

OPERATION MANUAL

Battery Cell Simulator Model 2500-Z100

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kg
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Declaration of Conformity



EU-Konformitätserklärung (nach EN ISO/IEC 17050-1:2010) EU-Declaration of conformity (in accordance with EN ISO/IEC 17050-1:2010)

Name des Ausstellers: burster präzisionsmesstechnik gmbh & co kg
Issuer's name:

Anschrift des Ausstellers: Talstr. 1-5
Issuer's address: 76593 Gernsbach, Germany

Gegenstand der Erklärung: Battery Cell Simulator für Batterie-Messmodul Typ 25xx
Object of the declaration: Battery Cell Simulator for battery measurement module type 25xx

Modellnummer(n) (Typ): 2500-Z1xx
Model number / type:

Diese Erklärung beinhaltet obengenannte Produkte mit allen Optionen
This declaration covers all options of the above product(s)

Das oben beschriebene Produkt ist konform mit den Anforderungen der folgenden Dokumente:
The object of the declaration described above is in conformity with the requirements of the following documents:

Dokument-Nr. <i>Documents No.</i>	Titel <i>Title</i>	Ausgabe <i>Edition</i>
2011/65/EU + delegD (EU) 2015/863	Richtlinie zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten <i>Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment</i>	2011 + 2015
2014/35/EU	Richtlinie zur Harmonisierung der Rechtsvorschriften der Mitgliedsstaaten über die Bereitstellung elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen auf dem Markt <i>Directive on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits</i>	2014
2014/30/EU	Richtlinie zur Harmonisierung der Rechtsvorschriften der Mitgliedsstaaten über die Elektromagnetische Verträglichkeit <i>Directive on the harmonization of the laws of the Member States relating to electromagnetic compatibility</i>	2014
EN 61010-1	Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte – Teil 1: Allgemeine Anforderungen <i>Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements</i>	2020 + A1:2022 + A2:2023
EN 61326-1	Elektrische Mess-, Steuer-, Regel- und Laborgeräte – EMV-Anforderungen – Teil 1: Allgemeine Anforderungen <i>Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements</i>	2022
EN 55011	Industrielle, wissenschaftliche und medizinische Geräte – Funkstörungen – Grenzwerte und Messverfahren, Gruppe 1, Grenzwertklasse A <i>Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement, group 1, class A</i>	2022

Gernsbach
Ort / place

25.11.2024
Datum / date

ppa. Christian Karius
Quality Manager

Dieses Dokument ist entsprechend EN ISO/IEC 17050-1:2010 Abs. 6.1g ohne Unterschrift gültig /
According EN ISO/IEC 17050 this document is valid without a signature.

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1 For your safety

The following symbols on the model 2500-Z100 battery cell simulator and in this operation manual are warning signs of hazards.

1.1 Symbols used in the operation manual

1.1.1 Signal words




The following signal words are used in the operation manual according to the specified hazard classification. The signal words introduce warnings that must be followed and acted upon with care to prevent accidents, injuries and damage to property.

	DANGER
High degree of risk: indicates a hazardous situation which, if not avoided, will result in death or serious injury.	
	WARNING
Moderate degree of risk: indicates a hazardous situation which, if not avoided, may result in death or serious injury.	
	CAUTION
Low degree of risk: indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.	
NOTICE	


Please note: It is important to read these safety notices in order to ensure you handle the model 2500-Z100 battery cell simulator correctly.

IMPORTANT: Follow the information given in the operation manual.

1.1.2 Pictograms

	Electric shock hazard.
	Electrostatic discharge. Do not touch! Avoid electrostatic discharge. Dissipate electrostatic charge.
	Observe the advice for protecting the instrument.

1.2 Symbols on the device

Symbol	Description
	<p>See manual! It is essential to gather the information and notes given in the operation manual for the model 2500-Z100 battery cell simulator. Follow safety instructions – professional servicing only.</p>

2 Introduction

IMPORTANT: Read the operation manual carefully before using the equipment, and keep it for future reference.

