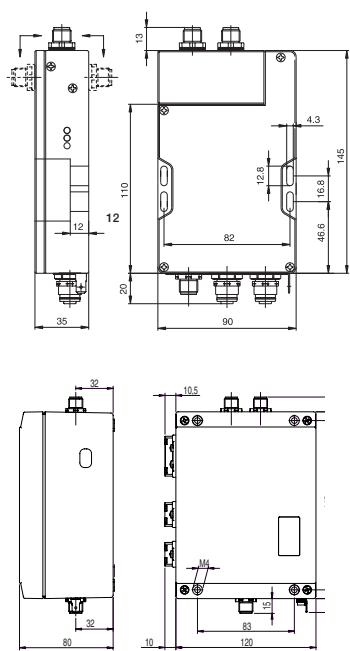


BIS C-60_8 PROFINET

Condensed Guide



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1 User Instructions

1.1 About this manual	This manual describes processors in the series BIS C-60_8 identification system as well as startup instructions for immediate operation.
1.2 Manual organization	The manual is organized so that the sections build on each other. Section 2: Basic safety information Section 3: The key steps for installing the Identification System Section 4: Introduction to the material Section 5: Technical data for the processor Section 6: Mechanical and electrical connection Section 7: Logging the processor on to the network Section 8: User-defined processor settings Section 9: Processor and host system interaction
1.3 Conventions	The following conventions are used in this manual: Enumerations Enumerations are shown as a list with en-dash. – Entry 1, – entry 2. Actions Action instructions are indicated by a preceding triangle. The result of an action is indicated by an arrow. ▶ Action instruction 1. ⇒ Action result. ▶ Action instruction 2. Syntax Numbers – Decimal numbers are shown without additional indicators (e.g. 123), – Hexadecimal numbers are shown with the additional indicator <code>hex</code> (e.g. 00_{hex}). Parameters Parameters are shown in italics (e.g. CRC_16). Directory paths References to paths in which data are stored or are to be saved to are shown in small caps (e.g. PROJECT:\DATA TYPES\USER DEFINED). Cross-references Cross-references indicate where additional information on the topic can be found (see Technical Data“ starting page 14).
1.4 Symbols	 Attention! This symbol indicates a safety instruction that must be followed.  Note, tip This symbol indicates general notes.

1 User Instructions

1.5 Abbreviations

BIS	Balluff Identification System
CRC	Cyclic Redundancy Check
DIL	Dual in-line package (also Dual In-Line)
EEPROM	Electrically Erasable and Programmable Read Only Memory
EMC	Electromagnetic Compatibility
GSD	General Station Description
GSDML	General Station Description Markup Language
MAC-ID	Media Access Control Identifier
PC	Personal Computer
PNO	Profibus Nutzerorganisation e.V.
PLC	Programmable Logic Controller

2 Safety

2.1 Intended use

The BIS C-60_8 processor is a component of the BIS C Identification System. Within the identification system it is used for linking to a host computer (PLC, PC). It may be used only for this purpose in an industrial environment corresponding to Class A of the EMC Law. This description is valid for processors in series BIS C-60_8-...

2.2 General safety notes

Installation and startup

Installation and startup are to be performed only by trained personnel. Any damage resulting from unauthorized manipulation or improper use voids the manufacturer's guarantee and warranty.

When connecting the processor to an external controller, observe proper selection and polarity of the connection as well as the power supply (see "Installation" section on page 18).

The processor may be operated only using an approved power supply (see "Technical Data" beginning on page 14).

Operation and testing

The operator is responsible for ensuring that local safety regulations are observed.

When defects and non-clearable faults in the Identification System occur, take the system out of service and secure it against unauthorized use.

2.3 Meaning of the warning notes



Attention!

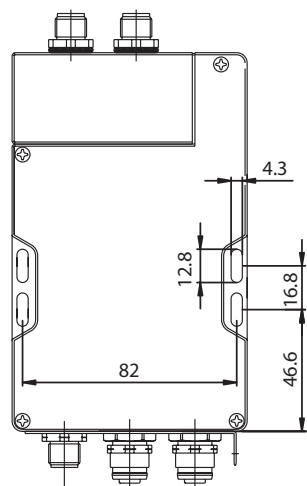
The pictogram together with the expression "Attention!" warns of a possible hazardous situation to the health of persons or of equipment damage. Disregard of these warning notes may result in injury or damage to equipment.

