

# BVM Cal kit

Calibration system for BVM units

## User's Manual



# Megger

WWW.MEGGER.COM

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1.800.561.8187

www.itm.com

information@itm.com

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# 1 Introduction

## 1.1 General

This manual is valid for the BVM Cal Box kit and it is designed for use for calibration of the Megger BVM instruments.

### Symbols on the instrument

	RoHS means restriction of hazardous substances. This is a method of addressing health and environmental concerns that are posed by materials and elements used in electronic equipments.
	WEEE, Waste Electrical and Electronic Equipment. Please utilize your local WEEE collection facilities in the disposal of this product and otherwise observe all applicable requirements.
	Equipment complies with current EU directives.

### Important

1. **Water and moisture.** Do not use the instrument near water. To prevent fire or shock hazard, do not expose the instrument to rain or moisture.
2. **Service.** Do not attempt to service the instrument yourself. If you attempt to service the instrument yourself the warranty is no longer valid.
3. **Accessories.** Do not use any accessories that are not intended for use together with the instrument.
4. **Cleaning.** Use a damp cloth for cleaning. Do not use liquid cleaners or aerosol cleaners.
5. **Servicing.** Refer all servicing to Megger authorized personnel.

## 1.2 Service and support

For technical assistance please contact your local Megger representative or direct your request to the office in Sweden.

### Contact Information

Internet: [www.megger.com](http://www.megger.com)  
 E-mail: [support-sweden@megger.com](mailto:support-sweden@megger.com)  
 Tel: +46 8 510 195 00

### Checklist before calling/e-mailing for support

- Read the manual
- Try to repeat the operation if possible
- Identify the instrument model, serial number and revision of software.

### Shipping

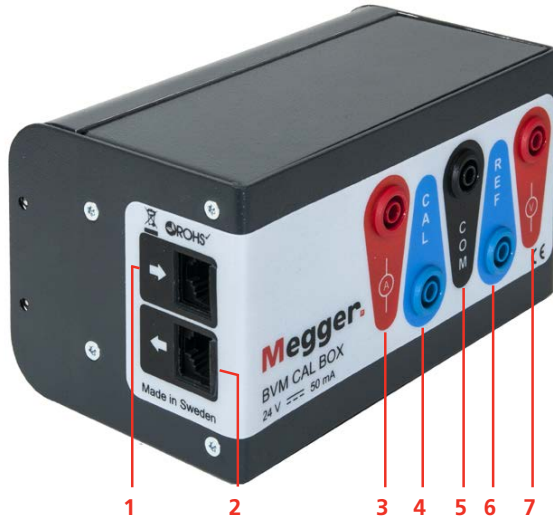
If you are going to send the instrument with parcel service use the original transport box or one with equivalent strength. Megger can not take responsibility for transport damages.

## 1.3 The calibration kit includes

Qty	Item	Part No.
1	BVM CAL Box	CJ-90077
1	BVM CAL Reference	MA-00272
1	Power and signal connector	MA-00271
1	AC adapter 100–240 V AC to 24 V DC	HC-04220
1	USB Memory stick BVM calib sw Agilent (CJ-8100X) BVM calib sw Keysight (CJ-8110X)	HF-10020
5	Control cable, black, RJ45, 0.5 m	GA-01100
2	Extension cable, black, 0.5 m	04-30050
2	Test cable, red, 0.5 m	04-35012
1	Test cable, black, 0.5 m	04-35010
1	User's manual	CJ0125XE
1	Transport case	GD-00620

# 2 The BVM CAL kit

## 2.1 BVM CAL Box



- |   |   |
|---|---|
| 1 | Input from Power and Signal Connector (To 1st BVM unit)<br>(RJ45 cable, Order No. GA-01100) |
| 2 | Output to BVM unit (IN) unit for calibration<br>(RJ45 cable, Order No. GA-01100)            |
| 3 | Current measuring output to multimeter<br>Agilent 34401A or 34410A or Keysight 34461A       |
| 4 | Output to BVM unit for calibration  |
| 5 | Common output to multimeter   |
| 6 | Output to BVM CAL Ref unit  |
| 7 | Voltage measuring output to multimeter  |

### Battery power

The BVM CAL Box is battery powered (non rechargeable) and function as a voltage reference. The batteries are located under the bottom cover. There are six AAA batteries and one 9V battery.

