Leuze

Original operating instructions

DCR56M2/R2

Stationary 2D-code reader

The Sensor People

We reserve the right to make technical changes
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1 About this document

Used symbols and signal words

Tab. 1.1: Warning symbols and signal words

	Symbol indicating dangers to persons
	Symbol indicating possible property damage
NOTE	Signal word for property damage Indicates dangers that may result in property damage if the measures for danger avoidance are not followed.
CAUTION	Signal word for minor injuries Indicates dangers that may result in minor injury if the measures for danger avoidance are not followed.

Tab. 1.2: Other symbols

	Symbol for tips Text passages with this symbol provide you with further information.
	Symbol for action steps Text passages with this symbol instruct you to perform actions.
	Symbol for action results 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 (Complementary metal-oxide semiconductor)
DCR	Image-based code reader (Dual code reader)
EMC	Electromagnetic compatibility
EN	European standard
FE	Functional earth
IO or I/O	Input/output
LED	Light-emitting diode
PLC	Programmable logic controller

2 Safety

This stationary 2D-code reader was developed, manufactured and tested in line with the applicable safety standards. It corresponds to the state of the art.

2.1 Intended use

The DCR56M2/R2 type stationary 2D-code reader is designed as an installation scanner with integrated decoder for all of the most popular 1D and 2D codes for automatic object detection.

Areas of application

The stationary 2D-code reader is intended especially for the following areas of application:

- Automatic analyzers
- For space-critical code reading tasks
- For installation in a housing or beneath covers

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

Comply with conditions and regulations!

- Observe the locally applicable legal regulations and the rules of the employer's liability insurance association.

2.2 Foreseeable 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
- 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 must not be opened. There are no user-serviceable parts inside.
- 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 stationary 2D-code reader is based on a scan engine with CMOS imager and integrated decoder for all commonly used 1D and 2D codes such as Data Matrix, Aztec, QR, 2/5 Interleaved, Code 39, Code 128, UPC/EAN.

The many possible configurations of the device allow it to be adapted to a multitude of reading tasks. Due to the device's small dimensions and large reading field, the stationary 2D-code reader can also be used in highly constrained spaces.

Information on technical data and features see chapter 11 "Technical data".

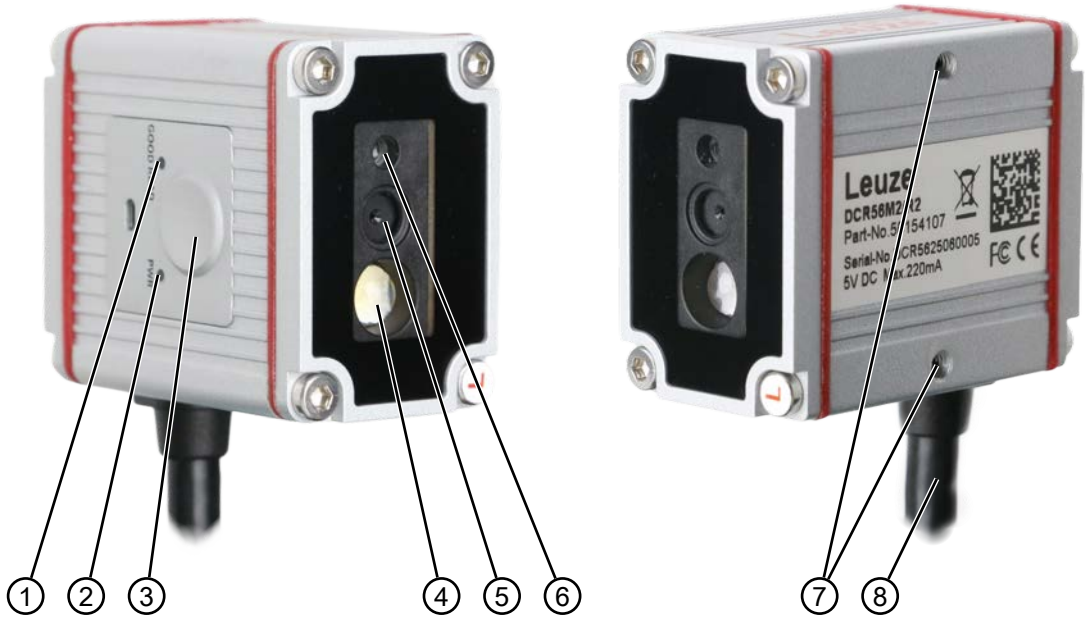
Stand-alone operation

The stationary 2D-code reader is operated as a single "stand-alone" device. It is equipped with a 6 conductors open-ended cable for the power supply electrical connection, the interface, the trigger input, and the switching output.

3.2 Performance characteristics

- High-performance compact code reader
- Compact design for simple integration, even in constrained spaces
- Reading of extremely small high-density codes and recording of standard codes in a large reading area using a special optical system
- Reading of shiny surfaces using a gloss reduction process
- Excellent decoding characteristics
- Clearly visible alignment LED
- RS 232 interface, one trigger input

3.3 Device construction



1 Status LED GOOD READ
2 Status LED PWR
3 Trigger button
4 Integrated LED for illumination (white light)
5 Center of optical axis
6 Integrated target LED
7 M3 thread holes for mounting
8 Open cable (6 conductors)

Fig. 3.1: DCR56M2/R2 device construction

3.4 Connection technology

6 conductors open-ended cable

4 Mounting

The stationary 2D-code reader can be attached at two M3 mounting threads, 3 mm deep.

4.1 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 code label, take into account the different reading characteristics of the scanner with various code modules.

NOTICE

Observe when choosing the mounting location!

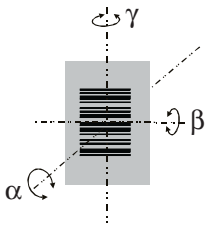
- Maintaining the required environmental conditions (temperature, humidity).
- Possible soiling of the reading window due to liquids, abrasion by boxes, or packaging material residues.
- Lowest possible chance of damage to the scanner by mechanical collision or jammed parts.
- Possible extraneous light influence (no direct sunlight).