- Always observe the described measures for preventing this danger.

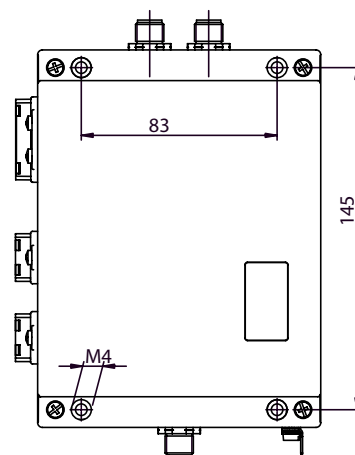
3 Getting Started

3.1 Mechanical connection

Condensed overview



BIS C -6008



BIS C -6028

Fig. 1: Mechanical connection (dimensions in mm)

- Attach processor using 4 M4 screws.

Installation with support rail holder (accessory for BIS C-6008)

Installation examples using mounting bracket and rail holder BIS Z-HW-001 (accessory).

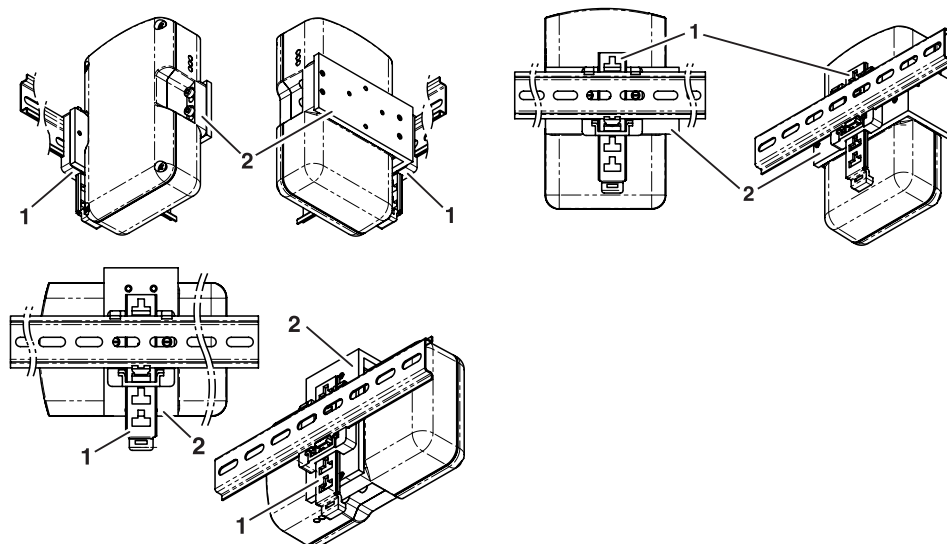


Fig. 2: Mounting using rail holder

- 1 Rail holder
- 2 Mounting brackets

3 Getting Started

3.2 Electrical
connection



Note
Make the ground connection either directly or using an RC combination to ground.
When making your connection to the Ethernet, be sure that the shield is perfectly
connected to the connector body.

BIS C-6008

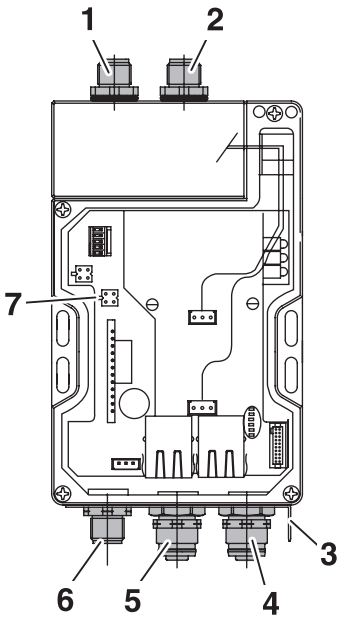


Fig. 3: Electrical connection for the BIS C-6008

- 1 Head 1 – Read/write head 1

2 Head 2 – Read/write head 2

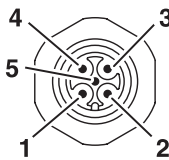
3 Function ground FE
- 4 X3 – PROFINET Port 2

5 X2 – PROFINET Port 1

6 X1 – Supply voltage

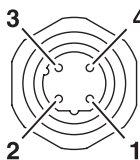
7 X7 – Service port

X1 – Supply voltage



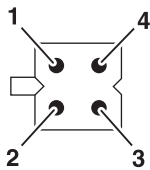
PIN	Function
1	+Vs
2	n.c.
3	-Vs
4	n.c.
5	n.c.