The operating manual must be read carefully before putting the device into service or carrying out maintenance or other work on the model 2500-Z100 battery cell simulator. All safety instructions and safety regulations relating to accessory equipment / attachments must be complied to ensure safe and proper handling of the device.

Only qualified personnel may perform maintenance work on electrical components (see section 2.5 Personnel). These safety instructions must be included (Download on [product page](#)) when the model 2500-Z100 battery cell simulator is sold.

2.1 Intended use

The model 2500-Z100 battery cell simulator is intended to simulate battery cell, to check the correct function of the model 2511 battery measuring module. Therefore, the model 2500-Z100 is simulating the voltage and internal resistance of a battery cell or pack in a four-wire connection.

2.2 Customer service

2.2.1 Customer service department

For repair inquiries, please call our customer service department on +49 7224 645-53, or email service@burster.de (in Germany only). In other countries please contact your local representative (see also <https://www.burster.com>).

Please have the serial number to hand. The serial number is the only way to clearly identify the technical version of the instrument so that we can provide help quickly. You will find the serial number on the type plate of the model 2500-Z100 battery cell simulator.

2.2.2 Contact person

If you have any questions relating to the model 2500-Z100 battery cell simulator, please get in touch with burster präzisionsmesstechnik gmbh & co. kg, or if outside Germany, please contact your burster representative (see also <https://www.burster.com>).

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2.3 Download the test certificate

You have the option to download the test certificate for your model 2500-Z100 battery cell simulator online. Please use the following link <https://www.burster.de/en/service-calibration/download-your-test-and-calibration-certificates-here>. You can then download the test certificate directly by entering the serial number.

2.4 Ambient conditions

2.4.1 Storage conditions

The following requirements must be met when storing the model 2500-Z100 battery cell simulator:



- Store at temperatures between -10 °C and +70 °C
- The model 2500-Z100 battery cell simulator must be packed in clean packaging
- Store in a dry environment
- No condensation

2.4.2 Operating conditions


The following requirements must be met when operating the model 2500-Z100 battery cell simulator:

- Indoor operation only
- Maximum altitude 2000 m
- Operate at temperatures between 0 °C ... +50 °C
- Humidity: 70% up to +31 °C, decreasing linearly above that temperature to 50% at T_{max} , non-condensing
- Protection class: 3
- Transient overvoltage category: CAT II
- Supply voltage +24VDC (+18 ... 30 V DC)


2.4.3 Restrictions on use

	 DANGER
	<p>The model 2500-Z100 battery cell simulator is not a substitute for safety devices and protective equipment. Use safety devices and protective equipment.</p>

2.4.4 Cleaning

	 DANGER
	<p>Electric shock hazard! Disconnect the model 2500-Z100 battery cell simulator from the power supply, before cleaning!</p>

Disconnect the model 2500-Z100 battery cell simulator from the power supply, before cleaning. Use a slightly damp cloth to clean the device.

	NOTICE
	<p>Do not immerse the model 2500-Z100 battery cell simulator in water or hold it under running water. Do not use strong cleaning agents as these may damage the instrument. Use a slightly damp cloth to clean the device.</p>

2.5 Personnel

Qualified personnel are persons who, due to their training, experience, instruction and knowledge of the relevant standards, regulations, accident prevention rules and working conditions have been authorized by the person responsible for the safety of the machine/product to carry out the relevant activities and are therefore able to recognize and avoid potentially dangerous situations (for the definition of *Fachkräfte* (competent persons) see VDE 0 105 or IEC 364, which also specify that unqualified persons must not be employed). Knowledge of first aid and the local emergency medical services organization is also required.

