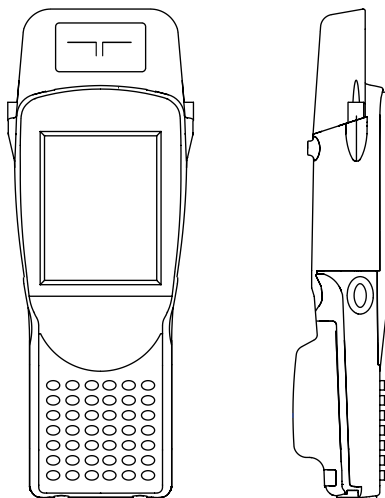


Handheld Programmer BIS U-870

Quick Guide



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1 User instructions

1.1 CE Declaration of Conformity and user safety



Declaration of Conformity

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



Note

You can request a Declaration of Conformity separately.
For additional safety instructions, refer to [Section „Safety“ on page 6](#).

1.2 Scope of delivery

Included in the scope of delivery:

- Handheld Programmer BIS U-870
- BIS Software-CD
- AC adapter
- Operating instructions in printed form (GER/ENG)

1.3 About this manual

This manual describes operation of the BIS U-870 Identification System together with the „Workabout Pro“ handheld computer made by PSION Teklogix GmbH.

This 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.

Refer to the manuals from PSION Teklogix GmbH [on the enclosed CD](#) for this information.

You can find the current documentation on the Internet at <http://www.pSION-teklogix.com/>.

1.4 Structure of the manual

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: Technical data for the Identification System.

1 User instructions

1.5 Typographical conventions

The following conventions are used in this manual.

Enumerations

Enumerations are shown as a list with an 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 (see „Technical Data“ starting page [24](#)).

Buttons

Buttons are set in square 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.

Keys

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

1.6 Symbols



Attention!

This symbol indicates a safety instruction that absolutely must be followed.



Note, tip

This symbol indicates general notes.

1.7 Abbreviations

BIS	Balluff Identification System
EEPROM	Electrically Erasable Programmable Read Only Memory
EMC	Electromagnetic Compatibility
EPC	Electronic Product Code
PC	Personal Computer
RFID	Radio Frequency Identification
PLC	Programmable Logic Controller
TID	Tag Identifier

2 Safety

2.1 Intended use

The BIS U-870 Handheld Programmer is a component of the BIS U Identification System. Within the Identification System it checks, corrects, or initializes data carriers.
The Handheld Programmer may only be used for this purpose in an industrial environment corresponding to Class A of the EMC Law.
This description is valid for Handheld Programmers of series BIS U-870-1-008-...

2.2 General safety notes

Startup

Startup is only to be performed 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 only to be operated using the power supply approved for the device (see „Technical data“ on page 24).

Operation and testing

The operator is responsible for ensuring that locally applicable safety regulations are observed. In the event of defects and non-correctable faults in the Identification System, take the system out of service and secure it from unauthorized use.

2.3 Notes on using and returning 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 type or a type recommended by the manufacturer.



Note

Every user is legally obligated by the German Battery Ordinance to return all regular or rechargeable batteries that have been used or spent. Disposal with household waste is prohibited. Old batteries and rechargeable batteries can be returned without charge at your municipal collection point and anywhere that batteries and rechargeable batteries of the type in question are sold. You can also return the included batteries to the following address (with sufficient postage) after using them:
Balluff GmbH, Schurwaldstraße 9, 73765 Neuhausen a.d.F., Germany



Attention!

Use only Balluff-approved power supplies.

2.4 Meaning of the warning notes



Attention!

The pictogram used with the word „Attention“ warns of a situation that could harm someone's health or damage equipment. Failure to observe these warning notes may result in injury or damage to equipment.

- Always take the described measures to prevent hazardous situations.