Recommended battery types	
1.5 V AAA	IEC LR03/ANSI 24D/ANSI 24A
9 V	IEC 6LR61/ANSI 1604A or IEC 6F22/ANSI 1604D

### Inserting batteries

- 1] Remove the lid at back by grabbing it and pull backwards.



- 2] Insert the batteries, observe polarity.



- 3] Replace the lid by pushing it into place until the snap locks will hold it.

## 2.2 Other parts in the kit

### BMV CAL Ref



### AC Adapter

Power supply, 24 V, for the calibration system. Connects to mains and output to Power and Signal Connector.



### Power & Signal Connector



### USB Memory stick

The USB stick contains the BVM calibration software and the User's manual.

### Cables

See section 1.3.

## 2.3 Other equipment needed

### Digital Multimeter (DMM)

The system is designed for use together with Agilent 34401A (connected via serial / COM-port) or Agilent 34410A (LAN / Ethernet connected). The system can also be used with Keysight 34461A (LAN / Ethernet connected). Probably also Keysight 34465A, but this has not been tested.

### Computer

PC with USB port and COM port or Ethernet port, depending on type of DMM (see above).

Cable for connection between PC and DMM, depending on type of instrument (serial null modem cable or Ethernet cable).

**Note:** *If the PC is of an older model, and LAN / Ethernet connected DMM is used, a crossover Ethernet cable may be required.*

# 3 Operation

## 3.1 Installing SW

The software is installed from the USB drive. There are two folders in the USB drive. Choose folder according to the DMM that you have.

- A]** If you have a DMM type 34401A or 34410A, open folder OLD\_(Agilent).
- B]** If you have a DMM type 34461A, open folder NEW\_(Keysight).
- 1]** Open folder BVM CAL SW, then double-click setup.exe to install the software.

## 3.2 Connect and setup

Make connections as shown in the diagram in figure 3.2.1. Supported multimeters are: Agilent 34401A serial connected or Agilent 34410A network connected.

For use with Keysight 34461A, see figure 3.2.2

**Note** *A null modem cable is needed for connection of the Digital Multimeter.*

### How to set COM port for the digital multimeter (DMM) (Agilent 34401A) or other equivalent instrument

This step is optional.

- 1]** Enter the COM port number.

