EN

# Identification System
# CIS


EUCHNER
More than safety.

# EUCHNER

More than safety.

Headquarters in Leinfelden-Echterdingen

Logistics center in Leinfelden-Echterdingen


Production location in Unterböhringen

## Internationally successful – the EUCHNER company

EUCHNER GmbH + Co. KG is a world-leading company in the area of industrial safety technology. EUCHNER has been developing and producing high-quality switching systems for mechanical and systems engineering for more than 50 years.
The medium-sized family-operated company based in Leinfelden, Germany, employs more than 500 people around the world, 400 in Germany alone.

In addition to the production locations in Unterböhringen and Shanghai/China, 14 subsidiaries and other sales partners in Germany and abroad work for our international success on the market.

## Quality and innovation – the EUCHNER products

A look into the past shows EUCHNER to be a company with a great inventive spirit. We take the technological and ecological challenges of the future as an incentive for extraordinary product developments.

EUCHNER safety switches monitor safety doors on machines and installations, help to minimize dangers and risks and thereby reliably protect people and processes. Today, our products range from electromechanical and electronic components to intelligent integrated safety solutions. Safety for people, machines and products is one of our dominant themes.

We define future safety technology with the highest quality standards and reliable technology. Extraordinary solutions ensure the great satisfaction of our customers. The product ranges are subdivided as follows:

- Transponder-coded Safety Switches (CES)
- Transponder-coded Safety Switches with guard locking (CET)
- Interlocking and guard locking systems (Multifunctional Gate Box MGB)
- Access management systems (Electronic-Key-System EKS)
- Electromechanical Safety Switches
- Magnetically coded Safety Switches (CMS)
- Enabling Switches
- Safety Relays
- Emergency Stop Devices
- Hand-Held Pendant Stations and Handwheels
- Safety Switches with AS-Interface
- Joystick Switches
- Position Switches

made in Germany

# Contents

## Identification System CIS

## Inductive Identification System CIS

### Applications

Inductive identification systems are used for the non-contact identification of products such as tools, product carriers or containers in the entire manufacturing and logistics sector. The data carriers for the identification systems CIS are mostly programmed with a unique sequential number. The product is identified at a read station using this number and the related production data are then assigned to the product.

The data carriers are read using a completely wear-free inductive coupling. The read heads and data carriers are of robust design, have a high degree of protection and are designed for harsh industrial usage. The identification system will also work without problems when subject to dirt and moisture.

### System overview and function

The identification system CIS essentially comprises the following components:

- Data carrier
- Read-only station or read/write station with data interface

The identification systems CIS3, CIS3A and CIS3A-Mini are very similar with regard to the interfaces to the higher level control system. As a result the integration into the control system is similar. There are differences, on the one hand, in the design of the antenna and, on the other hand, in the design of the components. The special features and advantages of the individual systems as well as the related system components are divided into separate sections for the systems CIS3, CIS3A and CIS3A-Mini. The components for the different identification systems CIS3, CIS3A and CIS3A-Mini must not be mixed between the systems, i. e. a CIS3 read head is not suitable for reading a CIS3A data carrier.

The read stations and read/write stations for the CIS3 and CIS3A are fitted compactly in one housing. In the case of the CIS3A-Mini the stations are split in two for space reasons, that is interface adapter and antenna are connected via an antenna cable.

Power is supplied to the transponder and the data are transferred between the read/write station and the data carrier without using any contacts.

The CIS identification system operates on the principle of inductive coupling in the near field, based on a carrier frequency of 125 kHz. This standard frequency at the low end of the frequency band used for RFID applications makes it possible, if necessary, to even install the data carrier flush in metal. However, it will certainly be of advantage if a non-metallic material is used in the immediate area around the data carrier.

A memory chip and an antenna are fitted in the data carrier, in various shapes (transponder). The $E^2$PROM to which data can be written (programmable) retains the data in non-volatile form. For all standard data carriers used for CIS the following applies:

- Transponder without battery
- Robust encapsulated data carrier housing with degree of protection IP67

The read-only stations communicate with the higher level control system via a 4-bit parallel interface and the read/write stations via a serial interface.

### Integration for read-only operation

The identification system CIS is mostly used in installation as a read-only system with the 4-bit parallel interface. The advantage of the parallel interface is simple integration into the control system and the transparent representation of the data. Quick and therefore low-cost integration into any type of PLC is possible.

The 4 data wires, which are connected directly to the PLC via inputs and outputs (I/O), represent at a point in time a related hex digit using high/low levels (24 V/0 V). After the read station is switched on, the level on all 4 wires is initially high. If a data carrier now enters the operating distance of the read station, first the data are automatically transferred from the data carrier to the memory in the read station and stored there temporarily. In the second step, the data are actively retrieved from the memory in the read station by the control system. For the second step it is no longer necessary for the data carrier to be in the read head's operating distance.

The read station saves the data from a data carrier read until the next data carrier is fed to the read station or the read station is switched off and on again. In the case of the CIS3A-Mini it is also possible to delete the temporary memory in the read station via a reset pulse. If there is a data carrier in front of the read head, the data are transferred again automatically.

In the first step, it is signaled to the control system via the high level on the STROBE output on the read station that there is a data carrier in the operating distance and new data are available in the memory on the read station. The STROBE output is set to the high level when the first 4 hex digits on the CIS3/CIS3A and the first 8 hex digits on the CIS3A Mini are available in the memory on the read station. If in the case of the CIS3/CIS3A more than 4 hex digits are required in the application, it is necessary to wait long enough until all the digits have been transferred to the memory in the read station (see pulse diagram in the manual for the read station). If, for some reason (e. g. excessively high relative speed), it was not possible to read all the digits, on the output of the data $F_{hex}$ is output as an error message from the point at which the data were no longer read from the data carrier.

In the second step, the data can be retrieved from the temporary memory in the read station by the control system. A value between 0 and 15 is represented at a point in time via a combination of high/low levels on the data outputs on the read station using binary coding (high level on A=1, B=2, C=4, D=8). The first digit from the data carrier is indicated immediately on the 4-bit data wire. Using pulses from the control system on the SKIP input on the read station, a maximum of 32 hex digits (16 bytes) can be read with the CIS3/CIS3A and 8 hex digits (4 bytes) with the CIS3A Mini. Reference is to be made to the pulse diagram in the manual for the read station for information on the timing of the pulses.

If the SKIP input on the read station is maintained static at a high level, no data are transferred from the data carrier into the memory in the read station. By maintaining the SKIP signal at the high level prior to the entry of the data carrier in the operating distance, on the change in the SKIP signal to the low level the data can be read statically at this defined point in time. As long as the SKIP input is maintained at the high level, the STROBE output remains at the low level, even if there is a data carrier in the operating distance of the read head. The signaling that there is a read head in front of the read head must therefore be provided separately if you want to use this reading method. On the application of this method of control, a CIS3 data carrier can, for instance, approach the read head in the opposite direction to the arrow.

In typical applications 2, 3 or 4 digits of these 8 (CIS3AMini) or 32 (CIS3/CIS3A) possible digits are combined to form a number and used in the application. Hereby, e. g. 150 product carriers (3 digits) with 001, 002, 003 to 150 are sequentially numbered in decimal notation. The definition of the sequence of numbers with leading zeros produces a logical series. The data carrier then has a data record address that is used to store the actual production information in the control system. In this example with 3 available digits, 999 different product carriers could be addressed in decimal notation. In the case of a 3-digit number, the data are provided on the 4-bit data wire in the following sequence: the first digit is displayed automatically, the second digit is displayed after the first SKIP pulse from the control system and the third digit is displayed after the second SKIP pulse.

There exist the following possible ways of programming the data carriers with digits:

- Order programmed data carriers
- Program in-house using read/write station with serial interface
- Program in-house using mobile hand-held terminal

The data carrier can be written (programmed) for read-only operation on customer request and also visibly labelled using a laser. In this case a data carrier programming and labelling information form is to be completed with the order. This form is available for download from www.euchner.de.

You will have significantly more flexibility if you have your own facility for data carrier programming. The read/write station for the related identification system with a serial interface can be used on a PC for easy writing to the data carriers (programming). For this purpose the programming software Transponder Coding (TC) is installed on the PC. TC is an ASCII/hex editor with which it is easy to write to and read from the data carrier on the PC.

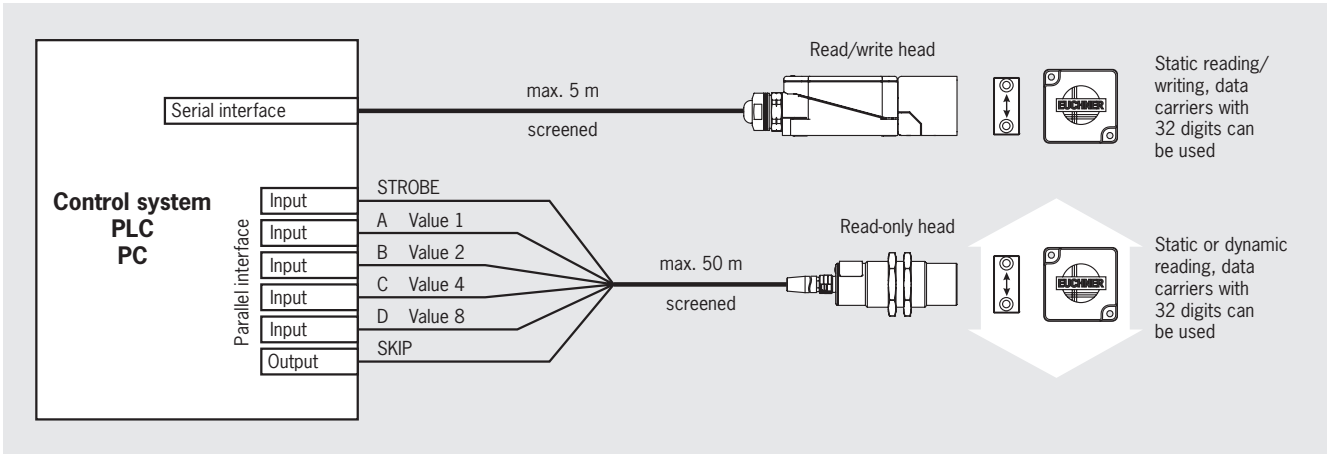
It is also possible to write to and read from data carriers with the aid of the portable mobile hand-held terminal MHT-G2. For this purpose a read/write head to suit the related identification system is fitted. The data carriers can be read and written (programmed) using the software Transponder Coding CE (TCCE). TCCE is an ASCII/hex editor with which it is easy to write to and read from the data carrier on the MHT.

**Integration for read/write operation**

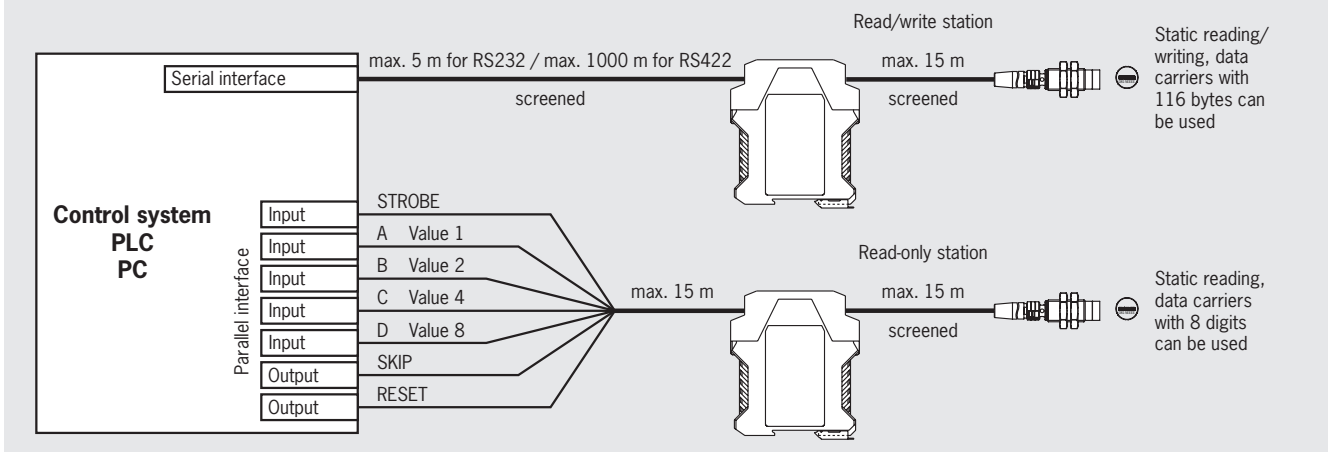
In the case of read/write stations with serial interface, the data communication is according to the 3964R transfer protocol. The individual commands, e. g. for reading the data or writing the data, are described in the device-specific manuals. For unusual CIS applications in which data carriers must also be re-programmed during production, the application is programmed in the control system with the aid of these commands based on the 3964R transfer protocol.