2 Safety

2.5 Safety distance between transmitter antenna and persons



Note

The International Commission of Radiological Protection (ICRP) has specified limit values for the exposure of humans to RF fields. These limit values are also recommended by the ICNIRP (International Commission of Non Ionizing Radiological Protection). Acc. to IEC 62369 „Evaluation of human exposure to electromagnetic fields from short range devices (SRDS) in various applications over the frequency range 0 GHz to 300 GHz“, the following limit values apply for UHF systems in the frequency range 860-930 MHz:

- Electric field strength: $E = 41.25 \text{ V/m}$
- Magnetic field strength: $H = 0.111 \text{ A/m}$
- RF power density: $E \times H = 4.57 \text{ W/m}^2$

For the maximum permissible radiated power acc. to ETSI, the safety distance should be maintained. This means that persons should not remain closer than 26 cm to the transmitter antenna for longer periods of time (several hours without interruption). Brief periods near the antenna (distance $< 0.26 \text{ m}$), even if repeated, pose no cause for concern according to current knowledge. Reducing the transmission power also reduces the required safety distance. With this device, a transmission power of 0.5 W is possible and the minimum safety distance that is to be maintained is $d = 0.13 \text{ m}$.

2.6 Impairment of transmission power



Note

To avoid negatively impacting the transmission power, please make certain that there are no objects between the Handheld Programmer and the data carrier.

3 Getting Started

3.1 Battery operation



Note

The system components of the Handheld Programmer are powered by a 3.7 V rechargeable battery pack (Li-Ion).

- Please charge rechargeable batteries provided by Balluff before using them for the first time!

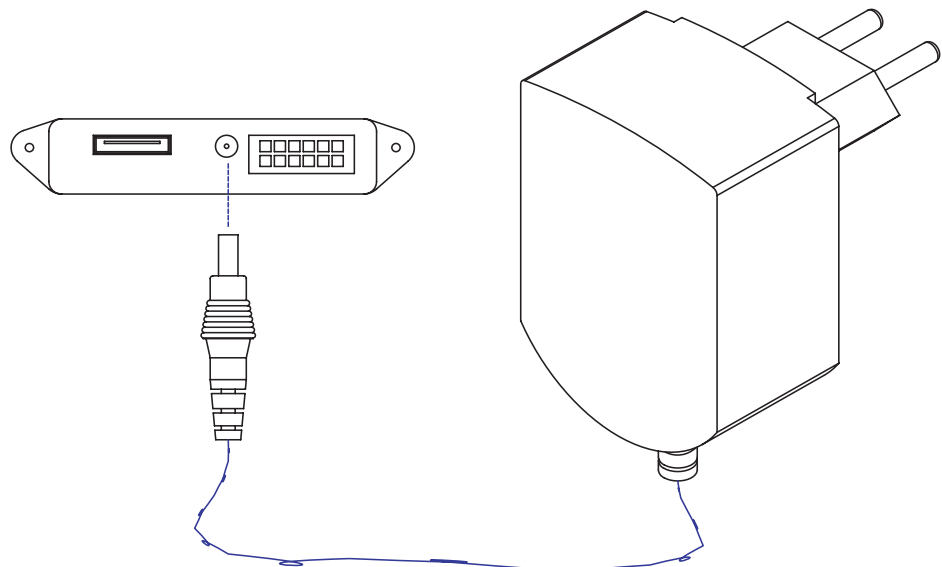


Fig. 1: Connecting the power supply – Charging the battery pack

Changing rechargeable batteries and operating life

A high-capacity rechargeable battery has a battery life of up to 48 hours after a full charge. Prerequisite: 200 read/write operations, after 3 minutes without being used, the device enters Suspend Mode. Data in the Handheld Programmer are retained for at least 10 to 15 minutes while the battery is being replaced.



Note

User data are saved by default 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 restarted cold (see also „Cold Reset“, Section 3.3 on page 9). The safest place to store the data is an SD or MMC memory card (flash disk).



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.

