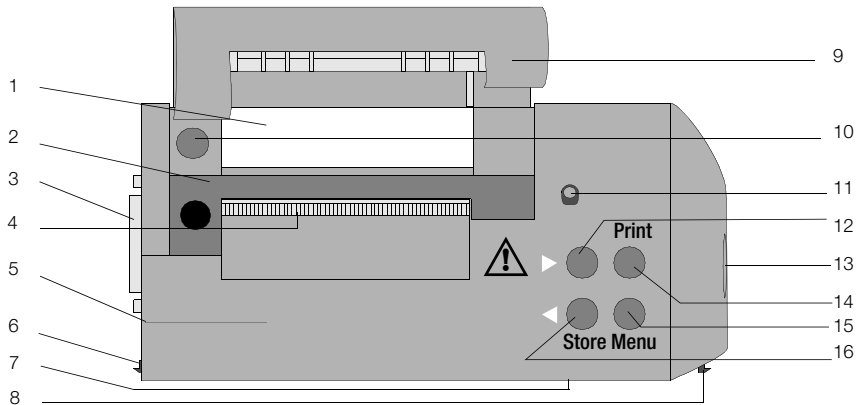


PROFITEST[®] PSI-E





- 1 Recording Chart
- 2 Ink Cartridge
- 3 RS 232 Port
- 4 Recording Chart Outlet with fold-down tear-off edge
- 5 Battery Compartment for 4 ea. 1.5 V mignon cells (rear panel)
- 6 Fixed Snap Hook
- 7 Infrared Transceiver Diode
- 8 Moving Snap Hook
- 9 Paper Compartment Cover
- 10 RESET Button
- 11 Functions LED
- 12 ► Adjustment Key FORWARDS/LARGER („>“ in the text)
- 13 Release Button
- 14 **PRINT** Key for printing function, paper advance and for the display of memory contents at the PROFITEST®0100S-II test instrument
- 15 **Menu** Selection Key as well as for cursor control

- 16 ◀ Adjustment Key BACKWARDS/SMALLER („<“ in the text) or **Store**, respectively (for direct storage of measured values)



Data Backup

The measurement and input data are stored and secured in the PSI module RAM as long as the associated battery supplies the required voltage. We advise you to regularly transmit your stored data to a PC in order to prevent potential loss of data in the PSI module. We assume no responsibility for any data loss. For data processing and management we recommend the following PC software:

- PS3 (transfer of measurement data to the PC, documentation, management, report generation and monitoring of deadlines)
- WinProfi (exchange of measurement data between PSI module and PC, preparation, print-out and archiving of test reports at the PC; available as freeware on the internet)
- PC.doc-WORD (report and list generation)
- PC.doc-ACCESS (test data management)

Contents	Page
1 Applications	6
2 Safety Features and Precautions	6
3 Initial Start-Up	7
3.1 Installing the Ink Cartridge and the Batteries	7
3.2 Attaching and Removing the PSI Module	9
3.3 Resetting the PSI Module Functions	9
4 Operation	10
4.1 Activating the PSI Module	10
4.2 Storing Measured Values to Memory	11
4.2.1 Direct Storage of Measured Values	11
4.2.2 Activating Automatic Memory	12
4.2.3 Deactivating Automatic Memory	13
4.3 Selecting an Object and an Electrical Circuit	14

Contents	Page
4.4 Reviewing and Printing Stored Measured Values	16
4.4.1 Printing Measured Values for the Active Circuit	16
4.4.2 Printing Measured Values for Stored Circuits	17
4.4.3 Hard Copy Print-Out at the PSI Module	19
4.4.4 Hard Copy Print-Out with External A4 Printer	19
4.5 Displaying and Printing the List of Stored Electrical Circuits	21
4.6 Deleting Stored Measured Values	22
4.7 Deleting the Entire Memory	24
4.8 Transmitting Measured Values via the Serial Data Interface	26
4.9 Setting the Date and Time	26
4.10 Error Message Assistance	27
5 Characteristic Values	29

Contents	Page
6 Maintenance	31
6.1 Batteries	31
6.2 Recording Chart Paper	31
6.2.1 Inserting the Recording Chart	32
6.3 Ink Cartridges	32
6.3.1 Replacing the Ink Cartridge	33
6.4 Housing	33
7 Appendix	34
7.1 Abbreviations and their Meanings	34
8 Repair and Replacement Parts Service DKD Calibration Lab and Rental Instrument Service	35
9 Product Support	35

Contents	Page
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1 Applications

The PROFITEST®PSI-E module has been especially designed as an accessory device for use with the PROFITEST®0100S-II test instrument. The PSI module can be directly attached and secured to the PROFITEST®0100S-II test instrument with two snap hooks.

Values measured with the PROFITEST®0100S-II test instrument within an electrical circuit are transmitted directly to the PSI module with an infrared transceiver diode and stored there to memory. All measured values from a total of up to 200 electrical circuits can be stored at the PSI module.

Measured values are printed out for each individual electrical circuit in the form of a measurement and test report including date and time of testing.