The best read results are obtained when

- the reading distance lies in the middle of the reading field.
- there is no direct sunlight and extraneous light is avoided.
- the barcode labels are of good print quality and have good contrast ratios.
- you do not use high-gloss labels.
- the barcode or Data Matrix code is moved past the reading window with an angle of rotation of 10° to 15°.

NOTICE

The front beam exit of the device is almost vertical to the optics. The code label must be rotated by > 10° to avoid a total reflection of the red light beam in the case of glossy labels.



α Azimuth angle
β Angle of inclination
γ Angle of rotation
Recommended angle of rotation: γ > 10°

Fig. 4.1: Definition of the reading angles

5 Electrical connection

CAUTION

Safety notices!

- Before connecting the device, be sure that the supply voltage agrees with the value printed on the name plate.
- Connection of the device and maintenance work while under voltage must only be carried out by a qualified electrician.
- The power supply unit for the generation of the supply voltage for the device and the corresponding connection units must have a secure electrical insulation according to IEC 60742 (PELV). For UL applications: only for use in class 2 circuits according to NEC.
- If faults cannot be cleared, the device should be switched off and protected against accidental use.

5.1 Voltage supply

The stationary 2D-code reader is designed for connection to a 5 V supply voltage.

- +5 V DC (red)
- GND (black)

5.2 Conductor assignment

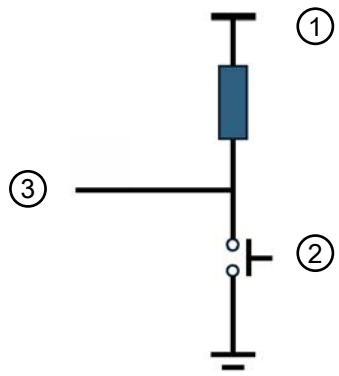
Tab. 5.1: Conductor assignment

Conductor	Signal	Description
Red	V+	5 V DC
Black	GND	Ground
Green	TxD	Serial output RS 232
White	RxD	Serial input RS 232
Blue	IN 1	Trigger
Orange	Shield GND	Shield ground

5.3 Switching input

The stationary 2D-code reader has a switching input which is used to trigger the code reading (TRIG).

A read process can be triggered using the blue conductor of the trigger input. Thanks to the opto-isolator design, the device can accept an input voltage ranging from 5 V to 24 V, with a maximum current of 15 mA.



1 Vin = 5 – 24 V DC
2 Trigger input
3 IN 1

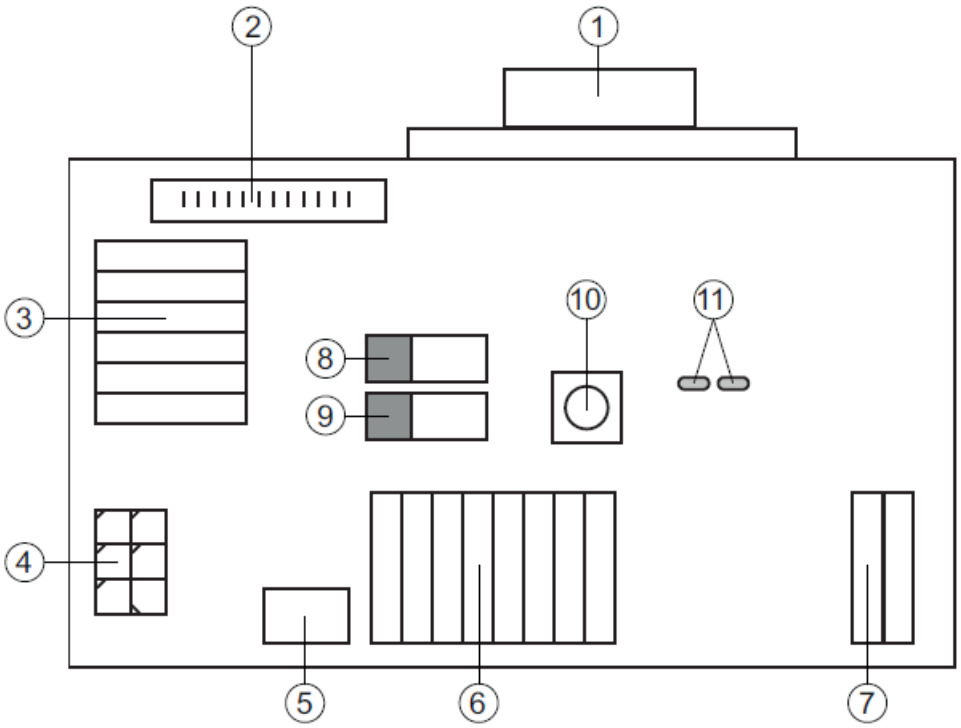
Fig. 5.1: Wiring example of the trigger input

5.4 PC or terminal connection

Via the serial interface, you can configure the 2D-code reader by means of a PC or terminal. For this, you need a RS 232 connection that establishes the RxD, TxD and GND connections between PC and 2D-code reader.

The RS 232 connection can be established in the following ways:

- Direct connection of the plug connector of the device to the PC or terminal via its own connector.
- Connection via a MA-CR modular adapter unit.
  To simplify the connection of the connection wires to the PC interface, a modular adapter unit (MA-CR) is available for implementing the 6-pin flying lead connector to D-SUB, 9-pin (see chapter 12 "Order guide and accessories").



