BALLUFF

sensors worldwide

Handheld Programmer BIS L-87_

Quick Guide

BIS L

english
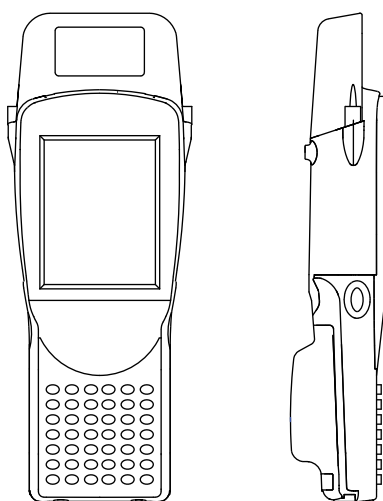
www.balluff.com

1 User Instructions

1.1 CE Declaration of Conformity and user safety

$C\epsilon$ **Declaration of Conformity**

This product was developed and produced in compliance with applicable European standards and directives.

i **Note**
You can request a Declaration of Conformity separately.
For additional safety instructions, refer to the "Safety" section on page 6

1.2 Scope of Delivery

Included in the scope of delivery:
– Handheld Programmer BIS L-87_
– BIS Software CD
– Power supply
– Printed Manual

1.3 About this manual

This manual describes the operation of the BIS L-87_ Identification System together with the "Workabout Pro" handheld computer made by "PSION Teklogix GmbH.

The present manual does not describe:
– Startup, operation and care of the "Workabout Pro" handheld computer,
– Installation and operation of accessories and expansion devices,
– Docking station and device interfaces.
This information is found in the manuals from PSION Teklogix GmbH on the enclosed CD.
The most current documentation can be found on the Internet at "www.psionteklogix.com".

i **Note**
A detailed user's guide for the processor can be found on the accompanying BIS-CD or in the Internet under www.balluff.com.

1.4 Manual organization

The manual is organized so that the sections build on each other.
Section 2: Basic safety information.
Section 3: First steps (starting the software).
Section 4: Processing data carriers and using files.
Section 5: Connecting the Handheld Programmer to the PC.
Section 6: Technical data for the identification system.

1 User Instructions

| 1.5 | 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.

Cross-references
Cross-references indicate where additional information on the topic can be found (e. g.: "see Technical Data on page 29").

Buttons
Buttons are set in brackets, e. g. **[Write]**.

Menu commands
Menu commands are joined with a greater than symbol, e. g. **"Start > Programs"** stands for the menu command <Programs> from the start menu.

Buttons
Keys are set in angle brackets, e. g. confirm by pressing **<Enter>** .

1.6 Symbols

⚠ **Attention!**
This symbol indicates a safety instruction that must be followed.

ℹ **Note, tip**
This symbol indicates general notes.

1.7 Abbreviations

BIS	Balluff Identification System
CRC	Cyclic Redundancy Check
EEPROM	Electrically Erasable Programmable Read Only Memory
EMC	Electromagnetic Compatibility
PC	Personal Computer
RFID	Radio Frequency Identification
PLC	Programmable Logic Controller

2 Safety

2.1 Intended use

The BIS L-87_ Handheld Programmer is a component of the BIS L identification system. Within the identification system it is used for checking, correcting or initializing data carriers.
The Handheld Programmer 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 L-87_-1-008-….

2.2 General safety notes

Startup
Startup is to be performed only by trained specialists. Any damage resulting from unauthorized manipulation or improper use voids the manufacturer's guarantee and warranty.
When starting up, observe the instructions in the manuals from PSION Teklogix GmbH.
The Handheld Programmer is to be operated only using the power supply approved for the device .

Operation and testing
The operator is responsible for ensuring that local prevailing 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 Important notes about rechargeable batteries

⚠ **Attention!**
Improper use, charging, disposal or replacement of the rechargeable battery may result in an explosion! Replace the rechargeable batteries only with the same or a type recommended by the manufacturer.

ℹ **Note**
Batteries and rechargeable batteries may not be disposed of with regular waste. As an end user you are legally required to recycle used batteries or rechargeable batteries. You can return batteries or rechargeable batteries after use at community collection points at no cost. You may also return batteries or rechargeable batteries to us by mail with sufficient postage:
Balluff GmbH, Schurwaldstraße 9, 73765 Neuhausen a.d.F., Deutschland

⚠ **Attention!**
Use only Balluff approved power supplies.