Stored measured values can be uploaded to a PC from the PROFITEST®PSI-E module via the RS 232 port, and can be archived or printed out in a predefined report template with a special PC software, see “Data Backup” on page 3.

2 Safety Features and Precautions

When used for its intended purpose, safety of the operator, as well as that of the instrument, is assured.

An electrically conductive plastic has been used to manufacture the housing and provide shielding in order to comply with legal requirements for electromagnetic compatibility (EMC). There is, however, no danger in touching the PSI module during normal operation, because the PSI module is fully isolated from the test instrument, and because no hazardous voltages occur within the PSI module.



Attention!

Voltage conducting components may not be contacted with the housing of the PSI module, because the housing would otherwise become electrically charged. The housing of the PSI module demonstrates conductive, metal-like characteristics.

Read the operating instructions thoroughly and carefully before placing your instrument into service, and follow all instructions contained therein.

3 Initial Start-Up

3.1 Installing the Ink Cartridge and the Batteries

Install the ink cartridge before initial start-up (see Replacing the Ink Cartridge, page 33).

Four commercially available 1.5 V mignon cells in accordance with IEC LR6 are required for operation of the PROFITEST® PSI-E module.



Attention!

Only alkaline-manganese batteries should be used which are in compliance with the IEC LR6 standard. The PSI module does not function correctly if zinc-carbon batteries are used.

Rechargeable NiCd cells may also be used. However, they must be recharged with an external battery charger. Always replace the entire set of batteries. Dispose of depleted batteries in an environmentally sound fashion.



Note

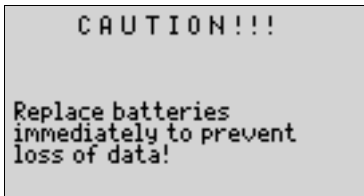
Approximately 3 rolls of recording chart can be printed with one set of batteries.

The battery compartment is located at the rear of the PSI module.

- ⇨ Open the battery compartment by pressing the retainer to the side and removing the cover. Slightly tilting the PSI modules in a backwards direction causes the battery holder to fall from the battery compartment, and can thus be easily removed.
- ⇨ Place four 1.5 V alkaline-manganese mignon batteries into the battery holder poled correctly in the direction indicated by the symbols.
- ⇨ Return the battery holder, along with the batteries, to the battery compartment.
- ⇨ Return the battery compartment cover to the battery compartment and press lightly until it snaps into place.

If battery voltage falls to a level below the acceptable value when the PSI module is initialized (by pressing any key at the PSI module), during printing or during paper advance, the printing sequence is interrupted.

The following message is displayed at the PROFITEST®0100S-II test instrument:



The PSI module is then deactivated. The batteries for the PSI module should be replaced as soon as possible. Stored measured values remain in memory for about 24 hours after the message appears.



Note

Stored data remain in memory for about 10 minutes without any battery voltage while the batteries are being replaced.



Note

Message page 27 may appear at the display when the PSI module is first activated after the batteries have been replaced. In such a case, follow the instructions at the display.



Attention!

Clear the memory completely before initial start-up, because useless data may otherwise remain which disable the downloading of data from a PC. Proceed as described in Deleting the Entire Memory, page 24.

3.2 Attaching and Removing the PSI Module

The PROFITEST® PSI-E module is secured to the swing-out control and display panel at the PROFITEST® 0100S-II test instrument by means of snap hooks.



Note

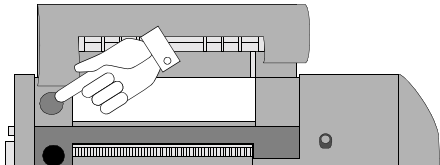
If the test instrument is operated while **lying on its back**, the **support bar** should be opened out before securing the PSI module to the control and display panel at the PROFITEST® 0100S-II test instrument.

- In order to **attach** the PSI module to the control and display panel, insert the fixed snap hook at the PSI module into the slot at the upper left of the test instrument, and press the PSI module until the moving snap hook audibly snaps into its holder (at the right).
- In order to **remove** the PSI module, lift it up and away to the right while holding the release button depressed.

3.3 Resetting the PSI Module Functions

If the PSI module no longer responds to key operations at the control panel, or if the functions LED should remain continuously lit, for example due to an operator error, all PSI module functions should be reset.

- Open the paper compartment cover and press the RESET button (arrow).
The RESET button is located at the left hand side above the ink cartridge.



Note

Pressing the RESET button does not delete stored measurement data from memory.

4 Operation

4.1 Activating the PSI Module



Attention!

Before activating the PSI module, the PROFITEST®0100S-II test instrument **must first** be activated by pressing the yellow “Menu” key.

The PSI module is activated by pressing the MENU key.

Do not press the keys at the PSI module too quickly one after the other. An exchange of data with the PROFITEST®0100S-II test instrument must take place after each key stroke in order to update the display at the test instrument. This takes approximately 0.4 s.

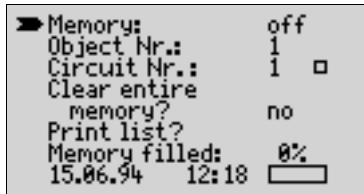
The menu arrow may jump too far if the keys are activated too quickly.