Transportation, assembly, installation, putting into service, maintenance and repairs must be carried out by qualified personnel or checked by a responsible competent person.

burster präzisionsmesstechnik gmbh & co kg is happy to provide your operating personnel with training. To find out more, please look at our range of services at <http://www.burster.com>

2.6 Delivery scope

The following components are supplied:

- Battery Cell Simulator Model 2500-Z100
- Test certificate on our [Homepage](#)
- Operation manual on our Homepage
- Free Version of the configuration and evaluation software DigiControl on our Homepage

2.7 Unpacking

	<div style="background-color: red; color: white; padding: 5px;">  DANGER </div> <p>Electric shock hazard! Never switch on the device if it shows signs of damage incurred in transit. Only ever use the device under the conditions specified in this operating manual.</p>
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Inspect the device for damage. If you suspect that the device has been damaged during shipping, notify the delivery company within 72 hours.

The packaging should be retained for examination by a representative of the manufacturer and/or the delivery company.

The model 2500-Z100 battery cell simulator should only be shipped in its original packaging or in packaging capable of providing an equivalent degree of protection.

2.8 Warranty

burster präzisionsmesstechnik gmbh & co kg provides a manufacturer's warranty for a period of 24 months after delivery.

Any repairs required during this time will be made without charge. This does not include damage arising from improper use.

Please note the following when sending the model 2500-Z100 battery cell simulator in for a repair:

- If there is a problem with the device, please attach a note to the body of the device summarizing the fault.
- Technical specifications subject to change at any time without notice. We also state explicitly that we do not accept liability for consequential damage.
- The model 2500-Z100 battery cell simulator must be shipped only in its original packaging or in packaging capable of providing an equivalent degree of protection

2.9 Conversions and modifications

Please note: The warranty shall be deemed void **immediately** if you open or dismantle the model 2500-Z100 battery cell simulator during the warranty period.

The model 2500-Z100 battery cell simulator does not contain any parts that are intended to be serviced by the user. Only the manufacturer's own qualified personnel are permitted to open the model 2500-Z100 battery cell simulator.

It is not permitted to make any changes to the model 2500-Z100 battery cell simulator without the written agreement of burster präzisionsmesstechnik gmbh & co kg.

burster präzisionsmesstechnik gmbh & co kg does not accept liability for damages or injury if this condition is disregarded.

3 Device concept

Please refer to the model 2500-Z100 battery cell simulator data sheet for full details of dimensions, weight, degree of protection etc.

3.1 Functional scope

The model 2500-Z100 battery cell simulator is designed to check the function of the battery measuring module model 2511.

The model 2500-Z100 battery cell simulator is simulating the customer specific internal resistance and open circuit voltage of a battery cell of various cell technologies. The resistance simulation is representing the ohmic part of the internal resistance of a battery cell.

3.2 Versions

Please refer to the data sheet for details on the versions of this product. The current datasheet and further related information about the model 2500-Z100 battery cell simulator can be obtained here https://www.burster.de/fileadmin/user_upload/redaktion/Documents/Products/Data-Sheets/Section_2/2500_EN.pdf or via the QR-code below:



3.3 Power supply

The model 2500-Z100 battery cell simulator can be operated with a voltage of 18 ... 30 VDC, nominal 24V. The maximum power consumption of the model 2500-Z100 battery cell simulator is 5 W.

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4 Controls and connections

4.1 Front view



Figure 1 Front face of the model 2500-Z100 battery measuring module

Item	Description
STAT	Status LED

4.2 Interfaces

Item	Description
Supply	Connector for supply voltage (+18 ... 30 VDC, nominal: +24 VDC)
Out R/U	Connector for output signals resistance / voltage

4.2.1 Connection: Power supply

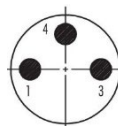


Figure 2 Connector for power supply

PIN	Description
1	+Supply voltage (+18 ... 30 VDC, nominal: +24 VDC)
3	-Supply voltage (0 V)
4	-Supply voltage (0 V)

4.2.2 Connection: Out R/U

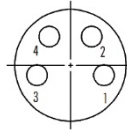


Figure 3 Connector for output signal R/U

PIN	Description
1	Sense+
2	Force+
3	Sense-
4	Force-

4.3 Connecting the model 2500-Z100 battery cell simulator

4.3.1 Connecting the power supply

The model 2500-Z100 battery cell simulator must be connected disconnectable to the power supply. Therefore, a switch or a relay must be integrated into the power supply cable.

