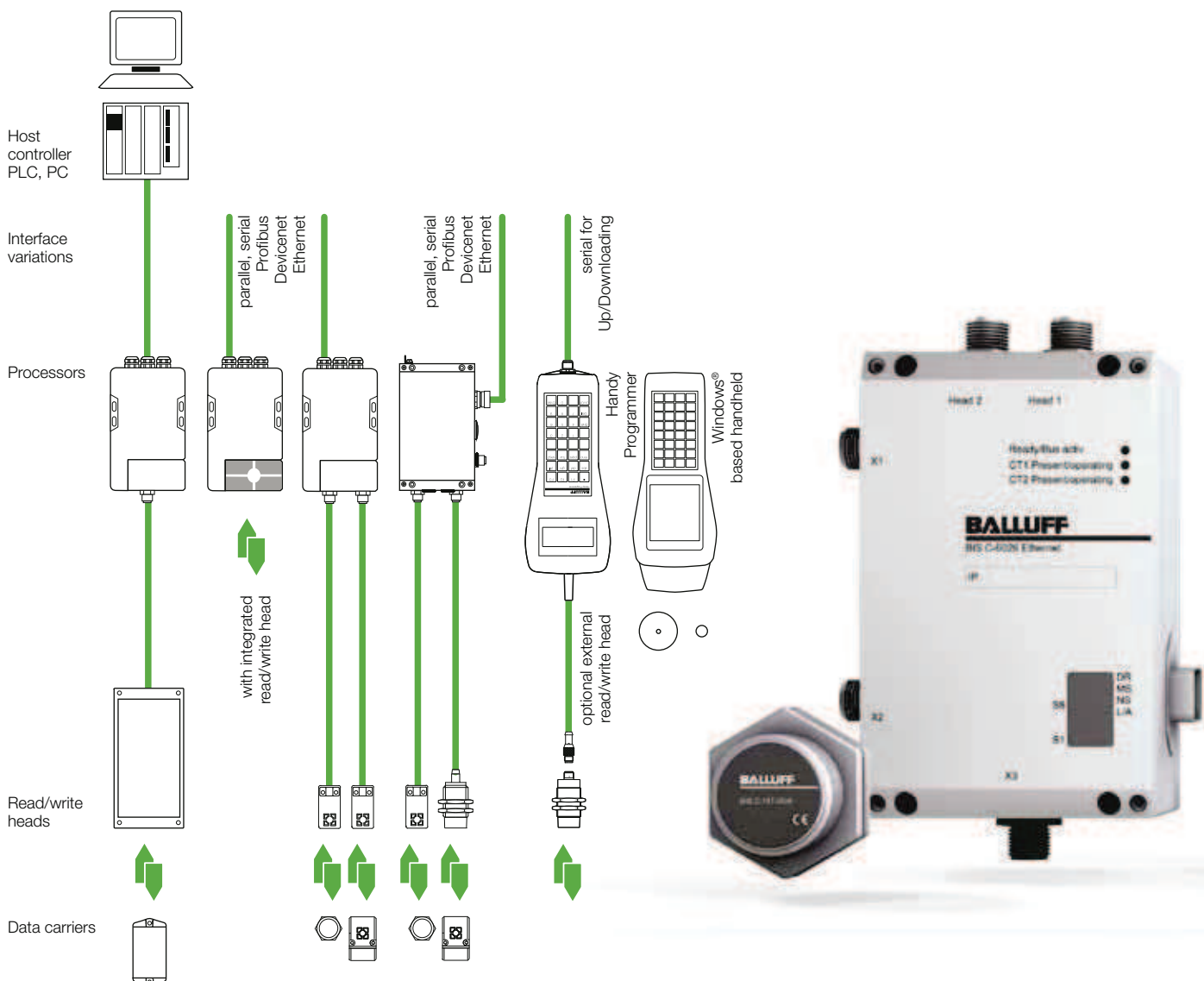




BIS C Industrial RFID System

Inductive Identification

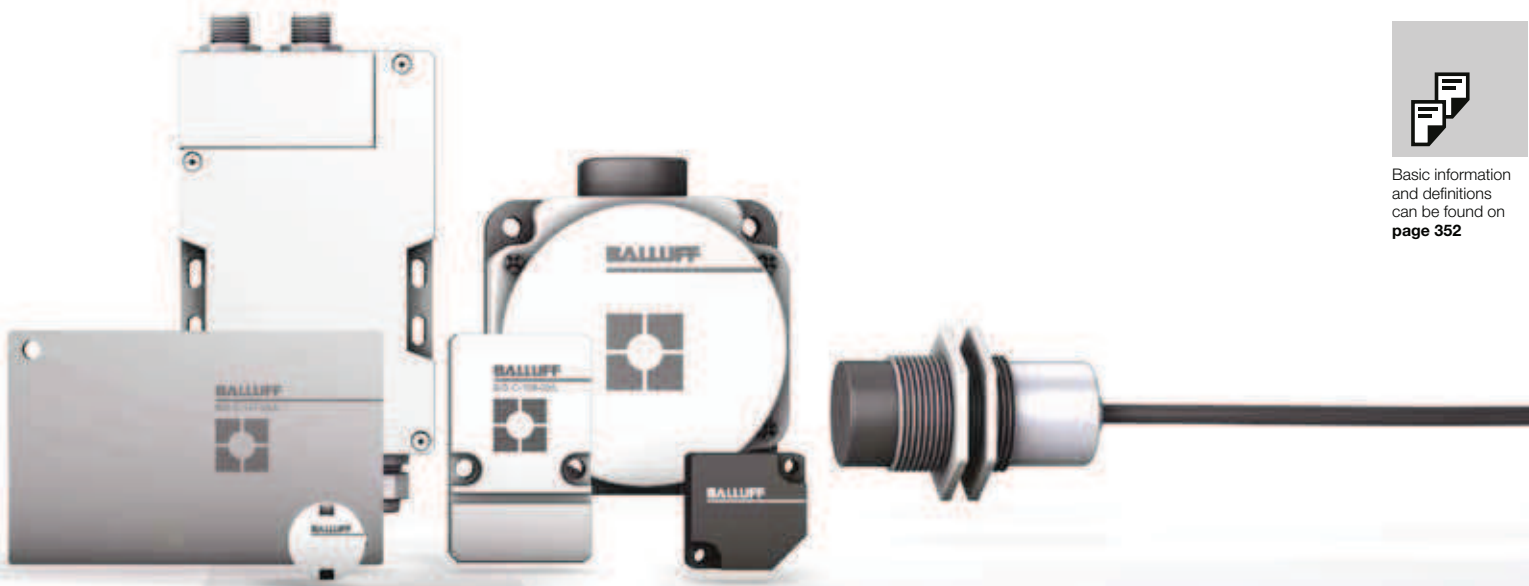
In a wide range of applications: BIS C is particularly powerful and flexible for the reliable identification of tools in machining centers that use large amounts of coolant and lubricants and when sterilising items at high temperatures in autoclaves.



BIS C Industrial RFID System

Inductive identification

Range of applications	130
Read/write distances overview	132
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8-bit processor for read-only mode	156
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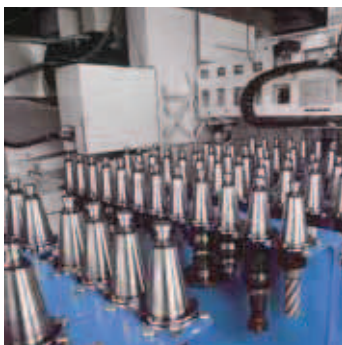


Basic information
and definitions
can be found on
page 352

BIS C Industrial RFID System

Range of applications

The versatile BIS C is ideal for a wide range of applications. Select the most suitable BIS C system for your application from the table.



Data carrier		
		Page
BIS0002	BIS C-100-05/A	135
BIS0004	BIS C-103-05/A	134
BIS0006	BIS C-104-11/A	136
BIS0007	BIS C-104-32/A	136
BIS0009	BIS C-105-05/A	134
BIS000C	BIS C-108-05/L	136
BIS000H	BIS C-108-11/L	136
BIS000K	BIS C-108-32/L	136
BIS000F	BIS C-108-05/L-SA2	139
BIS000J	BIS C-108-11/L-SA2	139
BIS000M	BIS C-117-05/A	135
BIS000N	BIS C-117-05/L	135
BIS000R	BIS C-117-11/L	135
BIS000T	BIS C-121-04/L	134
BIS000W	BIS C-121-04/L-SA1	138
BIS0011	BIS C-122-04/L	134
BIS0015	BIS C-122-11/L	134
BIS0017	BIS C-127-05/L	137
BIS0019	BIS C-128-05/L	135
BIS001C	BIS C-128-11/L	135
BIS001E	BIS C-130-05/L	135
BIS001H	BIS C-130-05/L-SA1	138
BIS001Z	BIS C-133-05/L	139
	BIS C-133-11/L	139
BIS0020	BIS C-134-05/L-H120	139
BIS0021	BIS C-134-11/L	139
BIS00J4	BIS C-140-05/L-M6	139
BIS00J2	BIS C-140-05/L-M8	139
BIS00J3	BIS C-140-11/L-M6	139
BIS00J1	BIS C-140-11/L-M8	139
BIS0028	BIS C-150-05/A	137
BIS002A	BIS C-150-11/A	137
BIS002E	BIS C-150-32/A	137
BIS002K	BIS C-190-05/L	137
BIS002M	BIS C-190-11/L	137
BIS002N	BIS C-190-32/L	137
BIS002P	BIS C-191-05/L	137
BIS002R	BIS C-191-11/L	137



70 kHz LF

Range of applications

Data carriers
read/write

Data couplers

processor
for read-only
mode

Standard handheld

for handy
programmers

Read/write
gun

protection

BIS C Industrial RFID System

Read/write distances overview

Mounting	Data carrier	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	90	100	mm
BIS C-300-PU1-																					
BIS C-306-PU1-																					
flush in steel	BIS C-100-05/A																				0...4
flush in steel	BIS C-103-05/A																				0...3.5
flush in steel	BIS C-105-05/A																				0...3.5
flush in steel	BIS C-121-04/L																				0...2
flush in steel	BIS C-121-04/L-SA1																				0...1.2
flush in steel	BIS C-122-04/L																				0...2.5
flush in steel	BIS C-130-05/L																				0...4
flush in steel	BIS C-134-__/L																				0...3
flush in steel	BIS C-130-05/L																				0...4
flush in steel	BIS C-130-05/L-SA1																				0...4
flush in steel	BIS C-191-__/L																				0...3.5
flush in steel	BIS C-140-__/L-M_																				0...3
BIS C-302-PU1-																					
flush in steel	BIS C-100-05/A																				0...4
flush in steel	BIS C-103-05/A																				0...3
flush in steel	BIS C-105-05/A																				0...3
flush in steel	BIS C-121-04/L																				0...1.5
flush in steel	BIS C-121-04/L-SA1																				0...0.7
flush in steel	BIS C-122-04/L																				0...2
flush in steel	BIS C-130-05/L																				0...3.5
flush in steel	BIS C-130-05/L-DB-002																				0...4
flush in steel	BIS C-130-05/L-SA1																				0...4
flush in steel	BIS C-191-__/L																				0...3
BIS C-305-PU1-																					
flush in steel	BIS C-100-05/A																				0...4
flush in steel	BIS C-103-05/A																				0...5
flush in steel	BIS C-105-05/A																				0...5
flush in steel	BIS C-108-__/L																				0...6
flush in steel	BIS C-108-__/L-SA2																				0...6
flush in steel	BIS C-117-05/A																				1...8
flush in steel	BIS C-117-05/L																				0...7
flush in steel	BIS C-121-04/L																				0...2
flush in steel	BIS C-121-04/L-SA1																				0...1.2
flush in steel	BIS C-122-04/L																				0...2.5
flush in steel	BIS C-117-05/A																				0...10
flush in steel	BIS C-128-05/L																				0...6
flush in steel	BIS C-130-05/L																				0...7
flush in steel	BIS C-130-05/L-SA1																				0...7
flush in steel	BIS C-134-11/L																				0...6
flush in steel	BIS C-140-__/L-M_																				0...4.5
BIS C-319-PU1-																					
flush in steel	BIS C-108-__/L																				0...14
flush in steel	BIS C-117-05/L																				0...15
flush in steel	BIS C-130-05/L																				0...13
flush in steel	BIS C-130-05/L-SA1																				0...13
flush in steel	BIS C-134-11/L																				0...12
flush in steel	BIS C-191-__/L																				0...11
BIS C-326-PU1-																					
flush in steel	BIS C-117-05/L																				0...18
flush in steel	BIS C-128-__/L																				0...15
flush in steel	BIS C-128-__/L																				0...12.5
flush in steel	BIS C-130-__/L																				0...13
flush in steel	BIS C-130-05/L-SA1																				0...13
flush in steel	BIS C-133-__/L																				0...12
flush in steel	BIS C-134-11/L																				0...12
flush in steel	BIS C-190-__/L																				0...18
BIS C-315-PU1-																					
flush in steel	BIS C-104-__/A																				1...13
flush in steel	BIS C-108-__/L																				2...16
flush in steel	BIS C-108-__/L-SA2																				2...16
flush in steel	BIS C-117-05/A																				0...15
flush in steel	BIS C-117-05/L																				0...18
flush in steel	BIS C-127-05/L																				10...30
flush in steel	BIS C-128-__/L																				0...18
flush in steel	BIS C-130-05/L																				0...18
flush in steel	BIS C-133-__/L																				0...15
flush in steel	BIS C-134-11/L																				0...16
flush in steel	BIS C-190-__/L																				0...20
BIS C-310-PU1-																					
flush in steel	BIS C-104-__/A																				1...11
flush in steel	BIS C-104-__/A																				0...12
flush in steel	BIS C-108-__/L																				0...12
flush in steel	BIS C-108-__/L-SA2																				0...11
flush in steel	BIS C-117-05/A																				1...12
flush in steel	BIS C-117-05/L																				0...13
flush in steel	BIS C-128-__/L																				0...8
flush in steel	BIS C-128-__/L																				0...13
flush in steel	BIS C-130-05/L																				0...11
flush in steel	BIS C-130-05/L-SA1																				0...8
flush in steel	BIS C-133-__/L																				0...10
flush in steel	BIS C-134-11/L																				0...10
flush in steel	BIS C-190-__/L																				0...11
flush in steel	BIS C-191-__/L																				0...10
flush in steel	BIS C-140-__/L-M_																				0...7

flush in steel non-flush on steel non-metal

www.balluff.com





Dimensions	Ø 9×4.5 mm	Ø 10×4.5 mm	Ø 12×8 mm	Ø 12×6 mm	
Housing material	EP	EP	EP	EP	
Weight	0.5 g	0.7 g	1.8 g	1.2 g	

BIS C read/write

511 bytes	Ordering code	BIS000T	BIS0011		
	Part number	BIS C-121-04/L	BIS C-122-04/L		
1023 bytes	Ordering code			BIS0004	BIS0009
	Part number			BIS C-103-05/A	BIS C-105-05/A
2047 bytes	Ordering code		BIS0015		
	Part number		BIS C-122-11/L		
Operating temperature	0...+70 °C	0...+70 °C	-30...+70 °C	-30...+70 °C	
Storage temperature	-30...+85 °C*	-30...+85 °C*	-30...+85 °C*	-30...+85 °C*	
Degree of protection per IEC 60529	IP 68	IP 68	IP 68	IP 68	

Appropriate read/write head with max. read/write distance

Mounting									
BIS C-300	2 mm	3 mm	2.5 mm	3 mm	3.5 mm	4 mm	3.5 mm	4 mm	
BIS C-302	1.5 mm	2.5 mm	2 mm	2.5 mm	3 mm	3.5 mm	3 mm	3.5 mm	
BIS C-305	2 mm	3 mm	2.5 mm	3 mm	5 mm	6 mm	5 mm	6 mm	
BIS C-306	2 mm	3 mm	2.5 mm	3 mm	3.5 mm	4 mm	3.5 mm	4 mm	
BIS C-310									
BIS C-315									
BIS C-318									
BIS C-319									
BIS C-323									
BIS C-324									
BIS C-325	1.7 mm	3 mm	2.5 mm	3 mm	4.5 mm	5 mm	4.5 mm	5 mm	
BIS C-326									
BIS C-327									
BIS C-328				3 mm					

For installation pay attention to Basic Information chapter.

* also available for up to + 120 °C on request

Mounting:

— flush in steel

— non-flush on steel

— non-metal

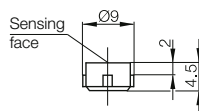
Antenna type:



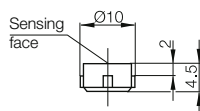
rod



round

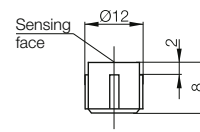


glue into hole Ø 9 H11

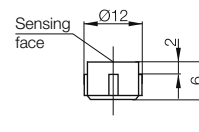


glue into hole Ø 10 H11

DIN 69 873



glue into hole Ø 12 H11

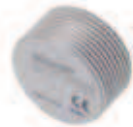


glue into hole Ø 12 H11



BIS C Industrial RFID System

Data carriers read/write



BIS C Industrial
RFID System

Range of
applications

Read/write
distances
overview

**Data carriers
read/write**

Read/write
heads

Data
couplers

8-bit
processor
for read-only
mode

Processors

Standard
handheld

Read/write
heads
for handy
programmers

Handy
programmer

Read/write
gun

Access
protection

Ø 16×7 mm

EP

2 g

Ø 16×10.5 mm

PA 66

3 g

Ø 26×6 mm

EP

6 g

Ø 30×16 mm

PBT

23 g

Ø 30×16 mm

PBT

5.5 g

BIS001E

BIS C-130-05/L

BIS0002

BIS C-100-05/A

BIS0019

BIS C-128-05/L

BIS000M

BIS C-117-05/A

BIS000N

BIS C-117-05/L

BIS001C

BIS C-128-11/L

BIS000R

BIS C-117-11/L

-30...+70 °C
-30...+85 °C*
IP 68

0...+70 °C
-20...+85 °C
IP 68

-20...+70 °C
-30...+85 °C*
IP 68

-30...+70 °C
-30...+85 °C
IP 68

-30...+70 °C
-30...+85 °C
IP 68

4 mm

4 mm

4 mm

4 mm

3.5 mm^(*)

6 mm^(*)

8 mm

10 mm

7 mm

6 mm

7 mm

4 mm

4 mm

8 mm

3 mm

2 mm

13 mm

13 mm

4 mm

4 mm

4 mm

4 mm

18 mm

18 mm

15 mm

22 mm

20 mm

6 mm

13 mm

4 mm

4 mm

14 mm

7.5 mm

13 mm

16 mm

7 mm

11 mm

18 mm

4 mm

4 mm

8 mm

13 mm

12 mm

13 mm

15 mm

4 mm

5 mm

4 mm

4 mm

8 mm

13 mm

12 mm

13 mm

13 mm

13 mm

18 mm

4 mm

4 mm

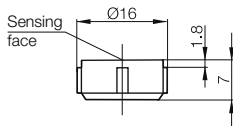
15 mm

8 mm

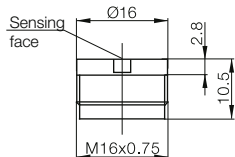
16 mm

18 mm

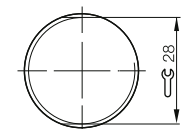
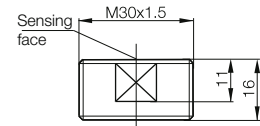
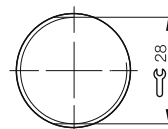
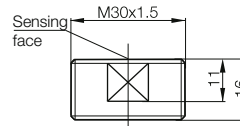
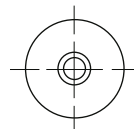
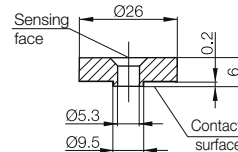
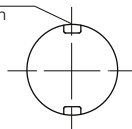
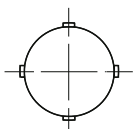
18 mm



glue into hole Ø 16 H11



for
wrench



Recommended accessories
(please order separately)



Compatible screws for BIS C-128-...
data carriers: DIN EN ISO 2009 M5
(countersunk slot head screw)
DIN EN ISO 7046-1 M5
(countersunk Philips head screw)
Screw tightening torque 2.5 Nm

^(*) BIS C-305, only if BIS C-128_ _
is attached using plastic screw.

Ordering code

710691

Part number

MONTAGESCHLÜSSEL BIS CODETRÄGER

Installation tool for BIS C-100-05/A data carrier



Dimensions	Ø 30x35 mm	52x32x11 mm	
Housing material	Brass, coated	PBT	
Weight	54 g	28 g	

BIS C read/write

1023 bytes	Ordering code		BIS000C	
	Part number		BIS C-108-05/L	
2047 bytes	Ordering code	BIS0006	BIS000H	
	Part number	BIS C-104-11/A	BIS C-108-11/L	
8 kBytes	Ordering code	BIS0007	BIS000K	
	Part number	BIS C-104-32/A	BIS C-108-32/L	
Operating temperature	-30...+70 °C	-30...+70 °C		
Storage temperature	-30...+85 °C	-30...+85 °C		
Degree of protection per IEC 60529	IP 67	IP 68		

Appropriate read/write head with max. read/write distance

Mounting				
BIS C-300				
BIS C-305				6 mm
BIS C-306				
BIS C-310	11 mm	12 mm	5 mm	12 mm
BIS C-315	13 mm	14 mm	10 mm	16 mm
BIS C-318				7 mm
BIS C-319			11 mm	14 mm
BIS C-323	11 mm	12 mm		12 mm
BIS C-324	11 mm	12 mm		12 mm
BIS C-325				
BIS C-326				
BIS C-327				8 mm
BIS C-350				
BIS C-351				

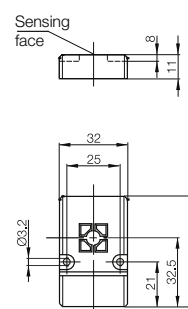
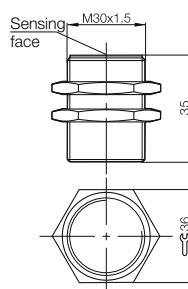
For installation pay attention to Basic Information chapter.

Mounting:

- flush in steel
- non-flush on steel
- non-metal

Antenna type:

- rod
- round



Screw tightening torque 40 Nm



Caution!

Reading or writing can be performed on one active surface as desired.



Dimensions	Ø 11×13 mm	Ø 15.5×7 mm	
Housing material	Glass	PBT	
Weight	0.9 g	28 g	

BIS C read/write

511 bytes	Ordering code	BIS000W		
	Part number	BIS C-121-04/L-SA1		
1023 bytes	Ordering code		BIS001H	
	Part number		BIS C-130-05/L-SA1	
2047 bytes	Ordering code			
	Part number			
Operating temperature	+10...+70 °C	–30...+70 °C		
Storage temperature	+10...+126 °C	–30...+85 °C		
Degree of protection per IEC 60529/DIN 40050	IP 68	IP 68		
Suitable for	use in autoclaves	use in vacuum		

Appropriate read/write head with max. read/write distance

Mounting				
BIS C-300	1.2 mm		4 mm	4 mm
BIS C-302	0.7 mm			
BIS C-305	1.2 mm		6 mm	7 mm
BIS C-306	1.2 mm		4 mm	4 mm
BIS C-310	1.7 mm		8 mm	11 mm
BIS C-315				
BIS C-318				
BIS C-319			7 mm	13 mm
BIS C-323			8 mm	11 mm
BIS C-324			8 mm	11 mm
BIS C-325			4 mm	5 mm
BIS C-326				13 mm

For installation pay attention to Basic Information chapter.