The PSI selection menu appears at the LCD of the PROFITEST®0100S-II test instrument.

The menu arrow is advanced from one field to the next, from the top to the bottom of the PSI menu, by **briefly** pressing the MENU key at the PSI module.

A data entry cursor (underline) appears in the “date and time” lines, which can be moved to the right from one field to the next by **briefly** pressing the MENU key.

If the MENU key is **pressed and held**, the menu arrow jumps to the first item (Memory) in the PSI selection menu.



After 10 seconds – the red lamp goes out

If none of the keys at the PSI module are activated for a period of 10 s, the module is shut down automatically in order to extend battery service life. However, the display at the PROFITEST®0100S-II test instrument remains active. If any of the keys at the PSI module is pressed after these 10 s have expired, the module is reactivated. The key must be pressed a second time in order to execute the corresponding function.

After 15 to 90 seconds ¹⁾ – the LCD is deactivated

If none of the keys at the PSI module are activated for a period of 15 to 90 s, the PROFITEST®0100S-II test instrument is automatically shut down in order to extend battery service life.

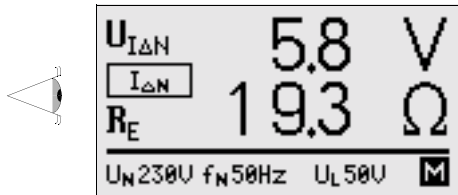
In order to reactivate the PSI module, one of the keys at the **test instrument** must first be pressed, **and then** one of the keys at the **PSI module**.

¹⁾ Adjustable at the PROFITEST®0100S-II

4.2 Storing Measured Values to Memory

4.2.1 Direct Storage of Measured Values

The current value from the PROFITEST®0100S-II test instrument is stored to its respective memory location by pressing the STORE key (compare chapter 4.3, page 14). The “M” symbol briefly appears at the lower right hand corner of the LCD at the PROFITEST®0100S-II during storage to memory.

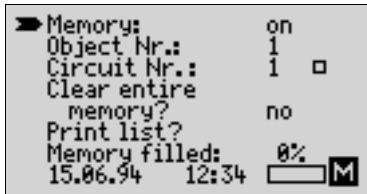


Any previously stored measured value is overwritten.

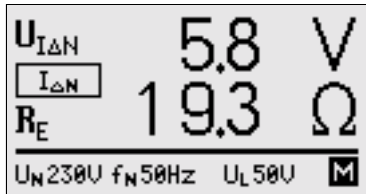
4.2.2 Activating Automatic Memory

When automatic memory is activated, valid measured values recorded with the test instrument are automatically stored to memory by means of a memory program.

- Press and hold the MENU key in order to select the first menu item, "Memory".
- Automatic memory is then activated by pressing the "<" or the ">" key (Memory: on). An "M" at the lower right hand corner of the display indicates that the memory mode is active.



The required measurements can now be performed with the test instrument. The measured values will be automatically stored to the PSI module. It is of no significance if the display is deactivated, the memory mode remains active. However, if the PSI module is removed from the test instrument, and if the test instrument is switched on, the memory mode is deactivated after the first valid measurement is performed ("M" disappears from the display). The fact that the memory mode is active is indicated during measurement within the various menus with an "M" at the lower right hand corner of the display.



Only one valid measured value is stored for a given measured quantity for the duration of measurement within a given electrical circuit. The storage program registers only the optimal value. The following are stored to memory:

Largest Value	Smallest Value	Last Value	Nominal Value	Longest Duration
$U_{I\Delta N}$ I_{Δ} $U_{I\Delta} (R_E)^{1)}$ Z_{Loop} R_I	R_{INS} I_{SLoop} I_{Si}	R_{LO} $R_{E 1)}$ $t_A \cdot I_{\Delta N}$	$U_{Mains}^{2)}$ $f_{Mains}^{2)}$	$t_A \cdot 5 \cdot I_{\Delta N}$

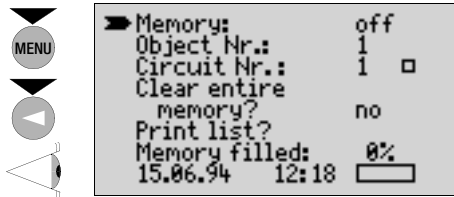
- 1) The calculated $U_{I\Delta N}$ value is also stored at the R_E memory location if no measurement of R_E has been performed in the R_E selector switch position. Measurements performed in the R_E selector switch position take precedence and overwrite the corresponding value measured for $U_{I\Delta N}$. The storage program cannot differentiate between measurements performed with or without a probe (loop).
- 2) The highest value is always stored for measurements within the U_{L-N} range. Nominal voltages and frequencies are stored for the other ranges. The U_{L-N} range takes precedence.

4.2.3 Deactivating Automatic Memory

In order to perform measurements without storing their values, select the "Memory" item in the PSI menu by pressing and holding the MENU key.

- Deactivate automatic memory by pressing the "<" key or the ">" key (Memory: off).

The "M" at the bottom right hand corner of the display disappears.