1 RS 232 connection
2 CR50 or DCR80 connection
3 DCR50, DCR55, DCR56, DCR85, CR100 or CR55 connection
4 Molex Micro-Fit, 6-pin
5 USB connection
6 Connection to machine control, PLC, external voltage supply 5 V DC
7 External voltage supply 10 … 30 V DC
8 SWIN DIP switch (level for trigger button; 5 V if the scanner high switching input is active, GND if the low input is active)
9 USB/PWR DIP switch (USB position if voltage is supplied via USB; PWR position if voltage is supplied via external voltage supply (7))
10 Trigger button
11 Status LEDs

Fig. 5.2: Connection options for the MA-CR modular adapter unit

5.5 Cable lengths and shielding

The maximum cable length is 1.8 m.

If cables are extended, ensure that the cables of the RS 232 interface are shielded.

6 Starting up the device - Configuration

6.1 Measures to be performed prior to the initial commissioning

	NOTICE
	↳ Please observe the notices for device arrangement, see chapter 4.1 "Selecting a mounting location". ↳ If possible, always trigger the scanner with the aid of commands or an external signal transmitter (photoelectric sensor). ↳ Before commissioning, familiarize yourself with the operation and configuration of the device(s). ↳ Before connecting the supply voltage, recheck all connections and ensure that they have been properly made.

6.2 Starting the device

6.2.1 Interface

Proper function of the interface can be most easily tested in service operation using the serial interface with the configuration software and a laptop computer.

6.2.2 Online commands

Using the online commands, important device functions can be checked, e.g. reading activation.

6.2.3 Problems

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 10 "Service and support".

6.3 Setting the communication parameters

The code type and code length are usually set via the configuration software.

7 Configuration control

7.1 Configuration command architecture

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

Tab. 7.1: 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 • Minimum: 5 bytes • Maximum: 36 bytes
Transmitting terminal	• 57 (HEX): the end terminal transmits data to the decoding device. • 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 + …]

7.2 Supported commands

7.2.1 Symbology

Tab. 7.2: Symbology

Function		Length (Hex) *1 Data length	Source (Hex)	ExID (Hex)	ExCMD (Hex)	Data (Hex)	High-byte checksum (Hex) *2 Refer to checksum calculation	Low-byte checksum (Hex)
UPC/EAN add-on codes	Activate	05	57	B0	02	0E	FE	E4
	Deactivate	05	57	B0	02	0D	FE	E5

Function			Length (Hex)	Source (Hex)	ExID (Hex)	ExCMD (Hex)	Data (Hex)	High-byte checksum (Hex)	Low-byte checksum (Hex)
			*1 Data length					*2 Refer to checksum calculation	
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 checksum (Hex)	Low-byte checksum (Hex)
			*1 Data length					*2 Refer to checksum calculation	
UPC-E	Activate		05	57	B2	01	0E	FE	E3
	Deactivate		05	57	B2	01	0D	FE	E4
	Transmit first character	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 required	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 characters	*2	*2
	Suffix for UPC-E		*1	57	B2	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	
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 cal-culation	
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 charac-ters	*2	*2
	Suffix for Code 128		*1	57	B5	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	
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
		Deactivate	05	57	B6	02	0D	FE	DF
	Transmit start / end character	Activate	05	57	B6	03	0E	FE	DD
		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 transmit-ting		05	57	B6	04	03	FE	E7
	Prefix for Code 39		05	57	B6	50	1 … 8 charac-ters	*2	*2
	Suffix for Code 39		05	57	B6	53	1 … 8 charac-ters	*2	*2
	Read length	Each length	05	57	B6	10	00	FE	DE
		1 discrete length	05	57	B6	11	1 byte of the length	*2	*2
		2 discrete lengths	05	57	B6	12	2 bytes of the length	*2	*2
		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
		Deactivate	05	57	B8	01	0D	FE	DE
	Prefix for Code 32		*1	57	B8	50	1 … 8 charac-ters	*2	*2
	Suffix for Code 32		*1	57	B8	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	
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 cal-culation	
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 transmit-ting		05	57	BA	02	03	FE	E5
	Transmit start / end character	Activate	05	57	BA	03	0E	FE	D9
		Deactivate	05	57	BA	03	0D	FE	DA
	Read length	Each length	05	57	BA	10	00	FE	DA
		1 discrete length	05	57	BA	11	1 byte of the length	*2	*2
		2 discrete lengths	06	57	BA	12	2 bytes of the length	*2	*2
		Length in the field	06	57	BA	13	2 bytes of the length	*2	*2
	Prefix for Codabar		*1	57	BA	50	1 … 8 charac-ters	*2	*2
	Suffix for Codabar		*1	57	BA	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	
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 cal-culation	
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
		Deactivate	05	57	BC	03	0D	FE	D8
	Read length	Each length	05	57	BC	10	00	FE	D8
		1 discrete length	05	57	BC	11	1 byte of the length	*2	*2
		2 discrete lengths	06	57	BC	12	2 bytes of the length	*2	*2
		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 charac-ters	*2	*2
	Suffix for MSI Plessey		*1	57	BC	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	
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
		1 discrete length	05	57	BD	11	1 byte of the length	*2	*2
		2 discrete lengths	06	57	BD	12	2 bytes of the length	*2	*2
		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 cal-culation	
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 charac-ters	*2	*2
	Suffix for 2/5 Hong Kong		*1	57	BF	53	1 … 8 charac-ters	*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 charac-ters	*2	*2
	Suffix for 2/5 Straight		*1	57	D0	53	1 … 8 charac-ters	*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 charac-ters	*2	*2
	Suffix for Pharma Code		*1	57	D1	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	
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 charac-ters	*2	*2
	Suffix for GS1 DataBar 14		*1	57	D2	53	1 … 8 charac-ters	*2	*2
GS1 DataBar Ex-panded	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 charac-ters	*2	*2
	Suffix for GS1 DataBar Expanded		*1	57	D3	53	1 … 8 charac-ters	*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 charac-ters	*2	*2
	Suffix for GS1 DataBar Limited		*1	57	D4	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	
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 charac-ters	*2	*2
	Suffix for CC-A	*1	57	D5	53	1 … 8 charac-ters	*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 charac-ters	*2	*2
	Suffix for CC-B	*1	57	D6	53	1 … 8 charac-ters	*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 charac-ters	*2	*2
	Suffix for CC-C	*1	57	D7	53	1 … 8 charac-ters	*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 charac-ters	*2	*2
	Suffix for PDF417	*1	57	D8	53	1 … 8 charac-ters	*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 charac-ters	*2	*2
	Suffix for Micro PDF417	*1	57	D9	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	
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 checksum (Hex)	Low-byte checksum (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