* also available for up to + 120 °C on request

Mounting:

-  flush in steel
-  non-flush on steel
-  non-metal

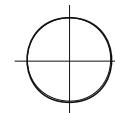
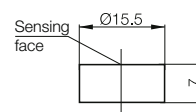
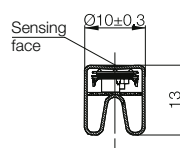
Antenna type:



rod



round



BIS C Industrial RFID System

Data carriers read/write



52×32×11 mm
PBT
28 g



25×25 mm
PA 66 (fiberglass reinforced)
9 g



Ø 60×21 mm
POM
85 g



Ø 22×21 mm
Steel, coated
18 g



Ø 22×21 mm
Steel, coated
18 g



BIS C Industrial
RFID System

Range of
applications

Read/write
distances
overview

**Data carriers
read/write**

Read/write
heads

Data
couplers

8-bit
processor
for read-only
mode

Processors

Standard
handheld

Read/write
heads

for handy
programmers

Handy
programmer

Read/write
gun

Access
protection

BIS000F

BIS C-108-05/L-SA2

BIS000J

BIS C-108-11/L-SA2

-30...+70 °C

-30...+85 °C*

IP 68

use in vacuum

BIS0020

BIS C-134-05/L-H120

BIS0021

BIS C-134-11/L

-30...+70 °C

-30...+85 °C*

IP 68

use in vacuum

BIS001Z

BIS C-133-05/L

BIS001Z

BIS C-133-11/L

-30...+70 °C

-30...+85 °C

IP 68

use in vacuum

BIS00J2

BIS C-140-05/L-M8

BIS00J1

BIS C-140-11/L-M8

-30...+70 °C

-30...+85 °C

IP 68/x9K

use in vacuum

BIS00J4

BIS C-140-05/L-M6

BIS00J3

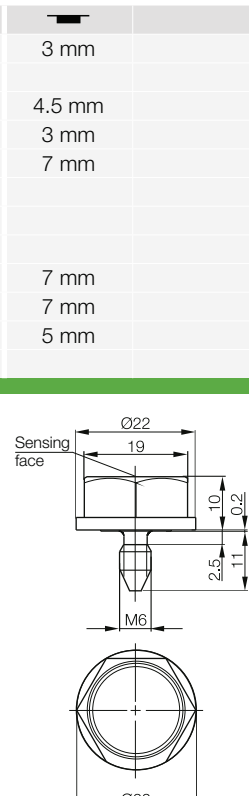
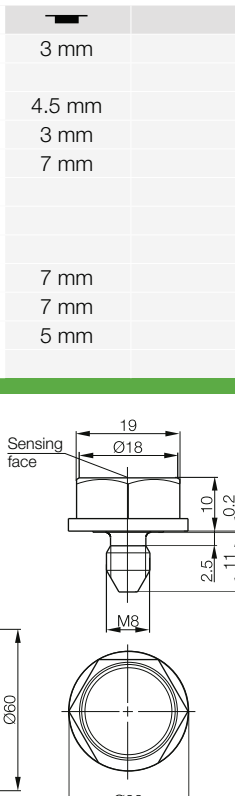
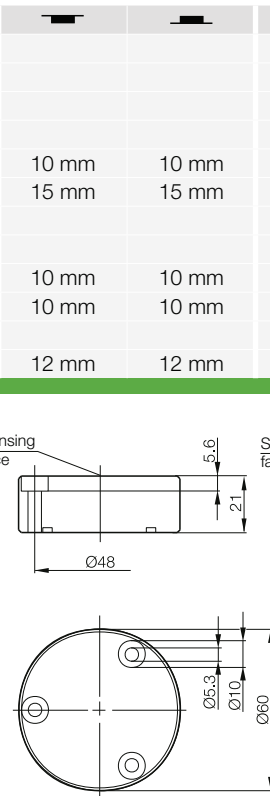
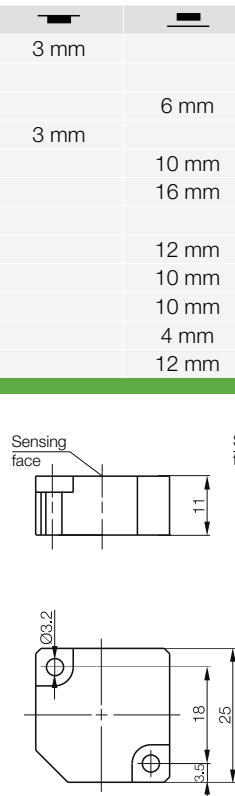
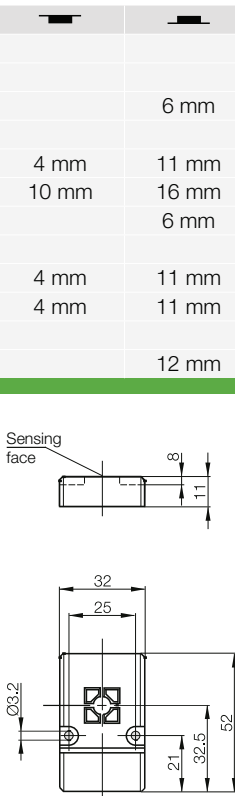
BIS C-140-11/L-M6

-30...+70 °C

-30...+85 °C

IP 68/x9K

use in vacuum





Dimensions		Ø 14.5 mm	M16×1	
Housing material		Brass, coated	Brass, coated	
1 m cable	Ordering code	BIS00P5	BIS00PC	
	Part number	BIS C-300-PU1-01	BIS C-306-PU1-01	
5 m cable	Ordering code	BIS005Z	BIS006F	
	Part number	BIS C-300-PU1-05	BIS C-306-PU1-05	
10 m cable	Ordering code	BIS00P6	BIS00PE	
	Part number	BIS C-300-PU1-10	BIS C-306-PU1-10	
Mounting		—	—	
Operating temperature		0...+70 °C	0...+70 °C	
Storage temperature		−20...+85 °C	−20...+85 °C	
Degree of protection per IEC 60529		IP 67	IP 67	
Connection to		Processor	Processor	
Connection cable		Cable included	Cable included	

Appropriate data carrier		BIS0002	BIS0004	BIS0009	BIS000T	BIS000W	BIS0011	BIS001E	see data carriers BIS C-134-__-L	BIS001E	BIS001H	see data carriers BIS C-130-05/L-SA1	see data carriers BIS C-191-__-L	see data carriers BIS C-140-__-L-M-__						
Mounting																				
Write distance in mm		0..4	0..35	0...35	0..2	0..12	0...25	0..4	0..3	0..4	0..4	0..35	0..3							
Read distance in mm		0..4	0..35	0...35	0..2	0..12	0...25	0..4	0..3	0..4	0..4	0..35	0..3							
Offset in mm at distance	0.7 mm					±2														
	1 mm	±3	±3	±3	±2		±2.5	±3.5	±4	±5	±5	±4	±3.5							
	3 mm	+2	+2	+2				+3		+4	+4	+3	+2							

For dynamic mode information pay attention to Basic Information chapter.

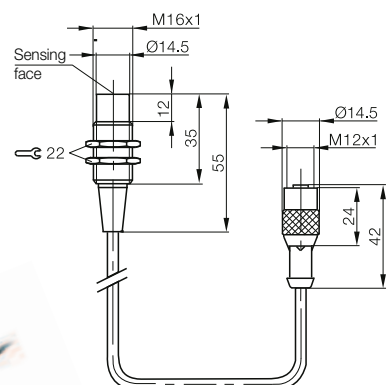
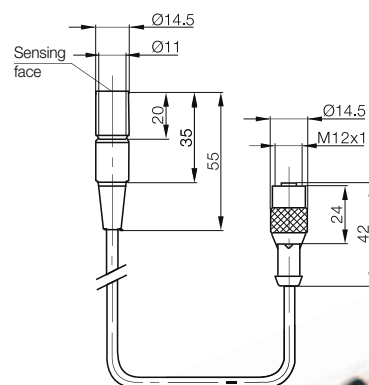
Caution!

Caution:
At 10 m cable length, read/write distance is reduced by 10 %

Mounting:

-  flush in steel
 non-flush on steel
 non-metal

Antenna type:



Description	Handle
Use	For read/write head
Ordering code	BAM012A
Part number	BIS C-300-HG1

See accessories section for details.





Dimensions	50×25×10 mm	
Housing material	ABS (fiberglass reinforced)	
1 m cable	Ordering code	BIS0066
	Part number	BIS C-305-PU1-01
5 m cable	Ordering code	BIS0067
	Part number	BIS C-305-PU1-05
10 m cable	Ordering code	BIS0068
	Part number	BIS C-305-PU1-10
Mounting	—	
Operating temperature	0...+70 °C	
Storage temperature	-20...+85 °C	
Degree of protection per IEC 60529	IP 67	
Connection to	Processor	
Connection cable	Cable included	

Appropriate data carrier		BIS0002	BIS C-100-05/A	BIS0004	BIS C-103-05/A	BIS0009	BIS C-105-05/A	see data carriers	see data carriers	BIS C-108-.../L-SA2	BIS000M	BIS C-117-05/A	BIS000N	BIS C-117-05/L	BIS000T	BIS C-121-04/L	BIS000W	BIS C-121-04/L-SA1	BIS0011	BIS C-122-04/L	BIS000M	BIS C-117-05/A	BIS0019	BIS C-128-05/L	BIS001E	BIS C-130-05/L	BIS001H	BIS C-130-05/L-SA1	BIS0021	BIS C-134-11/L	see data carriers	BIS C-140-.../L-M
Mounting		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Write distance in mm		0...4	0...5	0...5	0...5	0...6	0...6	0...6	0...6	1...8	0...7	0...2	0...12	0...25	0...10	0...6	0...7	0...7	0...6	0...45												
Read distance in mm		0...4	0...5	0...5	0...5	0...6	0...6	0...6	0...6	1...8	0...7	0...2	0...12	0...25	0...10	0...6	0...7	0...7	0...6	0...45												
Offset in mm at distance	0.7 mm																															
	1 mm	±3	±4	±4	±4	±8	±8	±5	±8,5	±2				±3	±6	±8	±5	±5	±5	±4,5												
	3 mm	±2	±3	±3	±3	±7	±7	±4	±7,5					±2	±6	±7	±5	±5	±5	±3,5												
	5 mm					±5	±5	±3	±6						±6	±5	±4	±4	±4													
	7 mm							±2	±4						±5	±2																
	10 mm																		±3													

For dynamic mode information pay attention to Basic Information chapter.

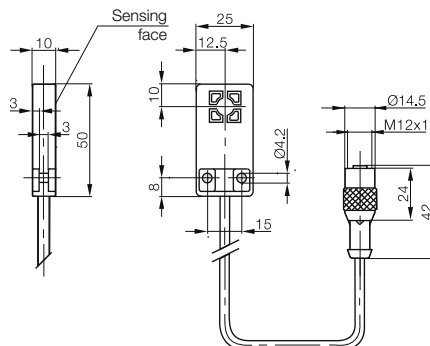
Caution!

At 10 m cable length, read/write distance is reduced by 10 %

Mounting:

- flush in steel
- non-flush on steel
- non-metal

Antenna type:



Data coupler BIS C-380-...

for data transmission between data carriers BIS C-1-... and read/write head BIS C-3-... via a contactless extension see page 154/155.



70 kHz LF

BIS C Industrial
RFID System

Range of
applications

Read/write
distances
overview

Data carriers
read/write

**Read/write
heads**

Data
couplers

8-bit
processor
for read-only
mode

Processors

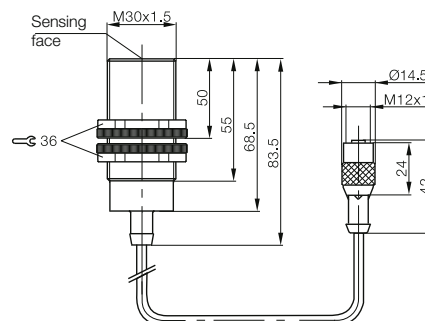
Standard
handheld

Read/write
heads
for handy
programmers

Handy
programmer

Read/write
gun

Access
protection



The diagram illustrates the connection of the BIS C-319 cable to the BIS C-650 and BIS C-621 units. The BIS C-319 cable is shown at the top, with a connector that fits into the top of the BIS C-650 unit. The BIS C-650 unit is connected to the BIS C-621 unit via a cable. The BIS C-621 unit is shown with a connector that fits into the top of the BIS C-650 unit.

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BIS C Industrial RFID System

Read/write heads



Dimensions	80×80×40 mm	
Housing material	PBT	
1 m cable	Ordering code	BIS00PK
	Part number	BIS C-315-PU1-01
5 m cable	Ordering code	BIS00PL
	Part number	BIS C-315-PU1-05
10 m cable	Ordering code	BIS00PM
	Part number	BIS C-315-PU1-10
Mounting	—	
Operating temperature	0...+70 °C	
Storage temperature	-20...+85 °C	
Degree of protection per IEC 60529	IP 67	
Connection to	Processor	
Connection cable	Cable included	

Appropriate data carrier

Mounting	see data carriers BIS C-104-_/A	see data carriers BIS C-108-_/L	see data carriers BIS C-108-_/L-SA2	BIS000M BIS C-117-05/A	BIS000N BIS C-117-05/L	BIS0017 BIS C-127-05/L	see data carriers BIS C-128-_/L	BIS001E BIS C-130-05/L	see data carriers BIS C-133-_/L	BIS0021 BIS C-134-11/L	see data carriers BIS C-190-_/L								
Write distance in mm	1...13	2...16	2...16	0...15	0...18	10...30	0...18	0...18	0...15	0...16	0...20								
Read distance in mm	1...13	2...16	2...16	0...15	0...18	10...30	0...18	0...18	0...15	0...16	0...20								
Offset in mm at distance																			
0.7 mm																			
1 mm	±15	±15		±15	±17		±17	±16	±17	±16	±18								
3 mm	±14	±14	±15	±15	±17		±17	±16	±15	±16	±18								
5 mm	±11	±12	±12	±14	±17		±17	±16	±15	±16	±18								
7 mm	±10	±11	±10	±12	±15		±15	±14	±14	±14	±18								
10 mm	±8	±8	±8	±12	±15	±30	±15	±14	±14	±12	±18								
15 mm					±14	±27	±14	±11			±16								
20 mm						±20													

For dynamic mode information pay attention to Basic Information chapter.

Caution!

At 10 m cable length, read/write distance is reduced by 10 %

Mounting:

- flush in steel
- non-flush on steel
- non-metal

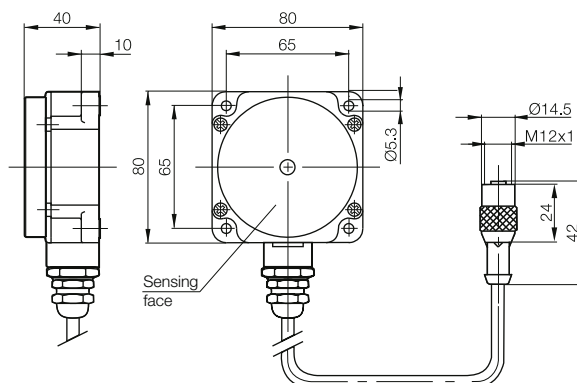
Antenna type:



rod



round





70 kHz LF

BIS C Industrial
 RFID System
 Range of
 applications
 Read/write
 distances
 overview
 Data carriers
 Read/write
**Read/write
 heads**
 Data
 couplers
 8-bit
 processor
 for read-only
 mode
 Processors
 Standard
 handheld
 Read/write
 heads
 for handy
 programmers
 Handy
 programmer
 Read/write
 gun
 Access
 protection

[illegible]

■ www.balluff.com



Dimensions		M18x1	M18x1	
Housing material		PBT	Stainless Steel	
For 1 m cable	Ordering code		BIS007P	
	Part number	BIS C-319/01-S4	BIS C-325/01-S4	
For 5 m cable	Ordering code	BIS007A	BIS007R	
	Part number	BIS C-319/05-S4	BIS C-325/05-S4	
For 10 m cable	Ordering code	BIS007C	BIS007T	
	Part number	BIS C-319/10-S4	BIS C-325/10-S4	
Mounting		—	—	
Operating temperature		0...+70 °C	0...+70 °C	
Storage temperature		–20...+85 °C	–20...+85 °C	
Degree of protection per IEC 60529		IP 67	IP 67	
Connection to		Processor	Processor	
Connection cable		See page 282 for cable options	See page 282 for cable options	

[illegible]

For dynamic mode information pay attention to Basic Information chapter.

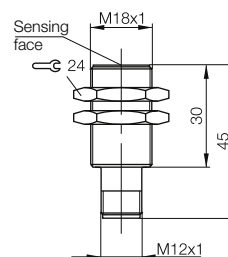
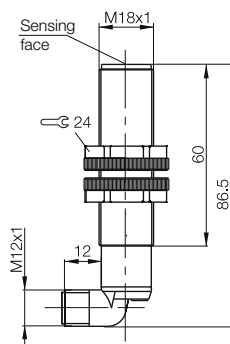
Caution!

Caution:
At 10 m cable length, read/write distance is reduced by 10 %

Mounting:

-  flush in steel
 non-flush on steel
 non-metal

Antenna type:

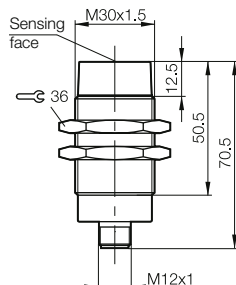




70 kHz LF

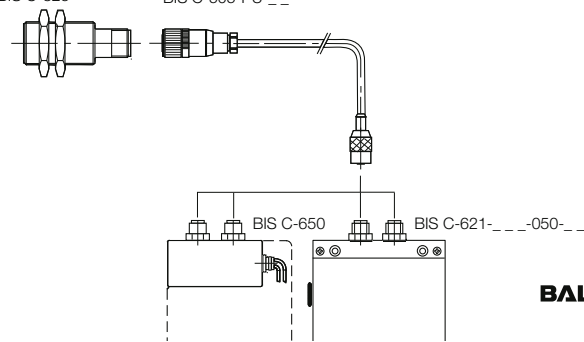
Data couplers
8-bit processor for read-only mode
Processors
Standard handheld
Read/write heads for handy programmers
Handy programmer
Read/write gun
Access protection

Data couplers
8-bit processor for read-only mode
Processors
Standard handheld
Read/write heads for handy programmers
Handy programmer
Read/write gun
Access protection



BIS C-325

BIS C-505-PU-



Cables on read/write heads must not be shortened, since functionality can then no longer be ensured.

BIS C Industrial RFID System

Read/write heads



Dimensions	80×80×40 mm	
Housing material	PBT	
For 5 m cable	Ordering code	BIS006Y
	Part number	BIS C-315/05-S4
For 10 m cable	Ordering code	BIS006Z
	Part number	BIS C-315/10-S4
Mounting	 flush in steel	
Operating temperature	0...+70 °C	
Storage temperature	-20...+85 °C	
Degree of protection per IEC 60529	IP 67	
Connection to	Processor	
Connection cable	See page 282 for cable options	

Appropriate data carrier		see data carriers BIS C-104-_-/_A	see data carriers BIS C-108-_-/_L	see data carriers BIS C-108-_-/_L-SA2	BIS000M BIS C-117-05/A	BIS000N BIS C-117-05/L	BIS0017 BIS C-127-05/L	see data carriers BIS C-128-_-/_L	BIS001E BIS C-130-05/L	see data carriers BIS C-133-_-/_L	BIS0021 BIS C-134-11/L	see data carriers BIS C-190-_-/_L								
Mounting																				
Write distance in mm		1...13	2...16	2...16	0...15	0...20	10...30	0...18	0...18	0...15	0...16	0...20								
Read distance in mm		1...13	2...16	2...16	0...15	0...20	10...30	0...18	0...18	0...15	0...16	0...20								
Offset in mm at distance	1 mm	±15			±15	±17		±17	±16	±17	±16	±18								
	3 mm	±14	±14	±15	±15	±17		±17	±16	±15	±16	±18								
	5 mm	±11	±12	±12	±14	±17		±17	±16	±15	±16	±18								
	7 mm	±10	±11	±10	±12	±15		±15	±14	±14	±14	±18								
	10 mm	±8	±8	±8	±12	±15	±30	±15	±14	±14	±12	±18								
	15 mm					±14	±27	±14	±11			±16								
	20 mm						±20													

For dynamic mode information pay attention to Basic Information chapter.

Caution!

At 10 m cable length, read/write distance is reduced by 10 %

Mounting:

 flush in steel

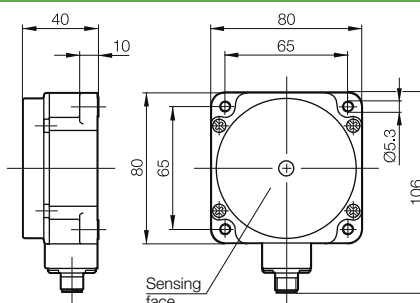
 non-metal

 non-metal

Antenna type:

 rod

 round



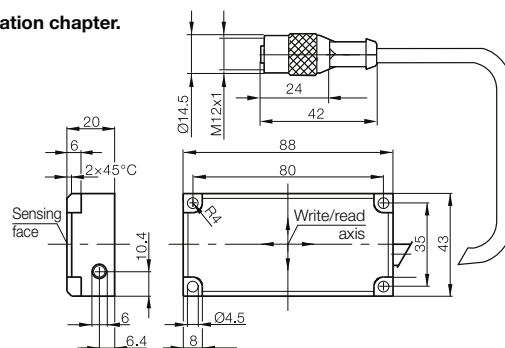


BIS000C	
BIS C-108-05/L	
BIS001C	
BIS C-128-11/L	
BIS002N	
BIS C-190-32/L	

Write distance in mm		0...8	0..8	0..8					
Read distance in mm		0...8	0..8	0..8					
Offset in mm at distance	1 mm	±6	±6	±6					
	2 mm	±6	±6	±6					
	3 mm	±6	±6	±6					
	4 mm	±5	±5	±5					
	5 mm	±5	±5	±5					
	6 mm	±4	±4	±4					
	10 mm								
	20 mm								

150

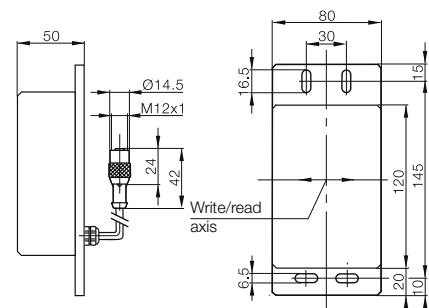
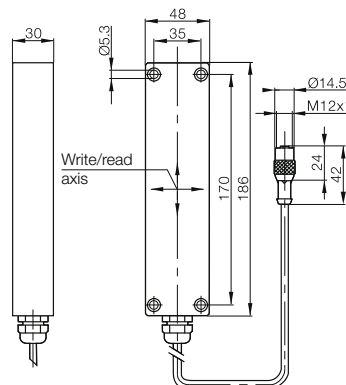
BALLUFF

150 | **BALLUFF**



70 kHz LF

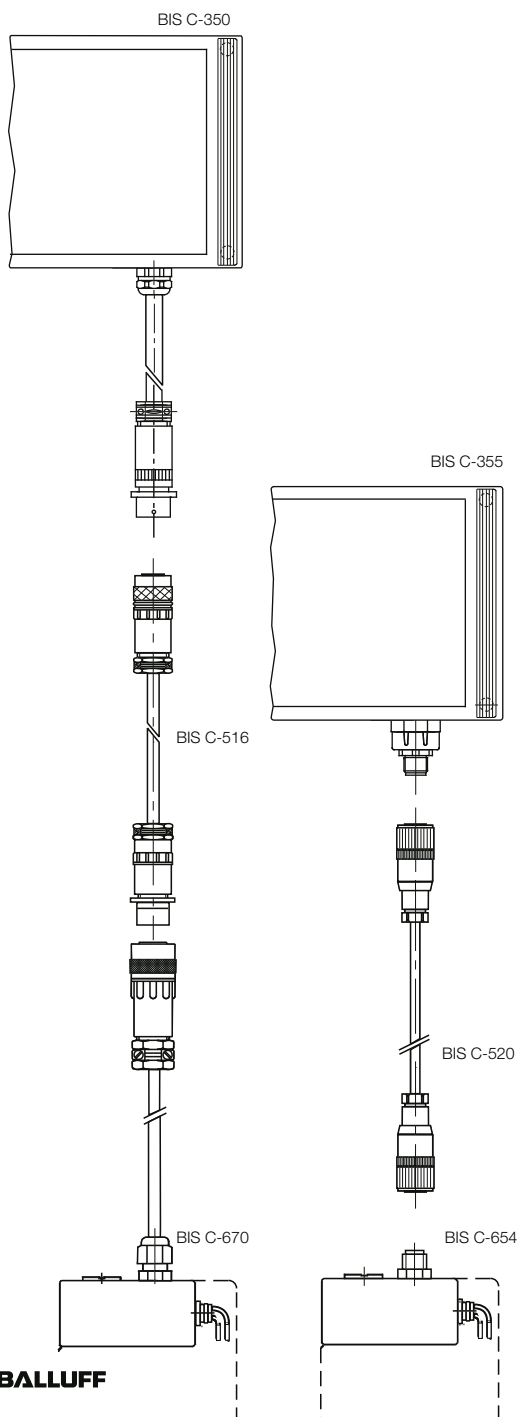
Read/write heads





Dimensions	
Housing material	
Ordering code	
Part number	
Mounting	
Operating temperature	
Storage temperature	
Degree of protection per IEC 60529	
Connection to	
Connection cable	

Example:



Appropriate data carrier

Write distance in mm	
Read distance in mm	
Offset in mm at distance	10 mm
	15 mm
	20 mm
	35 mm
	42 mm
	60 mm

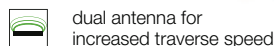
For dynamic mode information pay attention to Basic Information chapter.