Previously stored measured values remain in memory.

4.3 Selecting an Object and an Electrical Circuit

In order to provide for clear identification of individual electrical circuits within various objects (construction sites, building stories etc.) a unique identification number must be assigned to each object and each electrical circuit within memory.

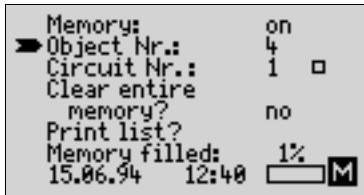
Numbers ranging from 0 to 999 can be selected as identification numbers for each object and each electrical circuit. . The meanings of the different numbers may originate from the building's electrical plans etc., or may be noted separately



Attention!

Measurement data from a maximum of up to 200 electrical circuits can be stored to memory at the PSI module.

- In order to enter the object identification number, repeatedly press the MENU key from within the PSI menu until the menu arrow is pointed at the "Object" item.



- The desired object identification number can now be selected by pressing the "<" or the ">" key.
- The menu arrow is then moved to the "Circuit no." item by once again pressing the MENU key.
- The desired circuit identification number can now be selected by pressing the "<" or the ">" key.



```
➔ Memory:           on
  Object Nr.:       1
  Circuit Nr.:      1 ■
  Clear entire
  memory?           no
  Print list?
  Memory filled:    1%
15.06.94  12:34  [ ] M
```



```
Memory:           on
  Object Nr.:       1
  ➔ Circuit Nr.:    2 □
  Clear entire
  memory?           no
  Print list?
  Memory filled:    1%
15.06.94  12:40  [ ] M
```



Attention!

Circuits for which data have already been recorded are identified with a solid square (■) in the identification number line within the PSI menu.

Circuits for which data have not yet been recorded are represented with an empty square (□) in the identification number line.



Note

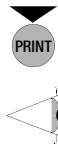
If the "<" or the ">" key is pressed and held during selection of the identification number for an object or an electrical circuit, identification number are decreased or increased in steps of 10 instead of in steps of 1. This allows for rapid selection of identification numbers.

4.4 Reviewing and Printing Stored Measured Values

4.4.1 Printing Measured Values for the Active Circuit

All previously stored data from the active electrical circuit can be queried after the measuring sequence has been completed by pressing the PRINT key.

The most important measured values from the active circuit appear at the test instrument display in tabular form.



RCD(A)	U _{IΔN}	t _{A-IΔN}	I _Δ
N 100m	4.3V	35.0ms	66.0mA
U _{IΔ}	R _E	R _{LO}	R _{INS}
1.3V	40.0Ω	0.17Ω	>100MΩ
Z _{LOOP}	I _{SLOOP}	R _I	I _{PI}
1.80Ω	127A	0.89Ω	258A
OBJECT	CIRCUIT	U _{MAINS}	F _{MAINS}
1	2	230V	50.0Hz



Attention!

If one of the keys at the test instrument is activated, the display is immediately switched to the corresponding measurement window for the test instrument, at which point measurement of the electrical circuit can be continued.

- ⇒ **Prior to issuing a print command:** Disconnect any link to the PC which may have been established (RS232 interface).
- ⇒ If the measured values are correct and complete, start the print job for the active electrical circuit data by pressing the PRINT key once again.

The data can be printed as often as required by pressing the PRINT key.

In addition to current date and time, the print-out includes all of the stored measured values from the electrical circuit, although in a different format than they appear at the display. The printout can, for example, be attached directly to the ZVEH report.

Approximately 2 mm of blank paper are left between two consecutive measurement report print-outs, which corresponds to the clearance used for approval reports as well. If greater clearance is required between two print-outs, you can either pull on the recording chart or activate the paper advance function at the PSI module.

- ⇒ In order to activate the paper advance function directly after a print-out, first press any key at the test instrument or the MENU key at the PSI module, and then press and hold the PRINT key at the PSI module until the desired clearance has been achieved. Print-out is started by once again pressing the PRINT key.

4.4.2 Printing Measured Values for Stored Circuits

Select the desired electrical circuit in the PSI menu (compare chapter 4.3, page 14).



Note

Circuits for which data have already been recorded are identified with a solid square (■) in the identification number line within the PSI menu, and circuits for which data have not yet been recorded with an empty square (□). If the PRINT key is pressed and held for an electrical circuit for which no data have yet been recorded, paper advance is activated.

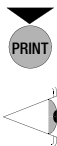
- ⇒ The stored measured values for the selected electrical circuit are displayed at the LCD for review by pressing the PRINT key. If the PRINT key is pressed again, the data are printed out (compare chapter 4.4.1, page 16).

A complete report for a given object can, for example, be prepared by selecting all of its circuits, one after the other, and printing their data out, and can be directly attached to an approval report.

As from software version BD, the data of all electrical circuits of an object can be printed:
Select for this purpose OBJECT with the „<“ key.

Selection	Print-out
CIRCUIT	Data of the electrical circuit currently indicated
OBJECT	Data of all electrical circuits of the selected object

Example: Print-out of all electrical circuits of the selected object.



