

BALLUFF

Uni-Standard
8-way, 500 mA, IP67
User's Guide



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1 Notes to the User

1.1. Scope of this manual This manual describes the construction, function and installation of the Balluff Uni-Standard inductive coupler. It applies to the following models:

Base BIC 113-P2A50-M30MI3-SM4ACA and
Remote BIC 213-P2A50-M30MI3-SM4ACA (see type designation code)

The manual is intended for qualified technicians. Read this manual before installing or operating the devices.

1.2. Typographical Conventions The following typographical conventions are used in this guide.

Enumerations Enumerations are shown as a list with preceding dash.

- Entry 1,
- Entry 2.

Actions Action instructions are indicated by a preceding triangle. The result of an action is indicated by an arrow.

- ▶ Action instruction 1

Action result

- ▶ Action instruction 2

Syntax Numbers

- Decimal numbers are shown without additional indicators (e.g. 123),
- Hexadecimal numbers are shown with the additional indicator hex (e.g. 00hex).

Cross references Cross-references indicate where further information on the topic can be found

1.3. Symbols



Attention!

This symbol indicates a security notice which must be observed.



Note

This symbol indicates general notes.

1.4. Abbreviations

BIC	Balluff Inductive Coupler
EMC	Electromagnetic Compatibility
FE	Function Ground

1.5. Differing views

Product views and images in this manual may differ from the product described. They are intended to serve only as illustrations.

Important!

Before commissioning, carefully read the operating manual.

2.1. Proper Use

The device is designed to replace a plug connection in order to ensure contact-free energy transmission. The system must not be used in applications in which the safety of persons is dependent on the function of the device.

Warranty and liability claims against the manufacturer are rendered void by:

- Unauthorized tampering
- Improper use
- Use, installation or handling contrary to the instructions provided in this operating manual

2.2. Authorized Personnel

Installation and commissioning may only be performed by trained specialist personnel.

2.3. Obligations of the Operating Company

The operating company must ensure that the locally applicable safety regulations are observed. The device corresponds to EMC Class A and can cause radio interference. The operating company must take appropriate precautions to prevent radio interference. The device may only be used with an approved power supply. (see "Technical Data"). Only approved cables may be used.

2.4. Malfunctions

In the event of defects and device malfunctions that cannot be rectified, the device must be taken out of operation and protected against unauthorized use.

2.5. Meaning of the Warning Notices

The warning notices in this guide and the measures described for avoiding dangers must be observed. The warning notices contain the following signal words that indicate the severity of the danger:

- **Danger:**
Indicates an immediate danger that will result in a severe injury or death of persons if not observed.
- **Warning:**
Indicates a potential danger that may result in a severe injury or death of persons if not observed.
- **Caution:**
Indicates a potential danger that may result in light injury to persons or damage to property if not avoided.
- **Attention:**
Indicates a situation that may result in property damage if not avoided.

When working with this product, the following warning notices apply:



Caution!

Risk of burning on hot surfaces!

The active surface heats up even under normal operating conditions.

Keep away hands and objects from the active surface.

Avoid contact of metal objects on the active surface. Fire hazard

2.6. Certification



With the CE marking, we confirm that our products meet the requirements of EC directives 2004/108/EC (EMC) and the EMC law.

In our EMC laboratory, which is accredited by DATech for testing electromagnetic compatibility, evidence has been provided that the Balluff products satisfy the EMC requirements of the generic standards:

EN 61000-6-4 (Interference emission) and

EN 61000-6-2 (Immunity to interference)

Balluff Inductive Coupler

Base BIC 1I3-P2A50-M30MI3-SM4ACA und

Remote BIC 2I3-P2A50-M30MI3-SM4ACA

Remote BIC 2I3-P2A50-M30MI3-BPX0C-002-M4CA

3 Construction and Function

3.1. Construction

The system is designed for applications with up to 8 sensors. It consists of the following two components:

- Base (transmitter)
- Remote (receiver)

The components are enclosed in a brass housing protected acc. to IP 67

Sensors

For the standard version of electronic sensors, the following are to be observed:

- Make certain that the total power consumption of the sensor is not greater than that of the base.
- Only use sensors with a voltage of 24 V DC

Mechanical switches

For the standard version of mechanical switches, the following are to be observed:

- Use switches for small load currents
- Use switches with a residual current $I < 0.1$ mA in the open switching state
- The total resistance of the circuit should be less than 1 kOhm

3.2. Function

This set transfers power from the base to the remote via an air bridge; the base then receives data back from the remote. The base and remote must match one another with respect to size.