7.2.2 Decoder and general decoding parameters

Tab. 7.3: Decoding parameters

Function		Length (Hex)	Source (Hex)	ExID (Hex)	ExCMD (Hex)	Data (Hex)	High-byte checksum (Hex)	Low-byte checksum (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 redundancy	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 information	Activate	05	57	A2	01	0E	FE	F3
	Deactivate	05	57	A2	01	0D	FE	F4
Decoding area	Whole area	05	57	A1	03	10	FE	F0
	Target barcode	05	57	A1	03	11	FE	EF
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
Multicode reading	None	05	57	A1	10	00	FE	F3
	2	05	57	A1	10	02	FE	F1
	3	05	57	A1	10	03	FE	F0
	4	05	57	A1	10	04	FE	EF
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

7.2.3 Scan operation

Tab. 7.4: Scan operation

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

7.2.4 Acknowledgements

Tab. 7.5: Acknowledgements

Function		Length (Hex)	Source (Hex)	ExID (Hex)	ExCMD (Hex)	Data (Hex)	High-byte checksum (Hex)	Low-byte checksum (Hex)
		*1 Data length					*2 Refer to checksum calculation	
ACK acknowledgement	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 characters	*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

7.2.5 Communication and output

Tab. 7.6: 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
Output interface	Virtual serial port	05	57	A1	49	03	FE	B7
	USB	05	57	A1	49	02	FE	B8
	Serial port	05	57	A1	49	01	FE	B9

7.2.6 Power mode parameters

Tab. 7.7: Power mode parameters

Function		Length (Hex)	Source (Hex)	ExID (Hex)	ExCMD (Hex)	Data (Hex)	High-byte check-sum (Hex)	Low-byte check-sum (Hex)
Sleep Mode Timer	Deactivate	05	57	A1	07	01	FE	FB
	1 s	05	57	A1	07	02	FE	FA
	2 s	05	57	A1	07	03	FE	F9
	3 s	05	57	A1	07	04	FE	F8
	5 s	05	57	A1	07	05	FE	F7
	7 s	05	57	A1	07	06	FE	F6
	10 s	05	57	A1	07	07	FE	F5
	15 s	05	57	A1	07	08	FE	F4

7.2.7 General information on the device

Tab. 7.8: 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

7.2.8 Device configuration

Tab. 7.9: 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
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

7.2.9 USB country keyboard types

Tab. 7.10: USB country keyboard

Function		Length (Hex)	Source (Hex)	ExID (Hex)	ExCMD (Hex)	Data (Hex)	High-byte check-sum (Hex)	Low-Byte check-sum (Hex)
USB country key-board type	US	05	57	A1	4B	00	FE	B8
	Belgium	05	57	A1	4B	01	FE	B7
	UK	05	57	A1	4B	02	FE	B6
	Denmark	05	57	A1	4B	03	FE	B5
	France	05	57	A1	4B	04	FE	B4
	Germany	05	57	A1	4B	05	FE	B3
	Italy	05	57	A1	4B	06	FE	B2
	Norway	05	57	A1	4B	07	FE	B1
	Portugal	05	57	A1	4B	08	FE	B0
	Spain	05	57	A1	4B	09	FE	AF
	Sweden	05	57	A1	4B	0A	FE	AE
	Switzerland	05	57	A1	4B	0B	FE	AD
	Japan	05	57	A1	4B	0C	FE	AC
	Hungary	05	57	A1	4B	0D	FE	AB
	Czech Republic	05	57	A1	4B	0E	FE	AA
	Slovakia	05	57	A1	4B	0F	FE	A9
	Rumania	05	57	A1	4B	10	FE	A8
	Croatia	05	57	A1	4B	11	FE	A7
	Poland	05	57	A1	4B	12	FE	A6
	Turkey	05	57	A1	4B	13	FE	A5
	Brazil	05	57	A1	4B	14	FE	A4
	Russia	05	57	A1	4B	15	FE	A3
	Bulgaria	05	57	A1	4B	16	FE	A2
	Vietnam	05	57	A1	4B	17	FE	A1

Function		Length (Hex)	Source (Hex)	ExID (Hex)	ExCMD (Hex)	Data (Hex)	High-byte check-sum (Hex)	Low-Byte check-sum (Hex)
Country code page	Traditional Chinese Big 5	05	57	A1	4C	01	FE	B6
	Traditional Chinese Microsoft Office Word	05	57	A1	4C	02	FE	B5
	Korean	05	57	A1	4C	03	FE	B4
	Korean Microsoft Office Word	05	57	A1	4C	04	FE	B3
	Japanese Shift-JIS	05	57	A1	4C	06	FE	B1
	Japanese Microsoft Office Word	05	57	A1	4C	07	FE	B0
	West European Latin	05	57	A1	4C	08	FE	AF
	Central and East European Latin	05	57	A1	4C	09	FE	AE
	Turkish	05	57	A1	4C	0A	FE	AD
	Greek	05	57	A1	4C	0B	FE	AC
	Hebrew	05	57	A1	4C	0C	FE	AB
	Thai	05	57	A1	4C	0D	FE	AA
	Vietnamese	05	57	A1	4C	0E	FE	A9

7.2.10 Additional functions

Code coordinate feedback

The code coordinate is transmitted as the pixel coordinate from the image sensor. It is possible to output the vertexes and the center point of the code.