X2, X3 – PROFINET



PIN	Function
1	TD+
2	RD+
3	TD-
4	RD-

X7 – Service port



PIN	Function
1	TxD
2	RxD
3	GND
4	n.c.

Getting Started

BIS C-6028

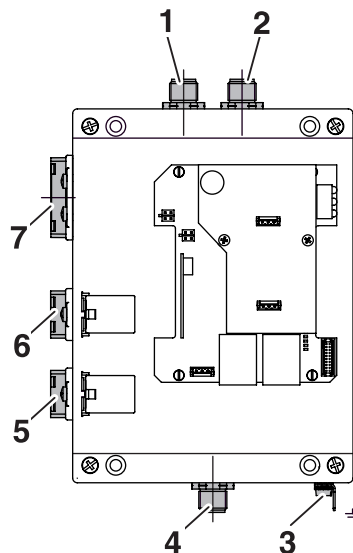
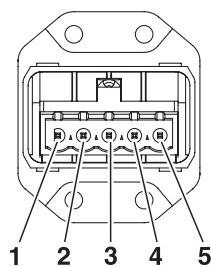


Fig. 4: Electrical connection for the BIS C-6028

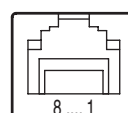
- | | |
|------------------------------|------------------------|
| 1 Head 2 – Read/write head 2 | 4 X4 – Service port |
| 2 Head 1 – Read/write head 1 | 5 X3 – PROFINET Port 2 |
| 3 Function ground FE | 6 X2 – PROFINET Port 1 |
| | 7 X1 – Supply voltage |

X1 – Supply voltage



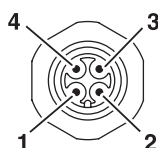
PIN	Function
1	+Vs
2	-Vs
3	n.c.
4	n.c.
5	n.c.

X2, X3 – PROFINET



PIN	Function
1	TD+
2	TD-
3	RD+
4	n.c.
5	n.c.
6	RD-
7	n.c.
8	n.c.

X4 – Service port



PIN	Function
1	n.c.
2	TxD
3	GND
4	RxD

3 Getting Started

3.3 Project administration

Project administration is accomplished for example using the project administration tool "SIMATIC NCM PC Manager" or using "STEP 7".

To integrate a BIS C-60_8 processor the following steps are generally required:

1. Install the GSDML file of the IO device in the hardware configuration
2. Update catalog
3. Using "Insert object" add the IO device "BIS C-60x8_RT" or "BIS C-60x8_IRT"
4. Insert both modules for inputs and outputs
(e.g. "RT 32 Byte E" and "RT 32 Byte A" for the processor "BIS C-60x8_RT" or "IRT 32 Byte E" and "IRT 32 Byte A" for processor "BIS C-60x8_IRT")

Additional project administration steps:

5. From the name suffix "RT" or "IRT" you can tell how the read and write data are exchanged.



Note

Both processors contain a 2-port switch and are therefore capable of passing IRT data packets.

The object properties of these modules can be used to set the start addresses of the input and outputs data.



Note

The input and output data can, as described in Section 9, be used for controlling the BIS C-60_8.

Device name

6. The object properties of the inserted object "c-60_8" can be used to assign the device name, the device number and the IP address.

The processor and the host system communicate over the PROFINET protocol. This requires an IP address and a unique device name. The device name and IP address can be stored in the IO device using "Target system > Ethernet > Edit Ethernet device".



Note

The BIS C-60_8 processor is shipped without a device name. In the included GSDML file the device name is preceded by "c-60x8".

4 Basic knowledge

4.1 Function principle of Identification Systems

The BIS C Identification System is classified as a non-contacting system with read and write function. This allows it to not only transport information which is fixed programmed in the data carrier, but also to collect and pass on current information.

The main components of the BIS C Identification System are:

- Processor,
- Read/write heads,
- Data carriers.

