

# CS – 4001PM/127

## Capacity Test Equipment



## Manual









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- We reserve the right to make alterations and changes in the said system and to make changes in the information included in this manual without notice.
- We do not accept responsibility for damages of any type occurring in the use of the test system and/or occurring due to the fact that employment purposes could not be performed. The manufacturer can, in no case, be held responsible for direct damages, indirect damages or subsequent damages which occur to the customer by employment or non-employment possibilities of the product.

## 1. Safety precautions

Before you begin to deal more deeply with the device itself we would like to give you a few safety hints in advance.

-  Please observe the respective DIN/VDE/EN/IEC/ANSI-guidelines, the rules and regulations for local operators and the instructions of the battery manufacturer.
-  While preparing and performing a discharge/capacity test it may happen under certain circumstances that a cell/block can explode which can damage any equipment next to it and/or harm personnel. For that reason **never run a discharge test unattended**. Which means in return **never run the discharge test equipment such as CS-4001PM, load units etc. unattended**.
-  Battery systems are electrical equipment systems having high short-circuit currents. Avoid short-circuits which can cause current interruption, damage to the battery, station equipment and/or harm to personnel. **Be sure to think about possible short-circuit dangers which can be caused by incorrectly connected shunts!**
-  Electrical conducting parts (Poles, Connectors, etc.) are only allowed to be touched with safety voltage probes or safety connection clamps.
-  The CS-4001PM, the safety measuring leads and the accessories should only be employed for those purposes described here. Incorrect use can cause damage to the measuring system. Damage or used components must be immediately replaced. Do not use force in plugging the components together.
-  **CS-4001PM** must only be connected to the, on the unit stated, mains voltage and frequency.
-  **Data transfer and output may only take place using the data transfer cable included in the delivery.** The use of connection cables originating from other manufactures can lead to destruction of the measuring device, as well as, the follow-up data device.
-  The device should not be exposed to direct sunshine or temperatures exceeding 45 degrees Celsius (e.g. laying onto heating units, radiators, etc.).

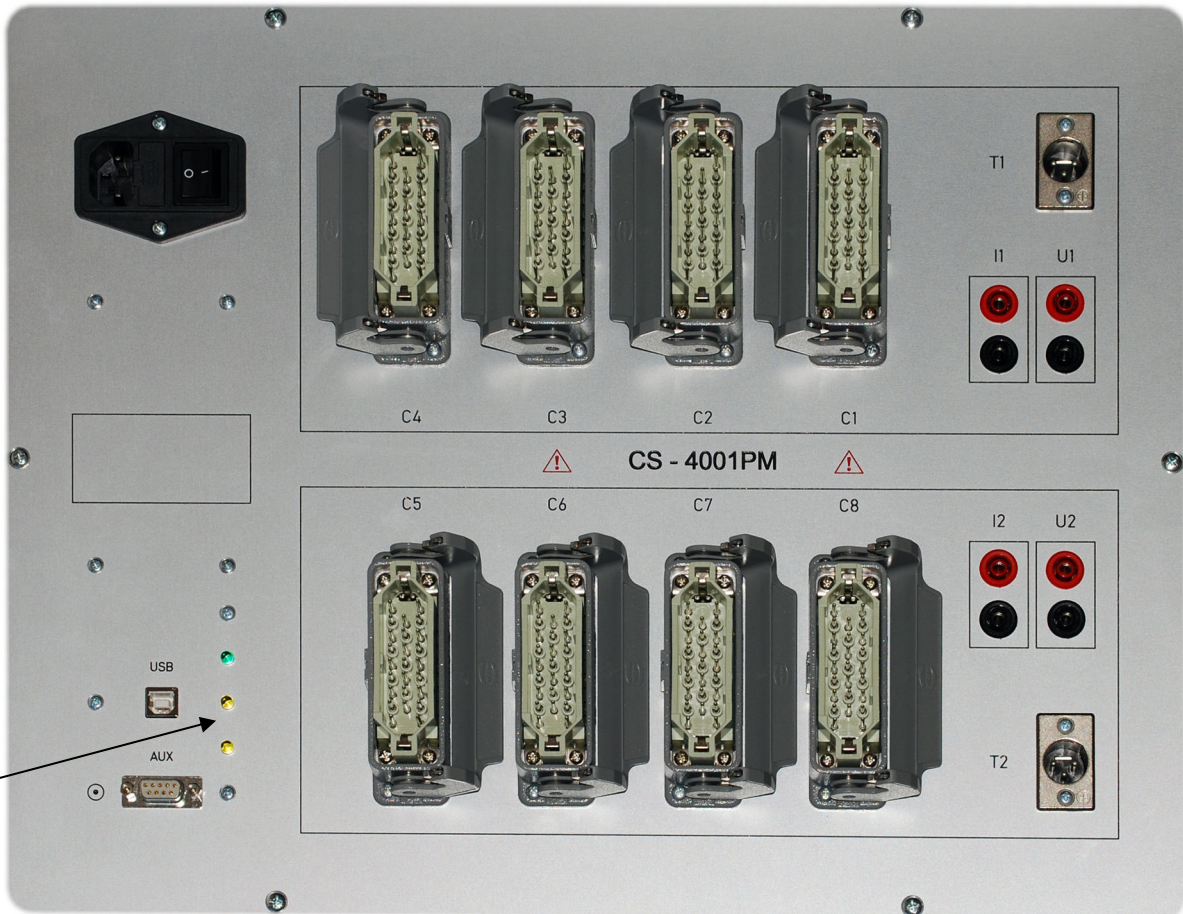
### Attention!