2.4 Meaning of the warning notes

⚠ **Attention!**
The pictogram used with the word "Caution" warns of a possible hazardous situation affecting the health of persons or equipment damage. Disregard of these warning notes may result in injury or damage to equipment.
► Always take the described measures to prevent hazardous situations.

3 Getting Started

3.1 Battery operation

> **ℹ Note**
> The system components of the Handheld Programmer are powered by a 3.7V rechargeable battery pack (Li-Ion).
> ▶ Rechargeable batteries provided by Balluff are not charged and have to be charged prior to first use.
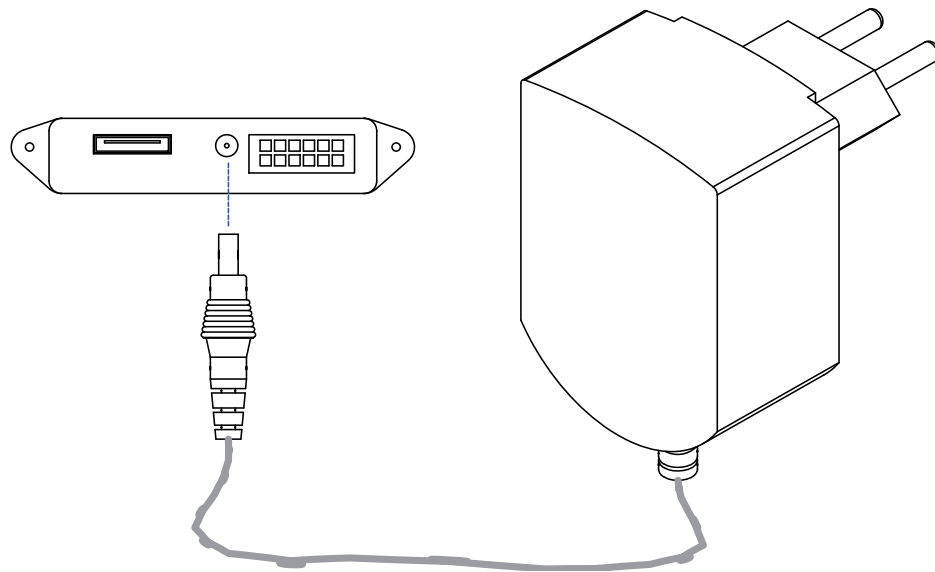

Fig. 3: Connecting the power supply – Charging the battery pack

Operating life and replacement of rechargeable batteries

A rechargeable battery with high capacity has a battery life of up to 48 hours after a full charge. Presumption: 200 readings, instrument switches to suspend mode after three minutes when not in use.
Data in the Handheld Programmer are retained for at least 10 to 15 minutes while the battery is being replaced.

> **ℹ Note**
> User data are by default saved in a RAM-based folder. The data in this RAM folder are lost if the main battery pack and backup battery pack are completely drained or if the device is cold started (see also "Cold Reset", Section 3.3 on page 10). The safest place to store the data is an SD or MMC memory card (Flash Disk).

Charging rechargeable batteries

> **⚠ Attention!**
> Components can be damaged by using an incorrect charging current.
> ▶ Use the docking station or the Balluff recommended charger/power supply for charging the battery pack.

▶ Insert unit in the docking station OR connect the power supply

> **ℹ Note**
> When using a docking station, an uncharged battery pack may be used. Then simply dock the unit and turn it on.