Interfacing of a read/write station with serial interface to the user's PC-based application is supported by the optionally available ActiveX® modules (can be used if Microsoft Windows®-based user programs support ActiveX®). CIS can thus be used in conjunction with PC-based control software or visualization software. The ActiveX® module is used here as a protocol driver for the 3964R transfer protocol. You can obtain further information on the usage of an ActiveX® module on request.

**Block diagram identification system CIS3/CIS3A**




**Block diagram identification system CIS3A-Mini**

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## Features and possible combinations for CIS components

| | | |
|---|---|---|
| **Key to symbols** | ● | Combination possible |
| | | Combination not permissible |

| Identification system | Features | Applications | Interface adapter, read/write head | Data carriers | | | |
|---|---|---|---|---|---|---|---|
| | | | | **CIS3P35X16SH16Y...** All items | **CIS3P16D08KH16YSNO...** All items | **CIS3AP50X50SH16YSNO...** All items | **CIS3AP10D05KH01K...** All items |
| **CIS3** | **Read distance max. 18 mm**<br>**Dynamic reading up to 410 mm/s** | **Coding of recirculating product carriers or larger tools with standard read distances** | Read-only head<br>**CIT3PL1N30-STA**<br>071 552 | ● | ● | | |
| | | | Read-only head<br>**CIT3PL1N30-STR**<br>071 950 | ● | ● | | |
| | | | Read/write head<br>**CIT3SX1R1G05KX**<br>096 560 | ● | ● | | |
| **CIS3A** | **Read distance max. 28 mm**<br>**Dynamic reading up to 230 mm/s** | **Coding of slowly recircu-lating product carriers or very large tools at increased read distances** | Read-only head<br>**CIT3APL1N30-STA**<br>071 900 | | | ● | |
| | | | Read-only head<br>**CIT3APL1G05ST**<br>077 805 | | | ● | |
| | | | Read/write head<br>**CIT3ASX1R1G05KX**<br>077 890 | | | ● | ● 1) |
| **CIS3A-Mini** | **Miniature dimensions**<br>**Read distance max. 6.5 mm** | **Coding of tools or small product carriers** | Interface adapter<br>**CIA3...**<br>All items with read/write head<br>**CIT3ASX1N12ST**<br>077 940 | | | | ● |

1) To set up a programming station for CIS3A-Mini data carriers, a CIS3A read/write head can be used.

## Identification system CIS3

| | Interface adapters | Read/write heads | Data carriers |
|---|---|---|---|
| Read only | **Parallel interface**<br>**integrated in the read head** |  <br>**CIT3PL1N30-ST...**<br>▸ Read-only head<br>▸ Cylindrical design M30<br>▸ M12 plug connector<br>▸ Axial or radial connection<br>(see page 12) |  <br>**CIS3P35X16SH16YHNO...**<br>▸ Cube-shaped<br>▸ Approach direction horizontal<br>(see page 16) |
| | | |  <br>**CIS3P35X16SH16YVNO...**<br>▸ Cube-shaped<br>▸ Approach direction vertical<br>(see page 16) |
| Read / write | **Serial interface**<br>**integrated in the read/write head** |  <br>**CIT3SX1R1G05KX**<br>▸ Read/write head<br>▸ Housing according to EN 50041<br>▸ Connection terminals<br>(see page 14) |  <br>**CIS3P16D08KH16YSNO...**<br>▸ Cylindrical ∅ 16 mm<br>(see page 17) |

## Identification system CIS3A

| | Interface adapters | Read/write heads | Data carriers |
|---|---|---|---|
| Read only | **Parallel interface**<br>**integrated in the read head** |  <br>**CIT3APL1N30-STA**<br>▸ Read-only head<br>▸ Cylindrical design M30<br>▸ M12 plug connector<br>▸ Axial connection<br>(see page 22) |  <br>**CIS3AP50X50SH16YSNO...**<br>▸ Square<br>(see page 28) |
| | |  <br>**CIT3APL1G05ST**<br>▸ Read-only head<br>▸ Housing according to EN 50041<br>▸ M12 plug connector<br>▸ Axial connection<br>(see page 24) | |
| Read / write | **Serial interface**<br>**integrated in the read/write head** |  <br>**CIT3ASX1R1G05KX**<br>▸ Read/write head<br>▸ Housing according to EN 50041<br>▸ Connection terminals<br>(see page 26) | |

## Identification system CIS3A-Mini

| | Interface adapters | Read/write heads | Data carriers |
|---|---|---|---|
| Read only | **Parallel interface**<br>  <br>**CIA3PL1G08**<br>▸ Plug-in screw terminals<br>(see page 34) |  <br>**CIT3ASX1N12ST**<br>▸ Read/write head<br>▸ Cylindrical design M12<br>▸ M8 plug connector<br>▸ Axial connection<br>(see page 38) |  <br>**CIS3AP10D05KH01K...**<br>▸ Cylindrical ∅ 10 mm<br>(see page 39) |
| Read / write | **Serial interface**<br>  <br>**CIA3SX1R1G08**<br>▸ Plug-in screw terminals<br>(see page 36) | | |

## Mobile hand-held terminal MHT-G2

### Basic unit

**MHT-G2-BU**
- For reading and programming the data carriers
- With touch-pen and cover for rechargeable battery compartment

(see page 44)

### Accessories

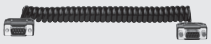
**Rechargeable battery**
**MHT-G2-BA**
(see page 45)

**SD memory card**
**MHT-G2-SD-TCCE**
- With software *Transponder Coding CE (TCCE)*

(see page 45)

**Docking station**
**MHT-G2-DS**
- With power supply unit and USB connecting cable

(see page 45)



**Extension cable**
- For read/write head

(see page 45)

**Read/write head**
**CIT3-H2**
- For identification system CIS3

(see page 45)

**Read/write head**
**CIT3A-H2**
- For identification system CIS3A

(see page 45)

**Read/write head**
**CIT3A-MINI-H2**
- For identification system CIS3A-Mini

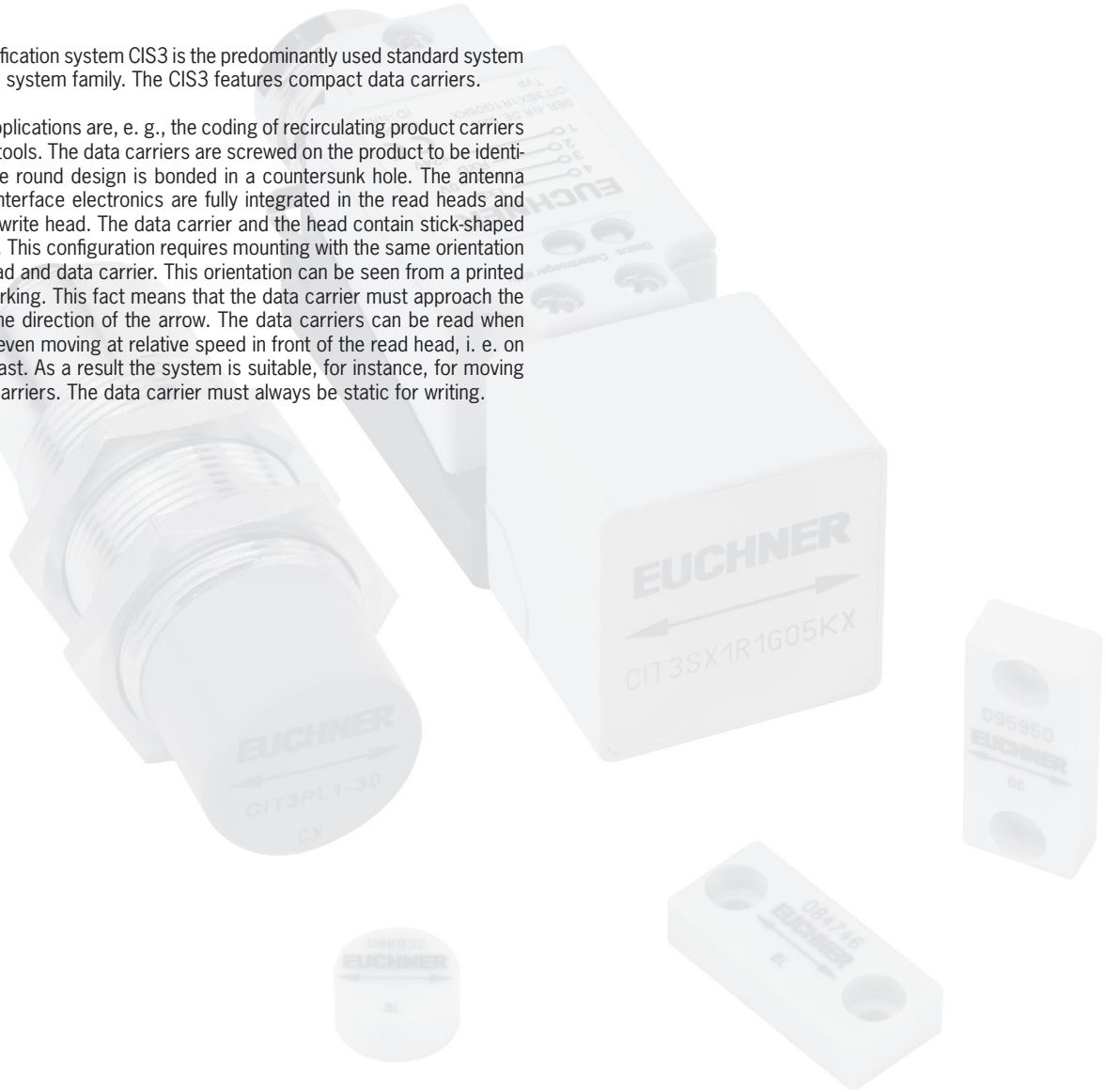
(see page 45)

## Identification System CIS3

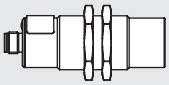
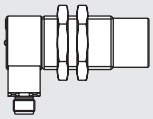
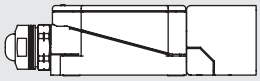
- **Low-cost read/write system with predominantly used, separate read-only heads**
- **Extremely compact head design, no separate interface adapter required**
- **Read distance maximum 18 mm**
- **Dynamic reading with a relative speed up to 410 mm/s**
- **Data carrier memory capacity 16 bytes E²PROM read/write**
- **Easy connection of the read-only heads to I/O on any control system via 4-bit parallel interface (24 V)**
- **Read/write heads with serial interface RS232**

The identification system CIS3 is the predominantly used standard system in the CIS system family. The CIS3 features compact data carriers.

Typical applications are, e. g., the coding of recirculating product carriers or larger tools. The data carriers are screwed on the product to be identified or the round design is bonded in a countersunk hole. The antenna and the interface electronics are fully integrated in the read heads and the read/write head. The data carrier and the head contain stick-shaped antennae. This configuration requires mounting with the same orientation of the head and data carrier. This orientation can be seen from a printed arrow marking. This fact means that the data carrier must approach the head in the direction of the arrow. The data carriers can be read when static or even moving at relative speed in front of the read head, i. e. on moving past. As a result the system is suitable, for instance, for moving product carriers. The data carrier must always be static for writing.



