
| 50135076 | KS ET-M12-4A-P7-150 | Ethernet connection cable, length 15 m |
| 50135077 | KS ET-M12-4A-P7-300 | Ethernet connection cable, length 30 m |
| **M12 plug (4-pin, D-coded), axial connector to RJ45, shielded** | | |
| 50135080 | KSS ET-M12-4A-RJ45-A-P7-020 | Ethernet interconnection cable (on RJ45), length 2 m |
| 50135081 | KSS ET-M12-4A-RJ45-A-P7-050 | Ethernet interconnection cable (on RJ45), length 5 m |
| 50135082 | KSS ET-M12-4A-RJ45-A-P7-100 | Ethernet interconnection cable (on RJ45), length 10 m |
| 50135083 | KSS ET-M12-4A-RJ45-A-P7-150 | Ethernet interconnection cable (on RJ45), length 15 m |
| 50135084 | KSS ET-M12-4A-RJ45-A-P7-300 | Ethernet interconnection cable (on RJ45), length 30 m |

## 14.4   Other accessories

Tab. 14.6:      Mounting systems

| Part no. | Designation | Description |
|---|---|---|
| 50154483 | BT DCR 100 | Mounting bracket |

## 15 Declaration of Conformity

The code readers of the DCR 100i series have been developed and manufactured in accordance with the applicable European standards and directives.

| | **NOTICE** |
|---|---|
| ℹ️ | You can download the EC Declaration of Conformity from the Leuze website. |
| | ↳ Call up the Leuze website: *www.leuze.com*. |
| | ↳ Enter the type designation or part number of the device as the search term. The article number can be found on the name plate of the device under the entry "Part. No.". |
| | ↳ The documents can be found on the product page for the device under the *Downloads* tab. |

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# 16    Appendix

## 16.1    ASCII character set

| ASCII | Dec. | Hex. | Oct. | Designation | Meaning |
|-------|------|------|------|-------------|---------|
| NUL | 0 | 00 | 0 | ZERO | Zero |
| SOH | 1 | 01 | 1 | START OF HEADING | Start of heading |
| STX | 2 | 02 | 2 | START OF TEXT | Start of text characters |
| ETX | 3 | 03 | 3 | END OF TEXT | Last character of text |
| EOT | 4 | 04 | 4 | END OF TRANSMISS. | End of transmission |
| ENQ | 5 | 05 | 5 | ENQUIRY | Request for data trans. |
| ACK | 6 | 06 | 6 | ACKNOWLEDGE | Positive acknowledgment |
| BEL | 7 | 07 | 7 | BELL | Bell signal |
| BS | 8 | 08 | 10 | BACKSPACE | Backspace |
| HT | 9 | 09 | 11 | HORIZ. TABULATOR | Horizontal tabulator |
| LF | 10 | 0A | 12 | LINE FEED | Line feed |
| VT | 11 | 0B | 13 | VERT. TABULATOR | Vertical tabulator |
| FF | 12 | 0C | 14 | FORM FEED | Form feed |
| CR | 13 | 0D | 15 | CARRIAGE RETURN | Carriage return |
| SO | 14 | 0E | 16 | SHIFT OUT | Shift out |
| SI | 15 | 0F | 17 | SHIFT IN | Shift in |
| DLE | 16 | 10 | 20 | DATA LINK ESCAPE | Data link escape |
| DC1 | 17 | 11 | 21 | DEVICE CONTROL 1 | Device control character 1 |
| DC2 | 18 | 12 | 22 | DEVICE CONTROL 2 | Device control character 2 |
| DC3 | 19 | 13 | 23 | DEVICE CONTROL 3 | Device control character 3 |
| DC4 | 20 | 14 | 24 | DEVICE CONTROL 4 | Device control character 4 |
| NAK | 21 | 15 | 25 | NEG. ACKNOWLEDGE | Negative acknowledge |
| SYN | 22 | 16 | 26 | SYNCHRONOUS IDLE | Synchronization |
| ETB | 23 | 17 | 27 | EOF TRANSM. BLOCK | End of data transmission block |
| CAN | 24 | 18 | 30 | CANCEL | Invalid |
| EM | 25 | 19 | 31 | END OF MEDIUM | End of medium |
| SUB | 26 | 1A | 32 | SUBSTITUTE | Substitution |
| ESC | 27 | 1B | 33 | ESCAPE | Escape |
| FS | 28 | 1C | 34 | FILE SEPARATOR | File separator |
| GS | 29 | 1D | 35 | GROUP SEPARATOR | Group separator |
| RS | 30 | 1E | 36 | RECORD SEPARATOR | Record separator |
| US | 31 | 1F | 37 | UNIT SEPARATOR | Unit separator |
| SP | 32 | 20 | 40 | SPACE | Space |
| ! | 33 | 21 | 41 | EXCLAMATION POINT | Exclamation point |
| " | 34 | 22 | 42 | QUOTATION MARK | Quotation mark |
| # | 35 | 23 | 43 | NUMBER SIGN | Number sign |
| $ | 36 | 24 | 44 | DOLLAR SIGN | Dollar sign |
| % | 37 | 25 | 45 | PERCENT SIGN | Percent sign |