3 Getting Started

3.2 **Overview of**
    WORKABOUT
    PRO C

    BIS L-870-1-
    008-X-000

Fig. 4: Handheld Programmer BIS L-870-1-008-X-000

1 Read/write head for BIS L data carriers with round coil Ø > 20 mm

2 Active surface (underside)

BIS L-871-1-
008-X-000

Fig. 5: Handheld Programmer BIS L-871-1-008-X-000

1 Read/write head for BIS L-15_-XX data carriers

2 Active surface (frontside)

3 Getting Started

BIS L-873-1-008-X-000
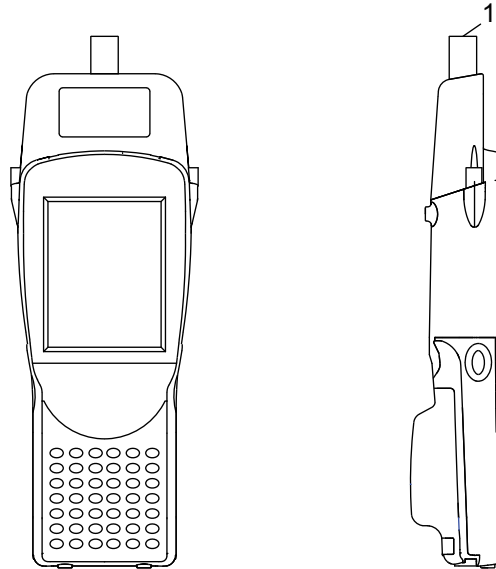
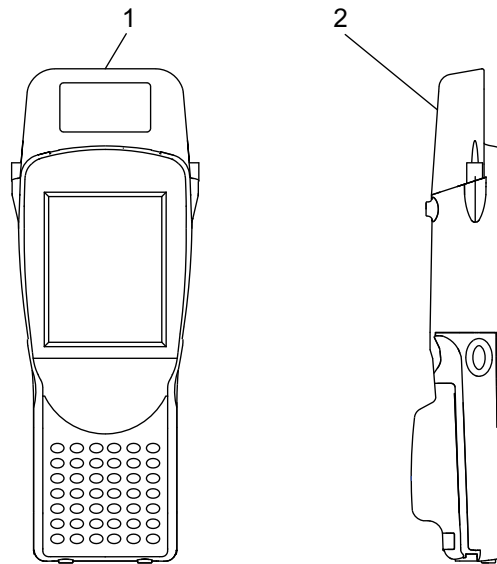Fig. 6: Handheld Programmer BIS L-873-1-008-X-000

1 Read/write head for BIS L data carriers with round coil Ø < 20 mm
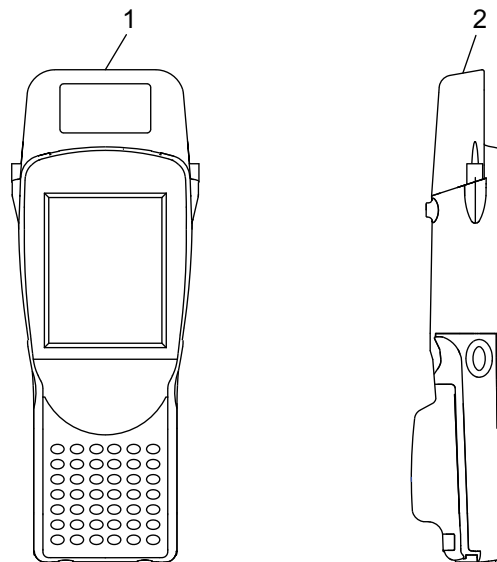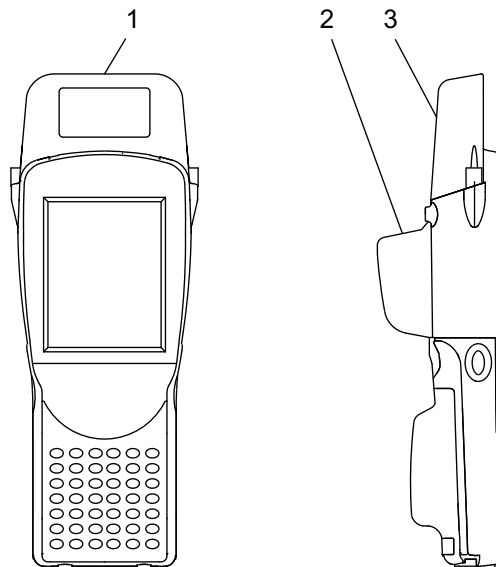Active surface (frontside)

BIS L-870-1-008-X-002

Fig. 7: Handheld Programmer BIS L-870-1-008-X-002

1 Read/write head for BIS L data carriers with round coil Ø > 20 mm
2 Barcode scanner
3 Active surface (underside)

3 **Getting Started**

3.3 COLD RESET or battery replacement

> **i** **Note**
> Removing the battery pack or performing a cold reset will delete data, drivers and settings form the RAM of the unit!
> The program **"Total Recall"** can be used to save the personal profile so that it is automatically loaded after a cold reset.
> The program **"Total Recall"** is located in the **"Control Panel"** of the Workabout Pro.