## Selection table for identification system CIS3

<table>
<tr><th colspan="2">Connection cable</th><th>Read/write heads</th><th>Data carriers</th></tr>
<tr><td rowspan="2">Read only</td><td rowspan="2">  <br>Page 18</td><td>Read-only head<br>CIT3PL1N30-STA<br>  <br>Page 12</td><td rowspan="3">Horizontal<br>CIS3P35X16SH16YHNO...<br>  <br>Page 16<br><br>Vertical<br>CIS3P35X16SH16YVNO...<br>  <br>Page 16<br><br>CIS3P16D08KH16YSNO...<br>  <br>Page 17</td></tr>
<tr><td>Read-only head<br>CIT3PL1N30-STR<br>  <br>Page 12</td></tr>
<tr><td>Read / write</td><td></td><td>Read/write head<br>CIT3SX1R1G05KX<br>  <br>Page 14</td></tr>
</table>

## Possible combinations for CIS3 components

To give you a quick overview of which CIS3 components can be combined with each other, there is a combinations table for each read head. The table will answer the following questions:

- Which data carrier can be read by the selected read head?
- What is the operating distance of this combination?

| | | |
|---|---|---|
| **Key to symbols** | L 18 | Combination possible, max. read distance 18 mm |
| | S 9 | Combination possible, max. write distance 9 mm |
| | | Combination not permissible |

## Identification system CIS3

| **Read/write heads** | **Data carriers** | |
|---|---|---|
| | **CIS3P35X16SH16Y...**<br>All items | **CIS3P16D08KH16YSNO...**<br>All items |
| Read-only head<br>**CIT3PL1N30-STA**<br>071 552 | L 18 | L 14 |
| Read-only head<br>**CIT3PL1N30-STR**<br>071 950 | L 18 | L 14 |
| Read/write head<br>**CIT3SX1R1G05KX**<br>096 560 | L 18<br>S 10 | L 14<br>S 9 |

## Read-only heads CIT3PL1N30-ST...

- **Parallel interface**
- **Cylindrical design M30**
- **M12 plug connector**
- **Axial or radial connection**

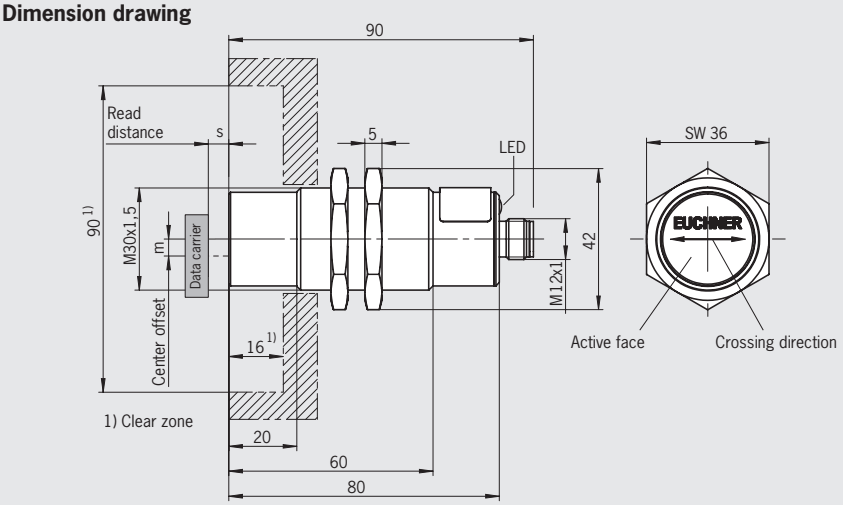
For possible combinations see page 11

**Mounting instructions**
On mounting the read head and data carrier, it is to be ensured the crossing direction as per the direction of the arrow on the active face of the read head is observed.

**Attention:**
On the usage of a screened cable the connection cable is allowed to be max. 50 m long.

### Read-only head CIT3PL1N30-STA
M12 plug, 8-pin, axial connection

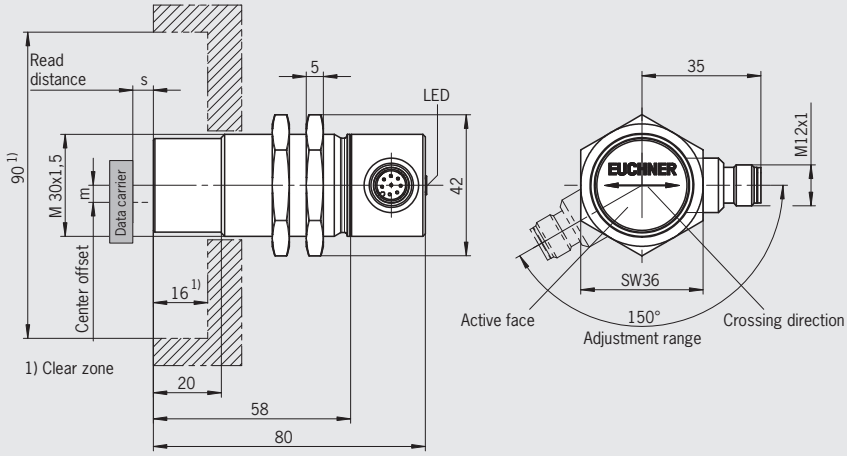
**Dimension drawing**




For connection cable see page 18

### Read-only head CIT3PL1N30-STR
M12 plug, 8-pin, radial connection

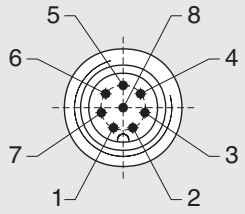
**Dimension drawing**




For connection cable see page 18

**Pin assignment**

| Pin | Designation | Description | Wire color |
|---|---|---|---|
| 1 | 0V/GND | Ground, DC 0 V | WH |
| 2 | 24 V/$U_B$ | Power supply, DC 24 V | BN |
| 3 | A | Output data wire A | GN |
| 4 | B | Output data wire B | YE |
| 5 | C | Output data wire C | GY |
| 6 | D | Output data wire D | PK |
| 7 | SKIP | Input data clock | BU |
| 8 | STROBE | Output data carrier active | RD |
| - | | Screen | Open |




View on the connection side of the read head

The screen on the connection cable is connected to the read head's housing via the knurled nut on the M12 plug connector.

**Ordering table**

| Series | Interface | Connection | Order no. / item |
|---|---|---|---|
| Read-only head for **CIS3** | **Parallel** | M12 plug connector **axial connection** | **071 552** CIT3PL1N30-STA |
| | | M12 plug connector **radial connection** | **071 950** CIT3PL1N30-STR |

## Technical data read-only heads CIT3PL1N30-ST...

| Parameter | Value min. | Value typ. | Value max. | Unit |
|---|---|---|---|---|
| Housing material | Brass (CuZn) nickel-plated | | | |
| Weight | 0.2 | | | kg |
| Ambient temperature at $U_B$ = DC 24 V | -25 | - | +50 | °C |
| Degree of protection according to EN 60529 | IP67 | | | |
| Type of installation | Non-flush | | | |
| Connection type | M12 plug connector, 8-pin, axial or radial connection, screw terminal | | | |
| Cable length | - | - | 50 | m |
| Operating voltage $U_B$ (regulated, residual ripple < 5 %) | 20 | 24 | 28 | V DC |
| Current consumption $I_B$ (without load current) | - | 65 | 100 [1] | mA |
| **Interface/data transfer** | | | | |
| Interface to I/O on a control system | 4-bit parallel, binary coded via HIGH/LOW level | | | |
| Load current per output $I_A$ (push-pull) | - | - | 30 | mA |
| Output voltage $U_A$ | | | | |
| A, B, C, D, STROBE = 1 (HIGH level) | $U_B$ - 3 | - | $U_B$ | V DC |
| A, B, C, D, STROBE = 0 (LOW level) | 0 | - | 2 | |
| Input voltage $U_E$ | | | | |
| SKIP = 1 (HIGH level) | 15 | - | $U_B$ | V DC |
| SKIP = 0 (LOW level) | 0 | - | 2 | |
| Input resistance $R_i$ (SKIP input) | - | 4.5 | - | kOhm |
| LED indication | Yellow: Data carrier active [2] | | | |

1) Continuous current in operation.

2) The LED illuminates yellow if there is a functional data carrier in the operating distance in front of the read head.

# Read/write head CIT3SX1R1G05KX

- **Serial interface RS232**
- **Active face can be adjusted to 5 different positions**
- **Standard housing according to EN 50041**
- **Connection terminals**


For possible combinations see page 11

**Serial interface**
The individual commands for reading and writing the data carrier are in accordance with the common 3964R protocol and are described in the EUCHNER CIS3 system manual (order no. 071 652).
For data carrier programming away from the system, a convenient WINDOWS®-compatible PC software application is available (Software Transponder Coding, see page 41).

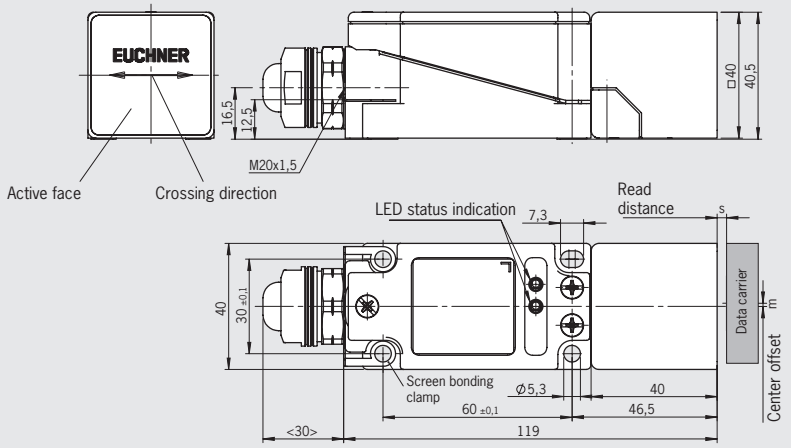
**Standard housing**
The size of the robust housing in degree of protection IP65 is compliant with the standard EN 50041.
The division into 3 assemblies permits easy mounting and straightforward replacement.

**Mounting instructions**
On mounting the read/write head and data carrier, it is to be ensured the crossing direction as per the direction of the arrow on the active face of the read/write head is observed.

**Attention:**
On the usage of a screened cable the connection cable for the serial interface is allowed to be max. 5 m long.

## Read/write head CIT3SX1R1G05KX

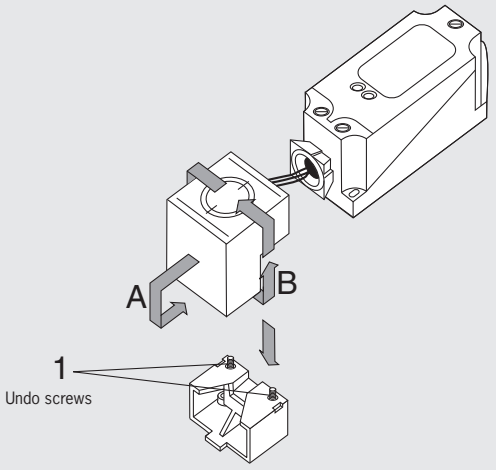
### Dimension drawing




### Pin assignment

| Terminal | Designation | Description |
|---|---|---|
| 1 | 24 V/$U_B$ | Power supply, DC 24 V |
| 2 | RxD | Serial interface receive |
| 3 | 0V/GND | Ground, DC 0 V |
| 4 | TxD | Serial interface transmit |

### Changing the active face




**Ordering table**

| Series | Interface | Connection | Order no. / item |
|---|---|---|---|
| Read/write head for **CIS3** | **Serial RS232** | Connection terminals | **096 560** CIT3SX1R1G05KX |

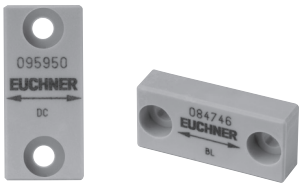
## Technical data read/write head CIT3SX1R1G05KX

| Parameter | Value min. | Value typ. | Value max. | Unit |
|---|---|---|---|---|
| Housing material | | Plastic | | |
| Weight | | 0.29 | | kg |
| Ambient temperature at $U_B$ = DC 24 V | 0 | - | +55 | °C |
| Degree of protection according to EN 60529 | | IP65 | | |
| Type of installation | | Non-flush | | |
| Connection type | | Screw terminals | | |
| Operating voltage $U_B$ (regulated, residual ripple < 5 %) | 20 | 24 | 28 | V DC |
| Current consumption $I_B$ (without load current) | - | 80 | 120 | mA |
| **Interface/data transfer** | | | | |
| Interface to the PC or to the control system | | Serial RS232 | | |
| Transfer protocol | | 3964R | | |
| Data transfer rate | - | 9.6 | - | kbaud |
| Data format | | 1 start bit, 8 data bits, 1 parity bit (even parity), 1 stop bit | | |
| Cable length RS232 interface | - | - | 5 | m |
| LED indication | | Green: Ready (in operation)<br>Yellow: Data carrier active [1)] | | |

1) The LED illuminates yellow if there is a functional data carrier in the operating distance in front of the read/write head.