Mounting:

- flush in steel
- non-flush on steel
- non-metal

Antenna type:

- rod
- round



70 kHz LF

BIS C Industrial
RFID System

Range of applications

Read/write distances overview

Data carriers read/write

Read/write heads

Data couplers

8-bit processor for read-only mode

Processors

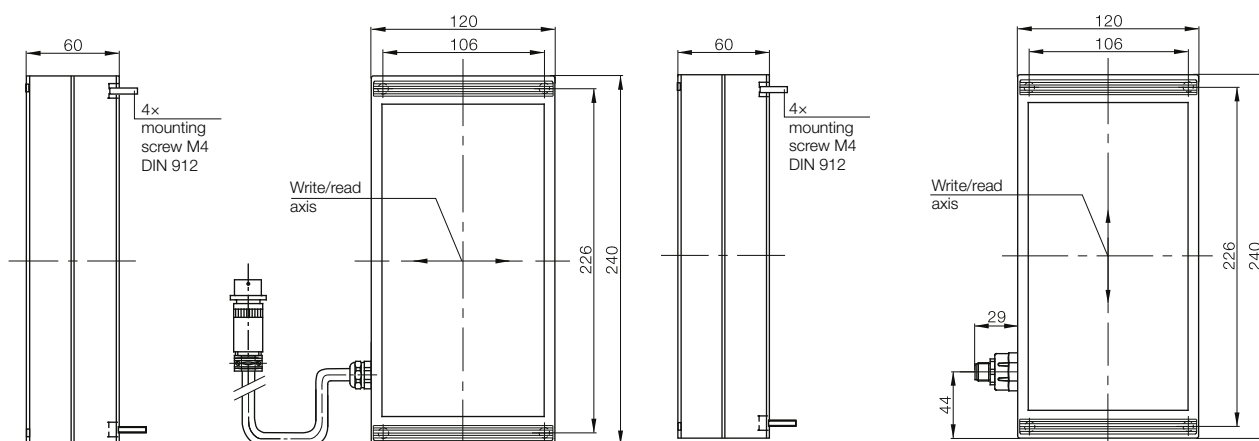
Standard handheld

Read/write heads for handy programmers

Handy programmer

Read/write gun

Access protection

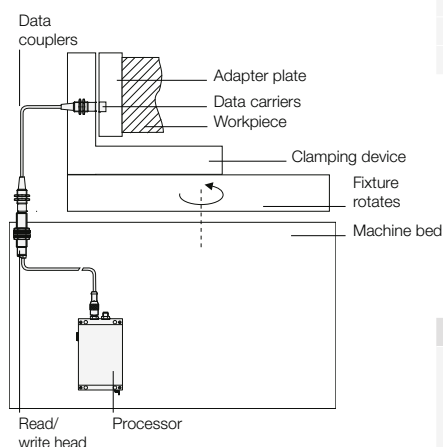
[illegible]

BIS C Industrial RFID System

Data couplers



Dimensions	M16x1 and M16x1	
Housing material	Brass, coated	
1 m cable	Ordering code	BIS00JJ
	Part number	BIS C-380-06/06-01
2 m cable	Ordering code	BIS00LU
	Part number	BIS C-380-06/06-02
5 m cable	Ordering code	BIS00N9
	Part number	BIS C-380-06/06-05
Read head connection	Contactless connection	
Operating temperature	0...+70 °C	
Storage temperature	-20...+85 °C	
Degree of protection per IEC 60529	IP 67	



Data couplers are used in applications where a dual mechanical interface is mandatory.

Appropriate data carrier

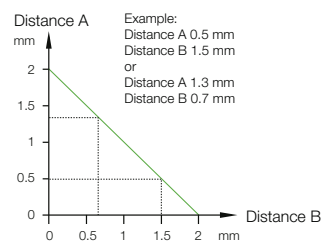
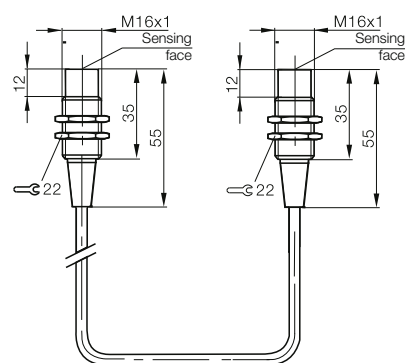
Mounting	BIS0002	BIS C-100-05/A	BIS0004	BIS C-103-05/A	BIS0009	BIS C-105-05/A	BIS000T	BIS C-121-04/L	BIS0011	BIS C-122-04/L								
Appropriate read/write head	BIS C-300 BIS C-302 BIS C-305 BIS C-306																	
Max. read/write distance	see diagram																	

Mounting:

- flush in steel
- non-flush on steel
- non-metal

Antenna type:

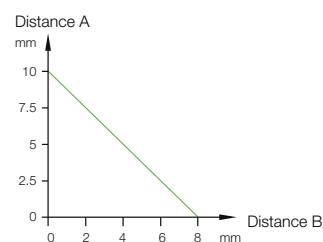
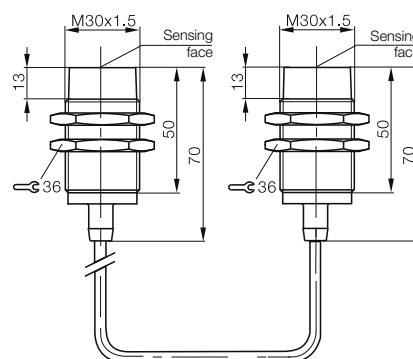
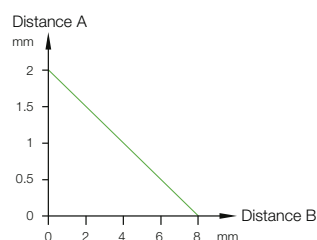
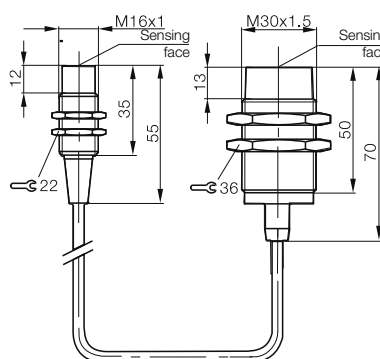
- rod
- round





70 kHz LF

BIS C Industrial RFID System





Dimensions		M30×1	M30×1	M30×1	
Housing material		Brass, coated	Brass, coated	Brass, coated	
Description/interface		8-bit parallel	8×8-bit parallel	2×8-bit parallel dynamic*	
5 m cable	Ordering code	BIS00H6	BIS00HC	BIS00HH	
	Part number	BIS C-60R-001-08P-PU-05	BIS C-60R-002-08P-PU-05	BIS C-60R-003-08P-PU-05	
10 m cable	Ordering code	BIS00H7	BIS00HE	BIS00HJ	
	Part number	BIS C-60R-001-08P-PU-10	BIS C-60R-002-08P-PU-10	BIS C-60R-003-08P-PU-10	
20 m cable	Ordering code	BIS00H8	BIS00TC		
	Part number	BIS C-60R-001-08P-PU-20	BIS C-60R-002-08P-PU-20	BIS C-60R-003-08P-PU-20	
Mounting					
Supply voltage		24 V DC +10/-20 %, incl. ripple	24 V DC +10/-20 %, incl. ripple	24 V DC +10/-20 %, incl. ripple	
Current		max. 300 mA without load	max. 300 mA without load	max. 300 mA without load	
Output current per output		max. 50 mA	max. 50 mA	max. 50 mA	
Voltage drop		≤ 1.5 V	≤ 1.5 V	≤ 1.5 V	
Leakage current		≤ 0.08 mA	≤ 0.08 mA	≤ 0.08 mA	
Operating temperature		0...+50 °C	0...+50 °C	0...+50 °C	
Degree of protection per IEC 60529		IP 67	IP 67	IP 67	
Tightening torque		20 Nm	20 Nm	20 Nm	
Conductor cross-sections		2× 0.5 mm² and 9× 0.18 mm²	2× 0.5 mm² and 9× 0.18 mm²	2× 0.5 mm² and 9× 0.18 mm²	
LED function indicator		Yes	Yes	Yes	

Appropriate data carrier

Mounting																
Read distance in mm		0...3	1...5	1...5	0...4	1...5	0...5	1...8	0...5	1...6	3...12	1...8	1...8	1...8	1...8	0...6
Offset in mm at distance																
	1 mm	±2	±3	±3	±4	±2.5	±3	±4	±2.5	±3		±5	±7	±7	±4	±7
	3 mm	±2	±3	±3	±2.5	±2.5	±3	±5	±3	±3	±7	±5	±7	±7	±4	±7
	5 mm		±3	±3		±2.5	±3	±5	±3	±3	±6	±5	±7	±7	±4	±6
	7 mm							±5			±5	±5	±6	±6	±4	

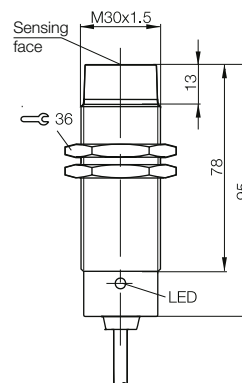
* Dynamic mode only possible for BIS C-60R-003

Mounting:

- flush in steel
- non-flush on steel
- non-metal

Antenna type:

- rod
- round





Access
protection

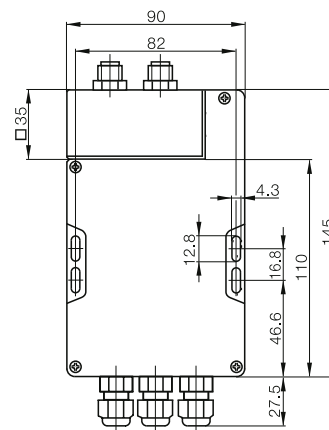
[illegible]



Description		Processor	
Housing material		ABS	
RS232,	Ordering code	BIS008U	
Balluff dialog	Part number	BIS C-600-007-650-00-KL1	
RS422/RS485,	Ordering code	BIS008W	
4-wire, point-to-point, Balluff dialog	Part number	BIS C-600-007-650-02-KL1	
Supply voltage, Ripple		24 V DC $\pm 20\%$, $\leq 10\%$	
Current		≤ 400 mA	
Operating temperature		0...+60 °C	
Storage temperature		0...+60 °C	
Degree of protection per IEC 60529		IP 65	
Read/write head ports		2× external	
Control inputs		1× via opto-coupler, 24 V DC	
Control outputs		4× via opto-coupler, 24 V DC	
Connection for			
Connection type		Terminals 3× Pg 9	
Accessories included		Configuration software	
Connection cable			



Adapter or antenna can be rotated in 3 directions



The **compact class BIS C-6__** with its reduced dimensions and various interface options can be used wherever ambient conditions require higher protection. The devices are ideal for IP 65 applications involving media that is not aggressive to PS plastic. Small, compact, flexible and economical. Read/write head can be rotated in 3 directions.

BIS C Industrial RFID System

Serial processors



Processor ABS	Processor ABS	Processor Aluminum cast, coated
BIS0092		BIS00AZ
BIS C-600-007-670-00-KL1	BIS C-600-007-654-00-KL1	BIS C-620-007-050-00-ST2
		BIS00KW
		BIS C-620-007-050-02-ST2
24 V DC $\pm 20\%$, $\leq 10\%$ ≤ 400 mA 0...+60 °C 0...+60 °C IP 65 1× external 1× via opto-coupler, 24 V DC 4× via opto-coupler, 24 V DC	24 V DC $\pm 20\%$, $\leq 10\%$ ≤ 400 mA 0...+60 °C 0...+60 °C IP 65 1× external/special 1× via opto-coupler, 24 V DC 4× via opto-coupler, 24 V DC	24 V DC $\pm 20\%$, $\leq 10\%$ ≤ 400 mA 0...+60 °C 0...+60 °C IP 65 2× external 1× M23 connector male, 9-pin 1× M12 connector male, 5-pin RS232/422/485 Read/write heads BIS C-3_ _ (Exception: BIS C-350) Configuration software See page 289/305 for cable options
Terminals 3× Pg 9	Terminals 3× Pg 9	
Configuration software	Configuration software	



70 kHz LF

BIS C Industrial
RFID System

Range of
applications

Read/write
distances
overview

Data carriers
read/write

Read/write
heads

Data
couplers

8-bit
processor
for read-only
mode

Processors

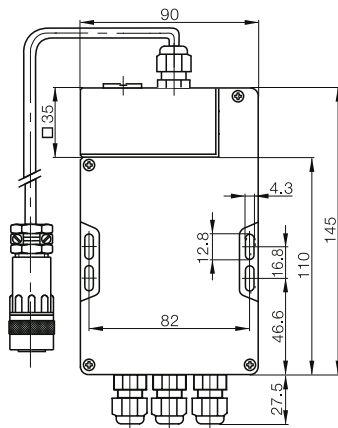
Standard
handheld

Read/write
heads
for handy
programmers

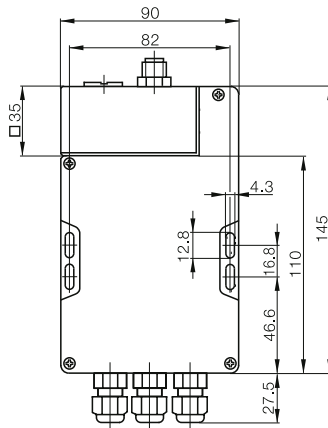
Handy
programmer

Read/write
gun

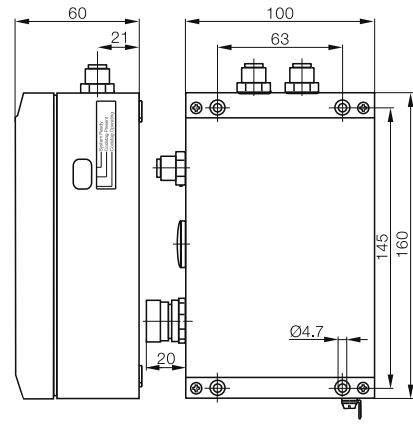
Access
protection



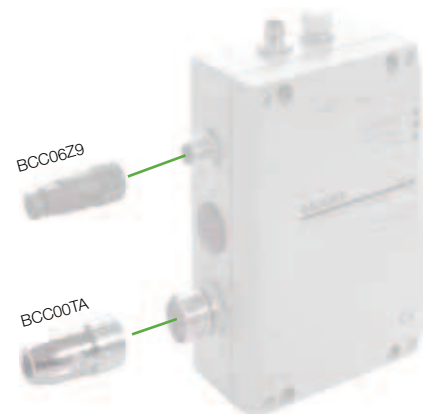
for read/write head C-350



for read/write head BIS C-355/05-S92



Processor unit **BIS C-62_** enclosed in a robust metal housing is suitable for applications requiring degree of protection IP 65. Flexible interface versions and the option of connecting two read/write heads to a single unit are ideal. The special housing provides effective protection against environmental influences and aggressive media. Impacts do not affect the degree of protection.



Advantages of the BIS C-6005 parallel version

The parallel interface is a read-only-interface. Writing is therefore not possible in parallel mode. However, the processor unit can write a single piece of bit information (OK/NOK, large/small, version 1/ version 2) to the data carrier. Bit information is transmitted in the form of a separate output signal.

The **compact class BIS C-6_ _** with its reduced dimensions and various interface options can be used wherever ambient conditions require higher protection. Small, compact, flexible and economical.



Description		
Housing material		
Parallel	Ordering code	
	Part number	
Supply voltage, Ripple		
Current		
Operating temperature		
Storage temperature		
Degree of protection per IEC 60529		
Read/write head ports		
Control inputs		
Control outputs		
Connection type		
Accessories included		
Connection cable		



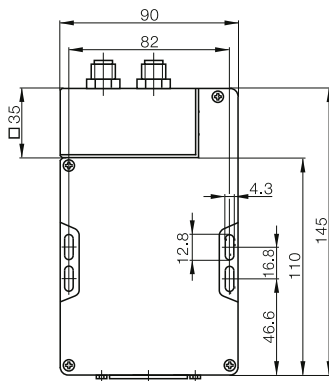
Adapter or antenna can be rotated in 3 directions

BIS C Industrial RFID System

Parallel processors



Processor
ABS
BIS00N7
BIS C-6005-027-650-05-ST4
24 V DC $\pm 20\%$, $\leq 10\%$
≤ 400 mA
0...+60 °C
0...+60 °C
IP 54
2× external
4× via opto-coupler, 24 V DC
13× via opto-coupler, 24 V DC
MIN Sub-D male, 25-pin
Configuration software
See page 287 for cable options



BIS C Industrial
RFID System

Range of
applications

Read/write
distances
overview

Data carriers
read/write

Read/write
heads

Data
couplers

8-bit
processor
for read-only
mode

Processors

Standard
handheld

Read/write
heads
for handy
programmers

Handy
programmer

Read/write
gun

Access
protection

BIS C Industrial RFID System

Profibus processors



The compact class

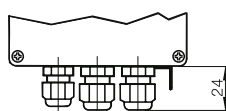
BIS C-600_ with its reduced dimensions and various interface options can be used wherever ambient conditions require higher protection. Small, compact, flexible and economical.

Cost-effective identification – operate two read/write heads simultaneously

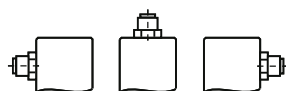
- Selectable division of the data width on the Profibus, from 4...128 bytes
- Free assigning of the data width for each read/write head
- Optimum data speed, internal cycle time is shorter than the bus activation time
- Service friendly, all parameter data are stored in an exchangeable memory
- Bus address selectable with switches
- Compatible with BIS C-602 device family
- Accepts all read/write heads
- Compatible with entire BIS C system



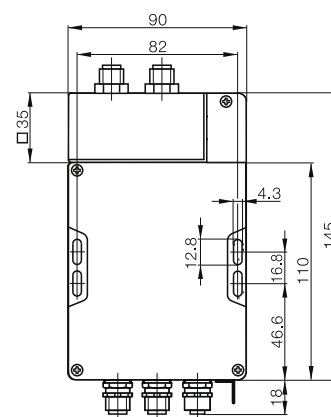
Description	Processor	
Housing material	ABS	
Profibus with connector	Ordering code	BIS009A
	Part number	BIS C-6002-019-650-03-ST11
Profibus memory optimization with connector	Ordering code	BIS009M
	Part number	BIS C-6002-028-650-03-ST11
Profibus with PG fitting	Ordering code	BIS0099
	Part number	BIS C-6002-019-650-03-KL2
Profibus memory optimization with PG fitting	Ordering code	BIS009L
	Part number	BIS C-6002-028-650-03-KL2
Supply voltage, Ripple	24 V DC $\pm 20\%$, $\leq 10\%$	
Current	≤ 400 mA	
Operating temperature	0...+60 °C	
Storage temperature	0...+60 °C	
Degree of protection per IEC 60529	IP 65	
Read/write head ports	2× external	
Service interface	RS232	
Control inputs	1× via opto-coupler, 24 V DC	
Control outputs	2× via opto-coupler, 24 V DC	
Connection version ST11	1× M12 connector male, 5-pin, B-coded	
	1× M12 connector female, 5-pin, B-coded	
	1× M12 connector male, 5-pin	
Connection type clamp terminals KL2	Terminals 1× Pg 9, Terminals 2× Pg 11	
Accessories included	Software GSD file	
Connection cable	See page 290/305 for cable options	



Version KL2



Adapter or antenna can be rotated in 3 directions



Recommended accessories

(please order separately)



Ordering code	BAM0114
Part number	BKS 12-CS-01

Threaded cover for M12 connector

BIS C Industrial RFID System

Profibus processors



Processor ABS	Processor ABS	Processor ABS
	BIS009F	BIS009J
	BIS C-6002-019-654-03-ST11	BIS C-6002-019-655-03-ST11
BIS009K		BIS009H
BIS C-6002-019-670-03-KL2		BIS C-6002-019-655-03-KL2
24 V DC $\pm 20\%$, $\leq 10\%$ ≤ 400 mA 0...+60 °C 0...+60 °C IP 65 1× external RS232 1× via opto-coupler, 24 V DC 2× via opto-coupler, 24 V DC 1× M12 connector male, 5-pin, B-coded 1× M12 connector female, 5-pin, B-coded 1× M12 connector male, 5-pin Terminals 1× Pg 9, Terminals 2× Pg 11 Software GSD file See page 290/305 for cable options	24 V DC $\pm 20\%$, $\leq 10\%$ ≤ 400 mA 0...+60 °C 0...+60 °C IP 65 1× external RS232 1× via opto-coupler, 24 V DC 2× via opto-coupler, 24 V DC 1× M12 connector male, 5-pin, B-coded 1× M12 connector female, 5-pin, B-coded 1× M12 connector male, 5-pin Terminals 1× Pg 9, Terminals 2× Pg 11 Software GSD file See page 290/305 for cable options	24 V DC $\pm 20\%$, $\leq 10\%$ ≤ 400 mA 0...+60 °C 0...+60 °C IP 65 4× external RS232 1× via opto-coupler, 24 V DC 2× via opto-coupler, 24 V DC 1× M12 connector male, 5-pin, B-coded 1× M12 connector female, 5-pin, B-coded 1× M12 connector male, 5-pin Terminals 1× Pg 9, Terminals 2× Pg 11 Software GSD file See page 290/305 for cable options



BIS C Industrial
RFID System

Range of
applications

Read/write
distances
overview

Data carriers
read/write

Read/write
heads

Data
couplers

8-bit
processor
for read-only
mode

Processors

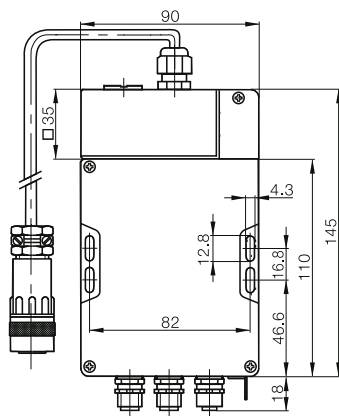
Standard
handheld

Read/write
heads
for handy
programmers

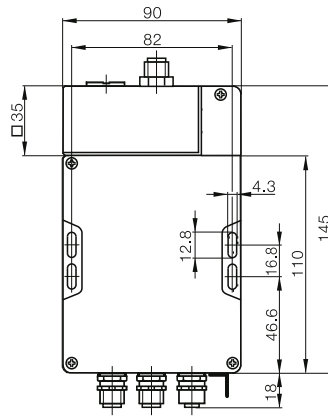
Handy
programmer

Read/write
gun

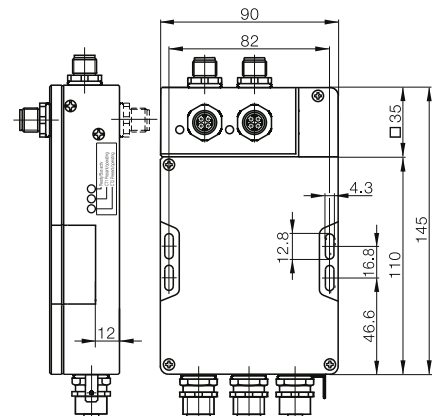
Access
protection



for read/write head BIS C-350



for read/write head BIS C-355/_ _-S92



Note: 2 read/write heads can
be operated simultaneously

BIS C Industrial RFID System

Profibus processors



Cost-effective identification – operate two read/write heads simultaneously! In a robust metal housing.