Saving your own profile with "Total Recall"

– To open the Control Panel: <Windows Start> - <Settings> - <Control Panel>.
– Double-click on the program <Total Recall>
  (or select it and in the upper left corner select <File> and <open>),
– A new window opens; click on <Next> ; the following window is opened,
– Change <Profile Name> to <BISM>,
– Change <Profile Type> to <AutoRestore for this device only>,
– Keep <Profile Location> (should be set to <Flash Disk>),
– Click on <Next>,
– <All Files> window opens. Do not change anything. Click on <Next>,
– <View Selections> window opens. Do not change anything. Click on <Next>,
– Click on <Backup>,
– In the <Perform the Operation> window click on <Finish1> .

3.4 Turning the Handheld Programmer on/ off

Requirements:
– Supply voltage is present (battery pack used and charged, device is in the docking station of power supply is connected).

> ⚠ **Attention!**
> This is a Class A product. When using this product indoors, the device may cause RF interference, requiring the user to take appropriate measures.

Turning on

► Hold down **<Enter>** for at least 1 second.
  As soon as the green LED flashes, release the **<ENTER>** key.
  ⇒ The start screen <(Today)> will be displayed.

> **i** **Note**
> If the device was used previously, it can happen that it is in Suspend mode; pressing **<ENTER>** reactivates the unit. The screen you were working in before the computer switched to Suspend mode is displayed again.

Turning off

 – Suspend –
► Press **<FN>** (blue) and then **<ENTER>** to shut off the WORKABOUT PRO
  or
► From the start menu select **"Shutdown > Suspend"** .

3.5 Keyboard, display and operating concept

Familiarize yourself with the operating concept and characteristics of the WORKABOUT PRO.
The operating manual can be found on the included CD.
The most recent documents are available in the Internet at: http://www.psion-teklogix.com/.

3.6 Creating your own operating interface

> **i** **Note**
> The BALLUFF.dll was developed as an independent software for creating a custom tailored operating interface, for the Handheld Programmer. The ordering code for this application is available on demand.

3 Getting Started

3.7 Starting the RFID application

▶ On the desktop press on **"Start > Programs > BALLUFF RFID > BIS L RFID"** (depending on the WindowsCE® version only the Windows®-Logo may appear (as shown in Fig. 8), instead of a **"Start"** button.

▶ **As an alternative start option** doubleclick the link "**BIS L RFID**" on the desktop.
⇒ The application "**BIS L RFID**" is started.
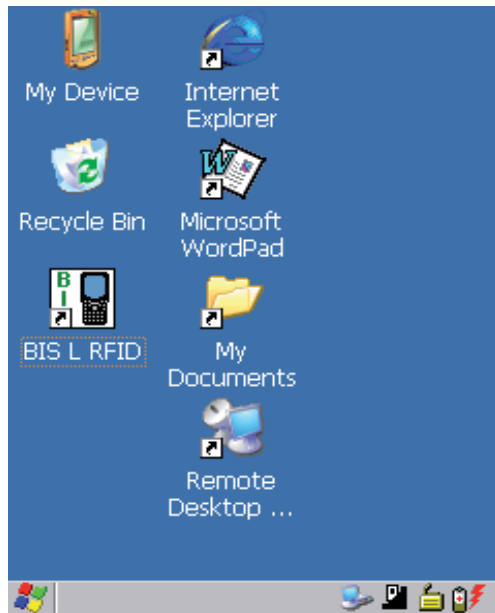⇒ The start screen is displayed.

Fig. 8: Windows CE Desktop

Fig. 9: Balluff application start screen

3.8 Operating menu overview

After the start screen the tab **"Settings"** is displayed.

"Settings" tab

Fig. 10: "Settings" tab

3 **Getting Started**

The "Settings" tab cont.

The following settings can be made:

CodeTag Type
Selection of the data carrier type. All or one particular data carrier type may be selected.

All	All **Balluff supported** data carrier types are processed (factory default setting).
BIS L-1xx	Only BIS L-1xx data carrier types are processed
BIS L-2xx	Only BIS L-2xx data carrier types are processed

Use CRC Check
Uses the CRC checksum. If the CRC data check is activated, the validity of the data is ensured using a CRC checksum (see also "Data integrity" in Section 4 "BasicKnowledge", starting on page 18).
If the CRC data check is not activated, the validity of the data is checked using a double read.