RCD(A)	U _{1ΔN}	t _{A-1ΔN}	I _Δ
N 100m	4.3V	35.0ms	66.0mA
U _{1Δ}	R _E	R _{LO}	R _{INS}
1.3V	40.0Ω	0.17Ω	>100MΩ
Z _{LOOP}	I _{SLOOP}	R _I	I _{PI}
1.80Ω	127A	0.89Ω	258A
OBJECT	CIRCUIT	U _{MAINS}	F _{MAINS}
1	2	230V	50.0Hz

4.4.3 Hard Copy Print-Out at the PSI Module

The layout of the lines and columns for the measured value table printed out by the PSI module differs from the LCD display, and includes additional information as well.

RCD	UI Δ N	time	5 I Δ N	I Δ	UI Δ
N 30m	2.1V	40.0ms	--- s	23.4mA	1.6V
ZLoop	I Δ Loop	Zi	Ipi	UMains	fMains
3.93 Ω	58A	2.14 Ω	107A	0.6V	50.0Hz
RIns	RE	RLO	Time	Date	Obj/Cir
>300M Ω	66 Ω	0.11 Ω	11:28	13.01.95	1/1

See chapter 7.1 on page 34 for definitions of abbreviations.

4.4.4 Hard Copy Print-Out with External A4 Printer

If the DA-II printer adapter has been connected to the PSI module, all stored data for the selected object are read out exclusively to the external printer when the PRINT key is pressed.

The layout of the lines and columns in the table differs from that of the print-out from the PSI module.

Additional information can be manually added to the empty fields in the print-out if required.



Note

The DA-II printer adapter works with almost all commercially available Centronics printers which are capable of understanding ASCII format. Pure "Windows printers" do not work in combination with the printer adapter. The printer's parameters may have to be adjusted to meet the requirements of the DA-II printer adapter.

Initial Start-Up

- ⇒ Switch the printer off.
- ⇒ Connect the PSI module to the printer via the DA-II printer adapter.

- ⇒ Now switch the printer on.
- ⇒ Then activate the PSI module.
- ⇒ Printing is started by pressing the PRINT key twice.

A4 Report Format (with optional DA-II printer adapter)

Customer:		Object:		Order No.:		Page No. 01	
Inspection result:		-all right-out of order-				Object/Distrib. No.:	
Connection of protection earth:		-all right-out of order-				No.: HALL01/D12	
RCD No.	Lamp outlets xx Socket outlets xx Circuit No.	Cable type size (mm ²) CPC length (m)	Overcurrent Device type Rating Break. cap. A / kA	Zloop Iplloop Zi Ipi	Mains/ Insul. UMains fMains Rins-L Rins-N	IN UL IdN UIdN	RCD type time Id UId
/C21				3.72 Ohm 61 A Ohm	230 V 50.0 Hz >300MOhm Ohm	A V A V	s A V
This installation do - not - accord with 1992 the IEE Wiring Regulations 16th Edition				Date of further inspection:			
Inspected by:		Date:		Signature:			
Address:							
Deviations from Wiring Regulations and special notes:							

4.5 Displaying and Printing the List of Stored Electrical Circuits

In order to determine which electrical circuits have already been stored to memory, a brief overview of these circuits can be displayed and printed with the "Print list?" function in the PSI menu.

- In order to select this function, repeatedly press the MENU key from within the PSI menu until the menu arrow points to "Print list?". The list of stored electrical circuits is displayed at the test instrument's LCD after briefly pressing the PRINT key.

The first number for each entry in the list identifies the object, and the second number identifies the electrical circuit.

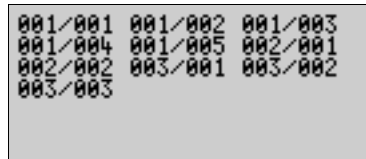
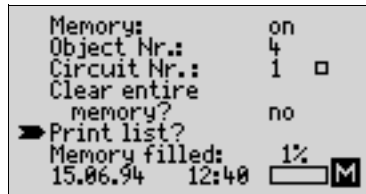


Note

The order in which the entries appear corresponds to the sequence in which measurement data have been recorded, as long as none of the electrical circuits have been deleted.

- If the PRINT key is pressed again, printing is started, or the display scrolls to the next page of stored electrical circuits. In the latter case, printing is started by pressing

the PRINT key once again. The Display can be returned to the PSI menu with the MENU key.



4.6 Deleting Stored Measured Values

Measured values for a given stored electrical circuit can be either deleted or overwritten with new values, separately for each measuring function. Measured values for the other measuring functions remain unchanged.



Attention!

All measured values for a given measuring function must be deleted simultaneously, because the individual values are dependent upon one another.

- In order to delete stored measured values, first select the desired object and electrical circuit with the identification numbers in the PSI menu (compare chapter 4.3, page 14).
- The measurement data from the selected electrical circuit can be displayed at the test instrument by pressing the PRINT key.
- Now press the “<” or the “>” key. The fields which are associated with the first measuring function are now highlighted.
The first field is always highlighted the first time the “<” or the “>” key is activated.