The main areas of application are:

- In production for controlling material flow (e.g. in model-specific processes, in workpiece transport with conveying systems, for acquiring quality assurance data, for acquiring safety-relevant data),
- In tool coding and monitoring,
- In process equipment organization,
- In warehousing for monitoring material movement,
- In transporting and conveying technology,
- In waste collection for quantity-based fee assessment.

4.2 Product description

Processor BIS C-6008:

- Plastic housing,
- PROFINET connections using 2 round M12 connectors (D-coded), supply voltage using M12 round connector,
- Read/write heads are suitable for dynamic and static operation,
- Power for the system components provided by the processor,
- Power for the data carrier provided by the read/write heads via carrier signal.

A single series BIS C-65_ read/write head can be directly installed on the processor, forming a compact unit. If the BIS C-650 adapter is installed instead of the BIS C-65_ read/write head, 2 read/write heads can be remotely connected via cable. If the BIS C-670 adapter is installed, one read/write head can be attached via cable.

Processor BIS C-6028:

- metal housing,
- PROFINET connections using 2 RJ45 plugs - IP65 (AIDA), supply voltage using push-pull power connector (AIDA),
- 2 read/write heads can be connected,
- Read/write heads are suitable for dynamic and static operation,
- Power for the system components provided by the processor,
- Power for the data carrier provided by the read/write heads via carrier signal.

Arrangement of the read/write heads:

Which arrangement of the read/write heads is most suitable depends mainly on the possible spatial arrangement of the components. There are no functional restrictions. Distance and relative speed depend on the characteristics of the respective data carriers. The possible combinations of read/write head and suitable data carriers are described in the manuals for the read/write heads series BIS C-65_ and BIS C-3_ _.



Note

If 2 read/write heads are connected to the BIS C-60_8 processor. both read/write heads may be operated independently of each other:
One data carrier can be read at the first read/write head, while the second read/write head can write to another data carrier.

4 Basic knowledge

4.3 Control function

The processor is the link between data carrier and controlling system. It manages two-way data transfer between data carrier and read/write head and provides buffer storage. The processor uses the read/write head to write data from the controlling system to the data carrier or reads the data from the carrier and makes it available to the controlling system.

Host systems may be the following:

- A control computer (e.g. industrial PC),
- a PLC.

Synchronous data transmission:

Using this method the controller ensures that the input and output buffer data are sent contiguously. A special software function is used in the PLC which controls access so that the data are sent contiguously.

Double bit header for asynchronous data transmission:

If in a controller the data range for updating the input/output buffer is not sent synchronously, data inconsistencies can occur when sending more than 2 bytes. Consistency of the sent data can be ensured by sending the control bits in the first byte and again in the last byte of the input/output buffer. By comparing the two bit headers you can determine whether the data have been fully updated and can therefore be accepted.

This method does not affect the PLC cycle, nor does it change the bus access time.

Only one byte is required in the data buffer for the byte in the 2. bit header instead of using it for data.

4 Basic knowledge

4.4 Data integrity

In order to ensure data integrity, data transfer between the data carrier and processor must be monitored using a check procedure.

The factory default setting in the processor is for double reading followed by a compare. Alternatively the CRC_16 data check may be selected.

In CRC_16 data checking a checksum is written to the data carrier which enables the data to be checked for validity at any time.

Which procedure is used depends on how the identification system is being used.



Note

Mixed operation of both check procedures is not allowed!

The following table provides an overview of the advantages of each check procedure.

CRC_16 data check	Double reading
Data integrity also during the non-active phase (data carrier outside the read/write head range)	No user information bytes are sacrificed for storing a check code.
Shorter read time – the page is read only once	Shorter write time – no check code is written.

4.5 Bus connection

Processor and host system are connected over PROFINET.

The PROFINET IO (decentralized peripheral) is tailored to communication between a controller and decentralized field devices.

PROFINET is the combination of ProfiBus DP and Ethernet in one system, whereby the IO view of ProfiBus is retained. The device model of PROFINET IO is likewise oriented towards ProfiBus technology. The properties of the IO devices are however described on an XML basis using GSD files (GSDML), while the project administration/system integration is accomplished analogous to ProfiBus devices.