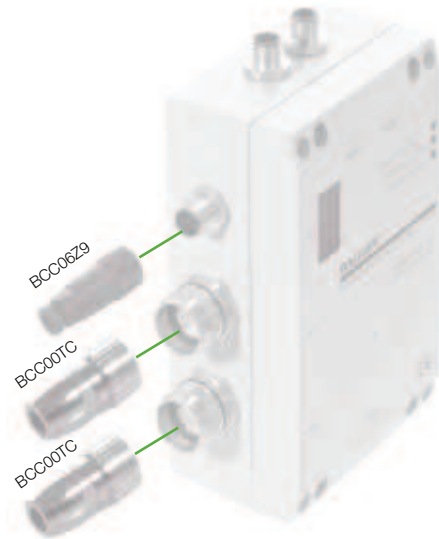


Description		
Housing material		
Profibus	Ordering code	
	Part number	
Profibus	Ordering code	
with memory optimized data carrier processing	Part number	
Supply voltage, Ripple		
Current		
Operating temperature		
Storage temperature		
Degree of protection per IEC 60529		
Read/write head ports		
Service interface		
Connection for		
Connection type		
Accessories included		
Connection cable		

Recommended accessories
 (please order separately)



Description	Threaded cover for M12 connector	Threaded cover for M23 connector
Ordering code	BAM0114	BAM012P
Part number	BKS 12-CS-01	BKS 23-CS-00



BIS C Industrial RFID System

Profibus processors



Processor	Processor
Aluminum cast, coated	Aluminum cast, coated
BIS00AL	BIS00AM
BIS C-6022-019-050-03-ST10	BIS C-6022-019-050-03-ST14
BIS00AP	BIS00AR
BIS C-6022-028-050-03-ST10	BIS C-6022-028-050-03-ST14
24 V DC $\pm 20\%$, $\leq 10\%$	24 V DC $\pm 20\%$, $\leq 10\%$
≤ 400 mA	≤ 400 mA
0...+60 °C	0...+60 °C
0...+60 °C	0...+60 °C
IP 65	IP 65
2x external	2x external
RS232	RS232
Read/write heads BIS C-3_ _	Read/write heads BIS C-3_ _
Exception: BIS C-350/BIS C-355	Exception: BIS C-350/BIS C-355
2x M23 connector female, 12-pin (bus)	1x M12 connector male, 5-pin, B-coded (bus)
1x M12 connector male, 5-pin (power)	1x M12 connector female, 5-pin, B-coded (bus)
1x M12 connector male, 4-pin (service)	1x M12 connector male, 5-pin (power)
	1x M12 connector male, 4-pin (service)
Software GSD file	Software GSD file
See page 289/305 for cable options	See page 290/305 for cable options



BIS C Industrial
RFID System

Range of
applications

Read/write
distances
overview

Data carriers
read/write

Read/write
heads

Data
couplers

8-bit
processor
for read-only
mode

Processors

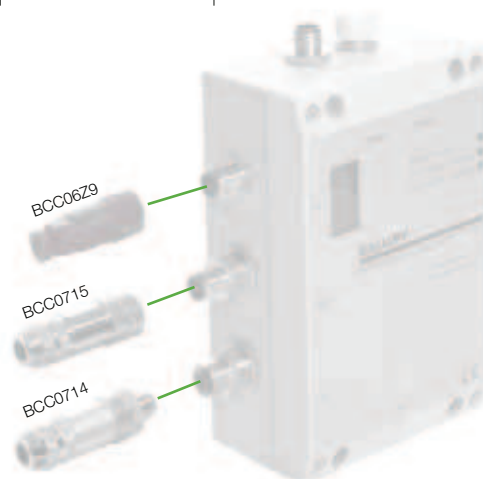
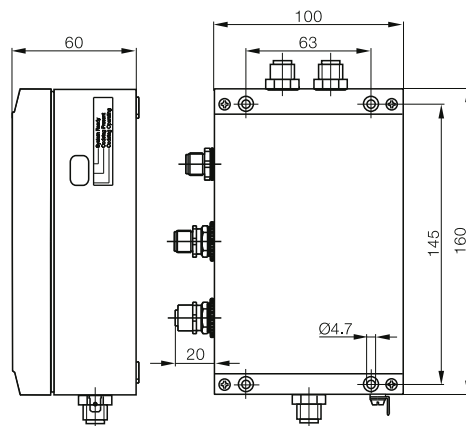
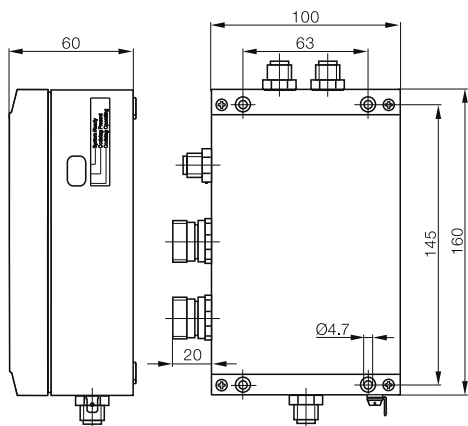
Standard
handheld

Read/write
heads
for handy
programmers

Handy
programmer

Read/write
gun

Access
protection



The devices are ideal for IP 65 and applications involving media that is not aggressive to PS plastic. Small, compact, flexible and economical.

The compact class

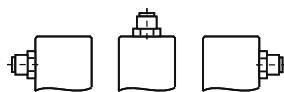
BIS C-600_ with its reduced dimensions and various interface options can be used wherever ambient conditions require higher protection.

Cost-effective identification – operate 2 read/write heads simultaneously

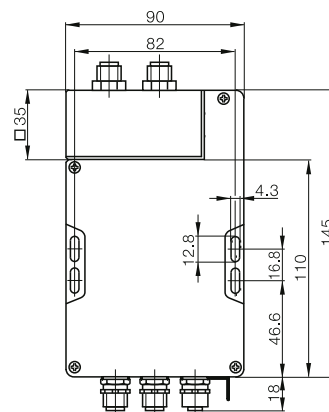
- Freely selectable buffer size between 0 and 256 bytes
- Service friendly, all parameter data are stored in an exchangeable memory
- Accepts all read/write heads
- Compatible with entire BIS C system



Description	Processor	
Housing material	ABS	
Devicenet	Ordering code	BIS009N
	Part number	BIS C-6003-025-650-03-ST12
Supply voltage, Ripple	24 V DC $\pm 20\%$, $\leq 10\%$	
Current	≤ 400 mA	
Operating temperature	0...+60 °C	
Storage temperature	0...+60 °C	
Degree of protection per IEC 60529	IP 65	
Read/write head ports	2× external	
Service interface	RS232	
Connection for	Read/write heads BIS C-3_ _ Exception: BIS C-350/BIS C-355	
Connection type	2× M12 connector male, 5-pin 1× M12 connector female, 5-pin	
Accessories included	Software EDS file	
Connection cable	See page 296/305 for cable options	



Adapter or antenna can be rotated in 3 directions



BIS C Industrial RFID System

Devicenet processors



Processor ABS	Processor ABS	Processor ABS
BIS009T		BIS009R
BIS C-6003-025-670-03-ST12	BIS C-6003-025-654-03-ST12	BIS C-6003-025-655-03-ST12
24 V DC $\pm 20\%$, $\leq 10\%$	24 V DC $\pm 20\%$, $\leq 10\%$	24 V DC $\pm 20\%$, $\leq 10\%$
≤ 400 mA	≤ 400 mA	≤ 400 mA
0...+60 °C	0...+60 °C	0...+60 °C
0...+60 °C	0...+60 °C	0...+60 °C
IP 65	IP 65	IP 65
1× external	1× external	4× external
RS232	RS232	RS232
Read/write heads BIS C-3_ _	Read/write heads BIS C-3_ _	Read/write heads BIS C-3_ _
Exception: BIS C-350/BIS C-355	Exception: BIS C-350/BIS C-355	Exception: BIS C-350/BIS C-355
2× M12 connector male, 5-pin	2× M12 connector male, 5-pin	2× M12 connector male, 5-pin
1× M12 connector female, 5-pin	1× M12 connector female, 5-pin	1× M12 connector female, 5-pin
Software EDS file	Software EDS file	Software EDS file
See page 296/305 for cable options	See page 296/305 for cable options	See page 296/305 for cable options



BIS C Industrial
RFID System

Range of
applications

Read/write
distances
overview

Data carriers
read/write

Read/write
heads

Data
couplers

8-bit
processor
for read-only
mode

Processors

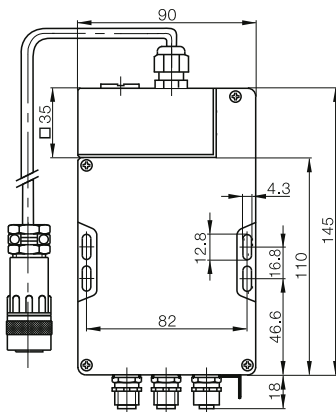
Standard
handheld

Read/write
heads
for handy
programmers

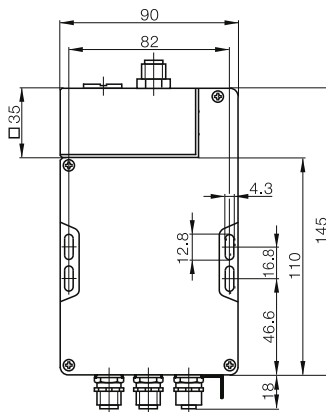
Handy
programmer

Read/write
gun

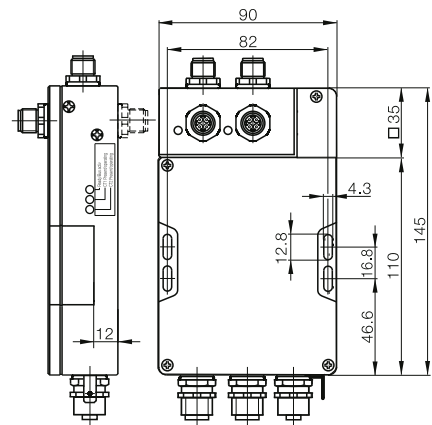
Access
protection



for read/write head BIS C-350



for read/write head BIS C-355/_ _-S92



Note: 2 read/write heads can
be operated simultaneously

BIS C Industrial RFID System

Devicenet processors



Cost-effective identification – operate two read/write heads simultaneously. In a robust metal housing.



Description	
Housing material	
Devicenet	Ordering code
	Part number
Supply voltage, Ripple	
Current	
Operating temperature	
Storage temperature	
Degree of protection per IEC 60529	
Read/write head ports	
Service interface	
Connection for	
Connection type	
Accessories included	
Accessories (please order separately)	

Recommended accessories (please order separately)



Description	Threaded cover for 7/8" connection
Ordering code	BAM012T
Part number	BKS-7/8-CS-00-A

BIS C Industrial RFID System

Devicenet processors



BIS C Industrial
RFID System

Range of
applications

Read/write
distances
overview

Data carriers
read/write

Read/write
heads

Data
couplers

8-bit
processor
for read-only
mode

Processors

Standard
handheld

Read/write
heads
for handy
programmers

Handy
programmer

Read/write
gun

Access
protection

Processor

Aluminum cast, coated

BIS00AT

BIS C-6023-025-050-03-ST13

24 V DC $\pm 20\%$, $\leq 10\%$

≤ 400 mA

0...+60 °C

0...+60 °C

IP 65

2x external

RS232

Read/write heads BIS C-3_ _

Exception: BIS C-350/BIS C-355

1x 7/8" connector male, 5-pin

1x 7/8" connector female, 5-pin

1x M12 connector male, 5-pin

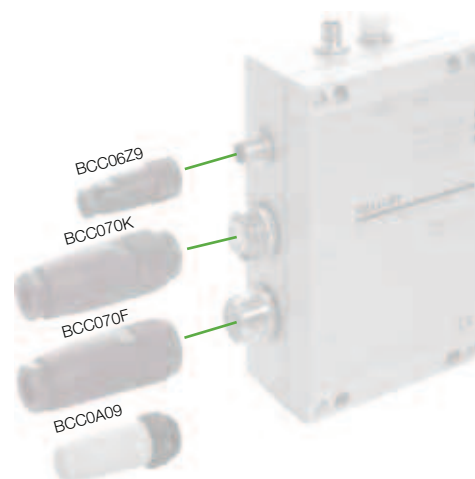
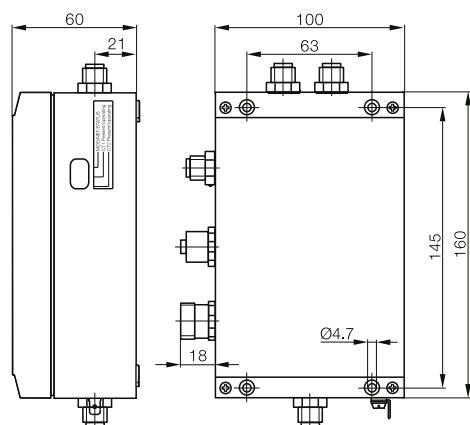
1x M12 connector male, 4-pin

Software ESD-file

Threaded cover 7/8"

See page 305/294 for cable options

Termination resistor page 295



BIS C Industrial RFID System

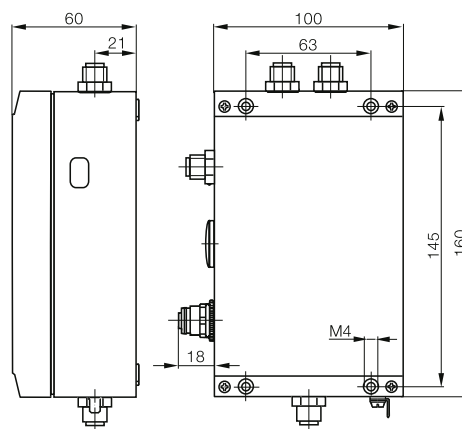
Ethernet/IP processors



Cost-effective identification –
operate 2 read/write heads
simultaneously. In robust metal
housing.



Description	Processor
Housing material	Aluminum cast, coated
Ethernet/IP	Ordering code BIS00AU
	Part number BIS C-6026-034-050-06-ST19
Supply voltage, Ripple	24 V DC $\pm 20\%$, $\leq 20\%$
Current	≤ 400 mA
Operating temperature	0...+60 °C
Storage temperature	0...+60 °C
Degree of protection per IEC 60529	IP 65
Read/write head ports	2× external
Service interface	RS232
Connection for	Read/write heads BIS C-3_ _ Exception: BIS C-350 and BIS C-355
Connection type	1× M12 connector female, 5-pin, D-coded 1× M12 connector male, 5-pin 1× M12 connector male, 4-pin
Accessories included	Configuration software
Connection cable	See page 292/305 for cable options





Description	Processor
Housing material	Aluminum cast, coated
Ethernet with	Ordering code BIS00AY
standard TCP/IP protocol	Part number BIS C-6027-039-050-06-ST19
Supply voltage, Ripple	24 V DC $\pm 20\%$, $\leq 10\%$
Current	≤ 400 mA
Operating temperature	0...+60 °C
Storage temperature	0...+60 °C
Degree of protection per IEC 60529	IP 65
Read/write head ports	2x external
Service interface	RS232
Connection for	Read/write heads BIS C-3_ _ Exception BIS C-350 and BIS C-355
Connection type	1x M12 connector female, 5-pin, D-coded 1x M12 connector male, 5-pin 1x M12 connector male, 4-pin
Accessories included	Configuration software
Connection cable	See page 292/305 for cable options



BIS C Industrial
RFID System

Range of
applications

Read/write
distances
overview

Data carriers
read/write

Read/write
heads

Data
couplers

8-bit
processor
for read-only
mode

Processors

Standard

handheld

Read/write

heads

for handy

programmers

Handy

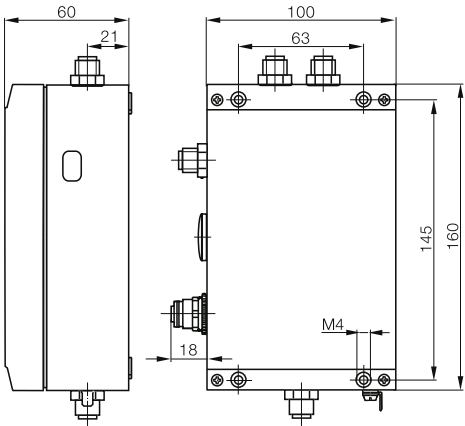
programmer

Read/write

gun

Access

protection



Suitable connectors
(please order separately)



Ordering code	BCC0C5J
Part number	BIS C-526-PU-00,6

Order accessories separately! Adapter cable for Ethernet
from M12, D-coded to coupling RJ45 see connectivity section.

BIS C Industrial RFID System

Profinet processors



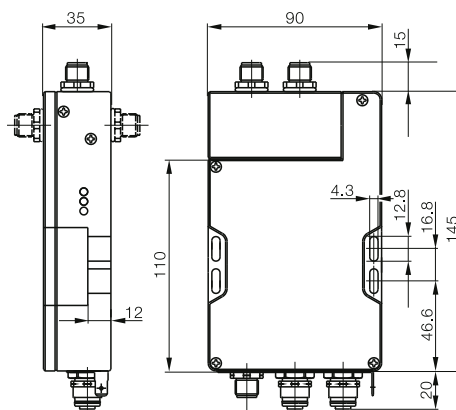
Cost-effective identification –
operate two read/write heads
simultaneously.



Description	Processor	
Housing material	ABS	
Profinet RT	Ordering code	BIS00K3
with IRT-capable 2-port switch	Part number	BIS C-6008-048-650-06-ST23
Supply voltage, Ripple	24 V DC $\pm 10\%$, $\leq 10\%$	
Current	≤ 400 mA	
Operating temperature	0...+60 °C	
Storage temperature	0...+60 °C	
Degree of protection per IEC 60529	IP 65	
Read/write head ports	2x external	
Service interface	RS232 internal	
Connection for	Read/write heads BIS C-3_ _	
	Exception: BIS C-350 and BIS C-355	
Connection type	1x M12 connector male, 5-pin	
	2x M12 connector female, 4-pin, D-coded	
Accessories included	Configuration software	
Connection cable	See page 292/305 for cable options	



Adapter or antenna can be
rotated in 3 directions



Suitable connectors
(please order separately)



Ordering code	BCC0C5J
Part number	BIS C-526-PU-00,6

Order accessories separately! Adapter cable for Ethernet
from M12, D-coded to coupling RJ45 see connectivity section.

BIS C Industrial RFID System

Profinet processors



BIS C Industrial
RFID System

Range of
applications

Read/write
distances
overview

Data carriers
read/write

Read/write
heads

Data
couplers

8-bit
processor
for read-only
mode

Processors

Standard
handheld
Read/write
heads
for handy
programmers
Handy
programmer
Read/write
gun
Access
protection

Processor
Aluminum cast, coated

BIS00TU

BIS C-6028-048-050-06-ST28

24 V DC $\pm 10\%$, $\leq 10\%$

≤ 400 mA

0...+60 °C

0...+60 °C

IP 65

2x external

RS232

Read/write heads BIS C-3_ _

Exception BIS C-350 and BIS C-355

1x 7/8" connector male, 5-pin

2x M12 connector female, 4-pin, D-coded

1x M12 connector male, 4-pin

Configuration software

See page 292/306 for cable options

Processor

Aluminum cast, coated

BIS00K4

BIS C-6028-048-050-06-ST22

24 V DC $\pm 10\%$, $\leq 10\%$

≤ 400 mA

0...+60 °C

0...+60 °C

IP 65

2x external

RS232

Read/write heads BIS C-3_ _

Exception BIS C-350 and BIS C-355

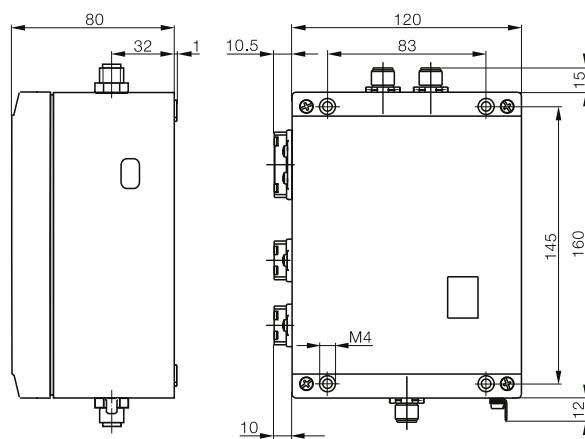
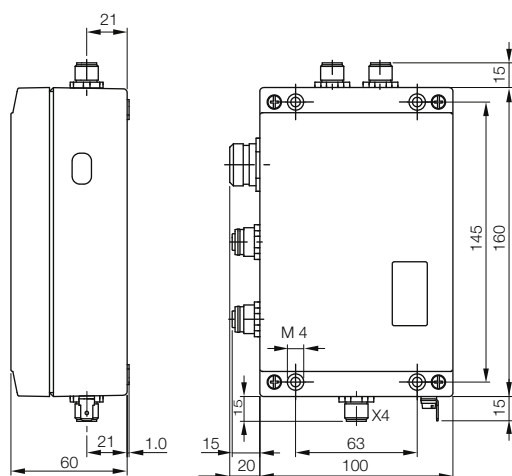
1x Push-pull AIDA connector, 5-pin

2x Push-pull RJ45 AIDA connector 8-pin

1x M12 connector male, 4-pin

Configuration software

See page 305 for cable options



The robust version solution for connection to Profinet with AIDA standard
(Automatisierungsinitiative Deutscher Automobilhersteller)

BIS C Industrial RFID System

Standard handheld

For enhanced operating convenience

Allows portable writing and reading of BIS C data carriers.

Easy operation thanks to:

- Touchscreen with large Windows CE® color display
- Pre-installed Balluff software and keyboard or stylus

Ideal for poor light conditions and challenging environments.