RCD(A)	U _{IΔN}	t _{A-IΔN}	I _Δ
N 100m	4.3V	35.0ms	66.0mA
U _{IΔ}	R _E	R _{LO}	R _{INS}
1.3V	40.0Ω	0.17Ω	>100MΩ
Z _{LOOP}	I _{SLOOP}	R _I	I _{PI}
1.80Ω	127A	0.89Ω	258A
OBJECT	CIRCUIT	U _{MAINS}	F _{MAINS}
1	2	230V	50.0Hz

RCD(A)	U _{IΔN}	t _{A-IΔN}	I _Δ
N 100m	4.3V	35.0ms	66.0mA
U _{IΔ}	R _E	R _{LO}	R _{INS}
1.3V	40.0Ω	0.17Ω	>100MΩ
Z _{LOOP}	I _{SLOOP}	R _I	I _{PI}
1.80Ω	127A	0.89Ω	258A
OBJECT	CIRCUIT	U _{MAINS}	F _{MAINS}
1	2	230V	50.0Hz

- The field within the measuring function which needs to be deleted can now be selected by pressing the “<” or the “>” again.



RCD(A)	U _{IΔN}	t _{A-IΔN}	I _Δ
N 100m	4.3V	35.0ms	66.0mA
U _{IΔ}	R _E	R _{LO}	R _{INS}
1.3V	40.0Ω	0.17Ω	>100MΩ
Z _{LOOP}	I _{SLOOP}	R _I	I _{PI}
1.80Ω	127A	0.89Ω	258A
OBJECT	CIRCUIT	UMAINS	FMAINS
1	2	230V	50.0Hz



- Acknowledge deletion of the stored measurement data by **simultaneously** pressing the “<” and the “>” keys. All measured values for the selected measuring function have now been deleted.

The corresponding measurement data can be recorded again, after the appropriate measuring function has been selected with the meas. range switch at the test instrument.



RCD(A)	U _{IΔN}	t _{A-IΔN}	I _Δ
N 100m	4.3V	35.0ms	66.0mA
U _{IΔ}	R _E	R _{LO}	R _{INS}
1.3V	40.0Ω	0.17Ω	----Ω
Z _{LOOP}	I _{SLOOP}	R _I	I _{PI}
1.80Ω	127A	0.89Ω	258A
OBJECT	CIRCUIT	UMAINS	FMAINS
1	2	230V	50.0Hz



Note

If you want to delete measured values for several measurement functions at the same time, select the appropriate measuring functions one after the other with the “<” or the “>” key, and delete the stored data by simultaneously pressing the “<” and the “>” keys.



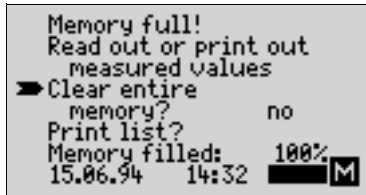
Attention!

If the **CIRCUIT** field has been selected for deletion, all measurement data for the corresponding electrical circuit are deleted. The other circuits remain unchanged.

If the **OBJECT** field has been selected for deletion, all circuits within the selected object are deleted. The circuits from all other objects remain unaffected.

Additional space for new measurements can thus be quickly created, without deleting the entire memory.

If the memory is full, an error message appears at the test instrument display.



In order to continue storing measured values, a part or all of the memory must be deleted.



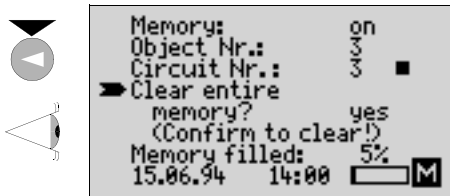
Attention!

Print all stored measured values out before deletion if they might be needed again in the future, or upload and store them to a PC (compare chapter 4.8, page 26).

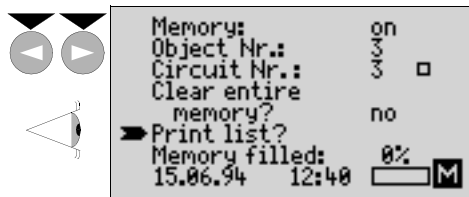
4.7 Deleting the Entire Memory

The amount of memory capacity which has already been occupied at the PSI module can be displayed with the "Memory occupancy: XX%" function in the PSI menu, either as a number or as a graphic representation.

- In order to delete the entire memory, press the “<” or the “>” key after the error message has appeared, or after selection of the “Delete entire memory?” item in the PSI menu.



- Press the “<” and the “>” keys simultaneously in order to acknowledge the function “Delete entire memory?”. All measured values are now deleted and new values can be recorded to memory.



4.8 Transmitting Measured Values via the Serial Data Interface

In order to store, archive and display measured values at a PC, the stored data must be uploaded to the PC.

A special PC program is required for this, see "Data Backup" on page 3 as well as interface cable RS232 (Z3241).



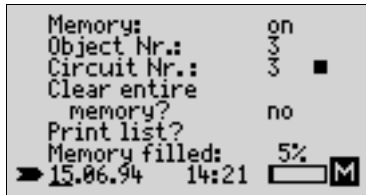
Note

Uploading from the PSI module to the PC can also be carried out after the PSI module has been disconnected from the PROFITEST®0100S-II.