## Data carrier CIS3P35X16SH16Y...

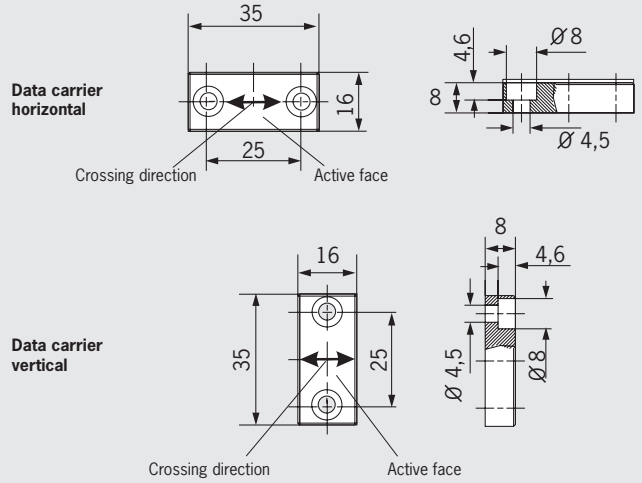
- **Cube-shaped design 35 x 16 mm**
- **Data carrier horizontal or vertical**
- **Unprogrammed or programmed**




For possible combinations see page 11

**Data carrier CIS3P35X16SH16Y...**

**Dimension drawing**




**Mounting instructions**

On mounting the read head and data carrier, it is to be ensured the crossing direction as per the direction of the arrow on the active face of the read head or read/write head is observed.

**Programming**

The data carrier can be written (programmed) for read-only operation with a maximum of 32 hexadecimal digits (value from $0_{hex}$ to $F_{hex}$) on customer request. Standard filler digit after the customer-specific defined digits is $E_{hex}$.

The housing is permanently laser marked with the digits programmed (not including filler digits) in hexadecimal notation.

**Technical data**

| Parameter | Value min. | Value typ. | Value max. | Unit |
|---|---|---|---|---|
| Memory capacity (read/write) | - | 16 | - | bytes |
| Housing material | Plastic PPS | | | |
| Weight | 0.005 | | | kg |
| Degree of protection according to EN 60529 | IP67 | | | |
| Ambient temperature | -40 | - | +85 | °C |
| Type of installation | Screw fixing, not flush (also on metal) | | | |
| Memory organization<br>Write<br>Read | <br>Only possible in 2-byte blocks<br>Possible byte by byte | | | |
| **Operating parameters on reading using read-only head CIT3PL1N30-STA or CIT3PL1N30-STR** | | | | |
| Read distance $s_L$ | 0 | 7 | 18 | mm |
| Center offset $m_L$ in x direction (for $s_L$ = 7 mm) | - | - | ± 23 | |
| Center offset $m_L$ in y direction (for $s_L$ = 7 mm) | - | - | ± 8 | |
| Relative speed for reading 4 hexadecimal digits<br>Reduction for each additional hexadecimal digit<br>(at $s_L$ = 7 mm and $m_L$ = 0 mm in y direction) | -<br>- | -<br>- | 410<br>25 | mm/s |
| Number of read cycles | Not limited | | | |
| **Operating parameters on reading and writing using read/write head CIT3SX1R1G05KX** | | | | |
| Read distance $s_L$ | 0 | 7 | 18 | mm |
| Write distance $s_S$ | 0 | 5 | 10 | |
| Center offset $m_L$ /$m_S$ in x direction (at $s_L$ /$s_S$ = 5 mm) | - | - | ± 10 | |
| Center offset $m_L$ /$m_S$ in y direction (at $s_L$ /$s_S$ = 5 mm) | - | - | ± 8 | |
| Number of write cycles | 100,000 | - | - | cycles |

**Ordering table**

| Series | Design | Version | Order no. / item |
|---|---|---|---|
| Data carrier for **CIS3** | Cube-shaped 35 x 16 mm | Horizontal, unprogrammed | **084 746**<br>CIS3P35X16SH16YHNOU |
| | | Horizontal, programmed | **084 747**<br>CIS3P35X16SH16YHNOP |
| | | Vertical, unprogrammed | **095 950**<br>CIS3P35X16SH16YVNOU |
| | | Vertical, programmed | **095 951**<br>CIS3P35X16SH16YVNOP |

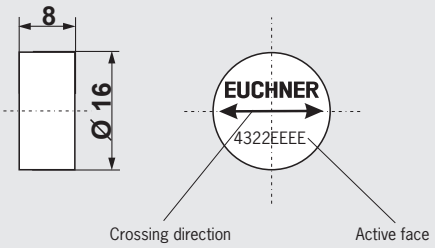
## Data carrier CIS3P16D08KH16YSNO...

- **Cylindrical design ∅ 16 mm**
- **Unprogrammed or programmed**


For possible combinations see page 11

**Data carrier CIS3P16D08KH16YSNO...**

**Dimension drawing**




### Notes on installation

- On mounting the read head and data carrier, it is to be ensured the crossing direction as per the direction of the arrow on the active face of the read head or read/write head is observed.
- For fastening use e.g. two-component epoxy resin adhesive.

### Programming

The data carrier can be written (programmed) for read-only operation with a maximum of 32 hexadecimal digits (value from $0_{hex}$ to $F_{hex}$) on customer request. Standard filler digit after the customer-specific defined digits is $E_{hex}$.

The housing is permanently laser marked with the digits programmed (not including filler digits) in hexadecimal notation.

### Technical data

| Parameter | Value min. | Value typ. | Value max. | Unit |
|---|---|---|---|---|
| Memory capacity (read/write) | - | 16 | - | bytes |
| Housing material | | Plastic PPS | | |
| Weight | | 0.003 | | kg |
| Degree of protection according to EN 60529 | | IP67 | | |
| Ambient temperature | -40 | - | +85 | °C |
| Type of installation | | Bonded, flush (also in metal) 1) | | |
| Memory organization<br>Write<br>Read | | Only possible in 2-byte blocks<br>Possible byte by byte | | |
| **Operating parameters on reading using read-only head CIT3PL1N30-STA or CIT3PL1N30-STR** 1) | | | | |
| Read distance $s_L$ | 0 | 5 | 14 | mm |
| Center offset $m_L$ in x direction (for $s_L$ = 5 mm) | - | - | ± 18 | |
| Center offset $m_L$ in y direction (for $s_L$ = 5 mm) | - | - | ± 6 | |
| Relative speed for reading 4 hexadecimal digits<br>Reduction for each additional hexadecimal digit<br>(at $s_L$ = 5 mm and $m_L$ = 0 mm in y direction) | -<br>- | -<br>- | 320<br>25 | mm/s |
| Number of read cycles | | Not limited | | |
| **Operating parameters on reading and writing using read/write head CIT3SX1R1G05KX** 1) | | | | |
| Read distance $s_L$ | 0 | 5 | 14 | mm |
| Write distance $s_S$ | 0 | 5 | 9 | |
| Center offset $m_L$ /$m_S$ in x direction (at $s_L$ /$s_S$ = 5 mm) | - | - | ± 10 | |
| Center offset $m_L$ /$m_S$ in y direction (at $s_L$ /$s_S$ = 5 mm) | - | - | ± 6 | |
| Number of write cycles | 100,000 | - | - | cycles |

1) On flush installation in a non-metallic material, better operating parameters as for the data carriers CIS3P35X16SH16Y... are obtained

### Ordering table

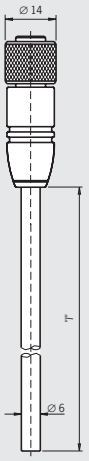
| Series | Design | Version | Order no. / item |
|---|---|---|---|
| Data carrier for **CIS3** | Cylindrical ∅ 16 mm | Unprogrammed | **088 832**<br>CIS3P16D08KH16YSNOU |
| | | Programmed | **088 833**<br>CIS3P16D08KH16YSNOP |

## Connection cables and documentation

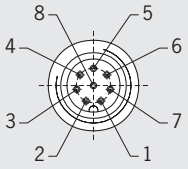
▶ **Screened connection cable for read-only heads CIT3PL.../CIT3APL...**

**For read-only heads CIT3**
M12 socket, 8-pin, silicone-free

**Dimension drawing**




View of connection side




| | | |
|---|---|---|
| 1 | = WH | ▶ 0 V/GND |
| 2 | = BN | ▶ 24 V/$U_B$ |
| 3 | = GN | ▶ A |
| 4 | = YE | ▶ B |
| 5 | = GY | ▶ C |
| 6 | = PK | ▶ D |
| 7 | = BU | ▶ SKIP |
| 8 | = RD | ▶ STROBE |
| | Open | ▶ Screen |

The screen on the connection cable is connected to the read head's housing via the knurled nut on the M12 plug connector.

**Technical data**

| Parameter | Value min. | typ. | max. | Unit |
|---|---|---|---|---|
| Plug connector | | 8-pin M12 female connector, straight | | |
| Connection type | | Screw terminal, knurled nut electrically connected to cable screen | | |
| Conductor cross-section | | 8 x 0.25 screened | | mm² |
| Material, outer sheath | | PVC | | |

**Ordering table**

| Plug connectors | Cable type | Cable length l [m] | Order no / item |
|---|---|---|---|
| **Straight** | **V** Cable PVC | 5 | **077 751** C-M12F08-08X025PV05,0-ZN-077751 |
| | | 10 | **077 752** C-M12F08-08X025PV10,0-ZN-077752 |
| | | 15 | **077 753** C-M12F08-08X025PV15,0-ZN-077753 |
| | | 20 | **077 871** C-M12F08-08X025PV20,0-ZN-077871 |
| | | 25 | **077 872** C-M12F08-08X025PV25,0-ZN-077872 |
| | | 50 | **077 873** C-M12F08-08X025PV50,0-ZN-077873 |

▶ **User manual CIS3/CIS3A**

**Ordering table**

| Series | Comment | Order no. |
|---|---|---|
| **Manual Inductive Identification system CIS3/CIS3A** | PDF file as download [1] | **071 652** |

1) Downloads available at www.euchner.de in Download/Manuals/Automation/Identification systems.

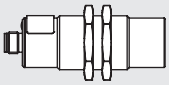
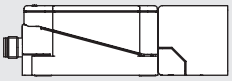
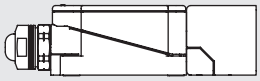
## Inductive Identification System CIS3A

- **Low-cost read/write system with predominantly used, separate read-only heads**
- **Extremely compact head design, no separate interface adapter required**
- **Read distance maximum 28 mm**
- **Dynamic reading with a relative speed up to 230 mm/s**
- **Data carrier memory capacity 16 bytes E²PROM read/write**
- **Easy connection of the read-only heads to I/O on any control system via 4-bit parallel interface (24 V)**
- **Read/write heads with serial interface RS232**

The identification system CIS3A is used if somewhat larger read distances are required. As a result a larger data carrier is necessary.

The data carrier is screwed on the product to be identified. The antenna and the interface electronics are fully integrated in the read heads and the read/write head. The data carrier and the head contain round-shaped antennae. The orientation of the data carrier in relation to the head is unimportant. This fact means that the data carrier can approach the head from any direction. The data carriers can be read when static or moving at low relative speed in front of the read head, i. e. on moving past. The data carrier must always be static for writing.