Data transfer via optional Bluetooth or wired USB. The handheld is also modular for expandability.

Additional convenience

A pistol grip is provided for ergonomic comfort.



Antenna type		
Function		
Housing material		
Standard base	Ordering code	
	Part number	
Standard + WLAN module	Ordering code	
	Part number	
Standard + 1D code reader	Ordering code	
	Part number	
Standard + 2D code reader	Ordering code	
	Part number	
Standard + 1D code reader + WLAN	Ordering code	
	Part number	
Standard + 2D code reader + WLAN	Ordering code	
	Part number	
Keyboard		
Display		
Supply voltage		
Capacity		
Interface		
Working temperature		
Degree of protection per IEC 60529		
Read/write head option		
Accessories included		
Appropriate data carrier		
Please order additional accessories separately		

Standard handheld **BIS C-87_-1-008-X-000_** includes charger and stylus.

Antenna type:



rod



round



Recommended accessories

(please order separately)



Description	Pistol grip option	Optional docking station with power supply
Ordering code	FHW0004	FHW0003
Part number	11023836	11023834

BIS C Industrial RFID System

Standard handheld



BIS C Industrial
RFID System

Range of
applications

Read/write
distances
overview

Data carriers
read/write

Read/write
heads

Data
couplers

8-bit
processor
for read-only
mode

Processors

**Standard
handheld**

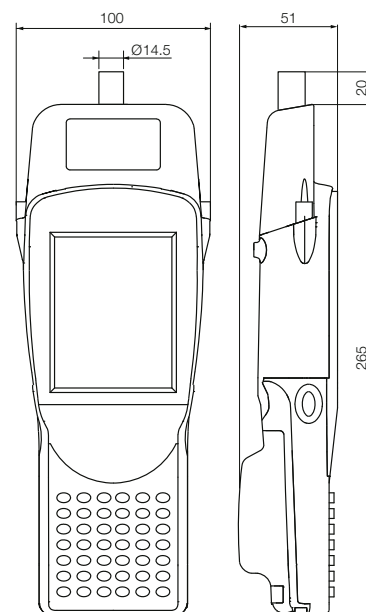
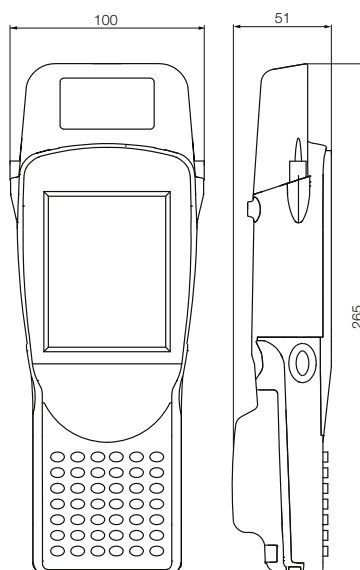
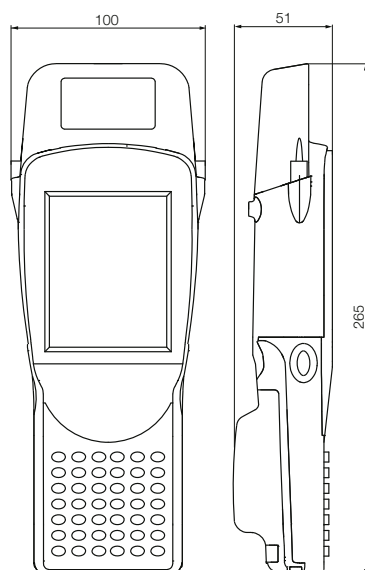
Read/write
heads
for handy
programmers

Handy
programmer

Read/write
gun

Access
protection

General purpose	Rod	Tool ID
Read/write ABS	Read/write ABS	Read/write ABS
BAE00C4	BAE00J6	BAE00CK
BIS C-870-1-008-X-000	BIS C-871-1-008-X-000	BIS C-873-1-008-X-000
BAE00CR		
BIS C-870-1-008-X-001	BIS C-871-1-008-X-001	BIS C-873-1-008-X-001
BIS C-870-1-008-X-002	BIS C-871-1-008-X-002	BIS C-873-1-008-X-002
BIS C-870-1-008-X-003	BIS C-871-1-008-X-003	BIS C-873-1-008-X-003
BAE00JG		BAE00E8
BIS C-870-1-008-X-004	BIS C-871-1-008-X-004	BIS C-873-1-008-X-004
BIS C-870-1-008-X-005	BIS C-871-1-008-X-005	BIS C-873-1-008-X-005
52 buttons, alphanumeric TFT Touchscreen display 3.7 V rechargeable battery pack 4000 mA/h RS232/Balluff Dialog -10...+50 °C IP 65 Integrated Charging power supply and stylus for BIS C-Data carrier with round coil Ø ≥ 35 mm Docking station and pistol grip	52 buttons, alphanumeric TFT Touchscreen display 3.7 V rechargeable battery pack 4000 mA/h RS232/Balluff Dialog -10...+50 °C IP 65 Integrated Charging power supply and stylus for BIS C-Data carrier with rod antenna Docking station and pistol grip	52 buttons, alphanumeric TFT Touchscreen display 3.7 V rechargeable battery pack 4000 mA/h RS232/Balluff Dialog -10...+50 °C IP 65 Integrated Charging power supply and stylus for BIS C-Data carrier with round coil Ø ≤ 34 mm Docking station and pistol grip



BIS C Industrial RFID System

Read/write heads for handy programmers

and read/write gun



Dimensions	
Description	
Housing material	
Ordering code	
Part number	
Operating temperature	
Storage temperature	
Degree of protection per IEC 60529	
Read head connection	
Connection to	

Appropriate data carrier

BIS C Industrial RFID System

Read/write heads for handy programmers and read/write gun



Ø 14.5×63 mm	Ø 30×66 mm	72×27×27 mm	
Read/write head	Read/write head	Read/write head	Adapter cable
Brass, coated	POM	PVC	
BAE0095	BAE0096	BAE0097	BAE0094
BIS C-851	BIS C-852	BIS C-853	BIS C-850
0...+70 °C	0...+70 °C	0...+70 °C	0...+70 °C
-20...+85 °C	-20...+85 °C	-20...+85 °C	-20...+85 °C
IP 67	IP 67	IP 67	IP 67
6.3 mm jack socket	6.3 mm jack socket	6.3 mm jack socket	6.3 mm jack socket
BIS C-810	BIS C-810	BIS C-810	BIS C-810
BIS C-820	BIS C-820	BIS C-820	BIS C-820
BIS C-720	BIS C-720	BIS C-720	BIS C-720
BIS C-100_ _	BIS C-100_ _	BIS C-150- _/A	Adapter cable for handy programmer or portable device and all read/write heads with M12 connector.
BIS C-103_ _	BIS C-104_ _		
BIS C-105_ _	BIS C-108_ _		
BIS C-121_ _	BIS C-117_ _		
BIS C-122_ _	BIS C-128_ _		
	BIS C-130_ _		
	BIS C-190_ _		
	BIS C-191_ _		



BIS C Industrial RFID System

Range of applications

Read/write distances overview

Data carriers read/write

Read/write heads

Data couplers

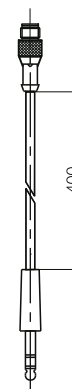
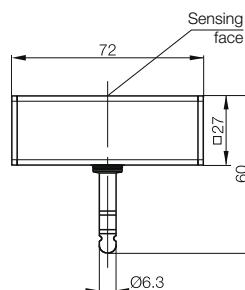
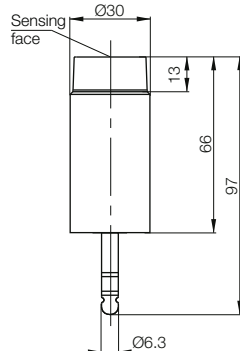
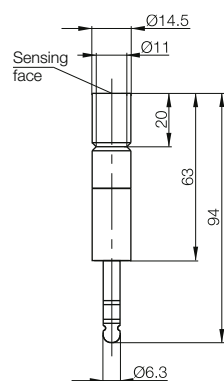
8-bit processor for read-only mode

Processors Standard handheld

Read/write heads for handy programmers

Handy programmer Read/write gun

Access protection



BIS C Industrial RFID System

Handy programmer

For maximum flexibility

The handy programmer with read/write function helps you stay mobile and independent. Benefit from increased mobility during repair work, for example. The handy programmer is fitted with an interface for connection to a PC. Option of customizing menu buttons.



Function	
Housing material	
Ordering code	
Part number	
Keyboard	
Display	
Current	
Capacity	
Interface	
Operating temperature	
Degree of protection per IEC 60529	
Read head connection	
Accessories	



Recommended accessories

(please order separately)



Description	Charger	Charging cradle with charging power supply
Ordering code	BAE0047	BAE0048
Part number	BIS C-701-A	BIS C-702-A

BIS C Industrial RFID System

Handy programmer



Handy programmer
ABS

BAE0088

BIS C-810-0-003

32 buttons, alphanumeric

LCD-display, 20 characters in 4 line

2.4 V rechargeable battery pack NiMH

1500 mA/h

RS232, Balluff Dialog

0...+50 °C

IP 40

1× 6.3 mm jack socket

Carrying case included

Handy programmer
ABS

BAE008C

BIS C-820-0-004-D

1 key

2 LED status/battery

2× R6 AA rechargeable NiMH

800 mA/h

RS232, Balluff Dialog

0...+50 °C

IP 40

1× 6.3 mm jack socket



BIS C Industrial
RFID System

Range of
applications

Read/write
distances
overview

Data carriers
read/write

Read/write
heads

Data
couplers

8-bit
processor
for read-only
mode

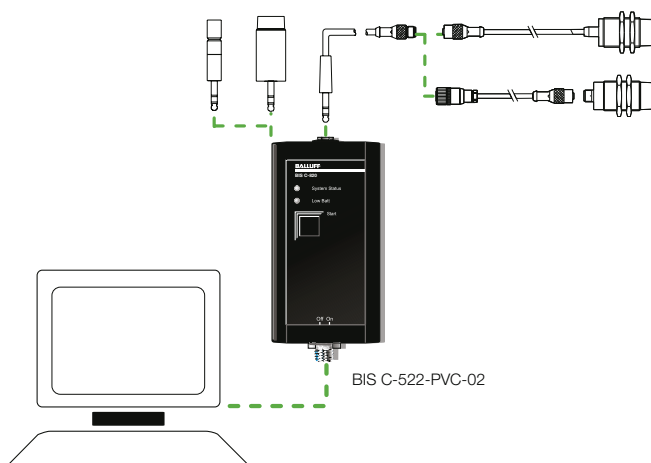
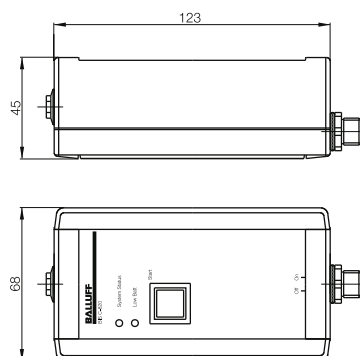
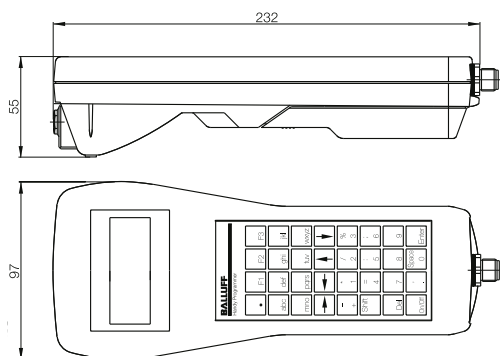
Processors
Standard
handheld

Read/write
heads
for handy
programmers

**Handy
programmer**

Read/write
gun

Access
protection



RS232 adapter cable

BIS C-522-PVC-02

BIS C-524-PVC-01,5

on page 285.

Please order separately!

BIS C Industrial RFID System

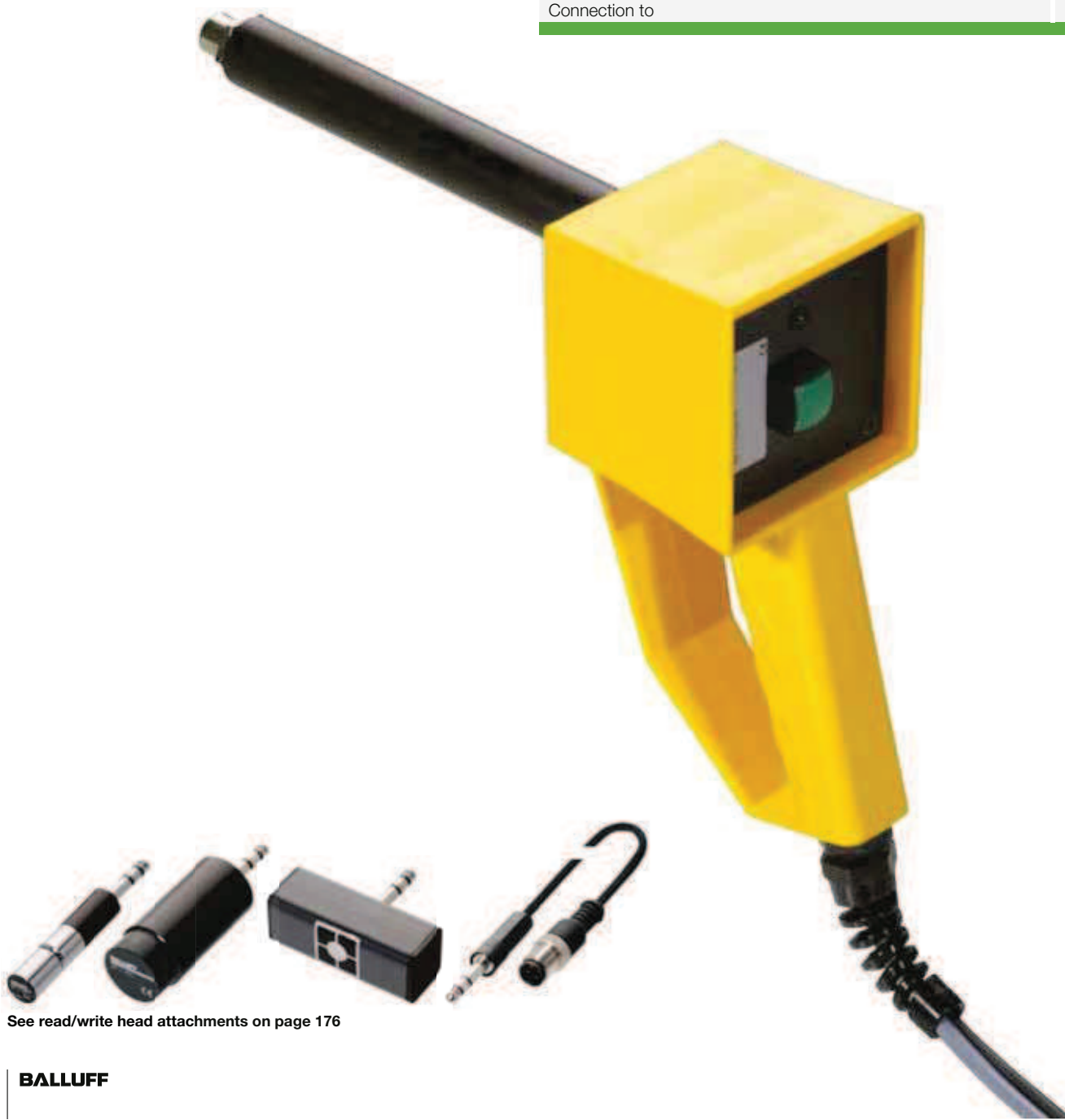
Read/write gun

Outstanding operating comfort

Benefit from the advantages of the ergonomic pistol grip with the option of attaching three different read/write heads. The pistol grip rests snugly in your hand while you activate a read/write function at the press of a button. LEDs and an integral buzzer signal the end of the read/write process.



Description	
Housing material	
Ordering code	
Part number	
Keyboard	
Display	
Operating temperature	
Storage temperature	
Degree of protection per IEC 60529	
Read head connection	
Coiled cable extended	
Connection to	



See read/write head attachments on page 176

BIS C Industrial RFID System

Read/write gun



BIS C Industrial
RFID System

Range of
applications

Read/write
distances
overview

Data carriers
read/write

Read/write
heads

Data
couplers

8-bit
processor
for read-only
mode

Processors

Standard
handheld

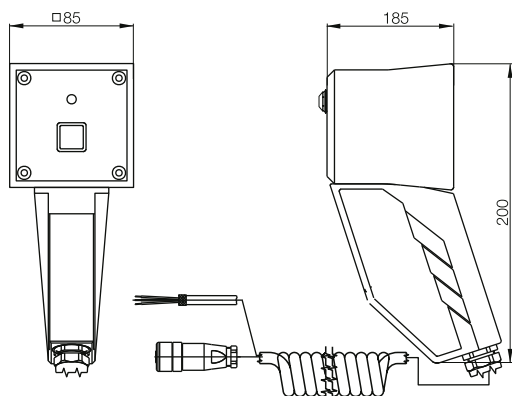
Read/write
heads
for handy
programmers

Handy
programmer

**Read/write
gun**

Access
protection

Read/write gun
PA 66
BAE004C
BIS C-720-01-03
1 key
1 LED
0...+70 °C
-20...+85 °C
IP 40
6.3 mm jack socket
3 m
Processor and PLC



BIS C Industrial RFID System

Access protection

Access protection

And here's how it works: Individual access codes are allocated via programmable data keys, which can then be disabled to prevent further programming.

Unauthorized personnel cannot manipulate the data key as a result. The data key is read via an antenna fitted to a special bracket. The processor unit then issues the data.

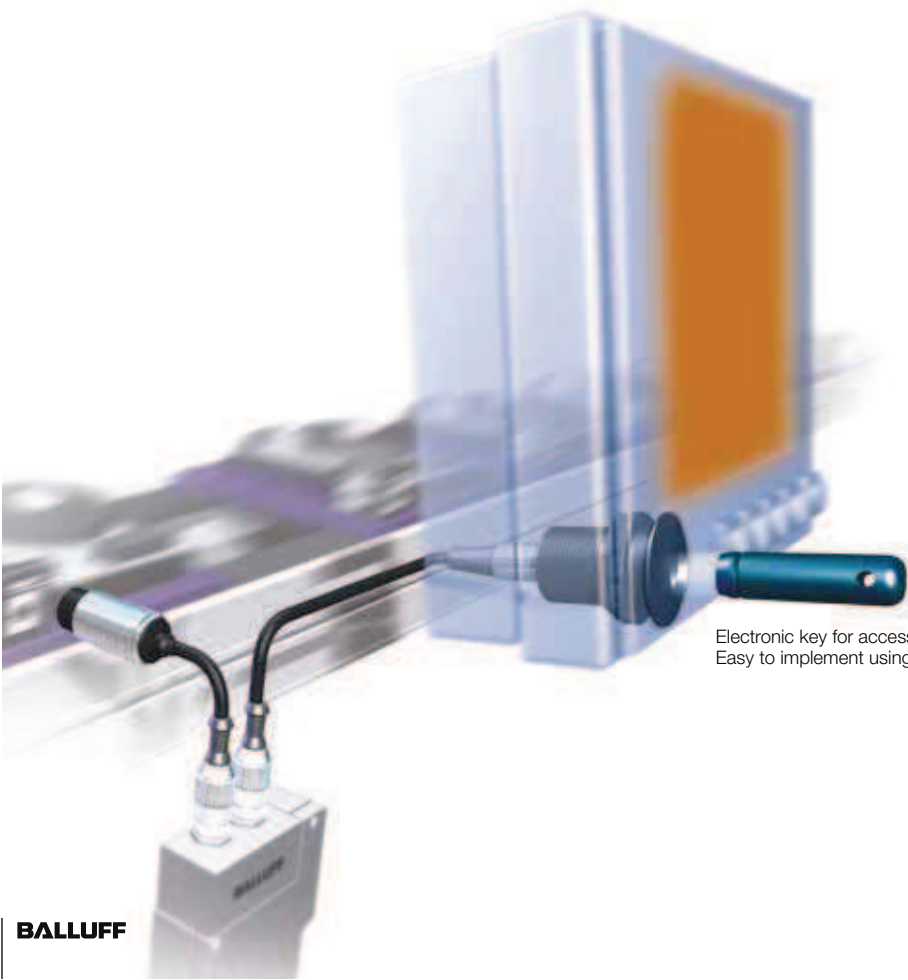
Different interfaces such as serial, Profibus, Interbus, Devicenet, Ethernet/IP or parallel interfaces enable simple connection to the monitored system. Available for systems BIS C, BIS L and BIS M.

The benefits to you

Simple upgrade and rapid replacement without modifying the system software. End users are independent of system providers. The access system is easy to integrate in read/write stations that already use an identification system. Simply connect the access monitoring antenna to the second channel on the existing processor unit. Hardware expenses are reduced to a minimum and software only requires slight modification in order to process both channels.



Version	
Use	
Housing material	
Ordering code	
Part number	
Operating temperature	
Storage temperature	
Degree of protection per IEC 60529	



Electronic key for access control.
Easy to implement using the "RFID key".