In a PROFINET network IO controllers and IO devices can be connected to each other using any common network topology: A star, line, ring or tree type topology is possible.

The BIS C-60_8 includes a built-in IRT switch with 2 ports for accomplishing this. Both RT and IRT can therefore be used.

5 Technical Data

5.1 BIS C-6008

Dimensions

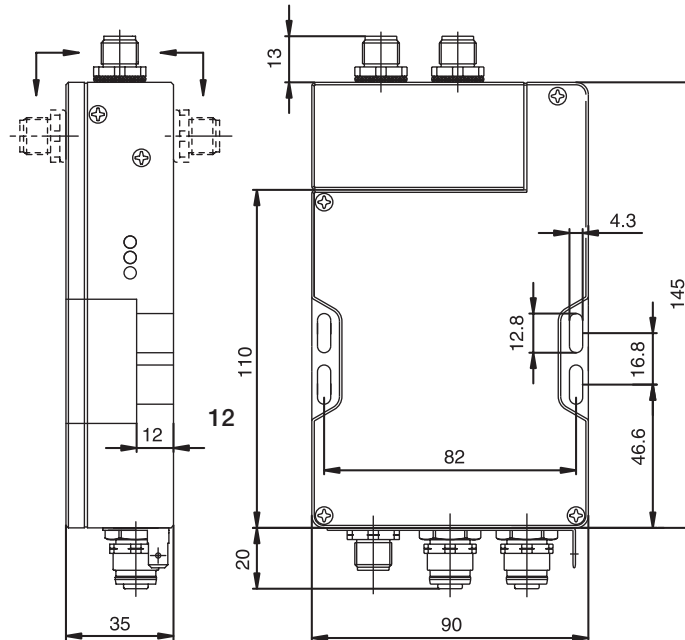


Fig. 5: Dimensions in mm

Mechanical data

Housing material	ABS
X1 – Supply voltage	V _s 24 V DC, 5-pin male panel connector, A-coded
X2 – PROFINET Port 1	Panel socket, M12 4-pin, D-coded
X3 – PROFINET Port 2	Panel socket, M12 4-pin, D-coded
Head 1, 2 (read/write head connections)	Panel plug, 4-pin, A-coded
Enclosure rating	IP65 (with connectors)
Weight	500 g

Electrical Data

Operating voltage VS	24 V DC ±10 %
Ripple	≤ 10 %
Current draw	≤ 400 mA
Device interface	Ethernet
Service interface	RS 232

5 Technical Data

Operating Conditions

Ambient temperature range	0 °C...+60 °C
EMC – EN 61000-4-2/3/4/5/6 – EN 55011	– Severity level 3A/3A/4A/2A/3A – Gr. 1, Cl. A
Vibration/shock	EN 60068 Part 2-6/27/29/64/32

Function Indicators

BIS operating states	Ready CT1 Present/operating CT2 Present/operating	LED green LED green/yellow LED green/yellow
Ethernet status	Port 1 Link Port 2 Link Port 1 Activity Port 2 Activity	LED green LED green LED yellow LED yellow
PROFINET status	Status Error	LED green LED red