## Selection table for identification system CIS3A

| | Connection cable | Read/write heads | Data carriers |
|---|---|---|---|
| Read only |  <br>Page 29 | Read-only head<br>CIT3APL1N30-STA<br>  <br>Page 22 | CIS3AP50X50SH16YSNO...<br>  <br>Page 28 |
| | | Read-only head<br>CIT3APL1G05ST<br>  <br>Page 24 | |
| Read / write | | Read/write head<br>CIT3ASX1R1G05KX<br>  <br>Page 26 | |

## Possible combinations for CIS3A components

To give you a quick overview of which CIS3A components can be combined with each other, there is a combinations table for each read head. The table will answer the following questions:

- Which data carrier can be read by the selected read head?
- What is the operating distance of this combination?

| | | |
|---|---|---|
| **Key to symbols** | L 20 | Combination possible, max. read distance 20 mm |
| | S 28 | Combination possible, max. write distance 28 mm |
| | | Combination not permissible |

## Identification system CIS3A

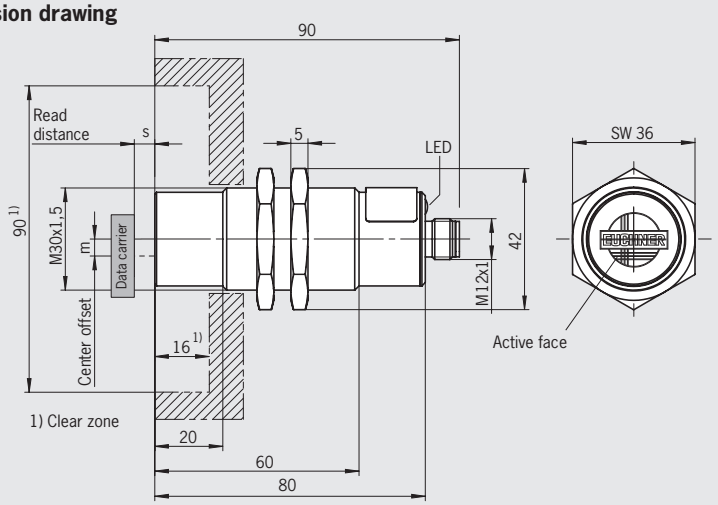
| **Read/write heads** | **Data carriers** |
|---|---|
| | **CIS3AP50X50SHYSNO...**<br>All items |
| Read-only head<br>**CIT3APL1N30-STA**<br>071 900 | L 20 |
| Read-only head<br>**CIT3APL1G05ST**<br>077 805 | L 28 |
| Read/write head<br>**CIT3ASX1R1G05KX**<br>077 890 | L 28<br>S 28 |

## Read-only head CIT3APL1N30-STA

- **Parallel interface**
- **Cylindrical design M30**
- **M12 plug connector**
- **Axial connection**

**Read-only head CIT3APL1N30-STA**
M12 plug, 8-pin, axial connection

**Dimension drawing**



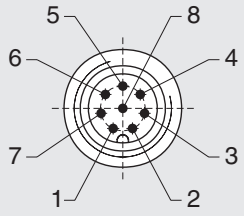

For connection cable see page 29

For possible combinations see page 21

**Attention:**
On the usage of a screened cable the connection cable is allowed to be max. 50 m long.

**Pin assignment**

| Pin | Designation | Description | Wire color |
|---|---|---|---|
| 1 | 0V/GND | Ground, DC 0 V | WH |
| 2 | 24 V/$U_B$ | Power supply, DC 24 V | BN |
| 3 | A | Output data wire A | GN |
| 4 | B | Output data wire B | YE |
| 5 | C | Output data wire C | GY |
| 6 | D | Output data wire D | PK |
| 7 | SKIP | Input data clock | BU |
| 8 | STROBE | Output data carrier active | RD |
| - | | Screen | Open |




View on the connection side of the read head

The screen on the connection cable is connected to the read head's housing via the knurled nut on the M12 plug connector.

**Ordering table**

| Series | Interface | Connection | Order no. / item |
|---|---|---|---|
| Read-only head for **CIS3A** | **Parallel** | M12 plug connector **axial connection** | **071 900** CIT3APL1N30-STA |

## Technical data read-only head CIT3APL1N30-STA

| Parameter | Value | | | Unit |
|---|---|---|---|---|
| | min. | typ. | max. | |
| Housing material | | Brass (CuZn) nickel-plated | | |
| Weight | | 0.2 | | kg |
| Ambient temperature at $U_B$ = DC 24 V | -25 | - | +50 | °C |
| Degree of protection according to EN 60529 | | IP67 | | |
| Type of installation | | Non-flush | | |
| Connection type | | M12 plug connector, 8-pin, axial connection, screw terminal | | |
| Cable length | - | - | 50 | m |
| Operating voltage $U_B$ (regulated, residual ripple < 5 %) | 20 | 24 | 28 | V DC |
| Current consumption $I_B$ (without load current) | - | 65 | 100 [1] | mA |
| **Interface/data transfer** | | | | |
| Interface to I/O on a control system | | 4-bit parallel, binary coded via HIGH/LOW level | | |
| Load current per output $I_A$ (push-pull) | - | - | 30 | mA |
| Output voltage $U_A$ | | | | |
| A, B, C, D, STROBE = 1 (HIGH level) | $U_B$ - 3 | - | $U_B$ | V DC |
| A, B, C, D, STROBE = 0 (LOW level) | 0 | - | 2 | |
| Input voltage $U_E$ | | | | |
| SKIP = 1 (HIGH level) | 15 | - | $U_B$ | V DC |
| SKIP = 0 (LOW level) | 0 | - | 2 | |
| Input resistance $R_i$ (SKIP input) | - | 4.5 | - | kOhm |
| LED indication | | Yellow: Data carrier active [2] | | |

1) Continuous current in operation.

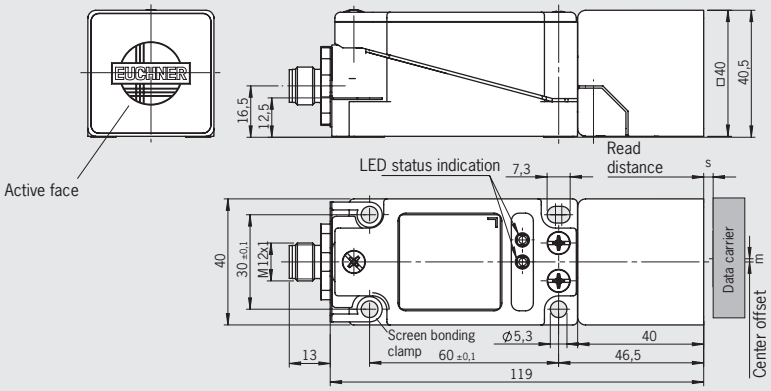
2) The LED illuminates yellow if there is a functional data carrier in the operating distance in front of the read head.

## Read-only head CIT3APL1G05ST

- **Parallel interface**
- **Active face can be adjusted to 5 different positions**
- **Standard housing according to EN 50041**
- **M12 plug connector**
- **Axial connection**

**Read-only head CIT3APL1G05ST**
M12 plug, 8-pin, axial connection

**Dimension drawing**

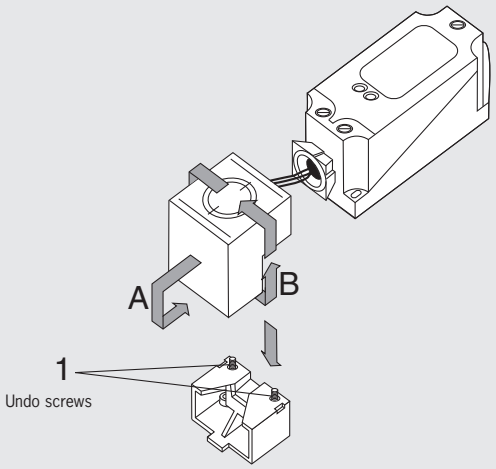



For connection cable see page 29

For possible combinations see page 21

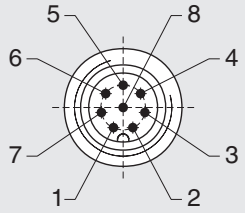
**Attention:**
On the usage of a screened cable the connection cable is allowed to be max. 50 m long.

**Changing the active face**




**Pin assignment**

| Pin | Designation | Description | Wire color |
|---|---|---|---|
| 1 | 0V/GND | Ground, DC 0 V | WH |
| 2 | 24 V/$U_B$ | Power supply, DC 24 V | BN |
| 3 | A | Output data wire A | GN |
| 4 | B | Output data wire B | YE |
| 5 | C | Output data wire C | GY |
| 6 | D | Output data wire D | PK |
| 7 | SKIP | Input data clock | BU |
| 8 | STROBE | Output data carrier active | RD |
| - | | Screen | Open |




View on the connection side of the read head

The screen on the connection cable is connected to the read head's screen bonding clamp via the knurled nut on the M12 plug connector.

**Ordering table**

| Series | Interface | Connection | Order no. / item |
|---|---|---|---|
| Read-only head for **CIS3A** | **Parallel** | M12 plug connector **axial connection** | **077 805** CIT3APL1G05ST |

## Technical data read-only head CIT3APL1G05ST

| Parameter | Value | | | Unit |
|---|---|---|---|---|
| | min. | typ. | max. | |
| Housing material | | Plastic | | |
| Weight | | 0.3 | | kg |
| Ambient temperature at $U_B$ = DC 24 V | 0 | - | +50 | °C |
| Degree of protection according to EN 60529 | | IP65 | | |
| Type of installation | | Non-flush | | |
| Connection type | | M12 plug connector, 8-pin, axial connection, screw terminal | | |
| Cable length | - | - | 50 | m |
| Operating voltage $U_B$ (regulated, residual ripple < 5 %) | 20 | 24 | 28 | V DC |
| Current consumption $I_B$ (without load current) | - | 90 | 120 [1] | mA |
| **Interface/data transfer** | | | | |
| Interface to I/O on a control system | | 4-bit parallel, binary coded via HIGH/LOW level | | |
| Load current per output $I_A$ (push-pull) | - | - | 30 | mA |
| Output voltage $U_A$ | | | | |
| A, B, C, D, STROBE = 1 (HIGH level) | $U_B$ - 3 | - | $U_B$ | V DC |
| A, B, C, D, STROBE = 0 (LOW level) | 0 | - | 2 | |
| Input voltage $U_E$ | | | | |
| SKIP = 1 (HIGH level) | 15 | - | $U_B$ | V DC |
| SKIP = 0 (LOW level) | 0 | - | 2 | |
| Input resistance $R_i$ (SKIP input) | - | 4.5 | - | kOhm |
| LED indication | | Green: Ready (in operation)<br>Yellow: Data carrier active [2] | | |

1) Continuous current in operation.

2) The LED illuminates yellow if there is a functional data carrier in the operating distance in front of the read head.

# Read/write head CIT3ASX1R1G05KX

- **Serial interface RS232**
- **Active face can be adjusted to 5 different positions**
- **Standard housing according to EN 50041**
- **Connection terminals**


For possible combinations see page 21

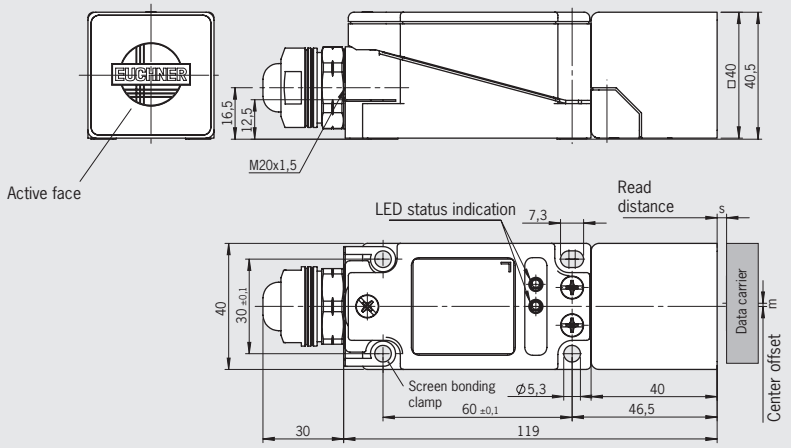
**Serial interface**
The individual commands for reading and writing the data carrier are in accordance with the common 3964R protocol and are described in the EUCHNER CIS3 system manual (order no. 071 652).
For data carrier programming away from the system, a convenient WINDOWS®-compatible PC software application is available (Software Transponder Coding, see page 41).

**Standard housing**
The size of the robust housing in degree of protection IP65 is compliant with the standard EN 50041.
The division into 3 assemblies permits easy mounting and straightforward replacement.

**Attention:**
On the usage of a screened cable the connection cable for the serial interface is allowed to be max. 5 m long.