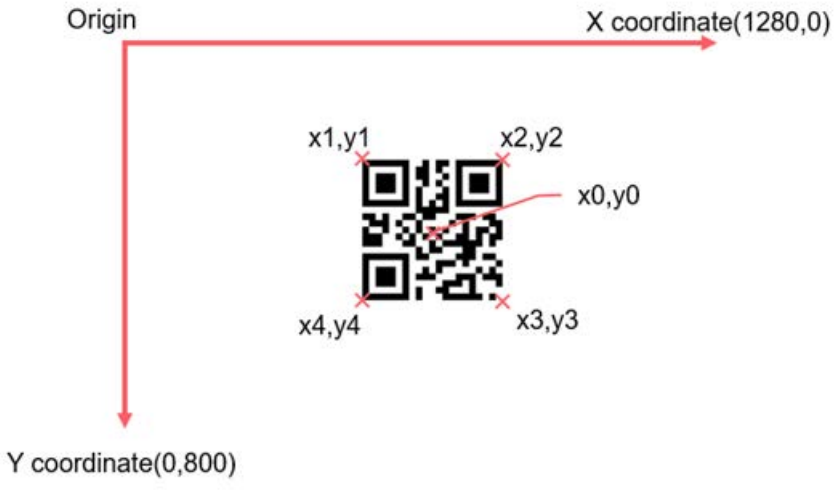


Fig. 7.1: Code position in the X/Y coordinate system

Tab. 7.11: Code coordinate feedback

Function		Length (Hex)	Source (Hex)	ExID (Hex)	ExCMD (Hex)	Data (Hex)	High-byte check-sum (Hex)	Low-Byte check-sum (Hex)
Code coordinate feedback	Activate	05	57	0E	CD	01	FE	C8
	Deactivate	05	57	0E	CD	00	FE	C9

Output format: (x0,y0)(x1,y1)(x2,y2)(x3,y3)(x4,y4) code data

Example: (524,269)(490,177)(617,236)(559,361)(432,302)Leuze DCR56

Setting Region of Interest (ROI)

The DCR56M2/R2 allows customization of the Region of Interest (ROI) to optimize decoding performance. By defining a specific ROI within the imager‘s field of view, the device processes only the selected area, reducing noise and improving read speed and accuracy.

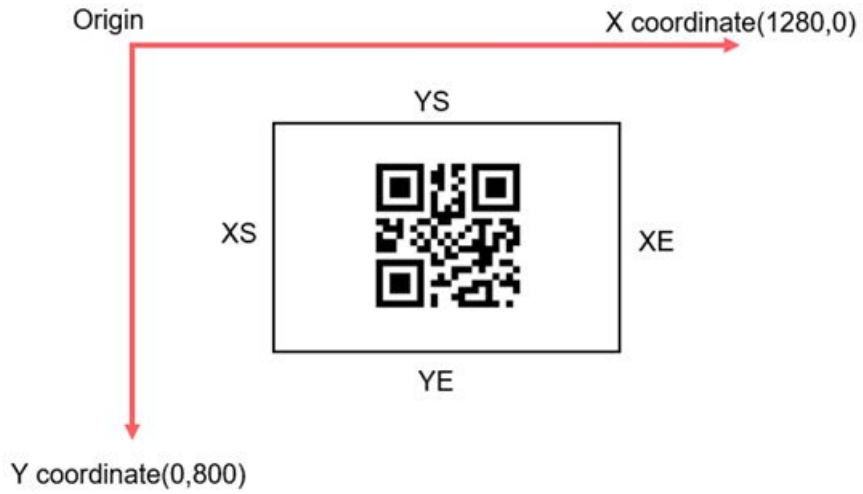


Fig. 7.2: Code position in the defined Region of Interest

The setting value XS, XE, YS and YE is the ratio of the image.

Tab. 7.12: Calculation of the set values

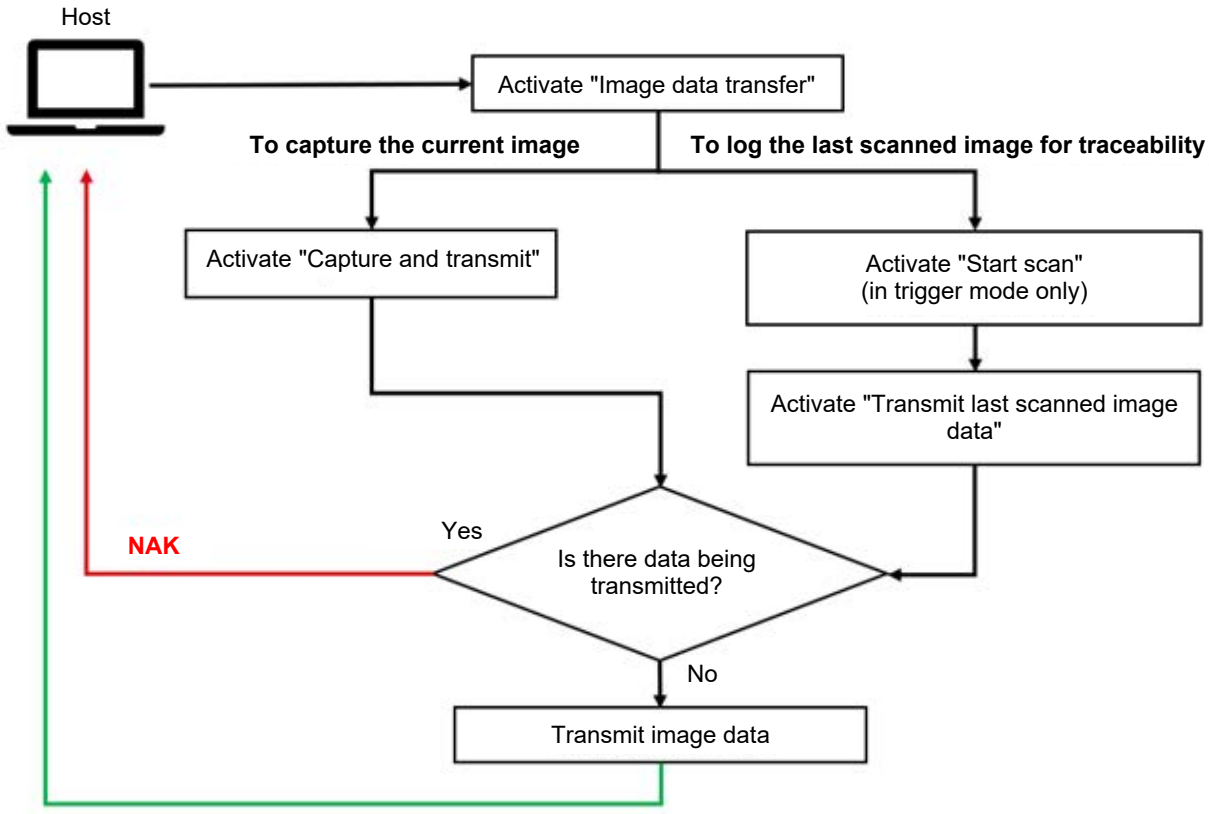
Set value	Description	Calculation
XS	X-direction, start	$\frac{\text{X start pixel}}{1280} \times 100$
XE	X-direction end	$\frac{\text{X end pixel}}{1280} \times 100$
YS	Y-direction, start	$\frac{\text{Y start pixel}}{800} \times 100$
YE	Y-direction, end	$\frac{\text{Y end pixel}}{800} \times 100$