Sounds
Setting an audio signal for a read error ("on Error") or successful reading ("on Success").

UID Format
Setting the display format of the serial number.
The serial number can be displayed in "Hex" (hexadecimal), "Dec" (decimal) or "ASCII" format.

Continuous Read
Continuous Read.
If this option is enabled, read requests are carried out automatically at the set interval.

[Open Reader]
Activating the read/write head.
The read/write head is activated with the settings made and the options are grayed out. The label on the button changes to **"Close Reader"**.
Go to the **"RW Data"** tab to perform read or write operations.

[Close Reader]
Deactivate the read/write head. The settings are enabled for editing.

Supported data carrier types

Following data carrier types can be processed with the BIS L-870:		
BIS L-100-01/L	BIS L-103-05/L	BIS L-202-03/L
BIS L-101-01/L	BIS L-200-03/L	BIS L-203-03/L
BIS L-102-01/L	BIS L-201-03/L	

A BIS L-871 is required to process the following data carriers:	
BIS L-150-05/A	BIS L-151-05/A

A BIS L-873 is required to process the following data carriers:	
BIS L-222-03/L	BIS L-245-03/L
BIS L-244-03/L	

You can obtain more detailed information upon request.

3 **Getting Started**
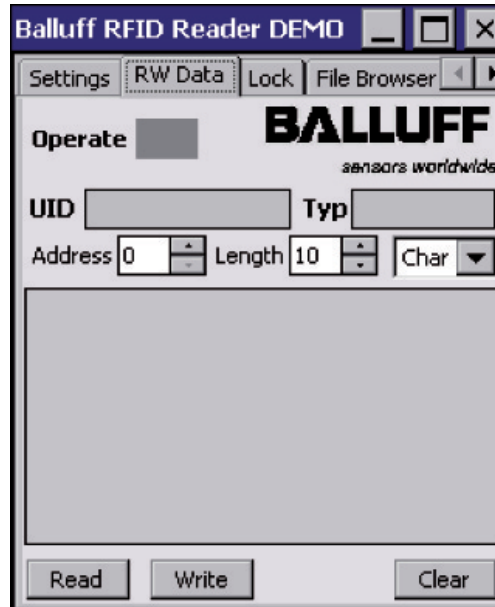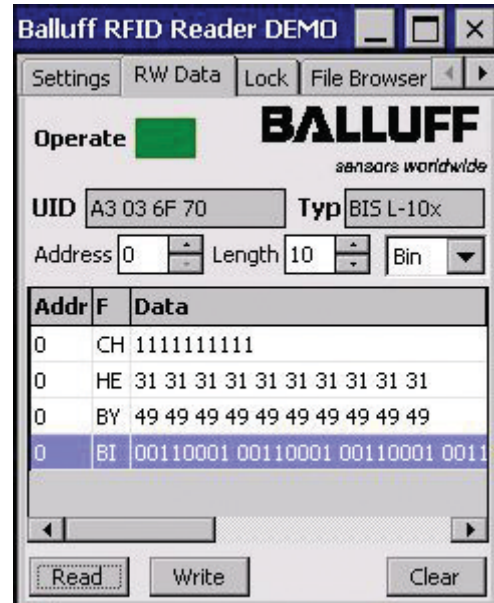
"RW Data" tab

Fig. 11: "RW Data" Tab

Fig. 12: "RW Data", Operation successful

Operate
Status indicator:
Yellow flashing: Read/Write head activated, waiting for data carrier.
Green: Read/write operation successfully finished.
Red: Read/write error occurred.

UID
Display data carrier serial number. The serial number is displayed in the format selected under
"Settings" (Hex, Dec, ASCII).

Type
Display of the data carrier type.

Address
Start address for reading or writing.
The start address can be entered or set using the spin box.

Length
Number of bytes you want to read or write.
The number of bytes can be entered or set using the spin box.

Format (Char, Byte, Hex, Bin)
Selecting the display format for data.
The data which were read are displayed according to the selection made in the selection field.

[Read]
Starts a read operation, the status indicator flashes yellow and the button label changes to
"Stop" (cancel read operation).