BIS C Industrial RFID System

Access protection



Access protection

Attachment for read/write head BIS C-300
POM and PA 6.6

BAM012C

BIS C-300-ZA1

0...+70 °C

-20...+85 °C

Data carrier and bracket

Used with BIS C-300-ZA1

POM and PA 12

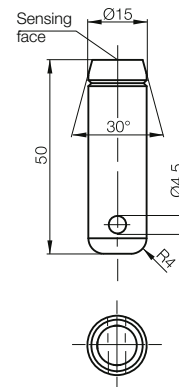
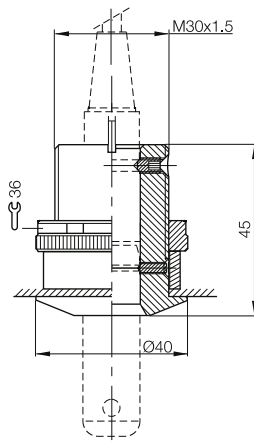
BIS002Y

BIS C-122-04/L-ZC1

-25...+70 °C

-25...+85 °C

IP 67



BIS C Industrial
RFID System

Range of
applications

Read/write
distances
overview

Data carriers
read/write

Read/write
heads

Data
couplers

8-bit
processor
for read-only
mode

Processors

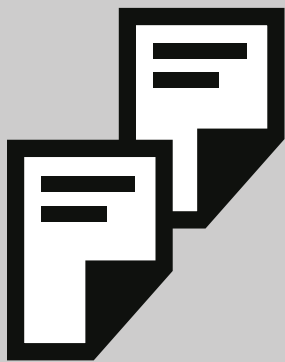
Standard
handheld

Read/write
heads
for handy
programmers

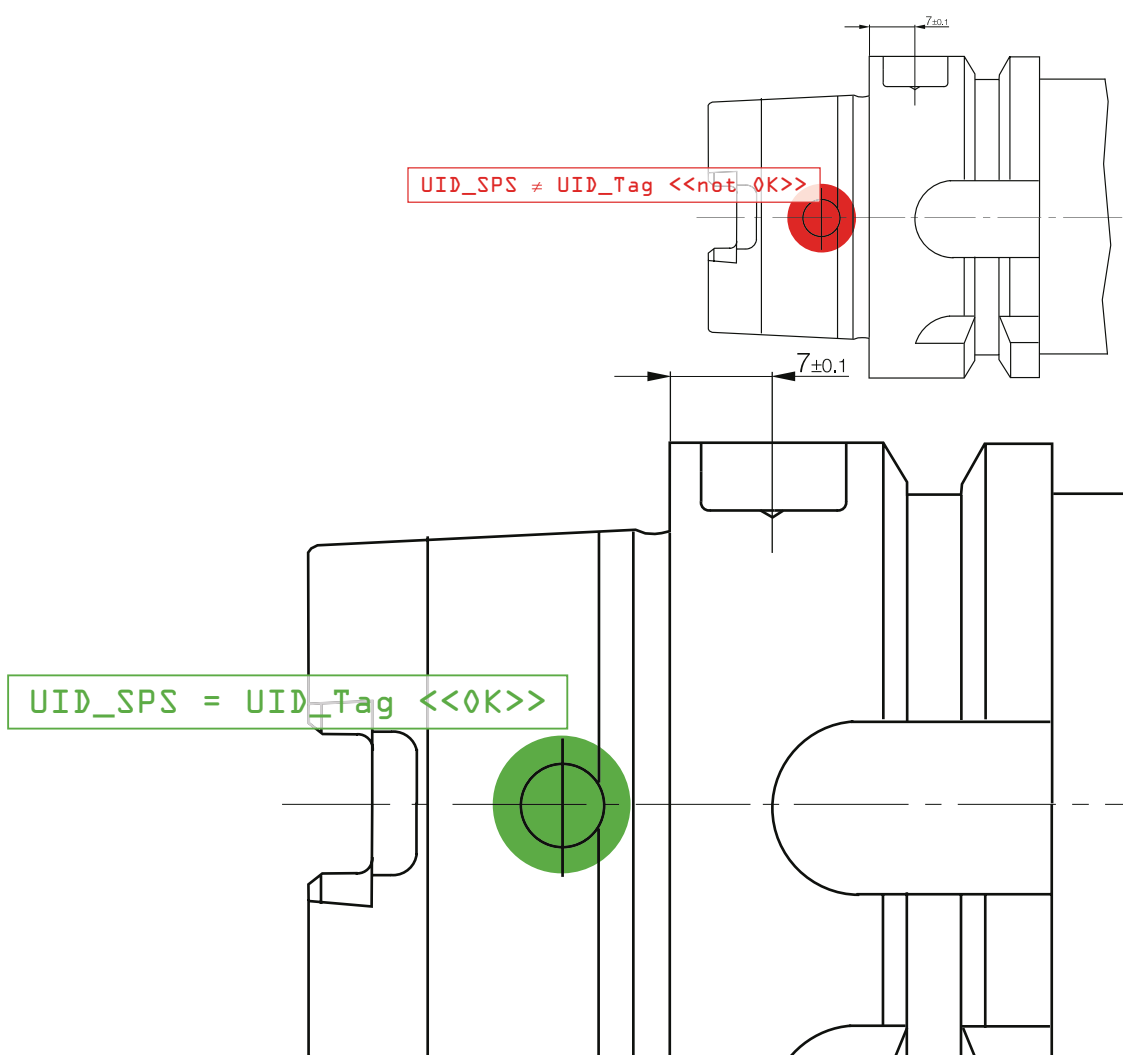
Handy
programmer

Read/write
gun

**Access
protection**



Basic Information and Definitions





Basic Information and Definitions

Contents

General information	354
Mechanical properties	356
Quality	357

Electro-magnetic identification

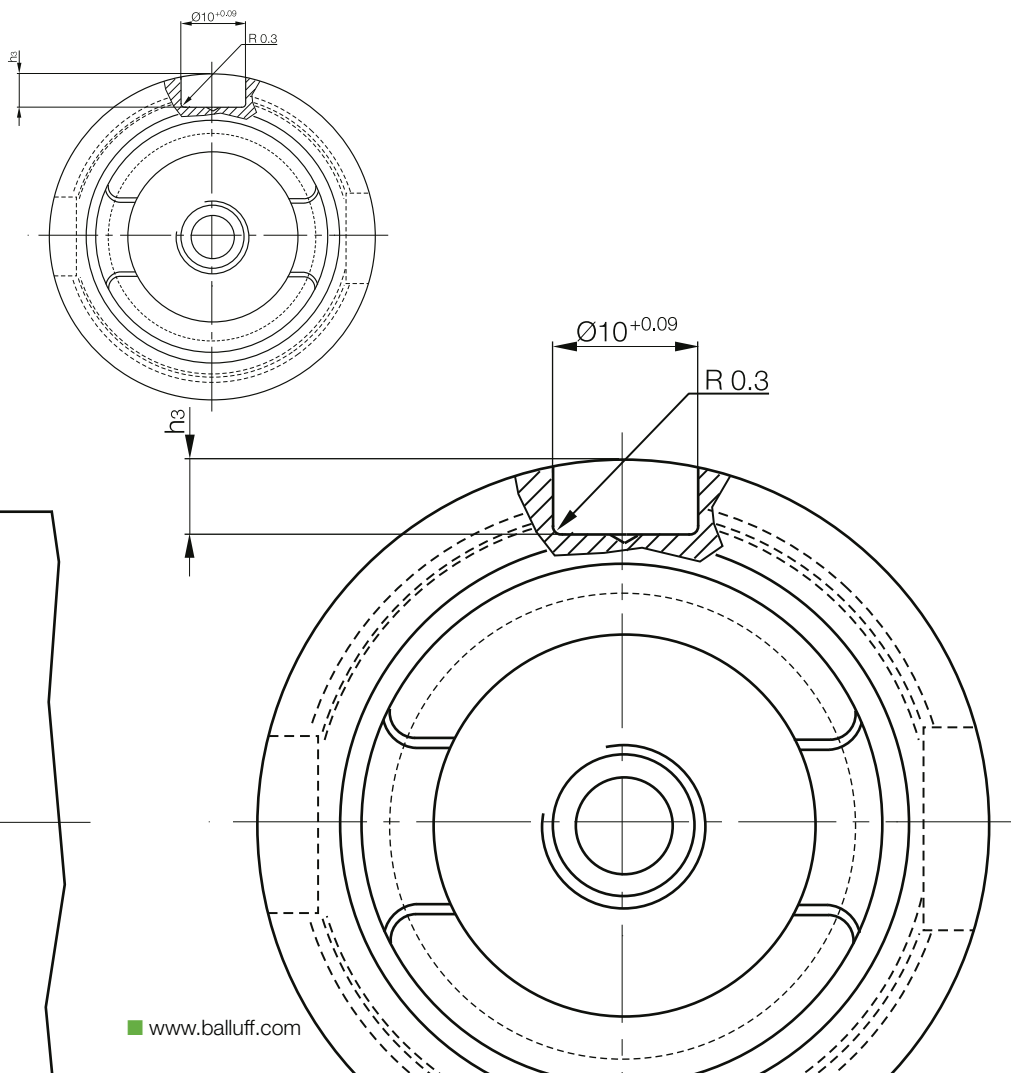
BIS U Industrial RFID System	358
------------------------------	-----

Inductive identification

BIS M Industrial RFID System	360
BIS C Industrial RFID System	364
BIS L Industrial RFID System	370
BIS S Industrial RFID System	374
Interaction between read/write heads and data carriers	376

Vision-based identification

BVS Vision Sensors	378
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Standards

Protection class	II □	EN 60947-5-2/IEC 60947-5-2
Degree of protection	IP 60...67	EN 60529/IEC 60529
	IP 68 per BWN Pr. 20	Balluff factory standard (BWN): Temperature storage 48 h at 60 °C, 8 temperature cycles according to EN 60068-2-14/IEC 60068-2-14 between the benchmark temperatures according to the data sheet, 1 h storage in water, insulation inspection, 24 h storage in water, insulation test, 8 temperature cycles according to EN 60068-2-14 IEC 60068-2-14 between the benchmark temperatures according to the data sheet, 7 days storage in water, insulation test.
	IP 68 per BWN Pr. 27	Balluff Factory Standard (BWN): Testing products for use in the foods industry.
EMC (Electromagnetic Compatibility)	IP 69K	DIN 40050 part 9: Protection against entry of water under high pressure- or steam jet cleaning.
	Emissions, RF noise voltage and RF noise radiation from electrical equipment	EN 55011
	Interference immunity against discharging static electricity (ESD)	EN 61000-4-2/IEC 61000-4-2
	Radio frequency immunity against high-frequency electromagnetic fields (RFI)	EN 61000-4-3/IEC 61000-4-3
	Immunity to fast transients (bursts)	EN 61000-4-4/IEC 61000-4-4
	Interference immunity against conducted interference, induced by high-frequency fields	EN 61000-4-6/IEC 61000-4-6
	Immunity to voltage dips and voltage interruptions	EN 61000-4-11/IEC 61000-4-11
Environmental simulation	Surge-voltage stability	EN 60947-5-2/IEC 60947-5-2
	Vibration, sinusoidal	EN 60068-2-6/IEC 60068-2-6
	Shock	EN 60068-2-27/IEC 60068-2-27
	Continuous shock	EN 60068-2-29/IEC 60068-2-29



Basic Information and Definitions

General information

Mounting torques

The following torques are to be followed so that the sensors are not mechanically destroyed during installation, as long as no other information is indicated on the data sheet or the sensor packaging.

Size	Material	Tightening torque
M12×1	Stainless steel	40 Nm
M18×1	PBT	1 Nm
M18×1	Stainless steel	60 Nm
M30×1.5	PBT	3 Nm
M30×1.5	Stainless steel	90 Nm

Degree of protection

The degrees of protection are given according to IEC 60529. Code letters IP (International Protection) designate protection for electrical equipment against shock hazard, ingress of solid foreign bodies and water.

First digit:

- 2 Protection against penetration of solid bodies larger than 12 mm, shielding from fingers and objects
- 4 Protection against penetration of solid bodies larger than 1 mm, shielding from tools and wires
- 5 Protection against damaging dust deposits, complete contact protection
- 6 Protection against penetration of dust, complete contact protection

Second digit:

- 0 No special protection
- 4 Protection against water, which is sprayed from all directions against the equipment
- 5 Protection against a stream of water from a nozzle which hits the equipment from all directions
- 7 Protection against water, if the equipment (housing) is temporarily submerged
- 8 Protection against water when submerged for some time



Basic
Information
and Definitions

General information

Mechanical
properties

Quality

BIS U

BIS M

BIS C

BIS L

BIS S

Interaction
between
read/write
heads and
data carriers

BVS

Basic Information and Definitions

Mechanical properties

Materials

Material	Use and characteristics
Plastics	
ABS Acrylonitrile-Butadiene-Styrene	Impact-resistant, stiff, limited chemical resistance. Some types flame-retardant. Used for housings.
ASA Acrylonitrile styrene acrylate	Impact-resistant material, scratch-resistant surface and good weather resistance
EP Epoxy resin	Duromer, molded plastic material, highest mechanical strength and temperature resistance. Very good dimensional stability. Cannot be melted.
Epoxy resin - hollow glass spheres	Hollow glass spheres can be treated with epoxy resins. They are used for manufacturing converters with low thickness and high pressure rating.
PA Polyamide	High impact resistance, good chemical resistance.
PA 6, PA 66, PA mod., PA 12 Polyamide	Good mechanical strength. Temperature resistance. PA 12 approved for food industry applications.
PBT Polybutylene terephthalate	High mechanical strength and temperature resistance. Some types flame-retardant. Good chemical resistance. Good oil resistance.
PC Polycarbonate	Clear, hard, elastic and impact resistant. Good temperature resistance. Limited chemical resistance.
PET Polyethylene terephthalate	High resistance to breakage, good dimensional stability. Frequently used in the food industry.
POM Polyoxymethylene	High impact resistance, good mechanical strength. Good chemical resistance.
Plastics	
PPS Polyphenylene sulfide	High strength, even at high temperatures. High chemical resistance.
PVC Polyvinyl chloride	Good mechanical strength and chemical resistance (cable).
PVDF Polyvinylidene fluoride	Thermoplastic. High mechanical strength and temperature resistance. Good chemical resistance (similar to PTFE).
Metal	
Wrought aluminum alloy	Standard-aluminum for machined cutting. Can be anodized. Used for housings and mounting components.
CuZn Brass	Standard-housing material with surface protection.
Stainless steel	Excellent corrosion resistance and strength. Quality 1.4034, 1.4104: Standard-material; quality 1.4305, 1.4301: Standard-material for the food industry; quality 1.4401, 1.4404, 1.4571: With increased requirements on chemical resistance at elevated temperatures for the food industry.
GD-Al die-cast aluminum	Low specific gravity. Good strength and resistance. Some types can be anodized.
GD-Zn die-cast zinc	Good resistance and strength. Usually with protective surface coating.
Other	
Glass	Good chemical resistance and strength. Used primarily in optical applications (lenses, cover lenses).

Quality and the environment

Quality management system per DIN EN ISO 9001:2008

Balluff companies

Balluff GmbH	Germany
Balluff SIE Sensorik GmbH	Germany
Balluff Controles Eléctricos Ltda.	Brazil
Balluff Sensors (Chengdu) Co., Ltd.	China
Balluff Ltd.	Great Britain
Balluff Automation S.R.L.	Italy
Balluff Canada Inc.	Canada
Balluff de México S.A. de C.V.	Mexico
Balluff GmbH	Austria
Balluff Sp. z o.o.	Poland
Balluff Hy-Tech AG	Switzerland
Balluff Sensortechnik AG	Switzerland
Balluff S.L.	Spain
Balluff CZ, s.r.o	Czech Republic
Balluff Elektronika Kft.	Hungary
Balluff Inc.	USA



Environmental management system per DIN EN ISO 14001:2009

Balluff companies

Balluff GmbH	Germany
Balluff Sensors (Chengdu) Co., Ltd.	China
Balluff Elektronika KFT	Hungary

Testing laboratory

The Balluff testing laboratory operates in accordance with ISO/IEC 17025 and is accredited by DAKKS for testing electromagnetic compatibility (EMC).



Balluff products comply with EU directives

Products that require labeling are subject to a conformity evaluation process according to the EU directive and the product is labeled with the CE marking.

Balluff products fall under the following EU directive:



2004/108/EC	EMC directive
2006/95/EC	Low Voltage Directive valid for products with supply voltage $\geq 75 \text{ V DC} / \geq 50 \text{ V AC}$

Product approvals

Product approvals are awarded by domestic and international institutions. Their symbols affirm that our products meet the specifications of these institutions.

"US Safety System" and "Canadian Standards Association" under the auspices of Underwriters Laboratories Inc. (cUL).



Basic
Information
and Definitions

General
information

**Mechanical
properties**
Quality

BIS U

BIS M

BIS C

BIS L

BIS S

Interaction
between
read/write
heads and
data carriers

BVS

Basic Information and Definitions

BIS U configuration software

Parameters are configured using the "BIS UHF Manager" software. One requirement is that the processor is connected to the controlling system. The parameter settings can be overwritten at any time. The parameters can be saved in an XML file so that they can be retrieved whenever needed.

Application software

Balluff partners with only best in class software providers and elite integrators to deliver the complete RFID solution. From a full system rollout to meshing into the current process, our software partners understand the needs of the manufacturing industry. Logistics, Work in process (WIP) production control, E-Kanban etc., are just a few of the applications in which our partners specialize.



Setting the transmission power and dependency on the antenna being used



The BIS U-6027 processor and the controlling system communicate via Ethernet. Assigning a unique IP address associates the processor with a network.



We assist you in finding a solution to your RFID task with short decision paths and personal contacts – from design to implementation. The objectives and probability of success of your RFID identification task are objectively analyzed and the system design refined. The RFID system components are then selected.

The solution design phase is concluded with a temporary test setup on-site on the system. You thereby receive valuable information for RFID use in your environment and are then able to perform a realistic ROI assessment.

Step 1: Preanalysis

Description of the installation conditions and physical characteristics:

- Mechanical installation
- Power limits
- Ambient parameters
- Detection type
- Transponder types
- Stationary/mobile read/write devices

Step 2: Feasibility

- Project description and definition of objectives
- Type and characteristics of the solution
- Where are the weak points
- Selection of system components

Step 3: Solution suggestion

- Preparation of samples and test settings
- Testing of RFID technology in the actual environment
- Performance comparison of various applications

Step 4: Project coaching

- Control of system integrators
- Support in all launch phases
- Project documentation and knowledge integration
- User training

We are happy to help!

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E-mail: TecSupport@balluff.de

Mounting definitions

Flush in steel

Active sensing surface can be flush mounted to surface of steel. Consult part data sheet for additional information.

Non-flush on steel

Active sensing surface must be clear and not be surrounded by steel. Consult part data sheet and clear zone definitions for more information.

Non-metal

Total clearance zone from any kind of metal must be maintained. Consult part data sheet and clear zone definitions for more information.

Consult technical support for other metal mounting options.



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Mounting definitions

Flush in steel

Active sensing surface can be flush mounted to surface of steel.
Consult part data sheet for additional information.

Non-flush on steel

Active sensing surface must be clear and not be surrounded by steel.
Consult part data sheet and clear zone definitions for more information.

Non-metal

Total clearance zone from any kind of metal must be maintained.
Consult part data sheet and clear zone definitions for more information.

Consult technical support for other metal mounting options.

Minimum distance between two data carriers

	BIS M-122-01/L, BIS M-122-02/L	BIS M-110-02/L	BIS M-101-01/A, BIS M-111-02/A	BIS M-102-01/L, BIS M-112-02/L	BIS M-105-01/A, BIS M-105-02/A	BIS M-108-02/A	BIS M-120-01/L	BIS M-151-02/A, BIS M-150-02/A
BIS M-300		> 100	> 100	> 150	> 100	> 100		
BIS M-301		> 200	> 200	> 200	> 100	> 200	> 250	
BIS M-302, BIS VM-307	> 100	> 100	> 100	> 100	> 100	> 100		
BIS M-304	> 100	> 100	> 100	> 100	> 100	> 100		
BIS M-400-007-001-00-S115		> 100	> 100	> 150	> 100	> 100		
BIS M-401-007-001-00-S115		> 200	> 200	> 200	> 100	> 200	> 250	
BIS M-400-007-002-00-S115	> 100	> 100	> 100	> 100	> 100	> 100		
BIS M-351, BIS VM-351								> 250
BIS M-451-007-001-00-S115								> 250

Dimensions in mm

Minimum distance between two read/write heads

BIS M-300	200
BIS M-301	600
BIS M-351/BIS VM-351	600
BIS M-302/BIS VM-307	100
BIS M-304	100
BIS M-400-007-001-00-S115	200
BIS M-401-007-001-00-S115	600
BIS M-451-007-001-00-S115	600
BIS M-400-007-002-00-S115	100
BIS M-410-007-002-00-S115	200
BIS M-411-007-002-00-S115	300

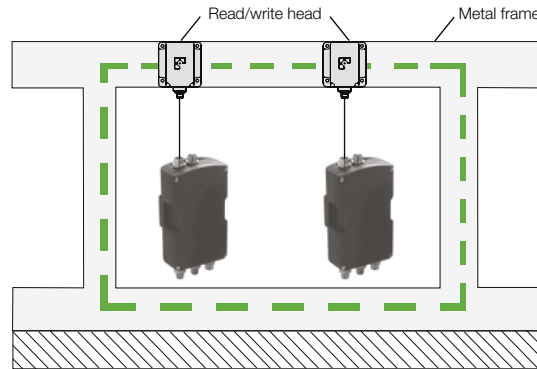
Dimensions in mm

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BIS M installation notes

Mounting the read/write heads on metal frames

If the read/write heads are mounted so that they are joined through an enclosed metal frame, mutual interference may result (conductor loop). This may reduce the read/write distances. The smaller the read/write head, the less the interference. This may result in a reduction of the maximum distance by 80 %. In such a case you should test the actual effective read distance.

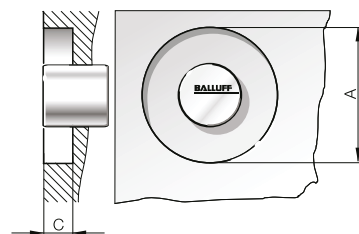


Clear zone dimensions for read/write heads

For compliance to the read/write distances as rated for a given data carrier to read/write head, the following Clear Zone Dimension must be used for a non-metal data carrier mounting:

Data carriers with clear zone dimensions	BIS M-111-02/L, BIS M-101-01/L		BIS M-112-02/L, BIS M-102-01/L		BIS M-105-02/A, BIS M-105-01/A		BIS M-120-01/L		BIS M-150-02/A, BIS M-151-02/A	
	A	C	A	C	A	C	A	C	A	C
Read/write head										
BIS M-300-001	100	30	150	30	100	20				
BIS M-301-001	200	70	200	70			250	70		
BIS M-302-001	60	30	60	30	60	30				
BIS M-351-001									250	70
BIS M-304-001	60	30	60	30	60	30				
BIS M-400-007-001	100	30	150	30	100	20				
BIS M-400-007-002	60	30	60	30	60	30				
BIS M-401-007-001	200	70	200	70			250	70		
BIS M-451-007-001									250	70

Dimensions in mm



Mechanical strength

Data carriers and read/write heads BIS M-1_ __, BIS M-3_ __

Shock load	100 g/6 ms per EN 60068-2-27 and 100 g/2 ms per EN 60068-2-29
Vibration	20 g, 10...2000 Hz per EN 60068-2-6

Processors BIS M-6_ __ _

Shock load	15 g/11 ms per EN 60068-2-27 and 15 g/6 ms per EN 60068-2-29
Vibration	5 g, 10...150 Hz per EN 60068-2-6



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BIS M read/write times

Memory access

Our processors can read or write each individual byte in the data carrier. But since the data carrier is divided into 16-byte blocks, the actual reading and writing is done by blocks. Our processor electronics converts this time accordingly. To calculate the read/write times the block read or write time must however be used.

Data carrier recognition

20 ms are required to recognize a data carrier.

Read times BIS M-1_ _

EEPROM – Data carrier with 16 byte blocks		FRAM – Data carrier with 16 byte blocks	
Byte	read time	Byte	read time
from 0 to 15	20 ms	from 0 to 15	30 ms
for each additional 16 bytes started add an additional	10 ms	for each additional 16 bytes started add an additional	15 ms

Write times BIS M-1_ _

EEPROM – Data carrier with 16 byte blocks		FRAM – Data carrier with 16 byte blocks	
Byte	write time	Byte	write time
from 0 to 15	40 ms	from 0 to 15	60 ms
for each additional 16 bytes started add an additional	30 ms	for each additional 16 bytes started add an additional	40 ms

Example:

Read and write 183 bytes starting at address 42
 Address 42 is in Block 3 (42/16)
 Address 224 is in Block 14 (224/16)

Therefore a total of 12 blocks will be processed, where the first block always has a slightly longer read or write time.

Read time = 20 ms + 11 × 10 ms = 130 ms
 Write time = 40 ms + 11 × 30 ms = 370 ms

Attention! Fluctuations in the ms range are possible.
 Electrical noise effects may increase the read/write time.



Basic Information and Definitions

BIS M read/write times

Read/write cycles

Data carriers	Memory type	Write cycles	Read cycles	Data retention time
112 bytes	EEPROM	100000	unlimited	10 years
160 bytes	EEPROM	100000	unlimited	10 years
736 bytes	EEPROM	100000	unlimited	10 years
752 bytes	EEPROM	100000	unlimited	10 years
992 bytes	EEPROM	100000	unlimited	10 years
2000 bytes	FRAM	unlimited	unlimited	10 years
8192 bytes	FRAM	unlimited	unlimited	10 years

Maximum speed

To calculate the permissible speed at which the data carrier and head may move relative to one another, the static distance values are used (see section BIS M).