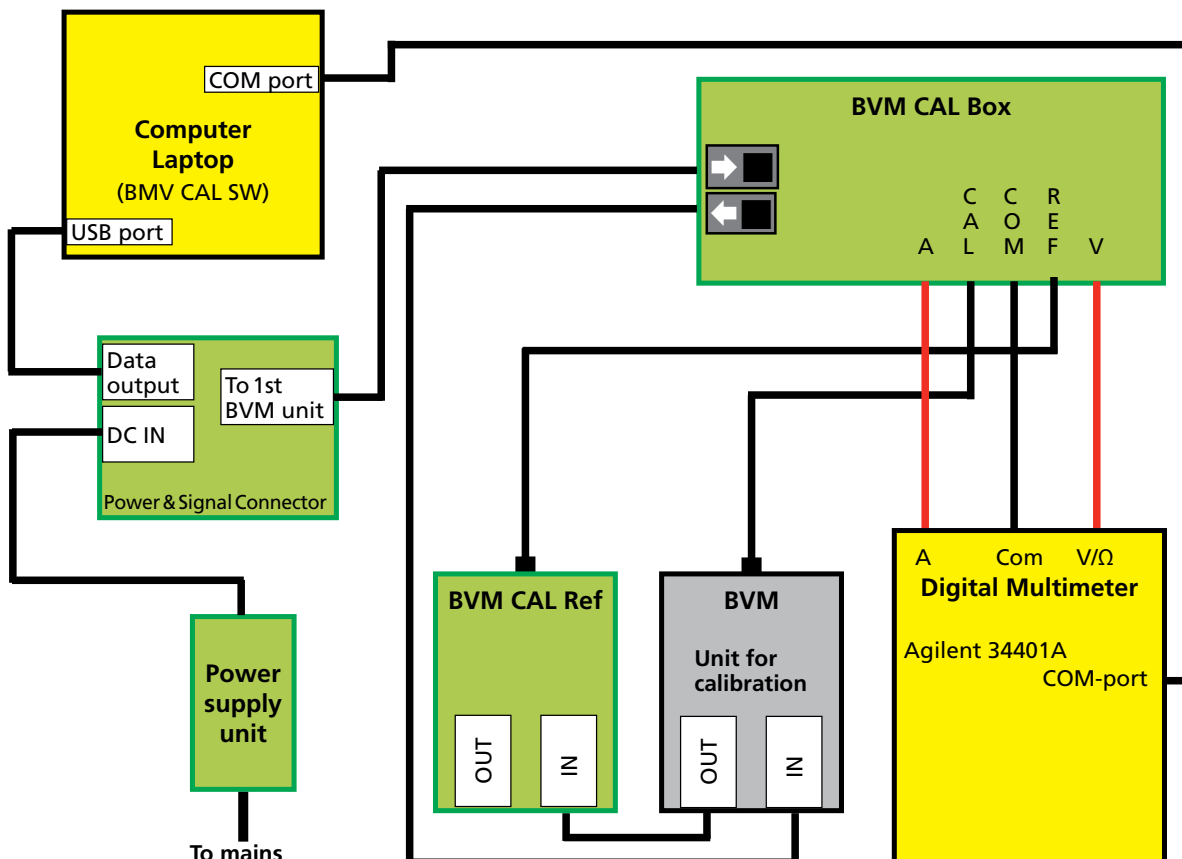


Figure 3.2.1 Connection diagram for calibration of BVM units using instrument with COM port

- 2] If you don't enter a COM port number, the software will search the PC for the COM port that the DMM is connected to.
  - 3] If the automatic search for right com port does not work you can set it manually.
  - 4] In MS Windows, open the "Control Panel".
  - 5] Select "Device Manager".
  - 6] Right-click on the port you want and select "Properties", "Port Settings", "Advanced", Select the number on the COM-port (from 1-15).
- 3] If the automatic search for right IP address does not work you can set it manually.
  - 4] It can be found by either starting PC Command window, then typing command "ipconfig", or by entering the menu on the DMM (press buttons Shift, then Display (Utility), then find LAN settings, or refer to DMM User's manual).  
The IP address is a series of digits separated by dots. It is normally 169.254.aa.bb, where aa and bb are numbers between 0 and 255.

**Note** *The BVM Cal System can only handle COM-ports from 1 to 15.*

## How to set IP address for the digital multimeter (DMM) (Agilent 34410A or Keysight 34461A)

This step is optional, but recommended.

- 1] Enter DMM IP address in BVM calib.
- 2] If you don't enter an IP address, the software will search for a connected DMM. Which will take some time.

**Note** *It takes up to one minute to establish connection between PC and DMM.*

- 5] Please refer to the manual for the DMM to find out how to get the IP-address for the instrument.