Charging rechargeable batteries

- Insert the device into the docking station or connect the power supply



Note

When using a docking station, an uncharged battery pack may be inserted. Then simply dock the unit and turn it on.

3 Getting started

3.2 Overview of WORKABOUT PRO

BIS U-870

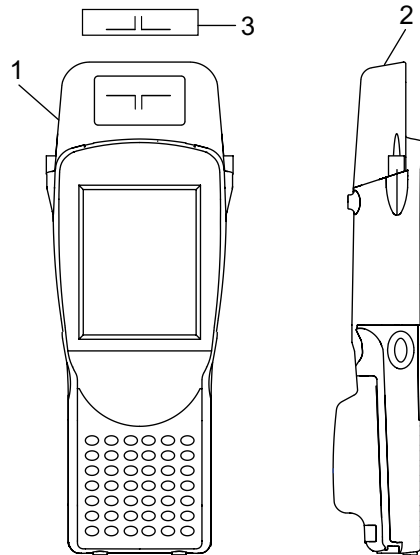


Figure 2: BIS U-870-1-008-X-000 Handheld Programmer

- 1 Read/write head for BIS U data carrier
- 2 Active surface read
- 3 BIS U data carrier



Note

Hold elongated data carriers to the antenna of the Handheld Programmer sideways so that they can be detected by the Handheld Programmer .

3.3 COLD RESET or battery replacement



Note

Removing the battery pack or performing a cold reset will delete data, drivers, and settings from the unit's RAM!

The „**Total Recall**“ program can be used to save the personal profile so that it is automatically loaded after a cold reset.

The „**Total Recall**“ program 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 <Total Recall> program (or select it and in the upper left corner select <File> and <open>).
- A new window opens; click <Create Profile>; the following window opens:
- Change <Type> to <AutoRestore>.
- Keep <Profile Location> (should be set to <\Flash Disk>).
- Click on <Next>.
- A new window opens. Select <Default Backup>. Press <Create Profile>.

3.4 Turning the Handheld Programmer (Workabout Pro 3) on/off

Requirements:

- Supply voltage is present (battery pack inserted and charged, device is in the docking station or power supply is connected).

3 Getting started

	 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 <Power> for at least 1 second. As soon as the LED flashes green, release the <Power> button again. ⇒ The start screen <Today> is displayed.
	 Note If the device was used previously, it may be in Suspend mode; press <Power> to reactivate the unit. The screen in which you were working before the computer switched to Suspend mode is displayed again.
Turning off	– Suspend mode – ► Press the <Power> button to turn off the WORKABOUT PRO 3 or ► Select „Shutdown > Suspend“ from the Start menu.
3.5 Turning the Handheld Programmer (Workabout Pro G2) on/off	Requirements: – Supply voltage is present (battery pack inserted and charged, device is in the docking station or 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 LED flashes green, release the <ENTER> key again. ⇒ The start screen <Today> is displayed.
	 Note If the device was used previously, it may be in Suspend mode; press <ENTER> to reactivate the unit. The screen in which you were working before the computer switched to Suspend mode is displayed again.
Turning off	– Suspend mode – ► Press <FN> (blue) and then <ENTER> to shut off the WORKABOUT PRO G2 or ► Select „Shutdown > Suspend“ from the Start menu.
3.6 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 or on the Internet at: http://www.pSION-teklogix.com/
3.7 Creating your own operating interface	 Note The UHF CAEN Reader software development kit can be used to create a custom user interface. The software development kit can be downloaded from http://www.pSION-teklogix.com/.

Getting started

3.8 Starting the RFID application

On the Windows CE desktop, tap on **„Start > Programs > BALLUFF RFID > BIS U RFID“** (depending on the Windows CE® version, tap on the four-color Windows® logo instead of „Start“). (See Fig. 3) or,

- ▶ Tap the **„BIS U RFID“** shortcut on the desktop.
 - ⇒ The **„BIS U RFID“** application starts.
 - ⇒ The start screen is displayed.