**Never connect voltage potentials greater than 250VDC on a single connector (C1-C8). This unit works with semiconductor switches. These switches are protected with transient absorption diodes, which shorten inputs on voltages greater than 300VDC.**

### Attention!

**Always use safety gloves, while connecting the CS-4001PM. Do not touch unused pins and connectors while a battery is connected!**

## 2. Panel CS-4001PM/127



Connector	Usage
C1 – C8	Measuring leads, Multi-cable
U1	Battery 1, total voltage
I1	Battery 1, current
T1	Temperature sensor 1
U2	Battery 2, total voltage
I2	Battery 2, current
T2	Temperature sensor 2
USB	USB-Port (main communication port)
AUX	Auxilliary serial port
LEDs	LED indication
Green	Unit is powered up, blinks if USB-Port is not connected, or suspended.
Yellow-1	Executing a command
Yellow-2	USB-Data transmitted or received. (Always works, it is powered from the USB-bus)

### 3. Connection of the battery to CS/-4001PM

**⚠ Attention!**

**The measuring cables must be connected to the CS-4001PM first, BEFORE being connected to the battery!**

**⚠ Attention!**

**Never connect voltage potentials greater than 250VDC on a single connector (C1-C8). This unit works with semiconductor switches. These switches are protected with transient absorption diodes, which shorten inputs on voltages greater than 300VDC.**

**⚠ Attention!**

**Always use safety gloves, while connecting the CS-4001PM. Do not touch unused pins and connectors while a battery is connected!**

- 1) Power-up the CS-4001PM and start the TMC-Manager or TMC-Light Software on your computer.
- 2) Connect the first measuring cable (multi-cable) to the connector **C1** of the CS-4001PM.
- 3) Take the first crocodile-clamp (labelled with "1") and connect it to the **electrical minus pole of the battery**. Continue connecting the remaining clamps in ascending order of numbering (from low voltage to high voltage) to the plus pole of each cell. If you need more than one multi-cable, connect them analogue to the first cable to the connectors **C2** to **C8**.
- 4) Connect the shunt voltage cable to the **I1**-connectors on CS-4001PM/127. Observe the correct polarity!
- 5) Connect the total voltage cable to the **U1**-connectors on CS-4001PM/127.  
If you are using a temperature sensor connect it to the **T1** on CS-4001PM/127.

Test of two batteries in parallel

**When testing two batteries in parallel proceed as follows:**

Connect the first battery to the connectors **C1** to **C4**, but **not more than 62 cells**. Connect the second battery to the connectors **C5** to **C8**. Connect the shunt voltage cables and the total voltage cables to the specific connectors (**I1**, **U1** and **T1** = batterie1; **I2**, **U2** and **T2** = batterie2) on the CS-4001PM. The total battery voltage must be less than 300VDC in this case.

- 6) Connect the **USB**-connector of the CS-4001PM to the USB-port of your computer. When you are using a TORKEL for testing connect it to the **AUX**-connector of the CS-4001PM. Observe the plug layout (**DSUB-female**: 2-TXD, 3-RXD, 5-GND; **DSUB-male**: 2-RXD, 3-TXD, 5-GND)!
- 7) Start the capacity test from the software.

#### 4. Removing the connections from CS-4001PM

- ⚠ **First** you **must** disconnect all crocodile-clamps from the battery.
- ⚠ **Next** you can remove the connections C1 to C8 from CS-4001PM.
- ⚠ You must not switch off the **CS-4001PM** before all connections are removed from the battery.

#### 5. Technical Data

##### No. of measuring inputs

	<b>CS-4001PM/127</b>
Cell/Block voltage	127
Total voltage	2
Current	2
Temperature	2

##### Accuracy

Input	Range DC	Resolution	Accuracy	Input impedance
Cell/Block voltage	3V	1,00 mV	±0,05% ±2 Digits	≥ 1 MΩ
	15V	1,00 mV	±0,05% ±2 Digits	
Total voltage	75V	10,0 mV	±0,10% ±2 Digits	
Current (shunt-voltage)	60mV	0,01 mV	±0,10% ±2 Digits	≥ 900 kΩ
	1000mV	0,10 mV	±0,10% ±2 Digits	

600V CAT II

##### Measuring multi-cables

If not otherwise specified (when ordering), CS-4001PM instruments are equipped with standard measuring multi-cables (Type MKB16/250) specified for 250V. Measuring multi-cables specified for 500 V (Type MKB16/500) are also available on request.

##### Others

Mains supply	85-264V~, 47-63Hz
Operating temperature	+10°C – 35°C
Storage temperature	+5°C – 50°C