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| ASCII | Dec. | Hex. | Oct. | Designation | Meaning |
|---|---|---|---|---|---|
| & | 38 | 26 | 46 | AMPERSAND | Ampersand |
| ' | 39 | 27 | 47 | APOSTROPHE | Apostrophe |
| ( | 40 | 28 | 50 | OPEN. PARENTHESIS | Open parenthesis |
| ) | 41 | 29 | 51 | CLOS. PARENTHESIS | Closed parenthesis |
| * | 42 | 2A | 52 | ASTERISK | Asterisk |
| + | 43 | 2B | 53 | PLUS | Plus sign |
| , | 44 | 2C | 54 | COMMA | Comma |
| - | 45 | 2D | 55 | HYPHEN (MINUS) | Hyphen |
| . | 46 | 2E | 56 | PERIOD (DECIMAL) | Period (decimal) |
| / | 47 | 2F | 57 | SLANT | Slant |
| 0 | 48 | 30 | 60 | 0 | Number |
| 1 | 49 | 31 | 61 | 1 | Number |
| 2 | 50 | 32 | 62 | 2 | Number |
| 3 | 51 | 33 | 63 | 3 | Number |
| 4 | 52 | 34 | 64 | 4 | Number |
| 5 | 53 | 35 | 65 | 5 | Number |
| 6 | 54 | 36 | 66 | 6 | Number |
| 7 | 55 | 37 | 67 | 7 | Number |
| 8 | 56 | 38 | 70 | 8 | Number |
| 9 | 57 | 39 | 71 | 9 | Number |
| : | 58 | 3A | 72 | COLON | Colon |
| ; | 59 | 3B | 73 | SEMICOLON | Semicolon |
| < | 60 | 3C | 74 | LESS THAN | Less than |
| = | 61 | 3D | 75 | EQUALS | Equals |
| > | 62 | 3E | 76 | GREATER THAN | Greater than |
| ? | 63 | 3F | 77 | QUESTION MARK | Question mark |
| @ | 64 | 40 | 100 | COMMERCIAL AT | Commercial AT |
| A | 65 | 41 | 101 | A | Capital letter |
| B | 66 | 42 | 102 | B | Capital letter |
| C | 67 | 43 | 103 | C | Capital letter |
| D | 68 | 44 | 104 | D | Capital letter |
| E | 69 | 45 | 105 | E | Capital letter |
| F | 70 | 46 | 106 | F | Capital letter |
| G | 71 | 47 | 107 | G | Capital letter |
| H | 72 | 48 | 110 | H | Capital letter |
| I | 73 | 49 | 111 | I | Capital letter |
| J | 74 | 4A | 112 | J | Capital letter |
| K | 75 | 4B | 113 | K | Capital letter |
| L | 76 | 4C | 114 | L | Capital letter |
| M | 77 | 4D | 115 | M | Capital letter |