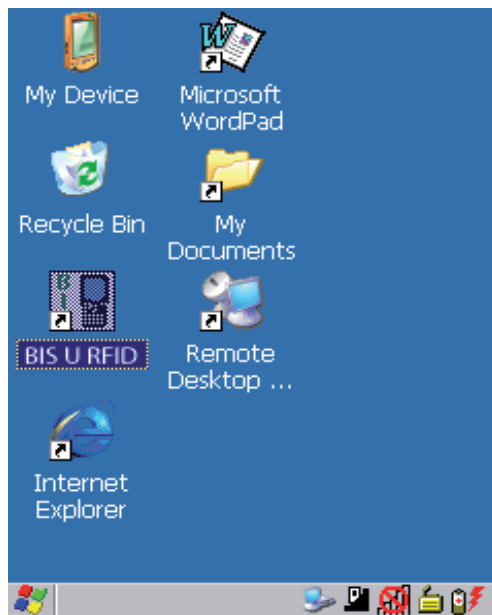


Fig. 3: Windows CE desktop



Fig. 4: Balluff application start screen

3.9 Operating menu overview

After the start screen, the **„Configuration“** tab is displayed.

„Configuration“
tab

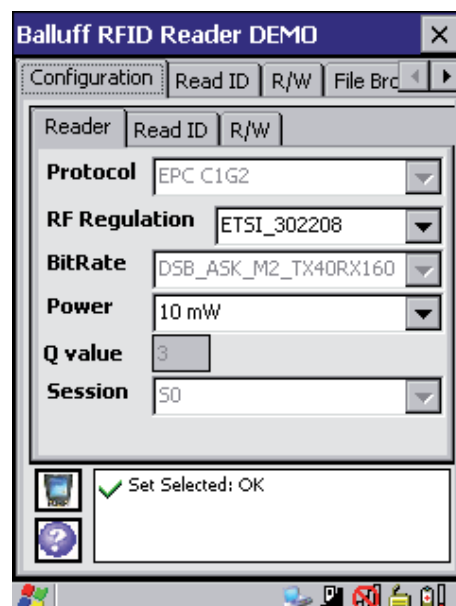


Figure 5: „Configuration“ tab, „Reader“ submenu

3 Getting started

„Reader“ submenu

This tab is divided into three submenus: „Reader“, „Read ID“ and „R/W“. The following settings can be made under the „Reader“ menu:

Protocol

EPC C1G2 is set by default.

RF Regulation

Select the RF regulation applicable in the given region. Select either „ETSI_302208“ or „FCC_US“.

BitRate

DSB_ASK_M2_TX40RX160 is preset as the default BitRate.

Power

Power defines the power made available by the reader. Select a power from 10 mW to 500 mW.

Q-Value

Q-Value defines the minimum value of Q. This is the number of time windows per round during the anti-collision phase. The number of time windows is 2^Q . The value „3“ is preset as the default.

Session

Each of the four indicators refers to an identification session. After the data carrier (tag) has been identified, this changes the status of the indicator of the session in which it was just identified. „S0“ is preset as the default value.

Information window

Click icon **A** to call up the current program version.

Click icon **B** to call up details about the reader, such as the FW version.



Figure 6: „Configuration“ tab, „Reader“ submenu

Getting started

„Read ID“
submenu

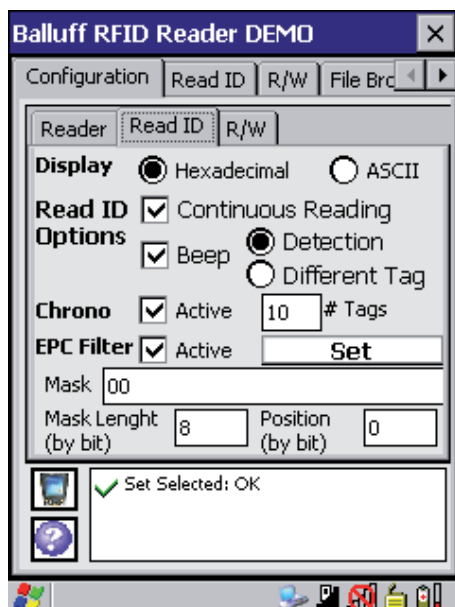


Figure 7: „Configuration“ tab, „Read ID“ submenu

Display

Select the display mode. The display in the Read ID window can be either ASCII or hexadecimal.