The sensors are wired to the remote. The remote is only inductively coupled to the base, however. The base transmits the energy for the sensors to the remote. The signal from the sensors is transmitted to the base by the remote.

The energy available for the sensors is dependent on the distance and on the offset between base and remote and is, therefore, limited. For this reason, the total current consumption of the connected sensors must not exceed the maximum power output of the remote.

3.3. Features, Advantages

- The cable length between the remote and consumers is limited depending on the cable resistance.
- LED indicator on the remote and base for operational readiness and operating voltage
- Angle offset is possible between base and remote
- Simple wiring of e.g. rotary tables, replaceable punch heads etc.
- M12 plug connection on the systems
- Control of capacitive loads
- More power in the same structural shape
- Large operating voltage range

3.4. Display

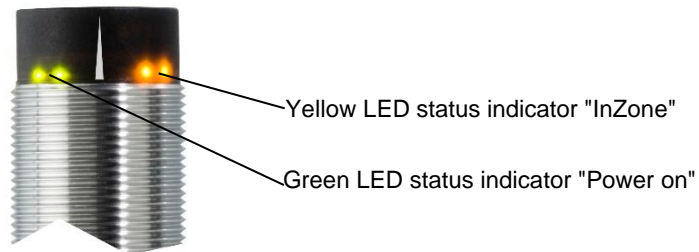
If the supply voltage is applied correctly, the green LEDs on the base and remote illuminate. If the green LEDs on the base only flash, the supply voltage is too low.

As soon as the yellow LED on the base illuminates, data transmission is also secured.

As soon as the remote moves out of the secured working range, its green LEDs begin to flash and the yellow LED on the base switches off.

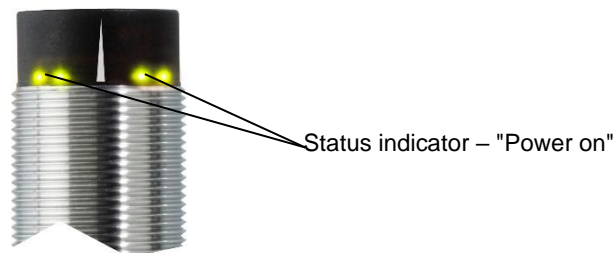
4 Indication

Base indicators



Indicators	Function
Green – static	Supply voltage OK
Green – flashing	Supply voltage too low
Yellow – off	No connection between base and remote, no data transmission
Yellow – static	Connection between base and remote OK, data transmission secured

Remote indicators



Indicators	Function
Green – static	Supply voltage OK
Green – flashing	No connection between base and remote, no data transmission

Balluff Inductive Coupler

Base BIC 1I3-P2A50-M30MI3-SM4ACA und Remote BIC 2I3-P2A50-M30MI3-SM4ACA Remote BIC 2I3-P2A50-M30MI3-BPX0C-002-M4CA

5 Installation and Connection

5.1. Mutual Interference

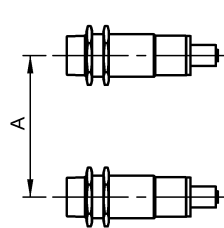


Attention!

Improper mounting may affect the function of the system and lead to damage. The spacings specified for installation must be adhered to.

To prevent mutual interference with adjacent bases or remotes, the specified minimum distances must be adhered to:

Type	A (mm)
BIC 1I3-P2A50-M30MI3-SM4ACA	100
BIC 2I3-P2A50-M30MI3-SM4ACA	100
BIC 2I3-P2A50-M30MI3-BPX0C-002-M4CA	100



5.2. Installation in Metal



Attention!

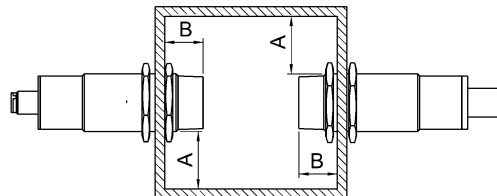
Device damage due to induction effects!

Metallic objects on the coil cap cause the objects to be heated.

Install the components so that no metallic objects can collect on the coil cap.

When installing in metal, the specified minimum distances to the surrounding sides of the metallic object must be maintained. Otherwise, the transmission distance between transmitter and receiver changes.

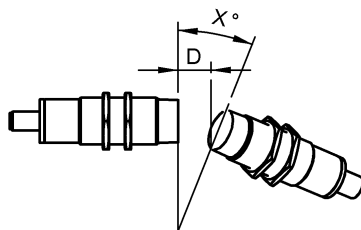
The transmission distance can also be influenced by the type of metal.