## Read/write head CIT3ASX1R1G05KX

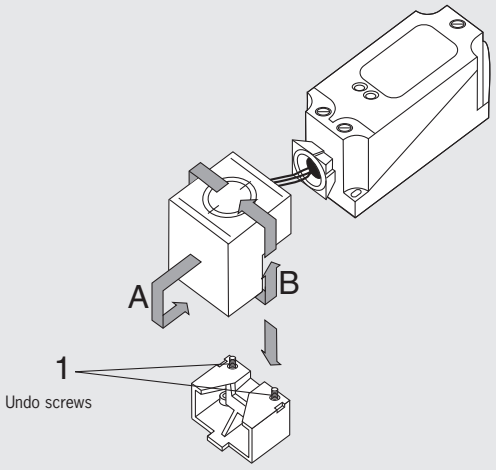
### Dimension drawing




### Pin assignment

| Terminal | Designation | Description |
|---|---|---|
| 1 | 24 V/$U_B$ | Power supply, DC 24 V |
| 2 | RxD | Serial interface receive |
| 3 | 0V/GND | Ground, DC 0 V |
| 4 | TxD | Serial interface transmit |

### Changing the active face




**Ordering table**

| Series | Interface | Connection | Order no. / item |
|---|---|---|---|
| Read/write head for **CIS3A** | **Serial RS232** | Connection terminals | **077 890** CIT3ASX1R1G05KX |

## Technical data read/write head CIT3ASX1R1G05KX

| Parameter | Value | | | Unit |
|---|---|---|---|---|
| | min. | typ. | max. | |
| Housing material | | Plastic | | |
| Weight | | 0.29 | | kg |
| Ambient temperature at $U_B$ = DC 24 V | 0 | - | +55 | °C |
| Degree of protection according to EN 60529 | | IP65 | | |
| Type of installation | | Non-flush | | |
| Connection type | | Screw terminals | | |
| Operating voltage $U_B$ (regulated, residual ripple < 5 %) | 20 | 24 | 28 | V DC |
| Current consumption $I_B$ (without load current) | - | 80 | 120 | mA |
| **Interface/data transfer** | | | | |
| Interface to the PC or to the control system | | Serial RS232 | | |
| Transfer protocol | | 3964R | | |
| Data transfer rate | - | 9.6 | - | kbaud |
| Data format | | 1 start bit, 8 data bits, 1 parity bit (even parity), 1 stop bit | | |
| Cable length RS232 interface | - | - | 5 | m |
| LED indication | | Green: Ready (in operation)<br>Yellow: Data carrier active [1)] | | |

1) The LED illuminates yellow if there is a functional data carrier in the operating distance in front of the read/write head.

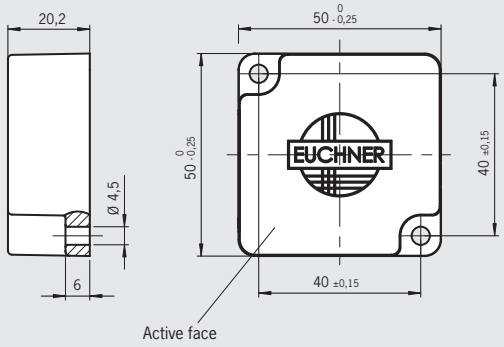
## Data carrier CIS3AP50X50SH16YSNO...

- **Square design 50 x 50 mm**
- **Unprogrammed or programmed**

For possible combinations see page 21

**Data carrier CIS3AP50X50SH...**

**Dimension drawing**




**Programming**

The data carrier can be written (programmed) for read-only operation with a maximum of 32 hexadecimal digits (value from $0_{hex}$ to $F_{hex}$) on customer request. Standard filler digit after the customer-specific defined digits is $E_{hex}$.

The housing is permanently laser marked with the digits programmed (not including filler digits) in hexadecimal notation.

**Technical data**

| Parameter | Value min. | Value typ. | Value max. | Unit |
|---|---|---|---|---|
| Memory capacity (read/write) | - | 16 | - | bytes |
| Housing material | Plastic PPS | | | |
| Weight | 0.07 | | | kg |
| Degree of protection according to EN 60529 | IP67 | | | |
| Ambient temperature | -20 | - | +85 | °C |
| Type of installation | Screw fixing, not flush (also on metal) | | | |
| Memory organization<br>Write<br>Read | Only possible in 2-byte blocks<br>Possible byte by byte | | | |
| **Operating parameters on reading using read-only head CIT3APL1N30-STA** | | | | |
| Read distance $s_L$ | 7 [1] | 12 | 20 | mm |
| Center offset $m_L$ (for $s_L$ = 12 mm) | - | - | ± 11 | |
| Relative speed for reading 4 hexadecimal digits<br>Reduction for each additional hexadecimal digit<br>(at $s_L$ = 12 mm and $m_L$ = 0 mm) | -<br>- | -<br>- | 200<br>25 | mm/s |
| Number of read cycles | Not limited | | | |
| **Operating parameters on reading using read-only head CIT3APL1G05-STA** | | | | |
| Read distance $s_L$ | 14 [1] | 20 | 28 | mm |
| Center offset $m_L$ (for $s_L$ = 20 mm) | - | - | ± 13 | |
| Relative speed for reading 4 hexadecimal digits<br>Reduction for each additional hexadecimal digit<br>(at $s_L$ = 20 mm and $m_L$ = 0 mm) | -<br>- | -<br>- | 230<br>25 | mm/s |
| Number of read cycles | Not limited | | | |
| **Operating parameters on reading and writing using read/write head CIT3ASX1R1G05KX** | | | | |
| Read distance $s_L$ and write distance $s_S$ | 0 | 20 | 28 | mm |
| Center offset $m_L$ /$m_S$ (at $s_L$ /$s_S$ = 20 mm) | - | - | ± 13 | |
| Number of write cycles | 100,000 | - | - | cycles |

1) It is necessary to maintain the minimum distance on the approach of the data carrier from the side if the data must be transferred correctly to the read head in one transmission.

**Ordering table**

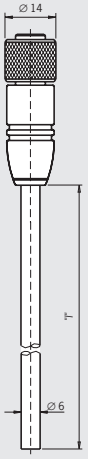
| Series | Design | Version | Order no. / item |
|---|---|---|---|
| Data carrier for **CIS3A** | Square 50 x 50 mm | Unprogrammed | **088 822**<br>CIS3AP50X50SH16YSNOU |
| | | Programmed | **088 823**<br>CIS3AP50X50SH16YSNOP |

## Connection cables and documentation

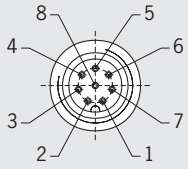
▶ **Screened connection cable for read-only heads CIT3PL.../CIT3APL...**

**For read-only heads CIT3**
M12 socket, 8-pin, silicone-free

**Dimension drawing**




View of connection side




| | | | |
|---|---|---|---|
| 1 | = WH | ▶ | 0 V/GND |
| 2 | = BN | ▶ | 24 V/$U_B$ |
| 3 | = GN | ▶ | A |
| 4 | = YE | ▶ | B |
| 5 | = GY | ▶ | C |
| 6 | = PK | ▶ | D |
| 7 | = BU | ▶ | SKIP |
| 8 | = RD | ▶ | STROBE |
| | Open | ▶ | Screen |

The screen on the connection cable is connected to the read head's housing via the knurled nut on the M12 plug connector.

**Technical data**

| Parameter | Value min. | Value typ. | Value max. | Unit |
|---|---|---|---|---|
| Plug connector | 8-pin M12 female connector, straight | | | |
| Connection type | Screw terminal, knurled nut electrically connected to cable screen | | | |
| Conductor cross-section | 8 x 0.25 screened | | | mm² |
| Material, outer sheath | PVC | | | |

**Ordering table**

| Plug connectors | Cable type | Cable length l [m] | Order no / item |
|---|---|---|---|
| **Straight** | **V** Cable PVC | 5 | **077 751** C-M12F08-08X025PV05,0-ZN-077751 |
| | | 10 | **077 752** C-M12F08-08X025PV10,0-ZN-077752 |
| | | 15 | **077 753** C-M12F08-08X025PV15,0-ZN-077753 |
| | | 20 | **077 871** C-M12F08-08X025PV20,0-ZN-077871 |
| | | 25 | **077 872** C-M12F08-08X025PV25,0-ZN-077872 |
| | | 50 | **077 873** C-M12F08-08X025PV50,0-ZN-077873 |

▶ **User manual CIS3/CIS3A**

**Ordering table**

| Series | Comment | Order no. |
|---|---|---|
| **Manual Inductive Identification System CIS3/CIS3A** | PDF file as download [1] | **071 652** |

1) Downloads available at www.euchner.de in Download/Manuals/Automation/Identification systems.

## Inductive Identification System CIS3A-Mini

- **One of the smallest plug-in read heads**
- **Interface adapter for fitting on the DIN rail in the control cabinet**
- **Miniature data carrier, diameter 10 x 4 mm**
- **Read distance maximum 6.5 mm (static, on installation in non-metallic material)**
- **Data carrier memory capacity 116 bytes E²PROM read/write**
- **Easy connection of the read-only adapter to I/O on any control system via 4-bit parallel interface (24 V), max. 4 bytes of the data carrier usable via parallel interface**
- **Read/write interface adapter with serial interface RS232 or RS422, complete memory of 116 bytes usable via serial interface**

The innovative identification system CIS3A-Mini is used if there is very little space to fit a data carrier to the product to be identified, or if there is very little space available for the read head.

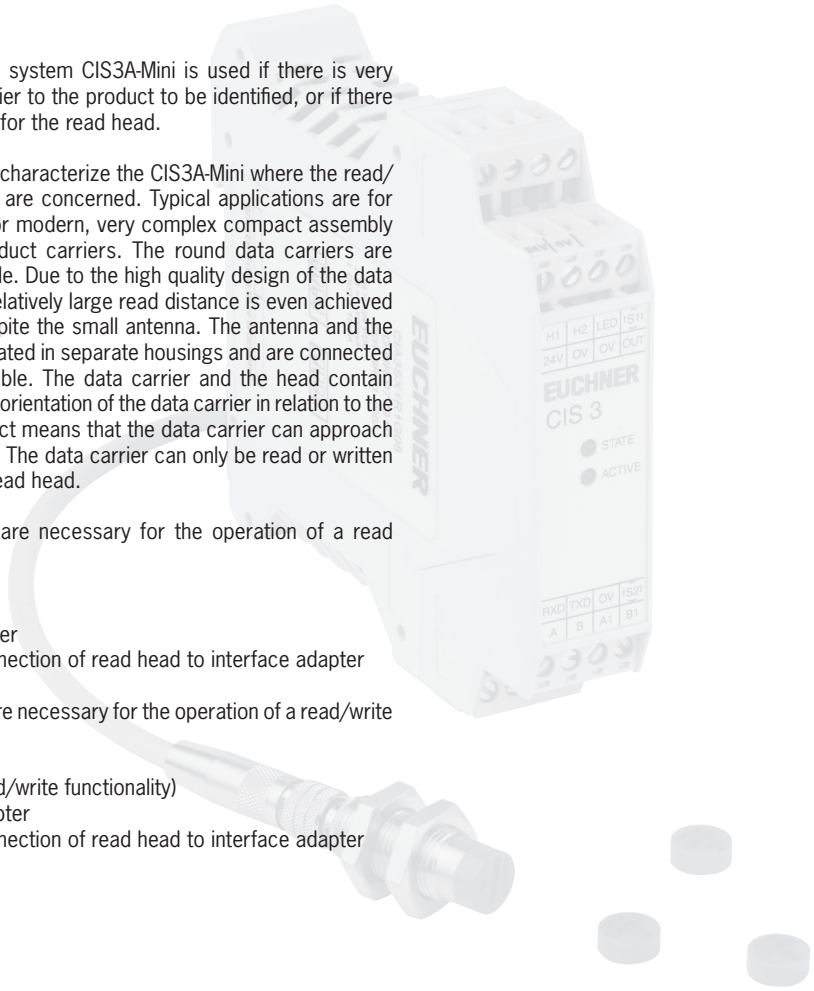
Incredibly small dimensions characterize the CIS3A-Mini where the read/write head and data carrier are concerned. Typical applications are for example tool identification or modern, very complex compact assembly installations with small product carriers. The round data carriers are bonded in a countersunk hole. Due to the high quality design of the data carrier with ferrite core, a relatively large read distance is even achieved on installation in metal, despite the small antenna. The antenna and the interface electronics are located in separate housings and are connected via a special connection cable. The data carrier and the head contain round-shaped antennae. The orientation of the data carrier in relation to the head is unimportant. This fact means that the data carrier can approach the head from any direction. The data carrier can only be read or written if it is static in front of the read head.