Tab. 7.13: Region of Interest

Function	Length (Hex)	Source (Hex)	ExID (Hex)	Ex-CMD (Hex)	Data (Hex)				High-byte check-sum (Hex)	Low-Byte check-sum (Hex)
					Byte 4	Byte 5	Byte 6	Byte 7	*2 Refer to checksum cal-culation	
Set ROI	08	57	72	6F	XS	XE	YS	YE	*2	*2
Return current ROI	05	57	72	6F	69				FE	5A
Return ROI (format)	08	52	72	6F	XS	XE	YS	YE	*2	*2

Image data transfer

This function enables the code reader to capture and transmit raw image data to an external system for analysis, verification, or traceability.



All commands are ignored during transmission of image data.

Fig. 7.3: Command sequence

Tab. 7.14: Image data transfer

Function		Length (Hex)	Source (Hex)	ExID (Hex)	ExCMD (Hex)	Data (Hex)	High-byte check-sum (Hex)	Low-Byte check-sum (Hex)
Image data transfer	Activate	05	57	A0	02	01	FF	01
	Deactivate	05	57	A0	02	00	FF	02
Capture and transmit		05	57	A0	01	03	FF	00
Transmit last scanned image data		05	57	0E	0D	07	FF	82

Tab. 7.15: Image data format

Identification code (8 bits)	Image byte depth (4 bits)	Code coordinate (16 bits)	JPG file
Image identifier *IMG*	Returned JPG image size	x1(2bits), y1(2bits) x2(2bits), y2(2bits) x3(2bits), y3(2bits) x4(2bits), y4(2bits)	Image data in JPG format

NOTICE

For better transmitting speed, please change the baud rate to 115200.