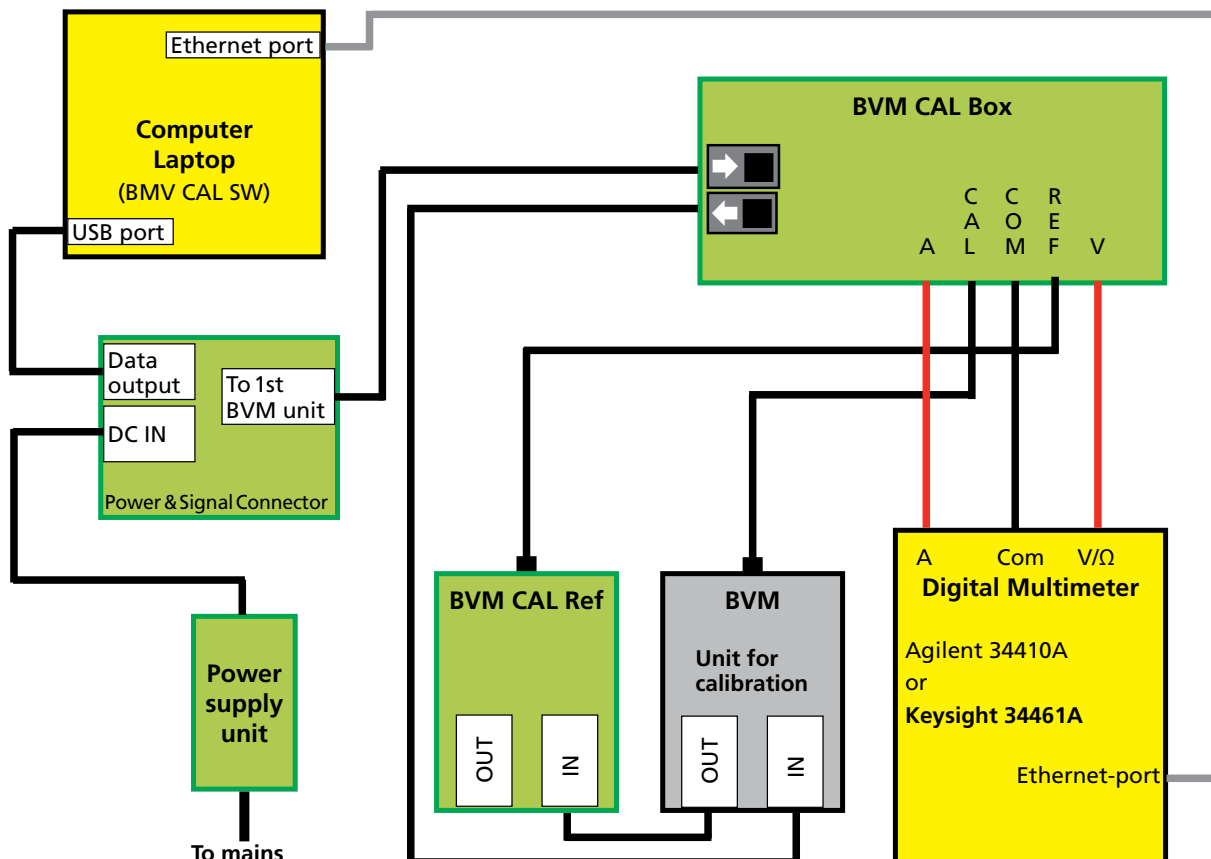
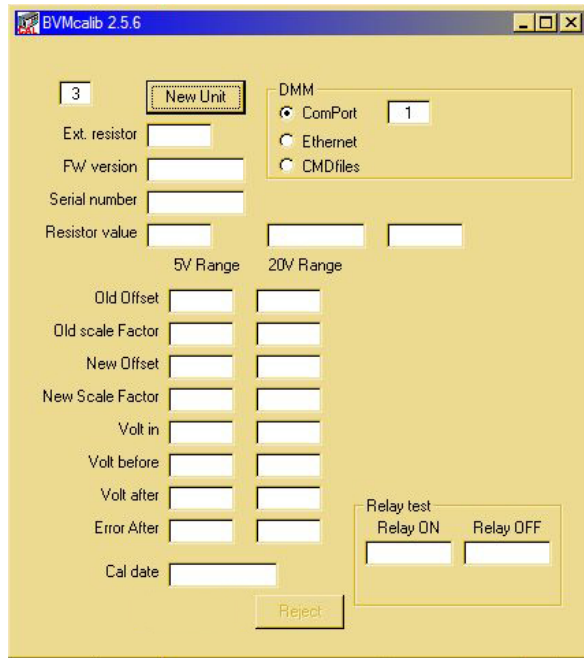


Figure 3.2.2 Connection diagram for calibration of BVM units using instrument with Ethernet port

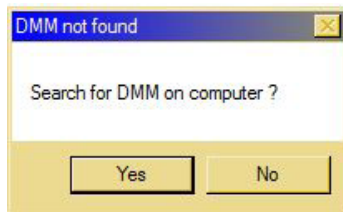
### 3.3 Calibration

- 1] Start the BVMcalib SW as administrator.
- 2] Press "New Unit".
- 3] Select connection type by clicking ComPort or Ethernet.

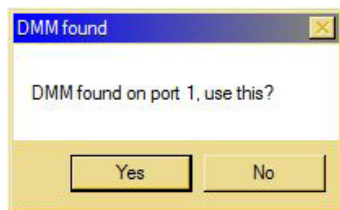
**Note** *If the port for the Digital Multimeter (DMM) is not found you shall follow the steps 3 to 5 below.*