Read ID Options

The following settings are possible:

Continuous Reading:	Continuous reading. If this option is enabled, read requests are carried out automatically at the set interval.
Beep:	Output an audio signal. If „Beep“ is activated, one of the following options can be selected: Detection: If „Detection“ is activated, a signal sound is output following each successful read. Different Tag: If „Different Tag“ is activated, a signal sound is output following the first successful read.

Chrono

If this option is activated, the time for reading a defined number of different data carriers is output (stopwatch function).

EPC Filter

If this option is selected and the **[SET]** button is clicked, the EPC filter in the Read-ID window is used. The individual input fields have the following functions:

Mask:	Field of bytes in hexadecimal form
Mask Length:	Mask length in bits (not bytes)
Position:	Position at which the mask begins with its defined length

Example: EPC = „FF3804714277360000093188“, if the EPC filter with mask F380 is activated, the mask length is 16 (16 bits = 2 bytes) and the position is 4 (1/2 byte), the Read ID operation returns all data carriers with the following EPC code: „x F380xxxxxxxxxxxxxxxx“.

3 Getting started

„R/W (Read/
Write)“ submenu

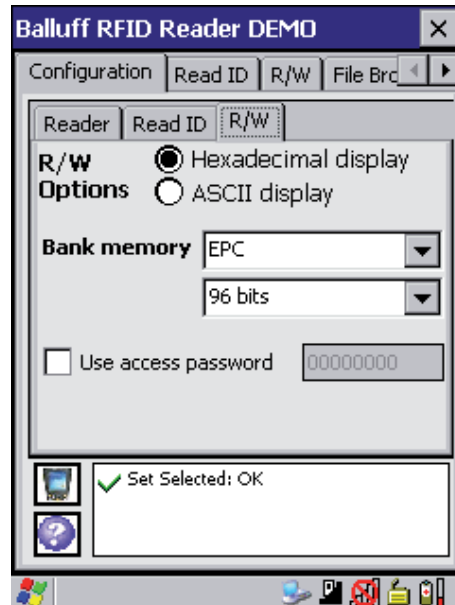


Figure 8: „Configuration“ tab, „R/W“submenu

R/W (Read/Write) Options

Select the display mode The display in the R/W window can be either ASCII or hexadecimal.

Bank memory

Defines for the R/W window which memory bank of the data carrier is to be read and written. Select from the following memory banks: RESERVED, EPC, TID, USER.

RESERVED	Contains the destruction and/or access passwords. This memory bank is read-only.
EPC	EPC is the ID of the data carrier. Depending on the setting of the second selection list, you can read and write 96, 240 or 512 bits. Note: Only available for EPC C1 G2 Air Protocol Version 1.2.
TID	Memory bank for the manufacturer information of the data carrier. You can read 32 or 64 bits (read-only).
USER	Memory bank for reading and writing user data with 96 or 512 bits.

Use access password

You can protect the EPC memory bank of the data carrier with a password. To do this, activate the check box to the left of „Use access password“ and define an access password for writing a new EPC.

Getting started

„Read ID“ tab

You can read the ID of a data carrier on the „Read ID“ tab.