The following components are necessary for the operation of a read station:

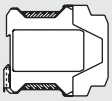
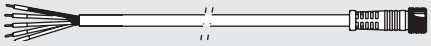
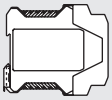
- Read head
- Read-only interface adapter
- Connection cable for connection of read head to interface adapter

The following components are necessary for the operation of a read/write station:

- Read head (here with read/write functionality)
- Read/write interface adapter
- Connection cable for connection of read head to interface adapter



## Selection table for identification system CIS3A-Mini

| | Interface adapter | Connection cable | Read/write head | Data carrier |
|---|---|---|---|---|
| **Read only** | Parallel interface CIA3PLG08  Page 34 |  Page 40 | Read/write head CIT3ASX1N12ST  Page 38 | CIS3AP10D05KH01K...  Page 39 |
| **Read / write** | Serial interface CIA3SX1R1G08  Page 36 | | | |

## Possible combinations for CIS3A-Mini components

To give you a quick overview of which CIS3A-Mini components can be combined with each other, there is a combinations table for each read head. The table will answer the following questions:

- Which data carrier can be read by the selected read head?
- What is the operating distance of this combination?

| | | |
|---|---|---|
| **Key to symbols** | L 6.5 | Combination possible, max. read distance 6.5 mm |
| | S 6 | Combination possible, max. write distance 6 mm |
| | | Combination not permissible |

## Identification system CIS3A-Mini

| **Read/write station** | **Data carriers** |
|---|---|
| | **CIS3AP10D05KH01K...** All items |
| Interface adapter **CIA3...** All items with read/write head **CIT3ASX1N12ST** 077 940 | L 6.5 S 6 |

## Read-only interface adapter CIA3PL1G08

- **Parallel interface**
- **In combination with read head CIT3ASX1N12ST**
- **DIN rail mounting**

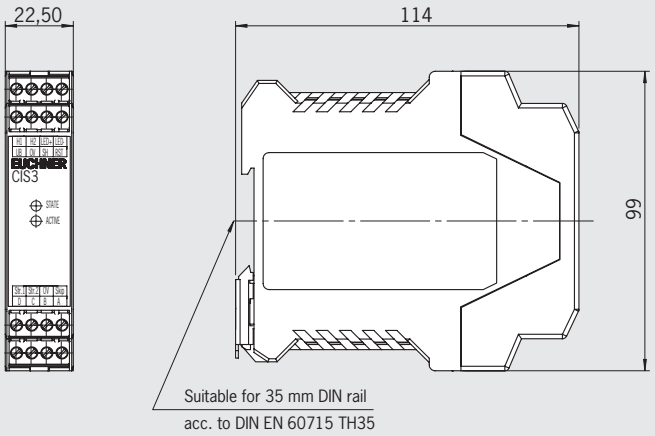

For possible combinations see page 33

**Attention:**

- The connection cable to the control system is allowed to be max. 15 m long.
- On the usage of a screened cable the connection cable to the read head is allowed to be max. 15 m long.
- It is only ever possible to connect 1 read head per interface adapter.

### Interface adapter CIA3PL1G08

#### Dimension drawing




#### Pin assignment power supply and interface

| Designation | Description |
|---|---|
| 0V/GND | Ground, DC 0 V |
| 24 V/$U_B$ | Power supply, DC 24 V |
| A | Output data wire A |
| B | Output data wire B |
| C | Output data wire C |
| D | Output data wire D |
| SKIP | Input data clock |
| STROBE 1 | Output data carrier active |
| RST | Input RESET |

#### Pin assignment read head

| Designation | Description | Wire color |
|---|---|---|
| H1 | Read head antenna | BN |
| H2 | Read head antenna | WH |
| LED + | Read head LED | YE |
| LED - | Read head LED | GN |
| SH | Read head screen | BK |

**Ordering table**

| Series | Interface | Order no. / item |
|---|---|---|
| Read-only adapter for **CIS3A-Mini** | **Parallel** | **091 875**<br>CIA3PL1G08 |

## Technical data read-only interface adapter CIA3PL1G08

| Parameter | Value min. | Value typ. | Value max. | Unit |
|---|---|---|---|---|
| Housing material | | Plastic | | |
| Weight | | 0.12 | | kg |
| Ambient temperature at $U_B$ = DC 24 V | 0 | - | +55 | °C |
| Degree of protection according to EN 60529 | | IP20 | | |
| Mounting | | 35 mm DIN rail acc. to DIN EN 60715 TH35 | | |
| Connection type | | Plug-in screw terminals | | |
| Cable length to control system | - | - | 15 | m |
| Cable length to read head | - | - | 15 | |
| Operating voltage $U_B$ (regulated, residual ripple < 5 %) | 20 | 24 | 28 | V DC |
| Current consumption $I_B$ (without load current) | - | 65 | 100 [1] | mA |
| **Interface/data transfer** | | | | |
| Interface to I/O on a control system | | 4-bit parallel, binary coded via HIGH/LOW level | | |
| Load current per output $I_A$ (push-pull) | - | - | 30 | mA |
| Output voltage $U_A$ | | | | |
| A, B, C, D, STROBE = 1 (HIGH level) | $U_B$ - 3 | - | $U_B$ | V DC |
| A, B, C, D, STROBE = 0 (LOW level) | 0 | - | 2 | |
| Input voltage $U_E$ | | | | |
| SKIP = 1 (HIGH level) | 15 | - | $U_B$ | V DC |
| SKIP = 0 (LOW level) | 0 | - | 2 | |
| Input resistance $R_i$ (RESET input and SKIP input) | - | 4.5 | - | kOhm |
| LED indication | | Green: Ready (in operation)<br>Yellow: Data carrier active [2] | | |

1) Continuous current in operation.

2) The LED illuminates yellow if there is a functional data carrier in the operating distance in front of the read head.

# Read/write interface adapter CIA3SX1R1G08

- **Serial interface RS232/RS422**
- **In combination with read head CIT3ASX1N12ST**
- **DIN rail mounting**

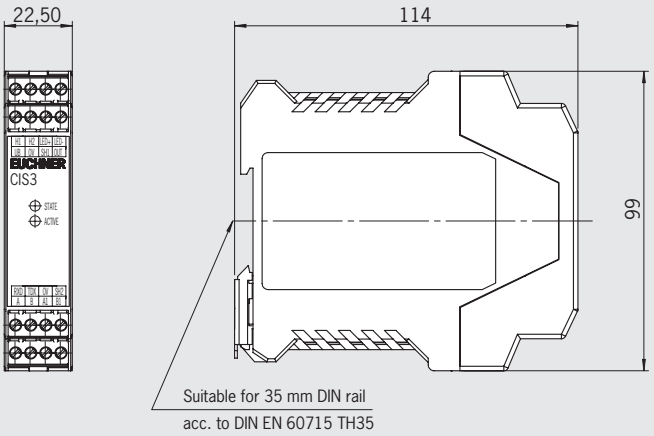

For possible combinations see page 33

**Serial interface**
The individual commands for reading and writing the data carrier are in accordance with the common 3964R protocol and are described in the EUCHNER CIS3 system manual (order no. 084 727).
For data carrier programming away from the system, a convenient WINDOWS®-compatible PC software application is available (Software Transponder Coding, see page 41).

**Attention:**
- On the usage of a screened cable the connection cable for the serial interface is allowed to be max. 5 m long for RS232 and max. 1000 m long for RS422.
- On the usage of a screened cable the connection cable to the read/write head is allowed to be max. 15 m long.
- It is only ever possible to connect 1 read head per interface adapter.

## Interface adapter CIA3SX1R1G08

### Dimension drawing




### Pin assignment

| Designation | Description | |
|---|---|---|
| 0V/GND | Ground, DC 0 V | |
| 24 V/$U_B$ | Power supply, DC 24 V | |
| TxD | Serial interface transmit | RS232 |
| RxD | Serial interface receive | |
| A/TxD+ | Serial interface transmit + | RS422 |
| B/TxD- | Serial interface transmit - | |
| A1/RxD+ | Serial interface receive + | |
| B1/RxD- | Serial interface receive - | |
| OUT | Output data carrier active, 24 V | |
| SH2 | Screen data wire | |

### Pin assignment read head

| Designation | Description | Wire color |
|---|---|---|
| H1 | Read head antenna | BN |
| H2 | Read head antenna | WH |
| LED + | Read head LED | YE |
| LED - | Read head LED | GN |
| SH1 | Read head screen | BK |

**Ordering table**

| Series | Interface | Order no. / item |
|---|---|---|
| Read/write interface adapter for **CIS3A-Mini** | **Serial RS232 / RS422** | **077 910**<br>CIA3SX1R1G08 |

## Technical data read/write interface adapter CIA3SX1R1G08

| Parameter | Value | | | Unit |
|---|---|---|---|---|
| | min. | typ. | max. | |
| Housing material | | Plastic | | |
| Weight | | 0.12 | | kg |
| Ambient temperature at $U_B$ = DC 24 V | 0 | - | +55 | °C |
| Degree of protection according to EN 60529 | | IP20 | | |
| Mounting | | 35 mm DIN rail acc. to DIN EN 60715 TH35 | | |
| Connection type | | Plug-in screw terminals | | |
| Operating voltage $U_B$ (regulated, residual ripple < 5 %) | 20 | 24 | 28 | V DC |
| Current consumption $I_B$ (without load current) | - | 65 | 100 | mA |
| **Interface/data transfer** | | | | |
| Interface to the PC or to the control system | | Serial RS232 / RS422<br>(can be changed using rotary switch) | | |
| Transfer protocol | | 3964R | | |
| Data transfer rate (selectable with DIP switch) | 9.6 | - | 28.8 | kbaud |
| Data format | | 1 start bit, 8 data bits, 1 parity bit (even parity), 1 stop bit | | |
| Cable length RS232 interface | - | - | 5 | m |
| Cable length RS422 interface | - | - | 1000 | |
| LED indication | | Green: Ready (in operation)<br>Yellow: Data carrier active [1)] | | |

1) The LED illuminates yellow if there is a functional data carrier in the operating distance in front of the read/write head.

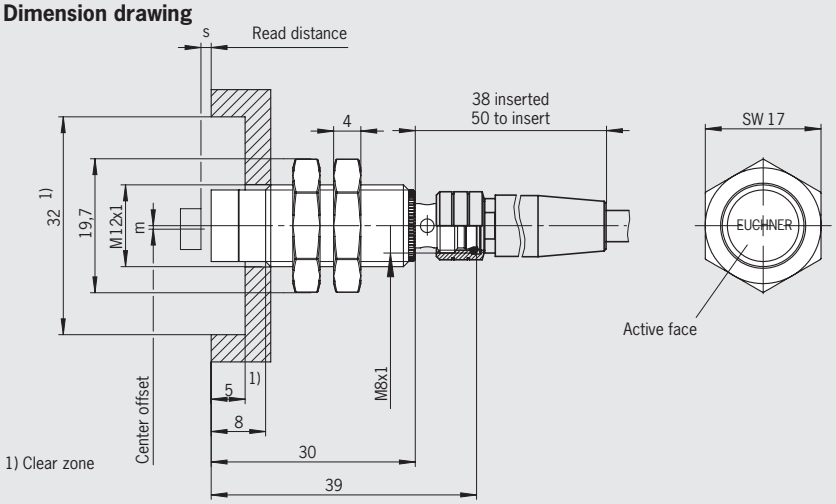
## Read/write head CIT3ASX1N12ST

- **Use with interface adapter CIA3...**
- **Cylindrical design M12**
- **M8 plug connector**
- **Axial connection**

For possible combinations see page 33

**Read/write head CIT3ASX1N12ST**
M8 plug, 4-pin, axial connection

**Dimension drawing**

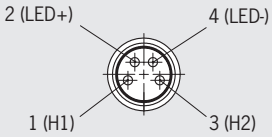



For connection cable see page 40

**Note**
The read head CIT3ASX1N12ST has
- Read-only functionality in combination with the read-only interface adapter with parallel interface
- Read/write functionality in combination with the read/write interface adapter with serial interface

**Attention:**
On the usage of a screened cable the connection cable to the interface adapter is allowed to be max. 15 m long.

**Pin assignment**




The screen on the connection cable is connected to the read/write head's housing via the knurled nut on the M8 plug connector.