Type	A (mm)	B (mm)
BIC 1I3-P2A50-M30MI3-SM4ACA	30	20
BIC 2I3-P2A50-M30MI3-SM4ACA	30	20
BIC 2I3-P2A50-M30MI3-BPX0C-002-M4CA	30	20

5.3. Angle Offset

The permissible angle offset ensures proper function, even in difficult installation conditions:



Distance D (mm)	Angle X
1	18°
2	12°
3	10°
4	5°
5	0°

5 Installation and Connection

5.4. Connection

Attention!
 Device damage due to incorrect voltage supply!
 Malfunctions may occur if the ripple is too high or if the output voltage is not regulated.
 Use only approved, regulated voltage supplies.

Attention!
 The remote (receiver) may be damaged by voltage spikes if cables that are too long are used!
 To satisfy the EMC requirements, the receiver cable must not be longer than 10 m.
 If a longer cable is used nevertheless, take all necessary measures to protect the receiver from voltage spikes.

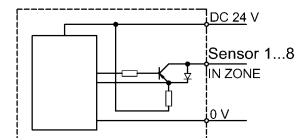
Electrical connections – base

The base is wired via a "type 2" characteristic acc. to IEC 61131-2.

Power (M12, 12-pin male plug)			
PIN	Signal	Meaning	
1	+24 V	Input voltage	
2	GND	Ground	
3	Signal 1	Signal 1	
4	Signal 2	Signal 2	
5	Signal 3	Signal 3	
6	Signal 4	Signal 4	
7	Signal 5	Signal 5	
8	Signal 6	Signal 6	
9	Signal 7	Signal 7	
10	Signal 8	Signal 8	
11	InZone		
12	NC	Not used	

Electrical connections – remote

The working side functions via a transistor output circuit with high-side switch and short-circuit protection.

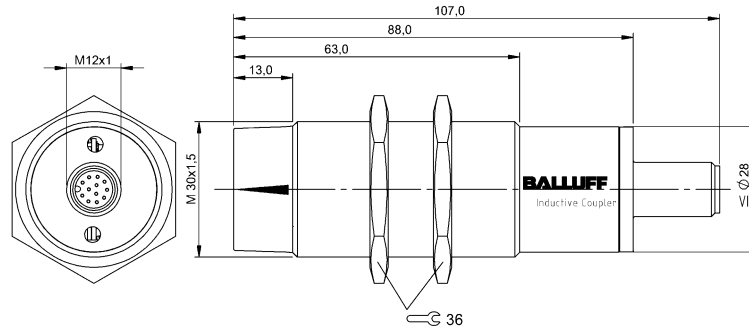


Power (M12, 12-pin female plug)			
PIN	Signal	Meaning	
1	+24 V	Output voltage	
2	GND	Ground	
3	Signal 1	Signal 1	
4	Signal 2	Signal 2	
5	Signal 3	Signal 3	
6	Signal 4	Signal 4	
7	Signal 5	Signal 5	
8	Signal 6	Signal 6	
9	Signal 7	Signal 7	
10	Signal 8	Signal 8	
11	InZone	InZone	
12	NC	Not used	

Balluff Inductive Coupler
Base BIC 1I3-P2A50-M30MI3-SM4ACA und
Remote BIC 2I3-P2A50-M30MI3-SM4ACA
Remote BIC 2I3-P2A50-M30MI3-BPX0C-002-M4CA

6 Installation and Connection

6.1. Dimensions – Base



6.2. Mechanical Data – Base

Housing material	Brass
Degree of protection per IEC 60529	IP 67 (only in plugged-in and screwed-down state)
Connection type	M12, A-coded
Dimensions (D x L in mm)	M30 X 100
Weight	Approx. 160 g
Tightening torque	70 Nm

6.3. Operating Conditions – Base

Transmission distance	1...5 mm
Ambient temperature T_a	0 °C...55 °C
Storage temperature	-25 °C...75 °C

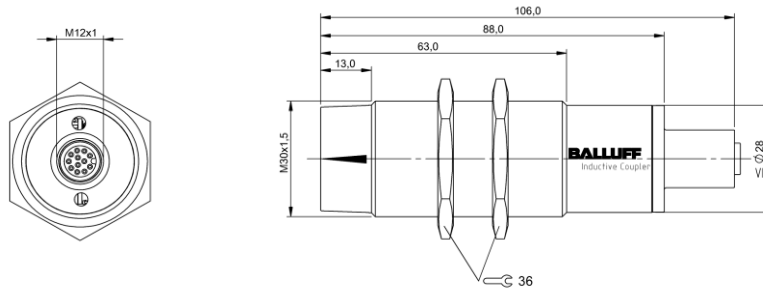
6.4. Electrical Data – Base

Operating voltage	24 V DC +-10% , acc. to EN 61131-2
Operating current at 24 V	Max. 1 A
Standby current	Max. 100 mA
Overload protected	Yes
Operating current per output	50 mA