4.9 Setting the Date and Time

The correct date and time must be entered after initial start-up of the PSI module, or if the battery has been removed for a period of more than 30 minutes.

- ⇨ Press the MENU key repeatedly from within the PSI menu until the menu arrow is pointed at the date.



- ⇨ The current day can be selected by pressing the "<" or the ">" key.
- ⇨ The cursor can be moved from the day to the month by pressing the MENU key once again.



```
Memory: on
Object Nr.: 3
Circuit Nr.: 3 ■
Clear entire
memory? no
Print list?
Memory filled: 5%
➔ 15.06.94 14:21 [ ] M
```

- The current month can now be selected by pressing the “<” or the “>” key.
- If the MENU key is pressed again, the cursor moves from the month to the year etc. All entries for date and time can be made in this fashion.



Note

If the “<” or the “>” key is pressed and held, counting is continued in steps of 5 until the maximum value has been reached.

4.10 Error Message Assistance

The message “Man. range selection!” may appear in the R_E measuring range with autoranging.

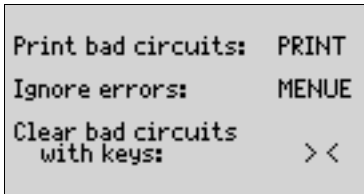
- Select the corresponding measuring range and repeat the measurement. The measurement is then stored to memory.

If excessive interference should occur at the mains, or if the batteries in the PSI module are weak, individual memory locations may be lost. However, this is extremely seldom and the PSI module continuously tests its memory for errors. If an error should occur, the following message, or another similar message, appears at the display:



```
CAUTION!!!
Bad data found in memory!
Stored circuits: 10
Bad circuits: 1
Continue with key: MENU
```

- ⇒ One of the following menu items can be selected after pressing the MENU key.



- ⇒ An overview of circuits with defective data is displayed by pressing the **PRINT** key. The list can be printed out by pressing the PRINT key again.
- ⇒ The error message can be ignored by pressing the **MENU** key without deleting any data.



Tip

Always print out the list of defective circuits first with the PRINT function, before ignoring the error message with the MENU key.

The questionable circuits can be tested for possible problems with the printed list (compare chapter 4.4, page 16).

If an error has occurred in the assignment of an object or an electrical circuit, all electrical circuits from the affected object are copied to object 999, and the individual circuits are numbered consecutively starting with 0. The individual electrical circuits can be checked in object 999 for possible errors.

Incorrect symbols appear as a “-” at the LCD and are printed as an “X”.

- ⇒ If you are not certain that the measured values are correct, delete the defective circuit by simultaneously pressing the “<” and the “>” keys. The following message then appears:



```

Stored circuits:    9
Bad circuits:      0

Continue as usual !

```

If the printing mechanism is defective, the following error message appears:



```

CAUTION!!!

Printer not ready!

Restart printing

```

If repeated attempts do not bring the desired results, please send the module to our repairs department (compare chapter 8, page 35).

5 Characteristic Values

Connectors

For Fastening to the Test Instrument

2 snap hooks
for direct mounting
to the test instrument
Direct measurement data
transmission via bidirectional
infrared interface
RS 232, 9-pole socket

Interface

Memory

RAM (data)

32 kByte

Printer

Printing Mechanism

4-needle matrix printer

Print Width

40 characters per line

Real-Time Clock with Date

Integrated battery backup

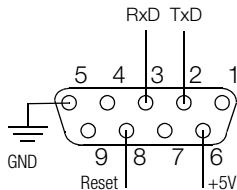
Data Interface

Type	RS 232 serial port per DIN 19241
Baud Rate	9600 baud
Parity	None
Data Bits	8
Stop Bits	1

Interface Connector Pin Assignments

The 9-pole connector socket for the serial interface is connected as follows:

- 1: NC
- 2: TxD (display PSI)
- 3: RxD (display PSI)
- 4: NC
- 5: GND
- 6: +5V
- 7: NC
- 8: Reset
- 9: NC



Ambient Conditions

Operating Temperature	0 °C ... 40 °C
Storage Temperature	- 20 °C ... +60 °C except for batteries, paper and ink cartridge
Relative Humidity	Max. 75%, no condensation

Power Supply

Battery Voltage	4.6 ... 6.5 V
- Data Backup	≥ 3.5 V
Source	4 batteries, 1.5 V IEC LR6 (mignon, alkaline-manganese)

Power Consumption:

- Stand-By (data backup)	approx. 0.6 mVA
- Function (continuous)	approx. 1 VA

Mechanical Design

Protection, Housing	IP 20
Dimensions	150 x 58 x 68 mm
Weight	approx. 0.4 kg

6 Maintenance

6.1 Batteries

Check the charge level of the batteries in the module on a regular basis by activating the paper advance function. If the message "Printer batteries are dead" appears at the test instrument's LCD during **paper advance** (see also page 7) the battery voltage has dropped to below the minimum allowable level, and the PSI module is no longer operable. Measurement data can nevertheless still be stored to memory.