4.3.2 Connecting a model 2511 battery measuring module

The schematic drawing below shows the basic connection logic.

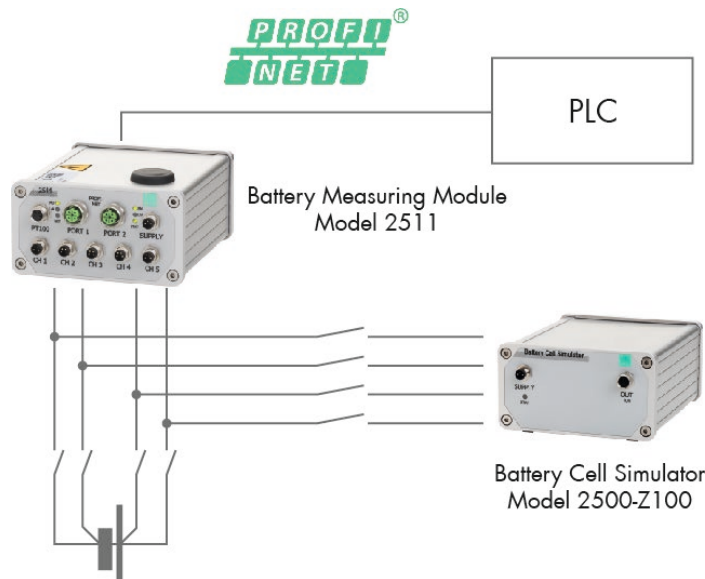


Figure 4 Schematic drawing of a battery measuring chain with a model 2500-Z100 battery cell simulator.

BATTERY CELL SIMULATOR 2511-Z100

Connecting the battery cell simulator must be done in a 4-wire configuration. There are two contacting possibilities:

- The model 2500-Z100 battery cell simulator can be connected directly to a model 2511 battery measuring module (shown in figure 5).
- The model 2500-Z100 battery cell simulator can be connected via a contacting adapter that represents a battery cell to a model 2511 battery (shown in figure 6).

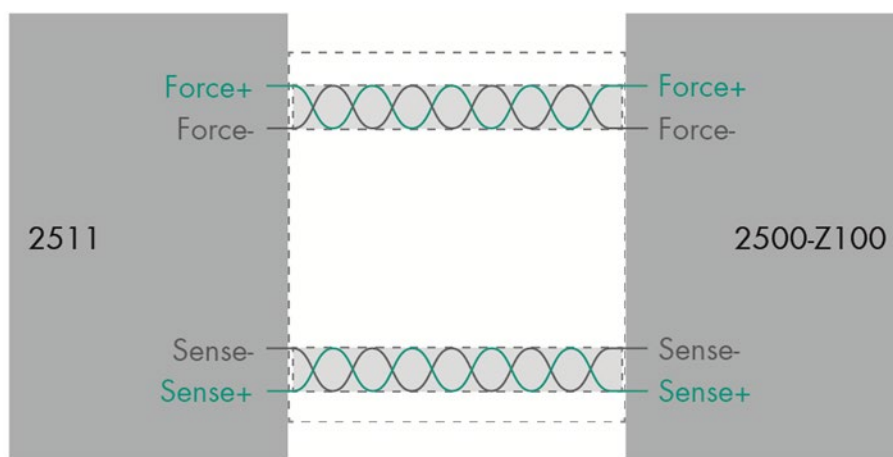
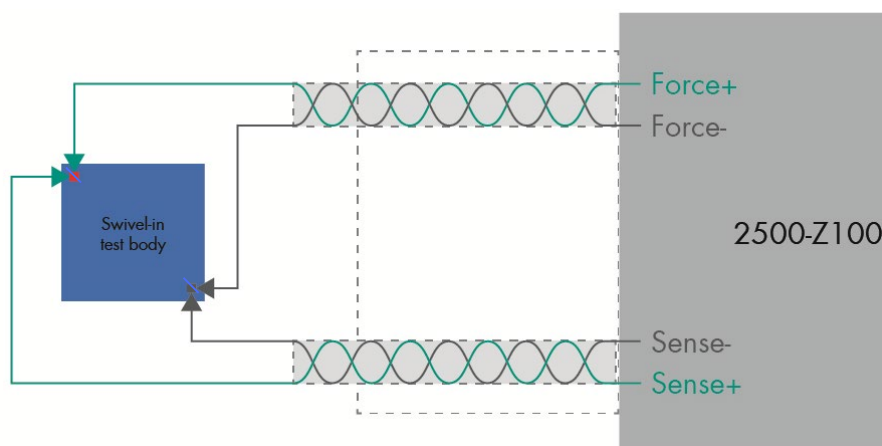