[Write]
Starts a write operation, the status indicator flashes yellow and the button label changes to
"Stop" (cancel write operation).

[CRC Init]
Initializes a data carrier for using the CRC checksum.
The button is only shown if on the **"Settings"** tab the option **"Use CRC Check"** is activated.

[Clear]
Clears the data read so far from the display window.

Editing data

Fig. 13: Example - Editing data
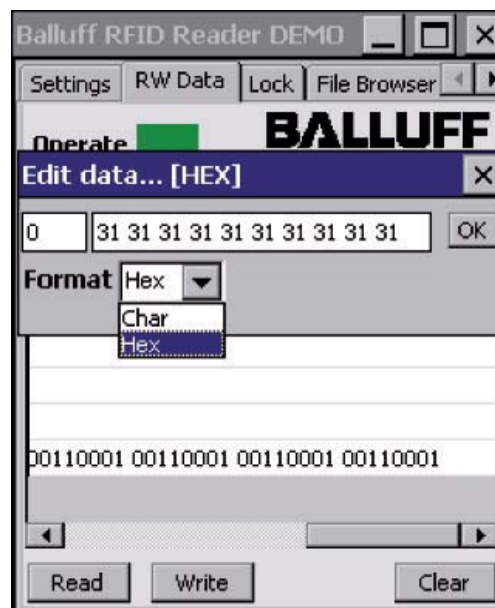
► Tap on a data line in the display window.
  ⇒ The entry field **"Edit data…"** opens.
  ⇒ The data can be changed using the keyboard.
► Confirm the change with **[OK]**.
  ⇒ The entry field is closed, the changed data are displayed on the **"RW Data"** tab.

3 Getting Started

"File Browser"
tab

"File Browser" can be used to load or save files.

Fig. 14: "File Browser" tab

[Open]
Opens the dialog **"Open file…"**.
A saved file can be selected and opened.
The data are displayed on the **"RW Data"** tab.

[Save]
Opens the dialog **"Save file as…"**.
The data (from the display field on the tab **"RW Data"**) can be saved in a file.

3 Getting Started

"About" tab   Display of the software version and manufacturer information.

Fig. 15: "About" tab

Handheld Programmer
BIS L-87_

4.1 Function principle of Identification Systems

The BIS L portable 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 portable BIS L Identification System are:
– Handheld Programmer,
– 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 safety-relevant data,
– In tool coding and monitoring,
– In process equipment organization,
– In warehousing for monitoring stock movement and levels,
– In transporting and conveying,
– In waste disposal for quantity-based fee assessment.

4.2 Product description

Handheld Programmer BIS L-87_:
– Plastic housing,
– Reading/writing using built-in antenna,
– Power for system components provided by 3.7V lithium-ion battery pack,
– Editor function for editing data to be read or written,
– Saving/loading files.

Creating your own operating interface

> **ℹ Note**
> The BALLUFF.dll software is available for creating a custom tailored operating interface. This application can be ordered separately. The ordering code is available on demand.

4.3 Control function

The Handheld Programmer is the link between data carrier and controlling system. The Handheld Programmer can be used to check, correct or initialize data carriers.
The data read on the equipment can be stored in the Handheld Programmer and sent at a later time to the host system.

Host systems may be the following:
– A control computer (e. g. industrial PC),
– a PLC.

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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 Handheld Programmer is for double reading with comparison. Alternately the CRC_16 data check can be selected.
Here a check code is written to the data carrier which always allows the data to be checked for integrity.

Which procedure should be used depends on how the identification system is used.

> **i** **Note**
> Mixed operation of both check procedures is not possible!

Data check

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

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

4.5 Files

Data read from a data carrier can be saved under a file name or saved files can be loaded.

> **i** **Note**
> User data are by default saved in a RAM-based folder. The data in this RAM folder are lost if the main battery pack and backup battery pack are fully drained or if the device is cold started. The safest place to store the data is an SD or MMC memory card (Flash Disk).

File format

Start address of the data on the data carrier	No. of bytes	Data carrier data
4 bytes	4 bytes	max. 184 bytes

Example: Data carrier file starting at Address 75 with 16 bytes of data in ASCII format.
Data: ABCDEFGHIJKLMNOP

Contents of data carrier file: 00750016ABCDEFGHIJKLMNOP

4   Basic knowledge

4.6 Data carrier types

The following data carrier types are available for the BIS L-87_ Handheld Programmer.
Depending on the instrument settings, can either 'ALL' or only one special data carrier 'TYPE' be processed.