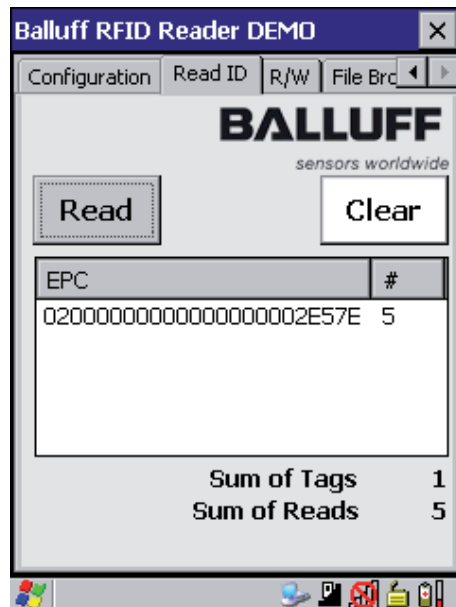


Figure 9: „Read ID“ tab

[Read]

The **[Read]** button can be used to start the read operation.

[Clear]

Use this button to delete the data that were read from the information window.

Information window

The data that were read are displayed here. The number combination shown in the „EPC“ column is the electronic product code (EPC - Electronic Product Code) of the data carrier. The number in the „#“ column shows the total number of successful read operations.

Sum of Tags

Shows how many different data carriers were read.

Sum of Reads

Shows the total number of successful read operations.

3 Getting started

„R/W“ tab

On the „R/W“ tab, you can read information from the memory of a data carrier or write information to the memory.



Figure 10: „R/W“ tab

Operate

Status indicator. As soon as reading or writing begins, the status indicator flashes yellow.

[Read]

This button can be used to start a read operation. Once started, the label of this button changes to **[Abort]** (abort read operation). If the read operation was successful, „Reading succeeded“ appears in red text to the right of the **[Read]** button and the result is displayed under the **[Read]** button.

[Copy]

This button can be used to copy the read data in order to use them during the write operation.

[Write]

Start a write operation. Once the write operation is started, the label of this button changes to **[Abort]** (abort write operation). If the write operation was successful, „Writing succeeded“ appears in red text to the right of the **[Write]** button and the result is displayed under the **[Write]** button.

[Clear]

Clears the data read so far from the information window and the input window.

Getting started

„File Browser“ and „About“ tabs

On the „File Browser“ tab, you can save the read data, load existing data or export Read-ID data.

On the „About“ tab, information on the software version and the manufacturer details are displayed.

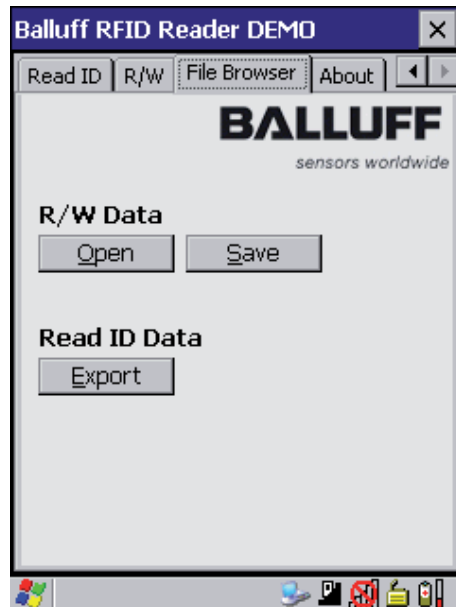


Figure 11: „File Browser“ tab



Figure 12: „About“ tab

[Open]

Opens the „Open file...“ dialog. You can select and open a saved file. The loaded data are displayed on the „R/W“ tab below the [Write] button.

[Save]

Opens the „Save file as...“ dialog. The data (from the information window below the [Read] button in the „R/W“) tab can be saved in a file.

[Export]

Opens the „Save file as...“ dialog. The read ID Data from the information window in the „Read ID“ tab can be saved in a file.

4 Basic knowledge

4.1 Function principle of Identification Systems

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

The main components of the portable BIS U 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 U-870:

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

Creating your own user interface



Note

The UHF CAEN Reader software development kit can be used to create a custom user interface. The software development kit can be downloaded from <http://www.psion-teklogix.com/>.