5 Technical Data

5.2 BIS C-6028

Dimensions

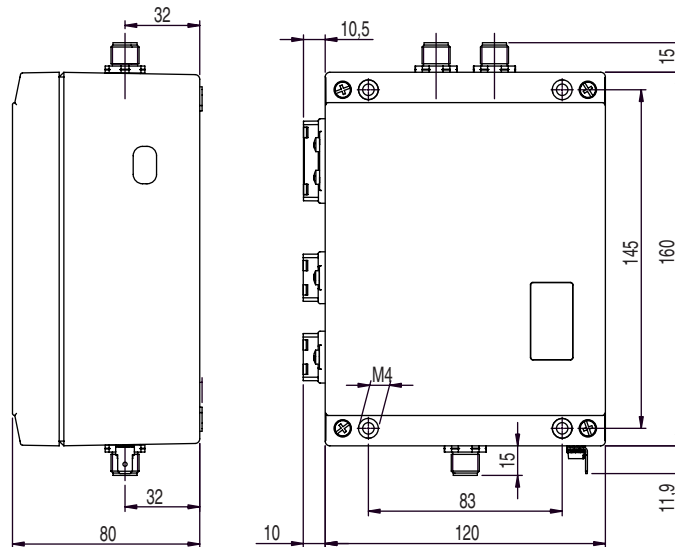


Fig. 6: Dimensions in mm

Mechanical Data

Housing material	EN AC-AISi12 (a), DIN EN 1706
X1 – Supply voltage	V _s 24 V DC, Push-Pull Power plug
X2 – PROFINET Port 1	RJ45 plug (AIDA recommendation)
X3 – PROFINET Port 2	RJ45 plug (AIDA recommendation)
Head 1, 2 (read/write head connections)	Panel plug, 4-pin, A-coded
Enclosure rating	IP65 (with connectors)
Weight	1080 g

Electrical Data

Operating voltage VS	24 V DC ±10 %
Ripple	≤ 10 %
Current draw	≤ 400 mA
Device interface	Ethernet
Service interface	RS 232

5 Technical Data

Operating Conditions

Ambient temperature range	0 °C...+60 °C
EMC – EN 61000-4-2/3/4/5/6 – EN 55011	– Severity level 3A/3A/4A/2A/3A – Gr. 1, Cl. A
Vibration/Shock	EN 60068 Part 2-6/27/29/64/32

Function Indicators

BIS operating states	Ready CT1 Present/operating CT2 Present/operating	LED green LED green/yellow LED green/yellow
Ethernet status	Port 1 Link Port 2 Link Port 1 Activity Port 2 Activity	LED green LED green LED yellow LED yellow
PROFINET status	Status Error	LED green LED red

Appendix

**A.1 BIS C-6008
Ordering
Information**

Type designation code

BIS C - 6008 -0 - - -06-ST -

Balluff Identification System

Series C Read/Write System

Hardware type

6008 = Plastic housing

Software type

044 = PROFINET IRT

048 = PROFINET RT

Version

000 = no read/write head

651 = with Type 651 read/write head (with top located round antenna)

652 = with Type 652 read/write head (with front located round antenna)

653 = with Type 653 read/write head (with bar antenna)

650 = Adapter with 2 connections for external read/write heads BIS C-3_ _ (except BIS C-350 and BIS C-352)

654 = Adapter with one connection for read/write head BIS C-355/_ _S92 with BIS C-520-... cable

655 = Adapter with 2 connections for external read/write heads BIS C-3_ _ (except BIS C-35_)

670 = Adapter with remote plug for an external read/write head BIS C-350 or BIS C-352

Interface

06 = Ethernet

Customer con-

nection

ST23 = Connector types

X1 = Round connector for supply voltage (5-pin male)

X2 = Round connector for Ethernet (4-pole female, D-coded)

X3 = Round connector for Ethernet (4-pole female, D-coded)

**Accessories
(optional, not
included)**

Type

Ordering code

Connectors

for X1

BKS-S 79-00

for X2, X3

BKS-S 182-00

Cover cap

for Head 1, Head 2

Cover cap, M12 female (121 671)

for X2, X3

BKS 12-CS-00

Adapter cable M12 D-coded
per RJ45

BIS C-526-PVC-00,5

Mounting brackets (mounting
kit)

For attaching the proces- BIS Z-HW-001
sor to rails

Appendix

**A.2 BIS C-6028
Ordering
Information**

Type designation code

	BIS	C	- 6028	-0	-	-	-06	-ST
Balluff Identification System								
Series C Read/Write System								
Hardware type								
6028 = Metal housing								
Software type								
044 = PROFINET IRT								
048 = PROFINET RT								
Version								
050 = with two ports for external read/write heads BIS C-3_ _ (except BIS C-350 and -352)								
Interface								
06 = Ethernet								
Customer con- nection								
ST22 = Connector types								
X1 = Supply voltage (5-pin male, AIDA recommendation)								
X2 = Ethernet connector (8-pole female, AIDA recommendation)								
X3 = Ethernet connector (8-pole female, AIDA recommendation)								
X4 = Round connector for RS232 interface (4-pin male)								

**Accessories
(optional, not
included)**

Type

Ordering code

Cover cap	For Head 1, Head 2, X4 for X2, X3	Cover cap, M12 female (121 671) on request
Female	X1	5-pole female, Push-Pull Power
Connector	X2, X3	8-pin male, Push-Pull RJ-45

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