Datenträger-Typ	Daten
BIS L-10_-01/L	192 Byte user data (read-/writable) + 4 Byte unique serial number (read only).
BIS L-10_-05/L	192 Byte user data (read-/writable) + 4 Byte unique serial number (read only). OR by data carrier management: 5 Byte unique serial number (read only) matches the user data.
BIS L-20_-03/L	192 Byte user data (read-/writable) + 5 Byte unique serial number (read only).

> **i**   **Note**
> – BIS L-10_-01/L data carrier types will be delivered in $FF_{hex}37_{hex}$ configuration. Only data carrier types in this configuration will be processed.
> – The data carrier type BIS L-10_-01/L contains additional memory areas for configuration and protected data. These areas cannot be processed with the Handy-Programmer BIS L-87_.
> – For data carrier type BIS L-10_-05/L the data division can be changed once only, with the Handy-Programmer BIS L-87_ (data carrier transformation).

4.7 CRC check

The CRC check is a procedure for determining a check value for data in order to be able to recognize transmission errors. If the CRC check is activated, an error message is sent when a CRC error is detected.

Initializing

To use the CRC check, the data carriers must be initialized (see "Initializing data carriers" starting on page 24).
If the data carrier does not contain the correct CRC when reading or writing, the Handheld Programmer sends the error message 'CRC-Error'.
Data carriers as shipped from the factory can be written immediately with a checksum, since all data are set to 0.

Error message
– If an error message is the result of a failed write job, the data carrier must be reinitialized to make it usable again.
– If an error message is not the result of a failed write job, the one or more memory cells in the data carrier is likely defective. The data carrier must be replaced.

Checksum

The checksum is written to the data carrier as 2 bytes of information. 2 bytes per block are sacrificed. This leaves 14 bytes per block available. The usable number of bytes can be found in the following table.

Data carrier type	Memory capacity (bytes)	Usable bytes for CRC_16
BIS L-10_-01/L	192 Byte	168 Byte
BIS L-10_-05/L	192 Byte or 5 Byte	168 Byte or 3 Byte
BIS L-20_-03/L	5 Byte	CRC_16 is not supported

5 | **Technical Data**
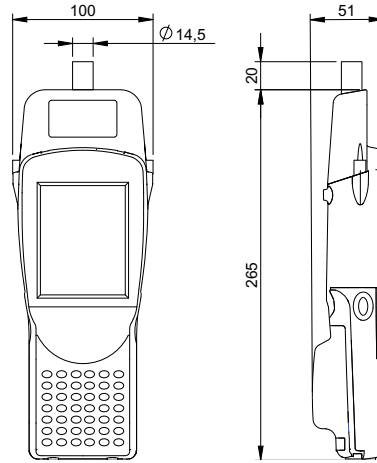
Dimensions

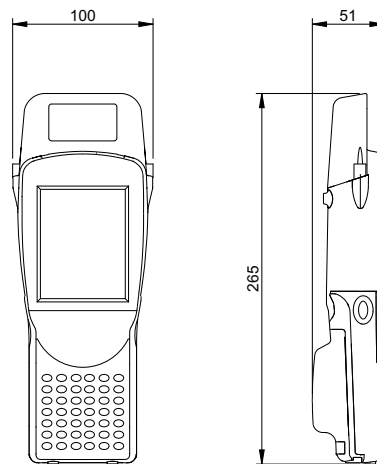

Fig. 33: BIS L-870-1-008-X-000 dimensions (in mm)
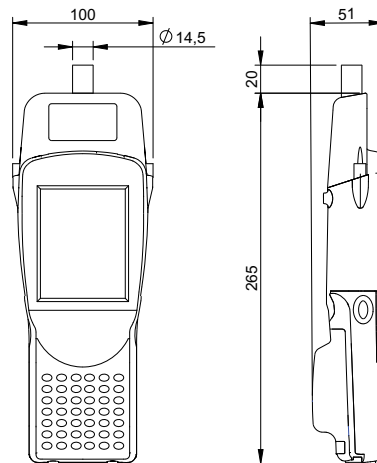