Note

Approximately 3 rolls of recording chart can be printed with one set of batteries.

If the message "Printer batteries are dead" appears while measurement data are being stored to memory, the PSI module should be immediately removed from service in order to avoid data loss.

The entire set of batteries should be replaced as soon as possible (compare chapter 3.1, page 7). Stored measured values remain in memory for approximately 1 day.



Attention

Dead batteries may not be left inside the module. Dispose of depleted batteries in an environmentally sound fashion.

6.2 Recording Chart Paper

Check the remaining balance of recording chart paper at regular intervals. The matrix printer should not be operated without paper, because the printing head might otherwise be damaged.

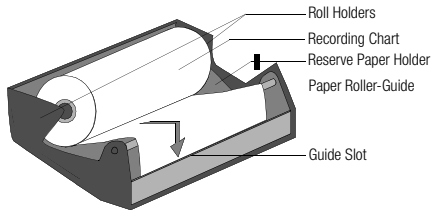
The recording chart paper may become deformed within the printer if high humidity or excessive ambient temperatures prevail. In such cases the printing mechanism is no longer able to transport the recording chart.

Remove the deformed paper plus an additional 20 cm of recording chart, and reinsert the chart (compare chapter 6.2.1, page 32).

A package of 10 rolls of recording chart paper is identified with the designation **PS-10P**.

6.2.1 Inserting the Recording Chart

- ⇒ Open the paper compartment cover and fold the tear-off edge forward and down.
- ⇒ Insert the new recording chart into the reserve paper holder in the paper compartment.
- ⇒ Feed approximately 5 cm of paper over the paper roller-guide, and push the front edge of the paper into the guide slot at the printing mechanism.



- ⇒ Press and hold the PRINT key for about 4 seconds in order to activate paper advance, and the paper is automatically fed through the printing mechanism. Hold the PRINT key depressed until the front edge of the paper appears at the discharge slot.
- ⇒ Clinch the paper roll between the two roll holders in the paper compartment.
- ⇒ Return the tear-off edge to its original position and press the paper compartment cover closed, until it audibly snaps into place.

6.3 Ink Cartridges

If the print-out becomes overly faded, the ink cartridge should be replaced (compare chapter 6.3.1, page 33).

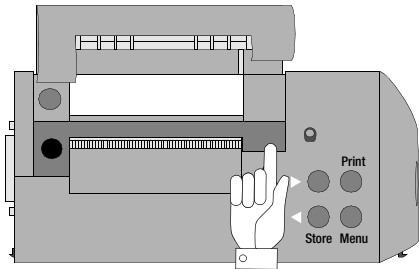


Note

A package of 10 ink ribbon cartridges is identified with the designation **Z3210**. Approximately 6 rolls of recording chart can be printed with one ink cartridge.

6.3.1 Replacing the Ink Cartridge

- Open the paper compartment cover and fold the tear-off edge forward and down.
- In order to **remove** the cartridge, press on it gently at the right hand side. The cartridge is tilted away from the holder. Carefully remove the ink cartridge.



- Insert the new ink ribbon cartridge, with the ribbon tensioning screw pointing to the left, into the slot provided for this purpose. Press lightly at the right hand side of the cartridge until it snaps into its holder.

If recording chart paper has already been installed, it must be fed between the ink ribbon and the cartridge before the ink cartridge is inserted into the slot.

The ink ribbon must be flat, and must be situated underneath the recording chart when the cartridge is inserted into the slot. The tension at the ink ribbon can be adjusted by turning the ribbon tensioning screw.

6.4 Housing

No special maintenance is required for the housing. Keep outside surfaces clean. Use a slightly dampened cloth for cleaning. Avoid the use of cleansers, abrasives or solvents.

7 Appendix

7.1 Abbreviations and their Meanings

$I_{\Delta N}$ (A) Nominal fault current ($N = \text{normal}$, $S = \text{selective}$)

$U_{I_{\Delta N}}$ Contact voltage with reference to nominal fault current $I_{\Delta N}$

t_A Release time

$5 I_{\Delta N}$ 5-fold nominal fault current

I_{Δ} Tripping current

$U_{I_{\Delta}}$ Contact voltage at the moment of tripping

Z_{Loop} Loop Impedance

$I_{S\text{LOOP}}$ Calculated short-circuit current during loop impedance measurement

R_i Internal line resistance

I_{si} Calculated short-circuit current during internal line resistance measurement.

U_{Mains} Line voltage

f_{Mains} Line frequency

R_{INS} Insulation resistance

R_E Measured earth resistance

R_{LO} Resistance at bonding conductors

8 Repair and Replacement Parts Service DKD Calibration Lab and Rental Instrument Service

If required please contact:

GOSSEN METRAWATT GMBH

Service-Center

Thomas-Mann-Strasse 20

90471 Nürnberg • Germany

Phone +49-(0)-911-8602-0

Fax +49-(0)-911-8602-253

E-Mail service@gmc-instruments.com

This address is only valid in Germany. Please contact our representatives or subsidiaries for service in other countries.

9 Product Support

If required please contact:

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