| ASCII | Dec. | Hex. | Oct. | Designation | Meaning |
|---|---|---|---|---|---|
| N | 78 | 4E | 116 | N | Capital letter |
| O | 79 | 4F | 117 | O | Capital letter |
| P | 80 | 50 | 120 | P | Capital letter |
| Q | 81 | 51 | 121 | Q | Capital letter |
| R | 82 | 52 | 122 | R | Capital letter |
| S | 83 | 53 | 123 | S | Capital letter |
| T | 84 | 54 | 124 | T | Capital letter |
| U | 85 | 55 | 125 | U | Capital letter |
| V | 86 | 56 | 126 | V | Capital letter |
| W | 87 | 57 | 127 | W | Capital letter |
| X | 88 | 58 | 130 | X | Capital letter |
| Y | 89 | 59 | 131 | Y | Capital letter |
| Z | 90 | 5A | 132 | Z | Capital letter |
| [ | 91 | 5B | 133 | OPENING BRACKET | Opening bracket |
| \ | 92 | 5C | 134 | REVERSE SLANT | Reverse slant |
| ] | 93 | 5D | 135 | CLOSING BRACKET | Closing bracket |
| ^ | 94 | 5E | 136 | CIRCUMFLEX | Circumflex |
| _ | 95 | 5F | 137 | UNDERSCORE | Underscore |
| ` | 96 | 60 | 140 | GRAVE ACCENT | Grave accent |
| a | 97 | 61 | 141 | a | Lower case letter |
| b | 98 | 62 | 142 | b | Lower case letter |
| c | 99 | 63 | 143 | c | Lower case letter |
| d | 100 | 64 | 144 | d | Lower case letter |
| e | 101 | 65 | 145 | e | Lower case letter |
| f | 102 | 66 | 146 | f | Lower case letter |
| g | 103 | 67 | 147 | g | Lower case letter |
| h | 104 | 68 | 150 | h | Lower case letter |
| i | 105 | 69 | 151 | i | Lower case letter |
| j | 106 | 6A | 152 | j | Lower case letter |
| k | 107 | 6B | 153 | k | Lower case letter |
| l | 108 | 6C | 154 | l | Lower case letter |
| m | 109 | 6D | 155 | m | Lower case letter |
| n | 110 | 6E | 156 | n | Lower case letter |
| o | 111 | 6F | 157 | o | Lower case letter |
| p | 112 | 70 | 160 | p | Lower case letter |
| q | 113 | 71 | 161 | q | Lower case letter |
| r | 114 | 72 | 162 | r | Lower case letter |
| s | 115 | 73 | 163 | s | Lower case letter |
| t | 116 | 74 | 164 | t | Lower case letter |
| u | 117 | 75 | 165 | u | Lower case letter |

| ASCII | Dec. | Hex. | Oct. | Designation | Meaning |
|-------|------|------|------|-------------|---------|
| v | 118 | 76 | 166 | v | Lower case letter |
| w | 119 | 77 | 167 | w | Lower case letter |
| x | 120 | 78 | 170 | x | Lower case letter |
| y | 121 | 79 | 171 | y | Lower case letter |
| z | 122 | 7A | 172 | z | Lower case letter |
| { | 123 | 7B | 173 | OPENING BRACE | Opening brace |
| \| | 124 | 7C | 174 | VERTICAL LINE | Vertical line |
| } | 125 | 7D | 175 | CLOSING BRACE | Closing brace |
| ~ | 126 | 7E | 176 | TILDE | Tilde |
| DEL | 127 | 7F | 177 | DELETE (RUBOUT) | Delete |

## 16.2   Code samples



1122334455

Module 0.3

Fig. 16.1:       Code type: 2/5 Interleaved



135AC

Module 0.3

Fig. 16.2:       Code type: Code 39



a121314a

Module 0.3

Fig. 16.3:       Code type: Codabar



abcde

Module 0.3

Fig. 16.4:       Code type: Code 128



leuze

Module 0.3

Fig. 16.5:       Code type: EAN 128

**Leuze**



SC 2

Fig. 16.6:      Code type: UPC-A



SC 3

Fig. 16.7:      Code type: EAN 8
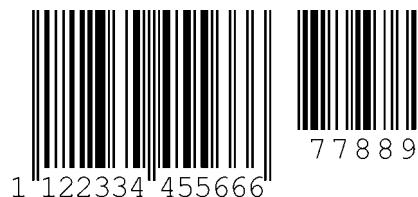


SC 0                    S

Fig. 16.8:      Code type: EAN 13 add-on



DCR 100i

Fig. 16.9:      Code type: Data Matrix ECC200



DCR 100i

Fig. 16.10:     Code type: QR code



Test symbol

Fig. 16.11:     Code type: Aztec



DCR 200i series

Fig. 16.12:     Code type: PDF417

## 16.3 Configuration via configuration codes

The code reader can also be configured using configuration codes. The device parameters in the device are set and permanently saved after reading this code.

Configuration changes via the configuration codes are only possible by scanning the 2D configuration code.

Proceed as follows to read in a configuration code:

↳ Connect the code reader to the supply voltage panel.

↳ Hold the configuration code at the correct distance in front of the optics of the code reader.

| NOTICE |
| --- |
| **Read in configuration codes individually!** |
| The configuration codes can only be read in individually. |

**Reset to factory settings**

Tab. 16.1: Configuration code: reset to factory settings

| 2D code | Function |
| --- | --- |
|  | Enter programming mode |
|  | Reset to factory default |
|  | Exit programming mode |

## 16.4 License terms

Leuze electronic GmbH & Co. KG grants users the right to use the Ident Studio V2 software free of charge, exclusively for the purpose of commissioning DCR 100i devices. This right is granted for an indefinite period and on a non-exclusive basis.

Leuze electronic GmbH & Co. KG does not accept any liability for damage or loss of data resulting from the use of this software, particularly if this is caused by failure to observe the warning notices listed here or the safety instructions in our operating instructions.