Fig. 34: BIS L-871-1-008-X-000 dimensions (in mm)

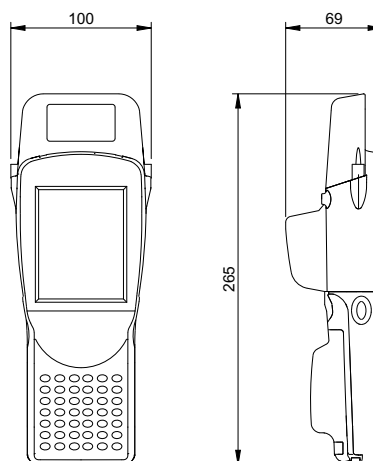

Fig. 35: BIS L-873-1-008-X-000 dimensions (in mm)

Handheld Programmer
BIS L-87_

Fig. 36: BIS L-870-1-008-X-002 dimensions (in mm)

Housing

Weight (including battery pack)	585 grams
Keyboard	46 buttons, alphanumeric
Display	Touchscreen TFT 3.6"
Enclosure rating	IP 65

Connections

Read head connection	Built-in antenna
Charging socket	2.5 mm jack socket

Electrical Data

Operating voltage VS		3.7 V
Current consumption	Normal operation	approx. 300 mA
	Reading/writing	approx. 450 mA
Voltage and current supply	Type	3.7 V, Lithium Ion rechargeable
	Capacity	4000 mAh
	max. charging voltage	5 V
	Charging current	0.9 A
	Charging time	5 h
Battery lifes	see page 7	48 h

Operating Conditions

Ambient temperature range	-10 °C … +50 °C
EMC – EN 61000-4-2/3/4/5/6 – EN 55011	– Severity Level 3A/3A/–/–/– – Gr. 1, Cl. A
Vibration/shock	EN 60068 Part 2-6/27/29/64/32

Appendix

Type designation code

Balluff Identification System ──────────────── BIS L – 87_ – 1 –008 – X – 000

Series L Read/Write System ────────────────

Hardware type ────────
  870 =   Portable reader with integrated read/write head
           for data carriers with Ø > 20 mm
  871 =   Portable reader with integrated read/write head
           for data carriers BIS L-15_-XX
  873 =   Portable reader with integrated read/write head
           for data carriers with Ø < 20 mm

Interface ────────
  1 = Bluetooth

Software type ──────────
  008 =   Balluff Software for BIS _-87x-...

Language ────────
  X = Multilingual

Additional features ──────
  000 =   Standard
  001 =   With WLAN
  002 =   With 1D barcode scanner
  003 =   With 2D barcode/matrix scanner
  004 =   With WLAN and 1D barcode scanner
  005 =   With WLAN and 2D barcode/matrix scanner

Accessory (scope of delivery)

Type	Ordering code
Power supply	11023835

Accessories (optional, not included in scope of delivery)

Type	Ordering code
Replacement stylus (package of 5)	11023833
Docking Station	11023834
Handle	11023836

Handheld Programmer
BIS L-87_

Accessory Charger Handheld Programmer

Features
– Consisting of charger/power supply with 2.5mm jack plug,
– primary connector EURO, UK, US interchangeable (included),
– CE, UL approvals.

Technical Data

Primary voltage $U_{primary}$	100-240 V_{AC}
Secondary voltage U_{sec}	6 $V_{DC\,\pm\,5\,\%}$
Input frequency $F_{primary}$	50-60 Hz
Secondary current I_{sec}	2,1 A
Ambient temperature range T_a	–40 °C ... +70 °C
Material	PPE-V1-125 °C
Color	black
Material number	11023835
Color	black

Accessory Docking Station

Features
– Consisting of charger/power supply with charge status indicator and charging cradle,
– primary connector EURO, UK, US interchangeable (included),
– CE, UL approvals.

Charge status indicator
LED red   Battery charged
LED red flashing   Battery charging

Technical Data

Primary voltage $U_{primary}$	100-240 V_{AC}
Secondary voltage U_{sec}	6 $V_{DC\,\pm\,5\,\%}$
Input frequency $F_{primary}$	50-60 Hz
Secondary current I_{sec}	800 mA
Ambient temperature range T_a	–40 °C ... +70 °C
Material	PPE-V1-125 °C
Color	black
Material number	11023834
Color	black

www.balluff.com