The permissible speed is:

$$V_{\text{max. perm.}} = \frac{\text{Path}}{\text{Time}} = \frac{2 \times |\text{offset value}|}{\text{Processing time}}$$

The offset value is dependent on the read/write distance actually used in the system.

$$\text{Processing time} = \text{Data-carrier detection time} + \text{Read/write time of first block to be read} + n^1 \times \text{Read/write time for other started blocks}$$

n^1 = Number of started blocks



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Mounting definitions

Flush in steel

Active sensing surface can be flush mounted to surface of steel.
Consult part data sheet for additional information.

Non-flush on steel

Active sensing surface must be clear and not be surrounded by steel.
Consult part data sheet and clear zone definitions for more information.

Non-metal

Total clearance zone from any kind of metal must be maintained.
Consult part data sheet and clear zone definitions for more information.

Consult technical support for other metal mounting options.

Installation in steel

For compliance to the read/write distances as rated for a given data carrier to read/write head, the following Clear Zone Dimension must be used for a "non-flush" or "non-metal" data carrier mounting:

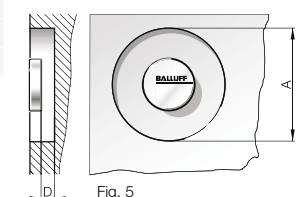
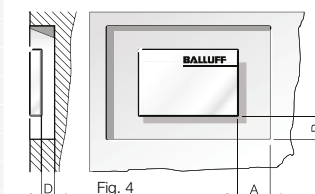
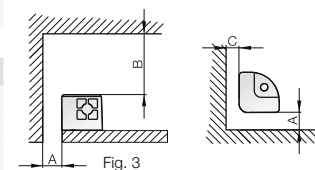
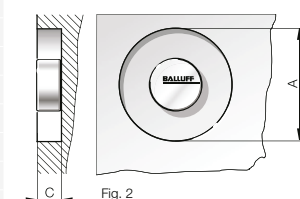
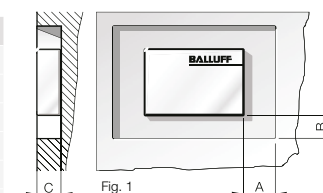
Clear zone dimensions

Data carriers	Fig.	A	D	C	B
BIS C-100-05/A		0	0	0	0
BIS C-103-_/A		0	0	0	0
BIS C-104-_/A		0	0	0	0
BIS C-105-_/A		0	0	0	0
BIS C-108-_/L		0	0	0	0
BIS C-117-05/A		0	0	0	0
BIS C-117-05/L	5	60			20
BIS C-121-04/L		0	0	0	0
BIS C-122-_/L		0	0	0	0
BIS C-127-05/L	4	30	30		30
BIS C-128-_/L	5	60			20
BIS C-130-05/L	5	70			2
BIS C-133-_/L		0	0	0	0
BIS C-134-_/L	2	70		11	
BIS C-150-_/A	1	20	20	22	
BIS C-190-_/L	3	20	17	20	
BIS C-191-_/L	3	9	27	9	

Read/write heads	Fig.	A	B	C
BIS C-300		0	0	0
BIS C-302		0	0	0
BIS C-305		0	0	0
BIS C-306		0	0	0
BIS C-310	2	60		13
BIS C-315		0	0	0
BIS C-318	1	50	50	30
BIS C-319	2	50		35
BIS C-323	2	60		13
BIS C-324	1	0	0	0
BIS C-325	2	0	0	0
BIS C-326	2	80		35
BIS C-327	1	50	50	20
BIS C-328	1	50	50	20
BIS C-350	1	60	50	60
BIS C-351	1	100	60	50

Dimensions in mm

Note! Depending on the combination of read/write head and data carrier, clear zone dimension A and B should always be selected for the larger of the components.



Installation in aluminum

With clear zone, static operation

When installing components in aluminum, provide clear zones for trouble-free operation. In static mode a clear zone depth in aluminum of at least 10 mm must be maintained, Fig. 1. Clear zone dimension **A** corresponds to the diameter of the larger communication partner (data carrier or read/write head) plus the maximum possible offset (see specification for read/write head), Fig. 2. When combined with read/write heads BIS C-318, 327, 328, 350, 351 and 355 dimension **B** and **C** are calculated from the length and width of the larger communication partner (data carrier or read/write head) plus the maximum permissible offset (see specification for read/write head), Fig. 3.

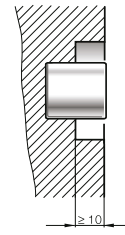


Fig. 1

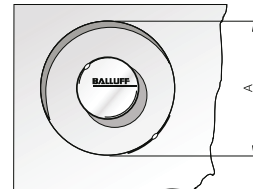


Fig. 2

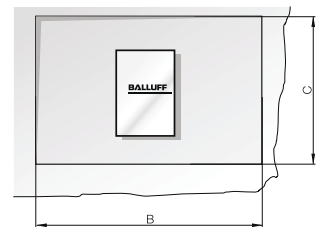


Fig. 3

With clear zone, dynamic operation

In dynamic mode a clear zone depth in aluminum of at least 10 mm must be maintained, Fig. 1. Clear zone dimension **A** corresponds to 2× the diameter of the larger communication partner + 1× the diameter of the smaller communication partner. Clear zone dimension **C** corresponds to the diameter of the larger communication partner plus the corresponding maximum offset (see specification for read/write head), Fig. 4. When combined with read/write heads BIS C-318, 327, 328, 350, 351 and 355 dimension **B** is calculated from 2× the read/write path (see specification for read/write heads) + the width of the data carrier. Clear zone dimension **C** corresponds to the read/write head length plus the corresponding maximum offset (see specification for read/write head), Fig. 5.

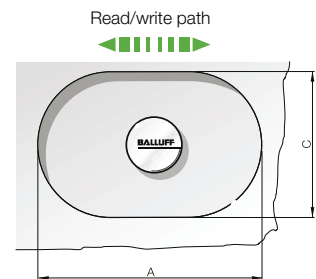


Fig. 4

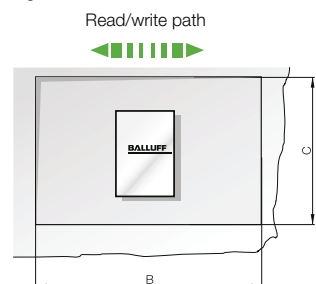


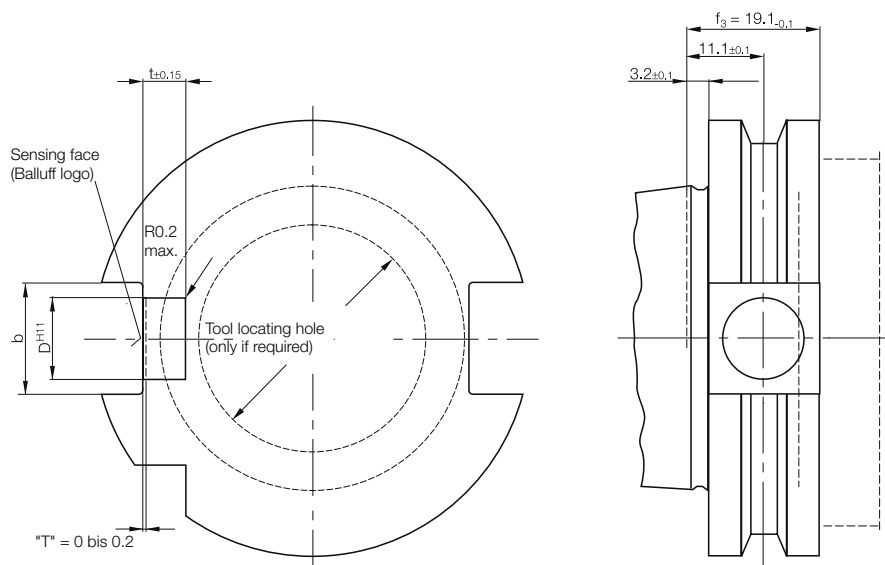
Fig. 5

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Installation in SK taper

Data carrier	BIS C-122			BIS C-103			BIS C-105		
Taper DIN 69871-A	D ^{H11}	t ±0.15	RPM _{max}	D ^{H11}	t ±0.15	RPM _{max}	D ^{H11}	t ±0.15	RPM _{max}
Nr. 30	10	4.65	90000	12	8.15	68000	12	6.15	68000
Nr. 40	10	4.65	75000	12	8.15	54000	12	6.15	54000
Nr. 45	10	4.65	66000	12	8.15	43000	12	6.15	43000
Nr. 50	10	4.65	59000	12	8.15	33000	12	6.15	33000

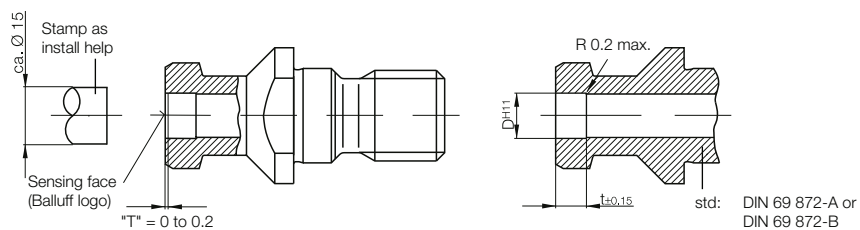
Dimensions in mm



Installation in retention knob

Data carrier	BIS C-122		BIS C-103		BIS C-105	
Taper DIN 69871-A	D ^{H11}	t ±0.15	D ^{H11}	t ±0.15	D ^{H11}	t ±0.15
Nr. 30						
Nr. 40	10	4.65				
Nr. 45	10	4.65	12	8.15	12	6.15
Nr. 50	10	4.65	12	8.15	12	6.15

Dimensions in mm



Installation

1. Degrease gluing surfaces
2. Apply a bead of glue (recommended glue e.g. LOCTITE Hysol 1C or UHU-Plus endfest 300) approximately 3 mm wide around the perimeter of the data carrier housing. Note manufacturer's instructions!
3. Press in data carrier housing by hand. Note dimension "T"!
4. Remove excess glue
5. Allow to harden

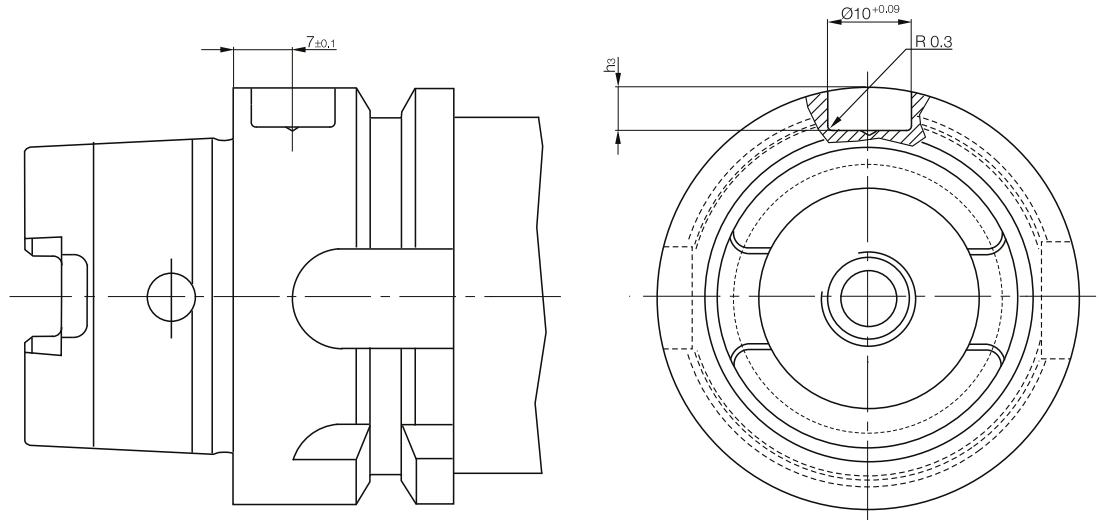
Basic Information and Definitions

BIS C installation notes

Installation in HSK taper

Data carrier	BIS C-122	
HSK Form A ISO/DIN 12164-1	$h_3 +0.20$	RPM _{max}
32	5.4	96000
49	5.2	80000
50	5.1	75000
63	5	65000
80	4.9	57000
100	4.9	48000

Dimensions in mm



Mechanical strength

Data carriers and read/write heads BIS C-1_ __, BIS C-3_ __

Shock load	100 g/6 ms per EN 60068-2-27 and 100 g/2 ms per EN 60068-2-29
Vibration	20 g, 10...2000 Hz per EN 60068-2-6 Values apply to data carriers BIS C-1_ __ and read/write heads BIS C-3_ __ except for the non-potted read/write heads BIS C-350, BIS C-351, BIS C-352 and BIS C-355.

Processors and non-potted read/write heads

BIS C-6_ __, BIS C-350, BIS C-351, BIS C-352, BIS C-355

Shock load	15 g/11 ms per EN 60068-2-27 and 15 g/6 ms per EN 60068-2-29
Vibration	5 g, 10...150 Hz per EN 60068-2-6



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BIS C read/write times

Read/write cycles

Data carriers	Memory type	Code	Write cycles up to 30 °C	Write cycles up to 70 °C	Read cycles	Memory Organization
511 bytes	EEPROM	-04	1000000	500000	unlimited	32 byte blocks
1023 bytes	EEPROM	-05	1000000	500000	unlimited	32 byte blocks
2047 bytes	EEPROM	-11	1000000	500000	unlimited	64 byte blocks
8 Kbytes	FRAM	-32	unlimited	unlimited	unlimited	64 byte blocks

Read times in static mode

For double read and compare:

Data carrier with 32-bytes blocks		Data carrier with 64-bytes blocks	
Bytes	Read time	Bytes	Read time
from 0 up to 31	110 ms	from 0 up to 63	220 ms
for each additional 32 bytes started add an additional	120 ms	for each additional 64 bytes started add an additional	230 ms
from 0 up to 255	= 950 ms	from 0 up to 2047	= 7350 ms

Write times in static mode

Includes checking and comparing:

Data carrier with 32-bytes blocks		Data carrier with 64-bytes blocks	
Bytes	Write time [ms]	Bytes	Write time [ms]
from 0 up to 31	$110 + n \times 10$	from 0 up to 63	$220 + n \times 10$
≥ 32	$y \times 120 + n \times 10$		$y \times 230 + n \times 10$
from 0 up to 255	= max. 3510	from 0 up to 2047	= max. 27830

n = number of contiguous bytes to be programmed
y = number of blocks to be processed

Example:

Write 17 bytes starting at address 187. Data carrier block size = 32 bytes. Blocks 5 and 6 are processed, since the start address 187 is in block 5 and end address 204 is in block 6.

$$t = 2 \times 120 + 17 \times 10 = \mathbf{410 \text{ ms}}$$

Read times in dynamic mode

Read times within the 1st block for double read and compare:

Data carrier with 32-bytes blocks		Data carrier with 64-bytes blocks	
Bytes	Read time	Bytes	Read time
from 0 up to 3	14 ms	from 0 up to 3	14 ms
for each additional bytes	3.5 ms	for each additional bytes	3.5 ms
from 0 up to 31	112 ms	from 0 up to 64	224 ms

The time indicated apply after the data carrier has been recognized. If the tag has not been recognized, an additional 30 ms must be added to allow for creating the energy field necessary to recognize the Data carrier.

Example:

Read 11 bytes starting at address 9, i.e. the highest address to be read is 20 (use for "m" in the formula).

$$t = 14 \text{ ms} + (m - 3) \times 3.5 \text{ ms} = \mathbf{73.5 \text{ ms}}$$

In the internal memory organization of the data carrier, a distinction is made between the two block sizes 32 and 64 bytes (also referred to as 'page size').



Basic Information and Definitions

BIS C read/write times

Memory organization

Memory size up to 1023 bytes = 32 bytes per block
Memory size 2047 bytes and larger = 64 bytes per block

Maximum speed

To calculate the permissible speed at which the data carrier and head may move relative to one another, the static distance values are used (see section BIS C).

The permissible speed is:

$$V_{\text{max. perm.}} = \frac{\text{Path}}{\text{Time}} = \frac{2 \times |\text{offset value}|}{\text{Processing time}}$$

The offset value is dependent on the read/write distance actually used in the system.

$$\text{Processing time} = \text{Data-carrier detection time} + \text{Read/write time of first block to be read} + n^1 \times \text{Read/write time for other started blocks}$$

n^1 = Number of started blocks



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BIS L installation notes

Mounting definitions

Flush in steel

Active sensing surface can be flush mounted to surface of steel.
Consult part data sheet for additional information.

Non-flush on steel

Active sensing surface must be clear and not be surrounded by steel.
Consult part data sheet and clear zone definitions for more information.

Non-metal

Total clearance zone from any kind of metal must be maintained.
Consult part data sheet and clear zone definitions for more information.

Consult technical support for other metal mounting options.

Minimum distance between two data carriers

	BIS L-100-01/L	BIS L-101-01/L	BIS L-102-01/L	BIS L-103-05/L	BIS L-200-03/L	BIS L-201-03/L	BIS L-202-03/L	BIS L-203-03/L
BIS L-300	250	300	400	250	250	300	400	250
BIS L-301	300	400	500	350	350	400	500	350
BIS L-302	150	200	200	180	180	200	250	180
BIS L-303	300	400	500	350	350	400	500	350
BIS L-304	150	200	200	180	180	200	250	180
BIS L-40_					≥ 250	≥ 300	≥ 400	

Dimensions in mm

Minimum distance between two read/write heads

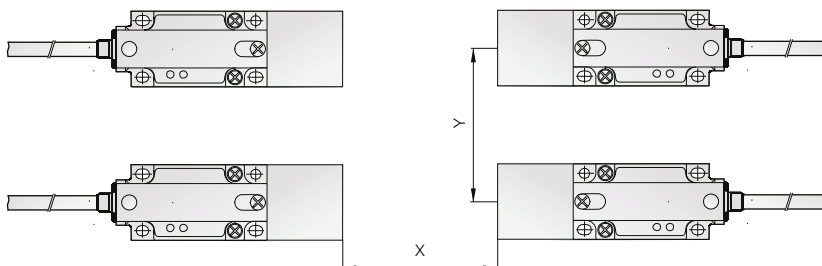
BIS L-300	800 mm
BIS L-301	800 mm
BIS L-302	200 mm
BIS L-303	800 mm
BIS L-304	200 mm

Dimensions in mm

Distance from read head to read head

Read head	Distance X	Distance Y
BIS L-40 _-...-001-...	1000 mm	1000 mm
BIS L-40 _-...-002-...	500 mm	300 mm
BIS L-40 _-...-003-...	500 mm	300 mm
BIS L-40 _-...-004-...	500 mm	300 mm

Dimensions in mm

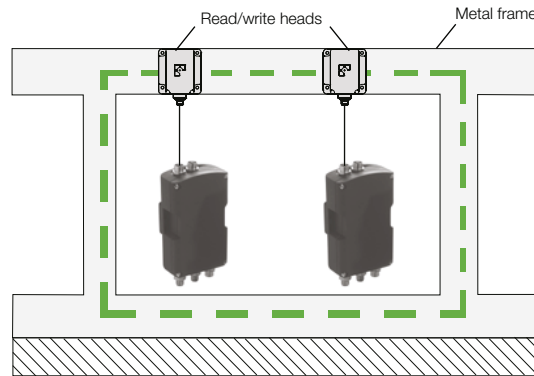


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BIS L installation notes

Mounting the read/write heads on metal frames

If the read/write heads are mounted so that they are joined through an enclosed metal frame, mutual interference may result (conductor loop). This may reduce the read/write distances. The smaller the read/write head, the less the interference. With the BIS L-301, the maximum distance can be reduced by up to 20 %. The distance should therefore be tested.



Installation in metal

For compliance to the read/write distances as rated for a given data carrier to read/write head, the following Clear Zone Dimension must be used for a "non-flush" or "non-metal" data carrier mounting.

Clear zone dimensions

Data carriers	Fig.	A	D	C	B
BIS L-100-01/L	1	100	50		
BIS L-101-01/L	1	100	50		
BIS L-102-01/L	1	100	50		
BIS L-103-05/L	1	100	50		
BIS L-150-05/A	3	0		3	0*
BIS L-200-03/L	1	100	50		
BIS L-201-03/L	1	100	50		
BIS L-202-03/L	1	100	50		
BIS L-203-03/L	1	100	50		

Read/write heads	Fig.	A	D	C	B
BIS L-300-__	2	100		50	
BIS L-301-__	1	240			0
BIS L-302-__	2	100		10	
BIS L-303-__	3	80	60	50	
BIS L-350-001-S4		50	50	30	
BIS L-304-__	3	50	50	10	
BIS L-400-__-001	2	100		40	
BIS L-400-__-002	2	100		10	
BIS L-400-__-003	2	100		10	
BIS L-400-__-004	3	50	50	10	
BIS L-405-__-001	2	100		40	
BIS L-405-__-002	2	100		10	
BIS L-405-__-003	2	100		10	
BIS L-405-__-004	3	50	50	10	

*in steel and BIS L-350 head

Dimensions in mm

Note! Depending on the combination of read/write head and data carrier, clear zone dimension A should always be selected for the larger of the components. If the clear zones cannot be maintained, the read/write distance will be reduced.

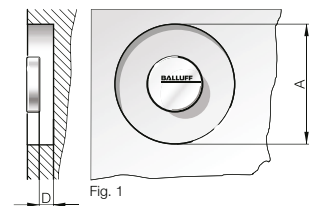


Fig. 1

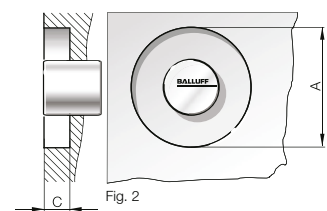


Fig. 2

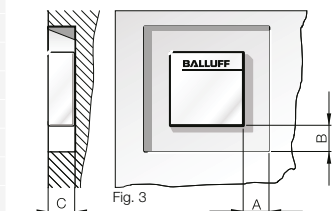


Fig. 3



Basic
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General
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Quality

BIS U

BIS M

BIS C

BIS L

BIS S

Interaction
between

read/write

heads and

data carriers

BVS

Mechanical strength

Data carriers and read/write heads BIS L-1_ _ , BIS L-2_ _ , BIS L-3_ _ , BIS L-4_ _

Shock load	100 g/6 ms per EN 60068-2-27 and 100 g/2 ms per EN 60068-2-29
Vibration	20 g, 10...2000 Hz per EN 60068-2-6

Processors BIS L-6_ _ _

Shock load	15 g/11 ms per EN 60068-2-27 and 15 g/6 ms per EN 60068-2-29
Vibration	5 g, 10...150 Hz per EN 60068-2-6

Maximum speed

To calculate the permissible speed at which the data carrier and head may move relative to one another, the static distance values are used (see section BIS L).

The permissible speed is:

$$V_{\text{max. perm.}} = \frac{\text{Path}}{\text{Time}} = \frac{2 \times |\text{offset value}|}{\text{Processing time}}$$

The offset value is dependent on the read/write distance actually used in the system.

$$\text{Processing time} = \frac{\text{Data-carrier}}{\text{detection time}} + \frac{\text{Read/write}}{\text{time of first block to be read}} + n^1 \times \frac{\text{Read/write}}{\text{time for other started blocks}}$$

n^1 = Number of started blocks



Basic Information and Definitions

BIS L read times

Read times BIS L-1_ _

Typically 110 ms for recognizing the serial number*

Data carrier with 4 byte blocks	
Byte	read time
from 0 to 3	180 ms
for each additional 4 bytes started add an additional	90 ms

Read times BIS L-2_ _

Serial number recognition = read data carrier = 100 ms*

Write times BIS L-1_ _

Data carrier with 4 byte blocks	
Byte	write time
from 0 to 3	305 ms
or each additional 4 bytes started add an additional	215 ms

*Applies only to parameter type and serial number output.