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.

4.4 Files

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



Note

User data are saved by default 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 restarted cold. The safest place to store the data is an SD or MMC memory card (flash disk).

4 Basic knowledge

File format

Type of memory bank (0x00=RESERVED, 0x01=EPC, 0x02=TID, 0x03=USER)	No. of bytes	Data carrier data
---	--------------	-------------------

1 byte	2 bytes	n bytes
--------	---------	---------

Example: Data carrier file from the USER memory bank with 12 bytes of data.
Data: ABCDEFGHIJKL

Contents of the data carrier file in HEX format:
03 0C 00 41 42 43 44 45 46 47 48 49 4A 4B 4C

4.5 Data carrier types

Only data carriers that satisfy standard EPC C1G2 can be used with the BIS U-870. You can obtain more detailed information upon request.

5 Technical data

Dimensions

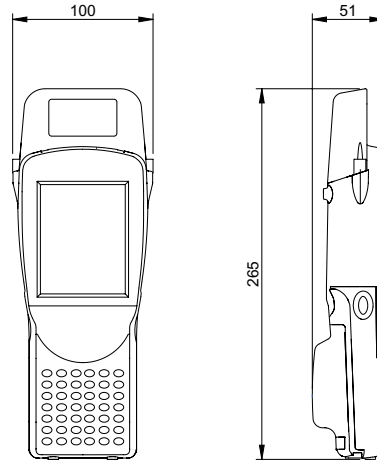


Figure 18: BIS U-870-1-008-X-000 dimensions (in mm)

Housing

Weight (including battery pack)	585 grams
Keyboard	46 keys, alphanumeric
Display	Touchscreen TFT 3.6"
Degree of protection	IP 65

Connections

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

Electrical data

Operating voltage V_s		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 battery
	Capacity	4000 mAh
	Max. charging voltage	5 V
	Charging current	0.9 A
	Charging time	5 h
	Battery lifes	8 h

Operating conditions

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

Appendix

Part designation code

	BIS	U	- 870 -	1	- 008 -	X	- 000
Balluff Identification System							
Series U Read/Write System							
Hardware type							
870 = Portable reader with integrated read/write head							
interface							
1 = Bluetooth							
Software type							
008 = Balluff software for BIS _-87x-...							
Language							
X = Multilingual							
Additional features							
000 = Standard							
001 = WLAN Module:							
– Model No: RA2041							
– Designation: 802.11b/g Direct Sequence (DS)-Extended Range Radio (CCX-Certified)							
002 = 1D Scanner:							
– Model No.: WA9000-G1							
– Designation: 1D xMod SE1223 High Performance Scanner							
003 = 2D Scanner:							
– Model No : WA9212-G1							
– Designation: 2D Slim Pod HHP 5180 Imager							
004 = With WLAN and 1D barcode scanner							
005 = With WLAN and 2D barcode/matrix scanner							

Accessory (scope of delivery)

Type

Power supply

Ordering code

11023835

Accessories (optional, not included in scope of delivery)

Type

Replacement stylus (package of 5)
Docking Station
Handle

Ordering code

11023833
11023834
11023836

Appendix

Handheld Programmer charger accessory

Features

- Consisting of charger/power supply with 2.5 mm 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} ± 5 %
Input frequency F_{primary}	47-63 Hz
Secondary current I_{sec}	2.1 A
Ambient temperature T_A	–40 °C ... +70 °C
Material	PPE-V1-125 °C
Color	Black
Part no.	11023835
Color	Black

Accessories 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} ± 5 %
Input frequency F_{primary}	50-60 Hz
Secondary current I_{sec}	800 mA
Ambient temperature T_A	–40 °C ... +70 °C
Material	PPE-V1-125 °C
Color	Black
Part no.	11023834
Color	Black



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