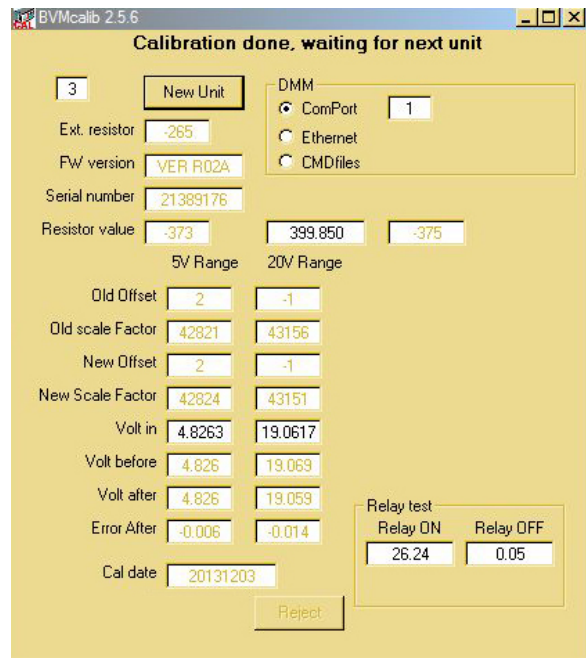
The calibration will proceed and data are presented subsequently. When calibration is ready and if it is approved it is automatically accepted and the new data are saved. Logfiles are saved in C:/ProgramFiles(x86)/BVMcalib.



- 4] Click "Yes".

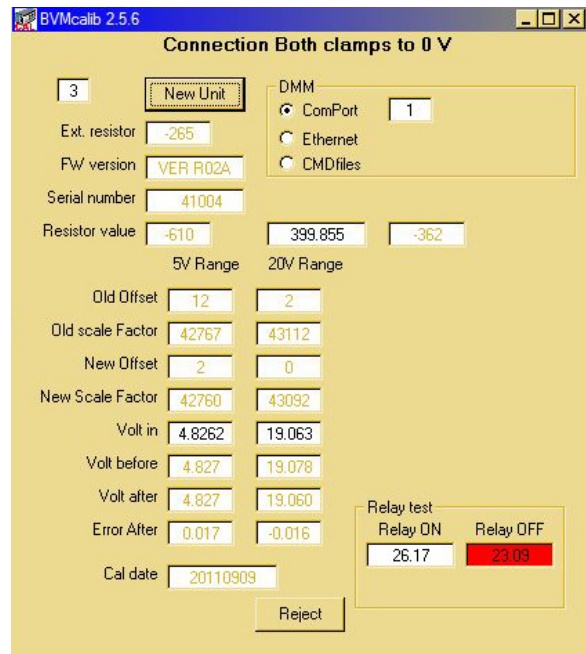


- 5] Click "Yes".  
The calibration will start.



- 6] Disconnect the calibrated BVM unit and connect the next BVM unit.

If the BVM unit does not pass the calibration the faulty value will be highlighted with red, see example below.



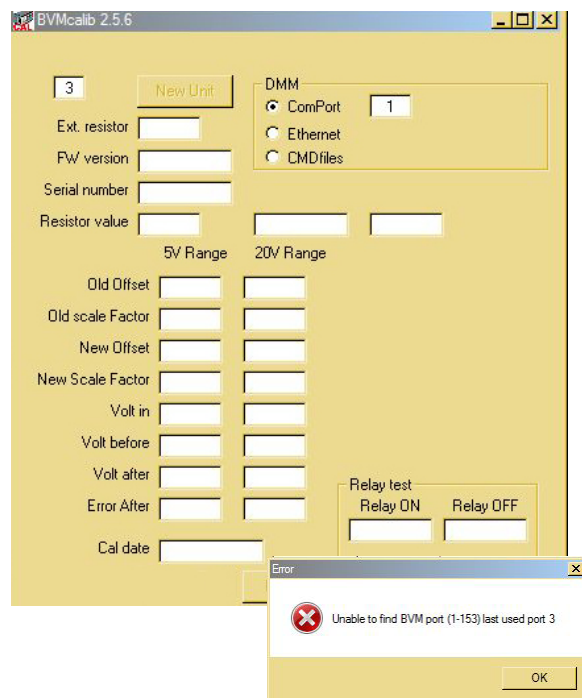
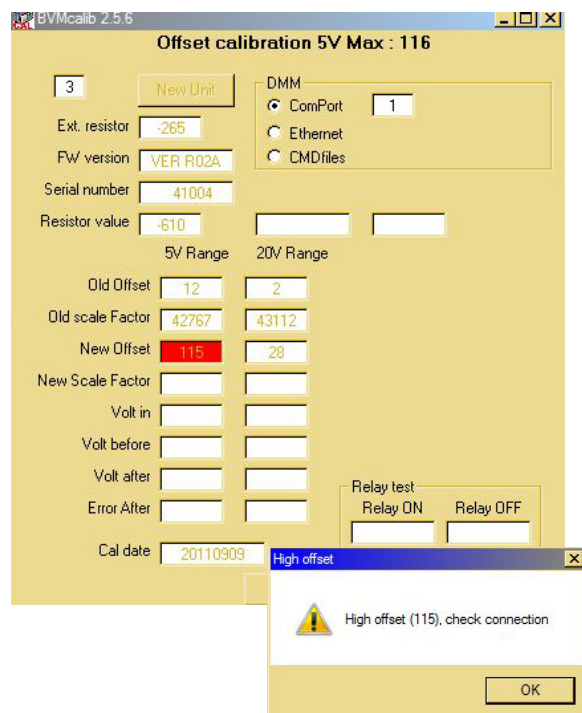
- 7] You can try to run the calibration once again to see if you get the same result. Click "Reject" and then "New Unit" to run a new calibration.