View on the connection side of the read head

| Pin | Designation | Description | Wire color |
|---|---|---|---|
| 1 | H1 | Antenna H1 | BN |
| 2 | LED + | LED connection + | YE |
| 3 | H2 | Antenna H2 | WH |
| 4 | LED - | LED connection - | GN |
| - | | Screen | BK |

**Technical data**

| Parameter | Value min. | Value typ. | Value max. | Unit |
|---|---|---|---|---|
| Housing material | Brass (CuZn) nickel-plated | | | |
| Weight | 0.02 | | | kg |
| Degree of protection according to EN 60529 | IP65 | | | |
| Ambient temperature | -25 | - | +50 | °C |
| Type of installation | Non-flush | | | |

**Ordering table**

| Series | Use | Connection | Order no. / item |
|---|---|---|---|
| Read/write head for **CIS3A-Mini** | With interface adapter CIA3 | M8 plug connector **axial connection** | **077 940** CIT3ASX1N12ST |

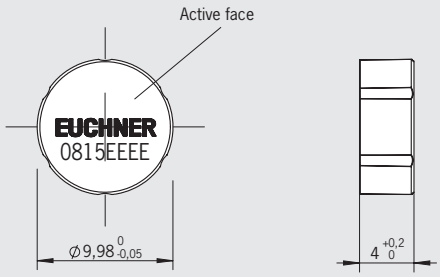
## Data carrier CIS3AP10D05KH01K...

- **Cylindrical design ∅ 10 mm**
- **Unprogrammed or programmed**

For possible combinations see page 33

**Data carrier CIS3AP10D05KH01K...**

**Dimension drawing**




**Mounting instructions**
For fastening use e.g. two-component epoxy resin adhesive.

**Programming**
The data carrier can be written (programmed) for read-only operation with a maximum of 8 hexadecimal digits (value from $0_{hex}$ to $F_{hex}$) on customer request. Standard filler digit after the customer-specific defined digits is $E_{hex}$.

The housing is permanently laser marked with the digits programmed (not including filler digits) in hexadecimal notation.

**Technical data**

| Parameter | Value min. | Value typ. | Value max. | Unit |
|---|---|---|---|---|
| Memory capacity (read/write) | - | 116 | - | bytes |
| Housing material | | Plastic PPS | | |
| Weight | | 0.001 | | kg |
| Degree of protection according to EN 60529 | | IP67 | | |
| Ambient temperature | -25 | - | +70 | °C |
| Type of installation | | Bonded, flush (also in metal) | | |
| Memory organization<br>Write<br>Read | | Only possible in 4-byte blocks<br>Possible byte by byte | | |
| **Operating parameters on reading using read/write head CIT3ASX1N12ST and interface adapter CIA3PL1G08 or CIA3SX1R1G08** | | | | |
| Read distance $s_L$ for non-metallic environment | 0 | 3 | 6.5 | mm |
| Read distance $s_L$ on flush installation in iron | 0 | 3 | 6 | |
| Read distance $s_L$ on flush installation in aluminum | 0 | 3 | 5 | |
| Center offset $m_L$ (for $s_L$ = 3 mm) | - | - | ± 2.5 | |
| Number of read cycles | | Not limited | | |
| **Operating parameters on writing using read/write head CIT3ASX1N12ST and interface adapter CIA3SX1R1G08** | | | | |
| Write distance $s_S$ for non-metallic environment | 0 | 3 | 6 | mm |
| Write distance $s_S$ on flush installation in iron | 0 | 3 | 5.5 | |
| Write distance $s_S$ on flush installation in aluminum | 0 | 3 | 4.5 | |
| Center offset $m_S$ (for $s_S$ = 3 mm) | - | - | ± 2 | |
| Number of write cycles | 100,000 | - | - | cycles |

**Ordering table**

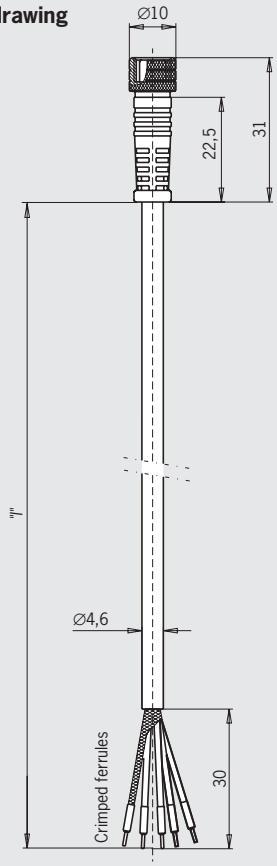
| Series | Design | Version | Order no. / item |
|---|---|---|---|
| Data carrier for **CIS3A-Mini** | Cylindrical ∅ 10 mm | Unprogrammed | **077 785**<br>CIS3AP10D05KH01K |
| | | Programmed | **092 320**<br>CIS3AP10D05KH01K-P |

## Connection cables and documentation

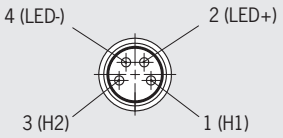
▶ **Screened connection cable for read/ write head CIT3ASX1N12ST**

**For read/write head CIT3ASX1N12ST**
M8 socket, 4-pin

**Dimension drawing**




View of connection side




| | | |
|---|---|---|
| 1 = BN | ▶ | H1 |
| 2 = YE | ▶ | LED + |
| 3 = WH | ▶ | H2 |
| 4 = GN | ▶ | LED |
| BK | ▶ | Screen |

The screen on the connection cable is connected to the read head's housing via the knurled nut on the M8 plug connector.

**Technical data**

| Parameter | Value min. | Value typ. | Value max. | Unit |
|---|---|---|---|---|
| Plug connectors | | 4-pin M8 female plug, straight | | |
| Connection type | | Screw terminal, knurled nut electrically connected to cable screen | | |
| Conductor cross-section | | 4 x 0.25 screened | | mm² |
| Material, outer sheath | | PVC | | |

**Ordering table**

| Plug connectors | Cable type | Cable length l [m] | Order no / item |
|---|---|---|---|
| **Straight** | **V** Cable PVC | 2 | **084 641** C-M08F04-04X025PV02,0-ES-084641 |
| | | 5 | **084 642** C-M08F04-04X025PV05,0-ES-084642 |
| | | 10 | **084 643** C-M08F04-04X025PV10,0-ES-084643 |
| | | 15 | **084 644** C-M08F04-04X025PV15,0-ES-084644 |

▶ **User manual CIS3A-Mini**

**Ordering table**

| Series | Comment | Order no. |
|---|---|---|
| **Manual Inductive Identification System CIS3A-Mini** | PDF file as download [1] | **084 727** |

1) Downloads available at www.euchner.de in Download/Manuals/Automation/Identification systems.

# Transponder Coding (TC)

- **Software for writing the data carriers**
- **In conjunction with read/write stations with serial RS232 interface**

## Description

The Transponder Coding (TC) software is an ASCII/hex editor that can be used to read and write the data carrier on the PC.
The software is used in conjunction with a read/write station with serial interface.

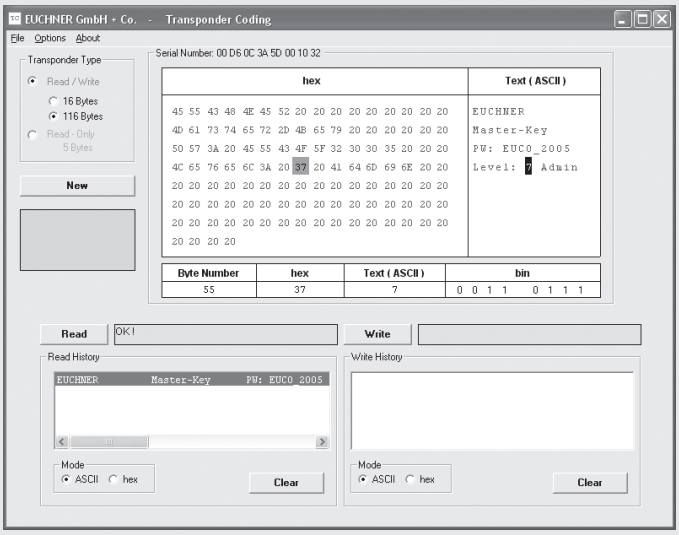
## Overview

- Display of the data in ASCII and in hex notation
- Byte-wise editing of the data
- Storage of the data as ASCII or hex file on PC

## System requirements

- Operating system: Microsoft Windows® 98/ME/NT/2000/XP/Vista/7
- Processor: from Pentium 2
- Available memory: min. 64 MB
- Hard disk space for the installation: approx. 20 MB
- Interface: serial

**Transponder Coding (TC)**





## Ordering table

| Designation | Comment | Order no. / item |
|---|---|---|
| **Software Transponder Coding** | On CD | **067 190** |

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## Mobile Hand-Held Terminal MHT-G2

The mobile hand-held terminal MHT-G2 supplements the identification systems CIS. It makes it possible to read from and write to data carriers independent of location. The basic unit is based on the hand-held computer PSION WORKABOUT PRO with the operating system Windows® Embedded CE. The device is powered using a rechargeable lithium-ion battery. The battery in the Basic unit is charged using a docking station. The docking station can also be used for data transfer between the basic unit and a PC via a USB port. An SD memory card is inserted in the basic unit, which contains the software Transponder Coding CE (TCCE) for writing (programming) and reading the data carriers. A read/write head to suit the data carrier is fitted to the basic unit. To achieve even more flexibility in use, the read/write head can be connected to the hand-held terminal via an optionally available coiled cable. The robust, splash-proof design (IP54) guarantees correct function even in difficult conditions in a harsh, industrial environment.

The following components are necessary for the operation of a mobile hand-held terminal:

- Basic unit
- Rechargeable battery
- Docking station
- SD memory card with Transponder Coding CE (TCCE)
- CIS3, CIS3A or CIS3A-Mini read/write head
- Coiled extension cable (optional)


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## Mobile hand-held terminal basic unit MHT-G2-BU

- **Reading, writing and editing EUCHNER CIS3, CIS3A and CIS3A-Mini data carriers**
- **With operating system Microsoft Windows® Embedded CE**

**Mobile hand-held terminal MHT-G2-BU**


### Technical data

| Parameter | Value min. | Value typ. | Value max. | Unit |
|---|---|---|---|---|
| **Basic unit MHT-G2-BU for the connection of 1 read/write head (via TTL port)** | | | | |
| Read/write head used | To suit the data carrier used | | | |
| Screen | Color, touch-sensitive | | | |
| Housing material | Plastic | | | |
| Degree of protection according to EN 60529 | IP54 | | | |
| Dimensions | Approx. 222 x 76 x 31 | | | mm |
| Weight (incl. rechargeable battery and read/write head) | Approx. 0.68 | | | kg |
| Ambient temperature | -20 | - | 50 | |
| Operating voltage $U_B$ (via lithium-ion rechargeable battery) | - | 3.7 | - | V DC |
| **Docking station MHT-G2-DS for a basic unit MHT-G2-BU** | | | | |
| Housing material | Plastic | | | |
| **Power supply unit for docking station with plug adapter for the countries EU, GB, USA, AUS** | | | | |
| Operating voltage (primary, 50 ... 60 Hz) | 100 | - | 240 | V AC |

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## Ordering guide mobile hand-held terminal MHT-G2

| Overview | Item | Designation | Order no. / item |
|---|---|---|---|
|  | **1a** | Mobile hand-held terminal basic unit | **099 975** MHT-G2-BU |
| | **1b** | Touch-pen | |
| | **1c** | Cover for rechargeable battery compartment | |
| | **2** | Rechargeable battery | **099 981** MHT-G2-BA |
| | **3** | SD memory card with software Transponder Coding CE (TCCE) | **099 982** MHT-G2-SD-TCCE |
| | **4a** | Docking station for recharge and for PC communication via USB | **099 976** MHT-G2-DS |
| | **4b** | Power supply unit for docking station | |
| | **4c** | USB cable for the connection of the docking station to a PC | |
| | **5** | Extension cable for read/write head | **071 759** |
| | **6** | Read/write head depending on configuration:<br>For identification system CIS3<br>For identification system CIS3A<br>For identification system CIS3A-Mini | <br>**071 755** CIT3-H2<br>**071 778** CIT3A-H2<br>**077 970** CIT3A-MINI-H2 |
| **Manual Mobile hand-held terminal MHT** | **-** | PDF file as download [1] | **103 702** |

1) Downloads available at www.euchner.de in Download/Manuals/Automation/Identification systems.

## Index by item designation



## Index by order numbers

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