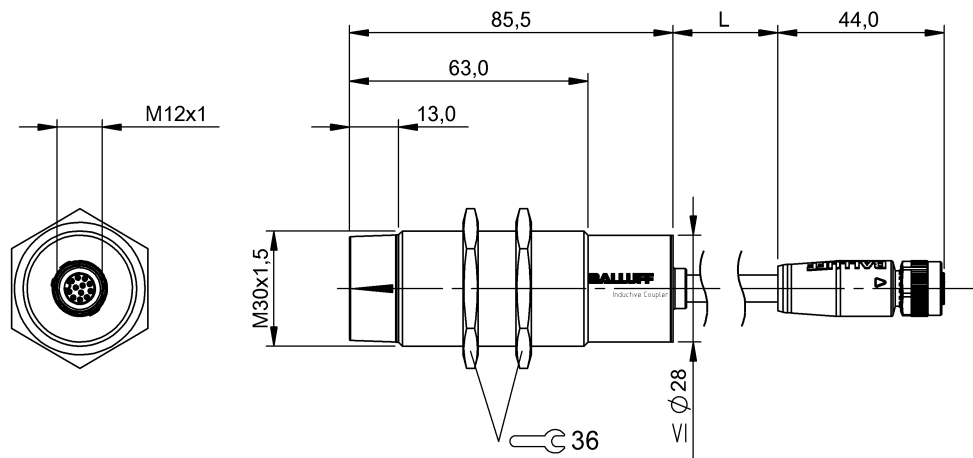
7 Installation and Connection

7.1. Dimensions – Remote

**Connector
SM4ACA**



**Cable
BPX0C-002-M4CA**



7.2. Mechanical Data – Remote

Housing material	Brass
Degree of protection acc. to IEC 60529	IP 67 (only in plugged-in and screwed-down state)
Connection type	M12, A-coded / Cable PUR
Dimensions (D x L in mm)	M30 X 100
Weight	Approx. 160 g
Tightening torque	70 Nm

7.3. Operating Conditions – Remote

Transmission distance	1...5 mm
Ambient temperature T_a	0 °C...55 °C
Storage temperature	-25 °C...75 °C

7.4. Electrical Data – Remote

Operating voltage	24 V DC +-5 %
Output current	500 mA
Short-circuit protected	Yes
Output peak current	Max. 800 mA
Operational readiness	< 100 ms



Balluff Inductive Coupler
Base BIC 1I3-P2A50-M30MI3-SM4ACA und
Remote BIC 2I3-P2A50-M30MI3-SM4ACA
Remote BIC 2I3-P2A50-M30MI3-BPX0C-002-M4CA

8 Accessories

8.1. Connectors

PUR	BCC M41C-0000-1A-049-PX0C14-XXX For base	XXX -> cable length
PVC	BCC M41C-0000-1A-049-VX8C14-XXX For base	XXX -> cable length
PUR	BCC M41C-0000-2A-049-PX0C14-XXX For remote	XXX -> cable length

8.2. Mounting Accessories

BES 30,0-BS-1 	BES 30-HW-1 
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8.3. Passive Splitters

BPI 4M303P-5K-00-SM48T 	BPI 8M303P-5K-B0-SM4CT 
BPI 4M4A5P-2K-B0-SM6LT 	BPI 8M4A4P-2K-B0-SM6CT 

9 Type Designation Code

9.1. Type Designation Code

BIC 1I3-P2A50-M30MI3-XXXXXX_002-M4CA

Balluff Inductiv Coupler

Base (1) Remote (2)
I3= Input 8-fach

Technology (PNP), variant (24 V),
power class (500 mA)

Housing shape (M30x1,5)

Housing material (M = brass) and length

SM4ACA:

Connector M12, axial

Number of pins and coding

BPX0C:

Cable PUR, Number of wire

Cable length

Pig Tail

Number of wire

9.2. Order Code

Description	Order code
BIC 1I3-P2A50-M30MI3-SM4ACA	BIC0009
BIC 2I3-P2A50-M30MI3-SM4ACA	BIC000A
BIC 2I3-P2A50-M30MI3-BPX0C-002-M4CA	BIC005J

Balluff Inductive Coupler
Base BIC 1I3-P2A50-M30MI3-SM4ACA und
Remote BIC 2I3-P2A50-M30MI3-SM4ACA
Remote BIC 2I3-P2A50-M30MI3-BPX0C-002-M4CA

Note

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