A defective unit should be replaced.

## 3.4 Error messages

### Bad connection

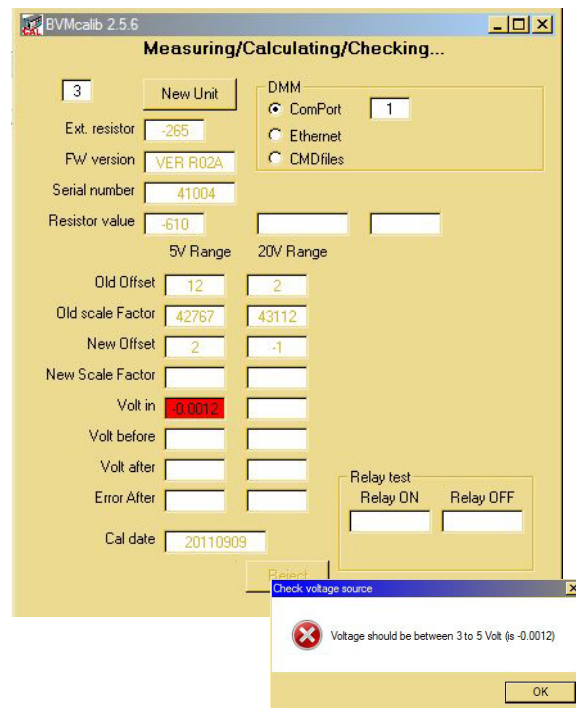
Here are some examples showing error messages when a connection is lost.



1] Check all leads and connections.

### Battery failure

If the battery power is too weak you will get the following error message.



1] Check batteries and replace with new batteries.

## 3.5 System calibration

Every six months the BVM CAL Ref unit should be calibrated. The system can calibrate itself and is done as follows.

- 1]** Connect in the same way as for a standard calibration but shift positions for CAL Ref BVM and BVM unit.
- 2]** Run a normal calibration.
- 3]** Shift back to right position for the CAL Ref.



# 4 Specifications

Specifications are valid at fully charged batteries and an ambient temperature of +25°C, (77°F). Specifications are subject to change without notice.

## Environment

**Application field** For use in high-voltage substations and industrial environments.

## Temperature

Operation -20°C to +45°C (-4°F to +113°F) \*

Storage -40°C to +70°C (-40°F to +158°F)

**Relative humidity %RH** 5%-95%, non condensing

## CE-marking

**EMC** 2004/108/EC

**LVD** 2006/95/EC

**RoHS** 2011/65/EU

## Power supply

**AC adapter** 100– 240 V AC to 24 V DC, 50 mA

**BVM CAL Box** 6 (six) 1.5 V AAA batteries and 1 (one) 9V battery

**Safety** Batteries are short circuit protected

## Dimensions

**BVM CAL Box** 143 X 85 X 80 mm

**BVM CAL Reference** 75 X 61 X 25 mm

**Power and signal connector** 75 X 61 X 25 mm

**AC adapter** 115 X 52 X 30 mm

**Transport case** 270 X 180 X 240 mm

## Weight

**BVM Cal Box** 0.5 kg

**BVM CAL Kit** 2.1 kg

(Incl. transport case)

## Output

**Output voltage** 20 V DC (max)



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- Power Quality Instruments
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