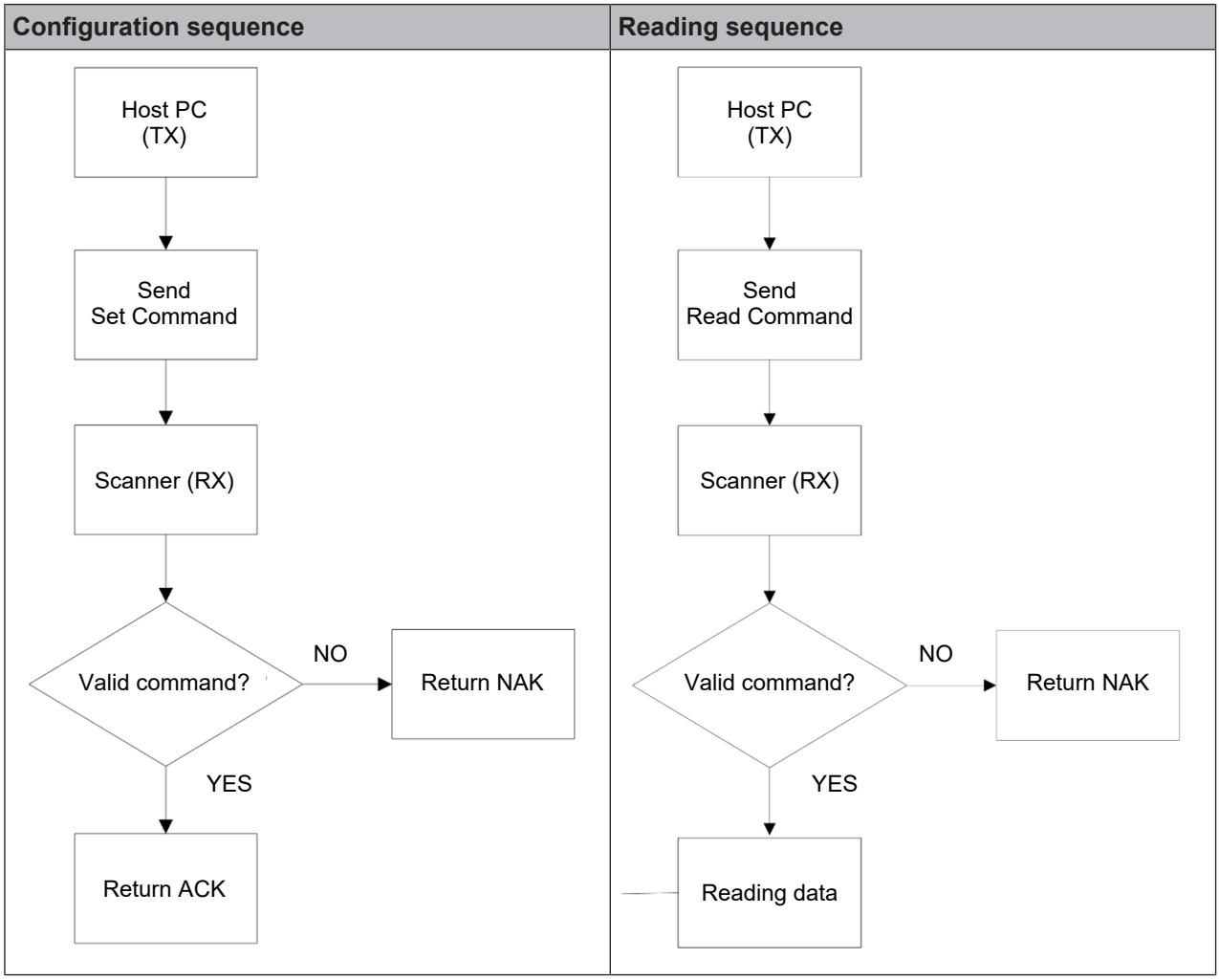
8 Command protocol

Each device has a clearly defined protocol for communication. The protocol consists of serial commands.

Serial commands

The user usually uses the command protocol when communicating with the device. The illustration shows the unformatted command sequence for sending a command to the device.

Tab. 8.1: Command sequence



9 Care, maintenance and disposal

Cleaning

Clean the glass window of the device with a soft cloth before mounting.

	NOTICE
	**Do not use aggressive cleaning agents!** ↳ 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 10 "Service and support").

Disposing

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

10 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:	
Display messages	
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

11 Technical data

11.1 General specifications

Tab. 11.1: Optical data

Optical system	CMOS imager, global shutter (1280 x 800 px)
Reading field	45 mm … 400 mm, code-dependent
Contrast	Minimum 20%
Resolution	1D code: m = 4 mil, distance-dependent 2D code: m = 7 mil, distance-dependent
Light sources • Illumination • Alignment LEDs (Aimer)	Integrated LEDs • Visible white light • Visible red light
LED group	Target LED: Exempt group (in acc. with IEC 62471:2006) Illumination: Risk group 1 (in acc. with IEC 62471:2006)

Tab. 11.2: Code specifications

Code type: 1D	UPC-A, UPC-E, EAN-8, EAN-13, Code 128, Code 39, Code 93, Code 32, Code 11, Codabar, Plessey, MSI, 2/5 Interleaved, 2/5 IATA, 2/5 Hong Kong, 2/5 Straight, Pharma Code, RSS-14, GS1
Code type: 2D	PDF417, MicroPDF417, Data Matrix, QR, Micro QR, Aztec, MaxiCode, Han Xin Code

Tab. 11.3: Interfaces

Interfaces	RS 232
Baud rate	9600 … 230400 baud, configurable
Trigger	Switching input • active: 0 V • inactive: 5 … 24 V

Tab. 11.4: Electrical connection

Supply voltage	5 V DC ± 5%
Current consumption	150 mA ± 5% (typical) 220 mA ± 5% (maximum)

Tab. 11.5: Mechanical data

Connection type	Open cable with 6 conductors
Weight	120 g (including cable)
Dimensions (W x D x H)	36 x 24 x 43 mm
Fastening	2 screws M3

Tab. 11.6: Environmental data

Ambient temperature, operation	-10 °C … +50 °C
Ambient temperature, storage	-40 °C … +70 °C
Air humidity	5% … 95% relative humidity, non-condensing

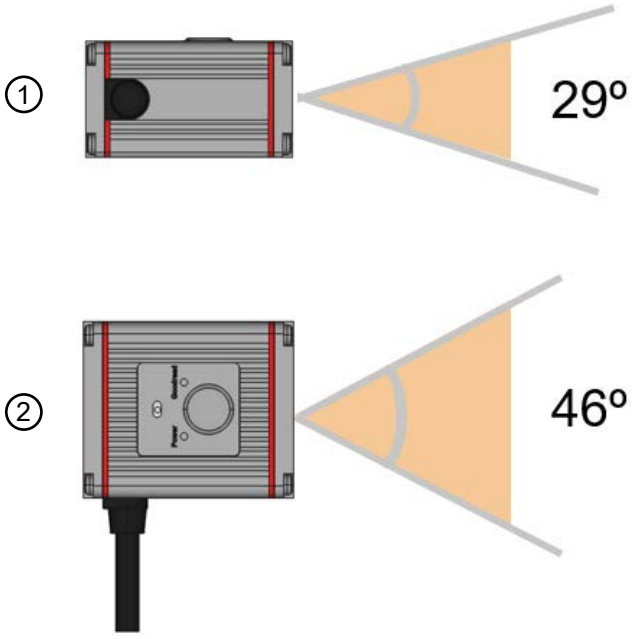
Ambient light	0 … 8,600 Lux (candles) 0 … 100,000 Lux (direct sunlight)

Tab. 11.7: Certifications

Degree of protection	IP54
Conformity	CE, FCC, RoHS
Electromagnetic compatibility	EN 55032:2015+A11:2020 EN 55035:2017+A11:2020

11.2 Reading field

NOTICE	
	Please note that the actual reading fields are also influenced by factors such as labeling material, printing quality, reading angle, printing contrast etc., and may thus deviate from the reading fields specified here. The origin of the read distance always refers to the front edge of the housing of the beam exit.