Figure 5 Direct connection of a model 2500-Z100 battery cell simulator to a model 2511 battery measuring module



Connection of a model 2500-Z100 battery cell simulator to a contacting adapter

To reduce magnetic crosstalk, both pairs of wires (pairs: [Force+, Force-], [Sense+, Sense-]) must be well twisted. For EMC reasons, the twisted sense leads should be shielded together. Also, for EMC reasons the twisted force leads should be shielded together. Additionally, the whole measuring lead should be shielded.

Only one end of the shielding should be connected, to the device.

If the twisting of the measuring leads ends, both shieldings should also end.

In addition, we strongly recommend:

- Position signal lines away from power supply lines (in particular when laying cables near servomotors)
- Preferably use the recommended burster test leads to connect test objects. The test lead must be connected in accordance with regulations and must not be exposed to mechanical disturbance or electromagnetic interference. Particular care must be taken to avoid metal objects in the immediate vicinity of the measuring cables.

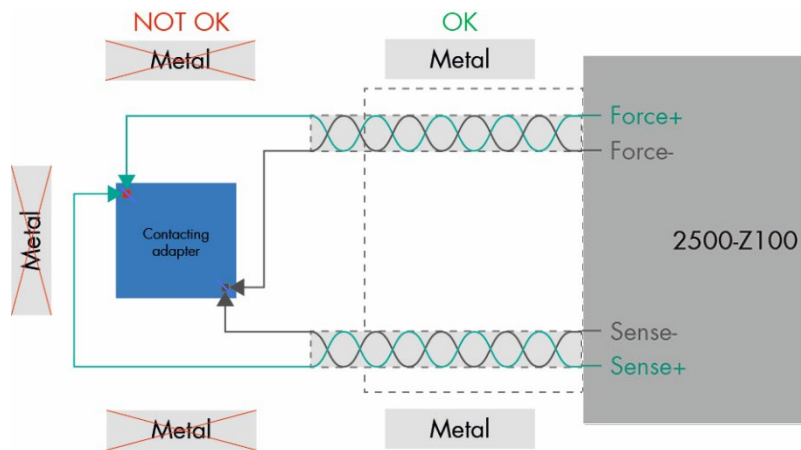





Figure 6 Metallic objects in the vicinity of the measuring cables cause interference.

- Ensure that cable lengths are kept to the minimum required.
- When using power cables from other manufacturers or a mains connection outside Germany, you must ensure that there is a proper connection to ground.


5 Using the instrument for the first time

	 DANGER
	<p>Electric shock hazard!</p> <ul style="list-style-type: none"> • Never switch on the model 2500-Z100 battery cell simulator if it shows signs of damage incurred in transit. Only ever use the model 2500-Z100 battery cell simulator under the conditions specified in this operation manual. • Only use the model 2500-Z100 battery cell simulator outside of potentially explosive areas. • Do not connect voltages that are higher than the specification. For the supported ranges, see the data sheet for the model 2500-Z100 battery cell simulator.