All specifications are typical values. Deviations are possible depending on the application and combination of read/write head and data carrier.



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Mounting definitions

Flush in steel

Active sensing surface can be flush mounted to surface of steel.
Consult part data sheet for additional information.

Non-flush on steel

Active sensing surface must be clear and not be surrounded by steel.
Consult part data sheet and clear zone definitions for more information.

Non-metal

Total clearance zone from any kind of metal must be maintained.
Consult part data sheet and clear zone definitions for more information.

Consult technical support for other metal mounting options.

Installation in steel

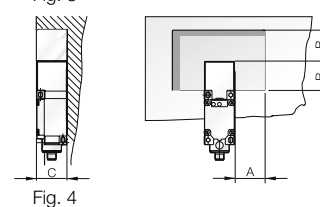
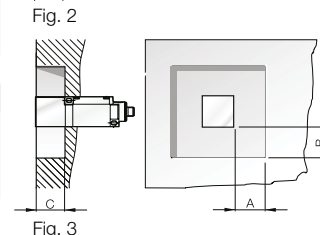
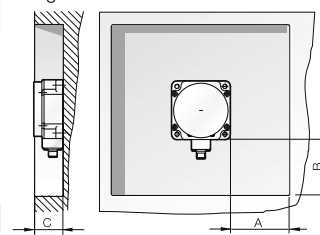
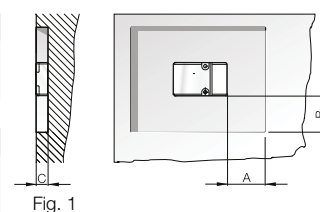
For compliance to the read/write distances as rated for a given data carrier to read/write head, the following Clear Zone Dimension must be used for a "non-flush" data carrier mounting:

Clear zone dimensions

Data carriers	Fig.	A	B	C
BIS S-108-_/L	1	35	35	11
BIS S-150-_/A	1	20	20	22

Read/write heads	Fig.	A	D	B
BIS S-301	2	80	80	40
BIS S-302	3	10	10	40
BIS S-303	4	10	10	40

Dimensions in mm



Installation in aluminum

Clear zone dimensions

Data carriers	Fig.	A	B	C
BIS S-108-_/L	1	35	35	11
BIS S-150-_/A	1	20	20	22

Read/write heads	Fig.	A	D	B
BIS S-301	2	80	80	40
BIS S-302	3	40	40	40
BIS S-303	4	40	40	40

Dimensions in mm

Note! Depending on the combination of read/write head and data carrier, clear zone dimension A and B should always be selected for the larger of the components.

Basic Information and Definitions

BIS S installation notes and read/write times

Mechanical strength

Data carriers and read/write heads BIS S-1 __, BIS S-3 __

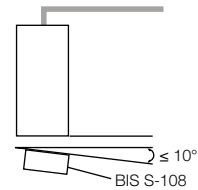
Shock load	100 g/6 ms per EN 60068-2-27 and 100 g/2 ms per EN 60068-2-29
Vibration	20 g, 10...2000 Hz per EN 60068-2-6

Processors BIS S-6 __

Shock load	15 g/11 ms per EN 60068-2-27 and 15 g/6 ms per EN 60068-2-29
Vibration	5 g, 10...150 Hz per EN 60068-2-6

Permissible inclination

The sensing surfaces of read/write head and data carrier should be installed in parallel. If the inclination of data carrier to read/write head becomes over 10 degrees, read/write distance and offset will decrease.



Read/write cycles

Data carriers	Memory type	Write cycles	Write cycles	Read cycles	Memory organization
8 kBytes	FRAM	unlimited	unlimited	unlimited	64 byte blocks
16 kBytes	FRAM	unlimited	unlimited	unlimited	64 byte blocks
32 kBytes	FRAM	unlimited	unlimited	unlimited	128 byte blocks

Read times

Byte	read time
from 0 to 63	29 ms
for each additional 64 bytes started add an additional	31 ms
from 0 to 2047	990 ms

Write times

Byte	write time [ms]
from 0 to 63	$31 + n \times 1.5$
≥ 64	$y \times 31 + n \times 1.5$
from 0 to 2047	= max. 4064

n = Number of contiguous bytes to write

y = Number of blocks to process

Example:

Write 87 bytes starting with Address 187. Data carrier = 64-byte blocks. Blocks 2 to 5 are processed, since start address 187 is in Block 2 and end address 274 is in Block 5.

$$t = 4 \times 31 + 87 \times 1.5 = 255 \text{ ms}$$

Maximum speed

No dynamic operation is recommendet.



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Interaction
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heads and
data carriers

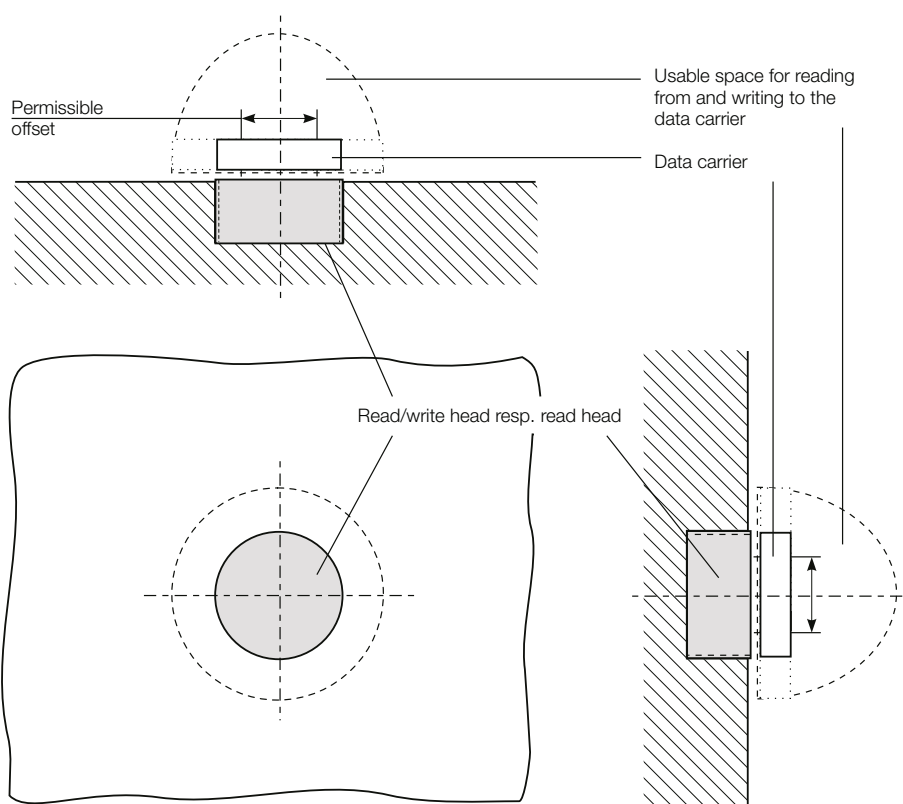
BVS

Spatial arrangement of read/write head resp. read head and data carrier

The key to reliable data exchange between the read/write head resp. read head and the data carrier is maintaining sufficient dwell time of the data carrier within a specified spatial distance from the read/write head resp. read head.

The sketches on the two following pages are intended to clarify this requirement, in the first sketch for read/write heads resp. read heads with non-directional operation, in the second for read/write heads resp. read heads in cases where the data carrier have to pass by from a certain direction or at a certain orientation.

For a **static read/write resp. read operation** the data carrier stops completely in front of the read/write resp. read heads; this permits a greater distance between the two.

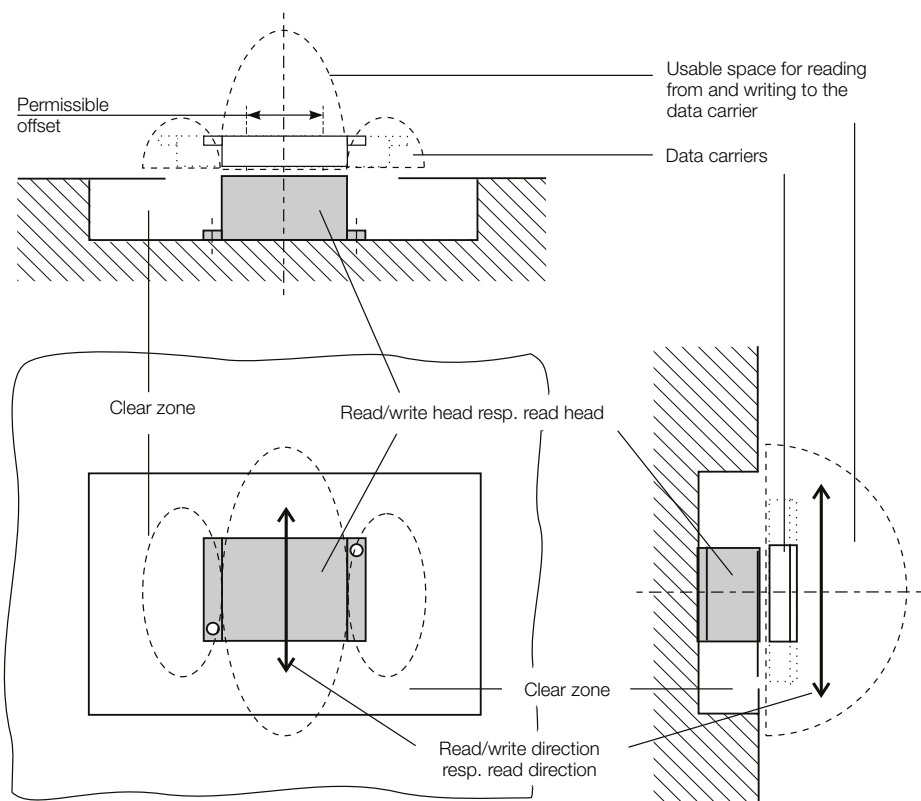


Spatial arrangement of read/write head resp. read head and data carrier for non-directional read/write heads resp. read heads and **flush mounting** (circular antenna).

Basic Information and Definitions

Interaction between read/write heads and data carriers

For **dynamic operation** the data carrier is read or programmed on the fly. The shorter distance is necessary in order to achieve as large a read/write resp. read path as possible. Each read/write head or read head has certain data carrier which can be used with it (the pairing is based on physical size and antenna field configuration). The associated specifications for distance and permissible offset are indicated as well as the distance and relative speed between the read/write head or read head and the data carrier.



Spatial arrangement of read/write head resp. read head and data carrier for directional read/write heads resp. read heads and **non-flush mount** (bar-shaped antenna).



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BIS L

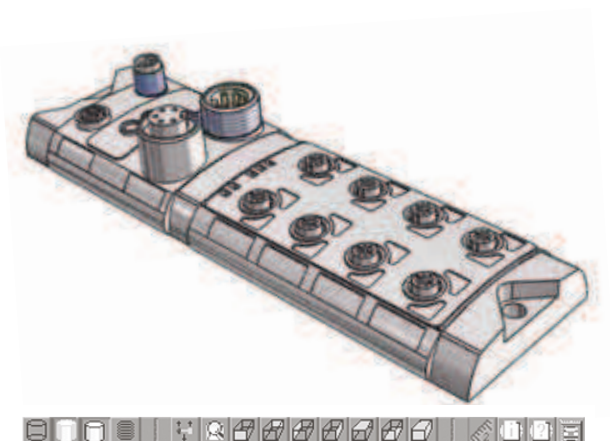
BIS S

**Interaction
between
read/write
heads and
data carriers**

BVS

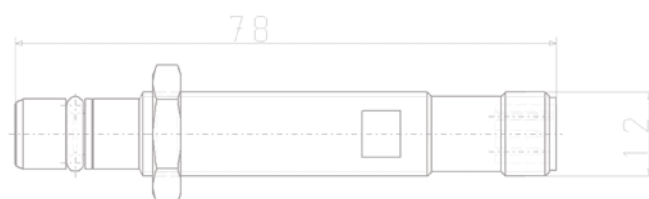
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Commissioning

Order expert knowledge. And benefit from a quick start of production.

Real-world examples:

- Setting up an optical checkpoint with the vision sensor BVS
- Consulting and support during the programming of RFID systems BIS
- Installation and commissioning of a color detection application with the BFS color sensor

Fully customized products

Specific versions according to your requirements: from preassembly to engineering services

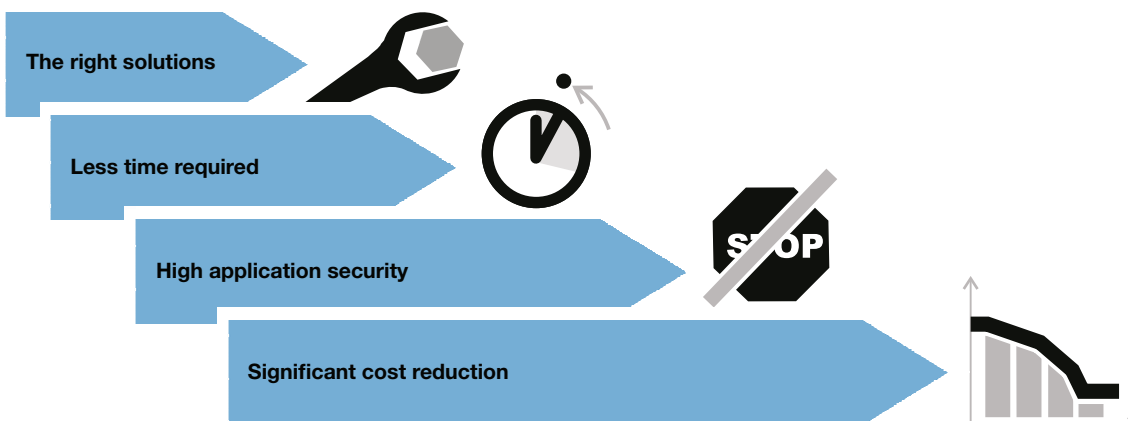
Real-world examples:

- Extending the housing of a BHS high-pressure resistant inductive sensor
- Extra threads for the housing cover of a BTL micropulse transducer
- Customer-specific holder for an RFID data carrier
- Adaptation of the characteristics for BAW analog sensors

Training

Make use of well-founded manufacturer knowledge. And benefit from application security.

- **Professional sensor use:** Select operating principles, install sensors professionally and ensure the reliable operation of your application.
- **Position and distance measurement:** This is how you make precise and wear-free measurements.
- **RFID:** The right data at the right time at the right place.
- **Vision sensor:** Using an image processing sensor, ensure manufacturing quality in three steps.
- **Vision sensor identification:** Reliably identify data matrix codes with an image-processing sensor.
- **Industrial networking with IO-Link:** Manage signals intelligently and cost-effectively.



Custom-programmed RFID data carriers

**Use data carriers written according to your specifications.
And accelerate your production.**

In assembly lines where the application is read-only or pallets will only need to be identified, it is often sufficient to write a consecutive number or a special code on the data carrier.

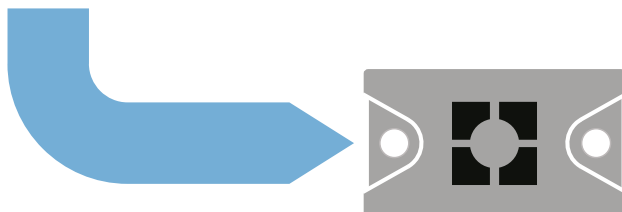
Let us take over this programming. And order increased comfort. By means of finished, written LF, HF or UHF data carriers from the factory which are ready for use immediately.

To do so, simply indicate your data to us, tell us your desired format and the section of the data carrier to which it should be saved. Use a service that brings advantages to your time management and guarantees quick commissioning.

The benefits to you

- Cost-effective – no need to maintain separate hardware for writing
- Time-saving – programming write routines can be omitted entirely
- Reorder availability – reorder a data carrier with the same programming

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Tool identification with Industrial RFID

Identify tools with Industrial RFID. And guarantee product quality.

Tool identification with Industrial RFID means incorrect assignments or missing tools are a thing of the past. Our systems provide complete tool data with extreme reliability and guarantee assured operation as well as increased productivity of the equipment.

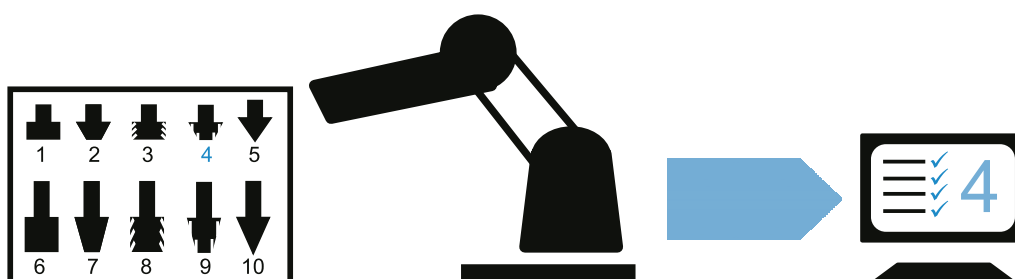
Capable of integration into all commonly used machine controls, our Industrial RFID systems ensure flexible and reliable communication in tool management. Absolutely without contact and maintenance-free. Tools are always accompanied by their individual data so they can be optimally used and managed.

The benefits to you

- Service life control outside of the machine as well
- Quality assurance through error prevention
- Electronic data transmission and paperless tool information
- Optimal tool utilization
- Reduce set-up time through quick and precise tool identification

The system

Balluff Industrial RFID stands for flexible, secure, contactless communication. The systems are entirely tolerant of environmental influences on account of their inductive operating principle. Therefore, they are excellently suited for use in harsh industrial environments such as the machine tool. Our systems therefore provide complete tool data robustly and reliably and ensure reliable identification. Balluff Tool ID supports process reliability.



TecSupport –

Your added value for planning and commissioning

We offer ...

- Decision help for the correct product selection
- Complex product and application support
- Integration support
- Customer-specific product and commissioning training
- Intensive technical support during the entire phase of the project
- Assumption of time-consuming project work

We support you during the project implementation, commissioning and integration

- Would you like to monitor and track production processes?
- Would you like to identify, control, monitor and optimize objects?
- Would you like to optimize and simplify your system wiring?

We provide you with specific support for Balluff system components

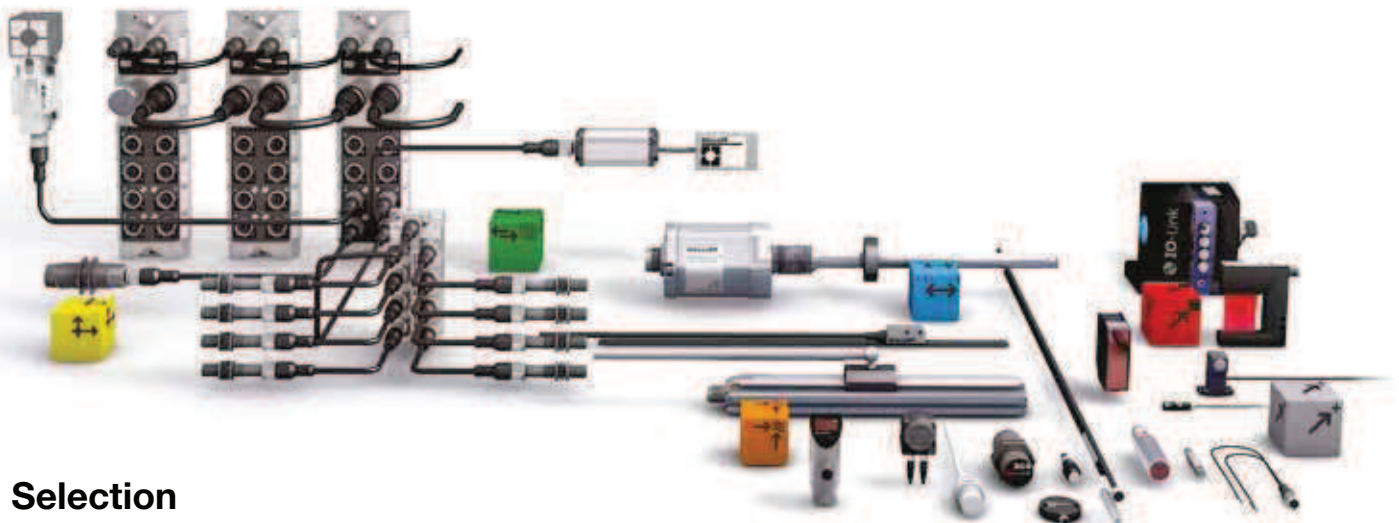
- Vision sensors BVS for optical identification
- Industrial networking and connectivity for wiring and networking
- IO-Link – network technology for reliable data transfer and greater efficiency
- Industrial identification – RFID for transparency in material flow

We are happy to help!

Phone +49 7158 173-401

+49 7158 173-727

E-mail TecSupport@balluff.de



Selection
Integration
Instruction
Application
Industrial Identification
Project support
Vision sensors
IO-Link
Industrial Networking and Connectivity
Product
System components
Decision help

BIS Application Specification

Company

Address

Contact

Phone

Salesperson

What is the application?

Description

How many read/write stations?

Read

Write

How much/what type of information
is going to be stored on the data carrier?

What are the read/write speeds required in the application?

Will the line be moving while reading or writing?
(If moving, what will max velocity be?)

m/min

What will the sensing distance be?

mm

What will the operating temperature range be?

°C

How many read and/or write operations per day and tags occur?

What will be the cable distance between PLC and processor?

What type of PLC or PC?

What will the data carrier be mounted in/on (material etc.)?

☐ Non-metal ☐ Aluminum ☐ Steel

What will the read/write head be mounted to (material etc.)?

☐ Non-metal ☐ Aluminum ☐ Steel

What will be the method of communication and protocol?

☐ RS232 ☐ RS422/RS485 ☐ Profibus
☐ Devicenet ☐ IO-Link ☐ easy-loop®
☐ Profibus ☐ Ethernet/IP ☐ EtherCAT
☐ Ethernet TCP/IP



BIS V – The new generation for more efficiency

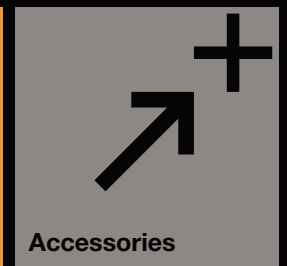
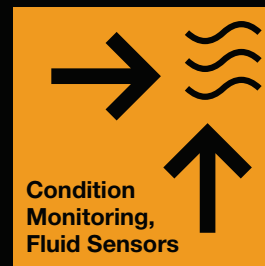
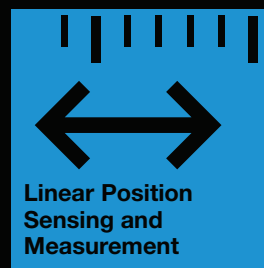
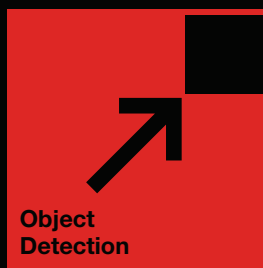
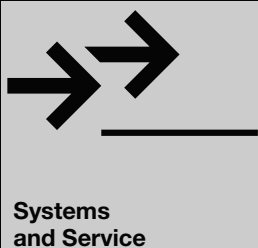


reddot design award
winner 2012

SENSOR SOLUTIONS AND SYSTEMS

For all areas of the automation industry

As a global player, we stand for comprehensive system expertise, continuous innovation, the highest quality and the greatest reliability. Balluff means technological variety and first-class service. Our 2450 worldwide employees are working to ensure this.





Systems and Service



Industrial Networking and Connectivity



Industrial Identification



Object Detection



Linear Position Sensing and Measurement



Condition Monitoring and Fluid Sensors



Accessories

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