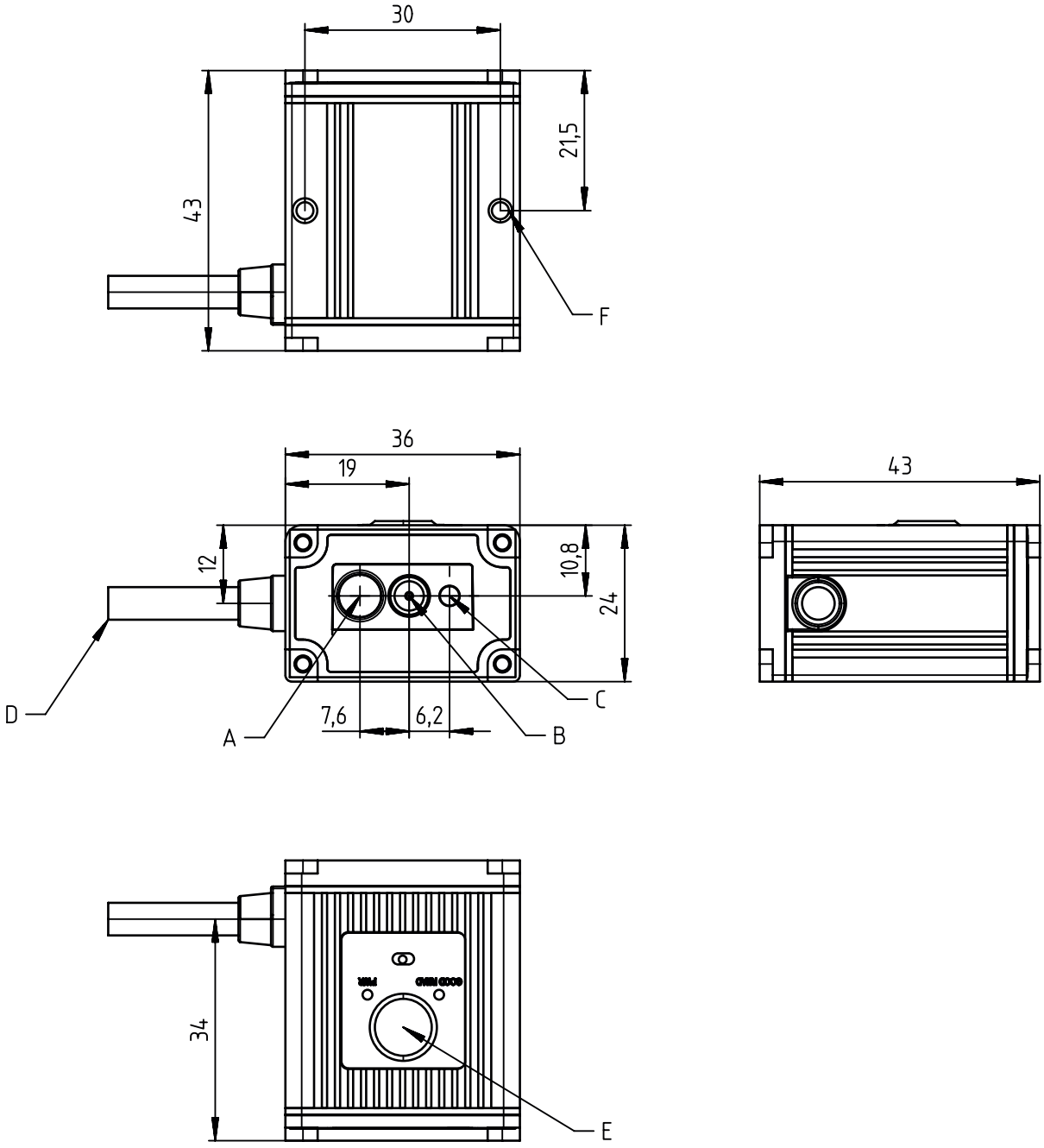
1 Reading field – bottom view
2 Reading field – lateral view

Fig. 11.1: Reading field

Tab. 11.8: Resolution and reading distance depending on code type

Code type	Resolution [mil]	Typical reading distance [mm]
Code 39 / Code 128	4	50 … 175
EAN-13	13	45 … 400
QR / Data Matrix Code	7	60 … 120

11.3 Dimensioned drawing



All dimensions in mm

A Integrated LED for illumination (white light)
B Center of optical axis
C Integrated target LED (red light)
D Open cable (6 conductors)
E Trigger button
F 2x M3 threaded hole

Fig. 11.2: DCR56M2/R2 dimensioned drawing

12 Order guide and accessories

Type overview

Tab. 12.1: Part numbers

Part no.	Part designation	Description
50154107	DCR56M2/R2	Stationary code reader for 1D and 2D codes

Accessories

Tab. 12.2: Modular adapter unit

Part no.	Part designation	Description
50128204	MA-CR	Module

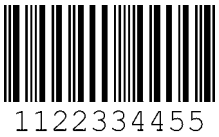
13 EC Declaration of Conformity

The stationary 2D-code readers of the DCR50 series have been developed and manufactured in accordance with the applicable European standards and directives.

	NOTICE
	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.

14 Appendix

14.1 Bar code sample



Module 0.3

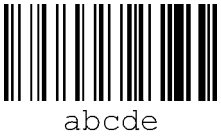
Fig. 14.1: Code type 01: 2/5 Interleaved

Module 0.3

Fig. 14.2: Code type 02: Code 39

Module 0.3

Fig. 14.3: Code type 11: Codabar



Module 0.3

Fig. 14.4: Code 128

Module 0.3

Fig. 14.5: Code type 08: EAN-128

SC 2

Fig. 14.6: Code type 06: UPC-A

SC 3

Fig. 14.7: Code type 07: EAN-8

GS1 DataBar

(01)00123456789012

PDF417

Car Registration

Data Matrix

Test Symbol

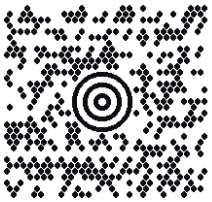
QR Code

Numbers

Aztec

Package Label

MaxiCode



Test Message

Micro PDF417

Test Message

Fig. 14.8: 2D example codes