	NOTICE
	<p>No special steps need to be taken before using the device for the first time, although the model 2500-Z100 battery cell simulator must first have reached thermal equilibrium. If the storage location is colder than the location where the unit is to be operated, the model 2500-Z100 battery cell simulator must remain switched off for a suitable period of time because of the possibility of condensation forming. Choose the installation site so that the model 2500-Z100 battery cell simulator is not exposed to extreme temperatures (see operating temperature range in the data sheet for the model 2500-Z100 battery cell simulator) or temperature fluctuations. Keep moisture, dust, oils, organic solvents, aerosols and strong vibrations away from the model 2500-Z100 battery cell simulator, and avoid installation in the immediate vicinity of strong sources of electrical interference. In particular, route the connecting cables so that they are not in the vicinity of sources of electromagnetic interference.</p>

5.1 Installation/removal

The model 2500-Z100 battery cell simulator is supplied with rubber feet as standard. A mounting rail kit or wall mounting kit is also available.

 WARNING
<p>Mount the model 2500-Z100 battery cell simulator only on a grounded mounting rail in a grounded control cabinet (mounting on a mounting rail) or on grounded surfaces / machine components (wall mounting).</p>

5.1.1 Mounting on a mounting rail

Installation



This is how it works

1. Place the upper edge of the mounting section on the mounting rail.
2. Press the model model 2500-Z100 battery cell simulator from the front against the mounting rail until it audibly engages.
3. Pull lightly on the model 2500-Z100 battery cell simulator to check it is securely mounted.

Removal

1. Press down slightly on the rear end of the model 2500-Z100 battery cell simulator until the bottom edge is unhooked.
2. Then tilt the model 2500-Z100 battery cell simulator slightly upward, grip its top edge and lift it off the mounting rail.



Figure 7 Model 2500-Z100 Battery Cell Simulator attached to a mounting rail.

6 Customer services for your model 2500-Z100 battery cell simulator

To complement the model 2500-Z100 battery cell simulator package you have purchased, burster präzisionsmesstechnik gmbh & co kg offers the following customer services:

- Test measurements by arrangement
- On-site support for preparing the instrument for use
- Product training (online)
- Initial calibration and recalibration

For customer service inquiries relating to the model 2500-Z100 battery cell simulator, please call our customer service department on +49 7224 645-53, or email service@burster.de (in Germany only). In other countries please contact your local representative (see also <https://www.burster.com>).

7 Technical Data

The current datasheet and further related information about the model 2500-Z100 battery cell simulator can be obtained here <https://www.burster.de/en/measure-test-devices/battery-test-and-measuring-modules/p/detail/2500> or via the QR-code below:



7.1 Electromagnetic compatibility

7.1.1 Interference immunity

Interference immunity in compliance with EN 61326-1:2013

Industrial environment

7.1.2 Interference emission

Interference emission in compliance with EN 61326-1:2013

8 Available accessories

Please refer to the data sheet for details of the accessories available. You can obtain the latest data sheet and additional information on the model 2500-Z100 battery cell simulator at <https://www.burster.de/en/measure-test-devices/battery-test-and-measuring-modules/p/detail/2500> or simply use the QR code below:



9 Disposal



Battery disposal

In Germany, the end user is legally obliged to return all used batteries, and it is illegal to dispose of batteries in the household waste. This law may also affect you as purchaser of the instrument described here. Please dispose of your used batteries properly and in accordance with national statutory regulations. Either take them to the relevant collection point in your organization or to the collection points provided by your local authority, our company or any battery retail outlet.

Instrument disposal

If your instrument is no longer usable, please comply with your legal obligations by disposing of the instrument described here in accordance with statutory regulations. You will then be helping to protect the environment!