# Voltage Source

# VS-1


# User Manual

2023

# User Manual

**www.hvtp.eu**

**hvtp@hvtp.eu**

# Table of content



# Table of figures

# Introduction

This manual contains general information about device, technical data, scope of use and description of safe maintenance during tests.

This document is delivered with each VS-1 voltage source.

## Target users

Telecom engineers, protection system engineers, commissioning engineers responsible for testing and operation protection signaling equipment.

The equipment manual describes the function and applications of VS-1 voltage source used for maintenance of teleprotection equipment.

## Safety condition

This manual contains general information for safety maintenance of equipment and also comprises important information about safe using to avoid damage or equipment's failure.

Before starting to use VS-1 voltage source, please read this manual.

## Warranty

The warranty for this appliance is for 1 year from the date of purchase. The appliance has been manufactured with care and meticulously examined before delivery. Please retain your invoice as proof of purchase. In the case of a warranty claim, please make contact by e-mail with our Customer Service.

The warranty covers only claims for material and manufacturing defects, but not for transport damage, wearing parts, cases, cables etc.

The warranty is void in the case of abusive and improper handling, use of force and internal tampering not carried out by our authorized service branch.

Your statutory rights are not restricted in any way by this warranty. The warranty period can be extended by annually regular company inspection and calibrations but not more than 5 years. The other damages and defects at the time of purchase must be reported immediately after unpacking.

**Safety compliance**

EC Declaration of Conformity – Low Voltage

Compliance was demonstrated to the following specification as listed in the Official Journal of the European Communities:

Low Voltage Directive 2006/95/EC.

EN 61010-1: 2001. Safety requirements for electrical equipment for measurement control and laboratory use.

Equipment type

Test and measurement equipment.

Equipment recycling

Manufacturing of this equipment required the extraction and use of natural resources. The equipment may contain substances that could be harmful to the environment or human health if improperly handled at the product's end of life. In order to avoid release of such substances into the environment and to reduce the use of natural resources, we encourage you to recycle this product in an appropriate system that will ensure that most of the materials are reused or recycled appropriately.

This symbol indicates that this product complies with the applicable European Union requirements according to Directives 2002/96/EC and 2006/66/EC on waste electrical and electronic equipment (WEEE) and batteries.

The other

This product has been classified as Monitoring and Control equipment, and is outside the scope of the 2002/95/EC RoHS Directive.

Battery recycling

This product contains a lithium ion (Li-ion) rechargeable battery, which must be recycled or disposed of properly.

Rechargeable Li-Ion batteries are subject to disposal and recycling regulations that differ by different regions or countries. Is necessary check local regulation before disposing batteries.

Place only discharged batteries in a special marked battery container. Use protection tape to cover battery poles, to prevent of short circuits.

**Electric shock**


**This product generate up to 240V DC signals (depend on customer order). Because of this touching of outputs during signal generation may cause electric shock, that can be dangerous specially for persons with pacemaker.**

# 1 Scope of delivery

VS-1 set contains:

- VS-1 voltage source
- toolcase
- test cables set (3x1,5m typical, other optional)
- test probes (3x short and 3x long)
- 4x LC14850(3,7V) rechargeable battery set
- power supply /charger (100-240VAC)
- equipment manual
- magnetic mounting strap (optional)

## 1.1 Equipment inspection

After receiving of the VS-1 set is necessary to check delivery set compatibility with order.

## 1.2 Functional checking

- insert LC14850 batteries into battery socket
- charge batteries if necessary
- switch On voltage source
- check output voltage presence, adequate to further parameters described in manual
- check cables

If you observe any problems with equipment or with delivery details, please contact with seller or directly with company.

# 2 Functional description

## 2.1 Device description and features

VS-1 is designed as handheld battery operated voltage source for powering input/output circuits of teleprotection devices. Schematics of test circuits .

Base scope of use of VS-1:

- Powering input circuits of teleprotection equipment on remote station to provide loopback function during measurement of command response time

## 2.2 Device parameters

### 2.2.1 Electrical parameters

| | |
|---|---|
| - power supply | 14,8V (4xLC14500 rechargeable batteries)<br>dedicated charger 16,8V DC |
| - battery operation time | min 8 h (up to 12h)* |
| - output voltage | Hi 100-250 VDC (+/- 10%)** |
| | Lo 24-150 VDC (+/- 10%)** |
| - output power | max 4W |
| - output current | max 20 mA |

* SWT3000 IFC-D – constant command 220V

** Fixed during manufacturing ex. 220V/48V, 125V/24V

## 2.3. Device description

**Enclosure**

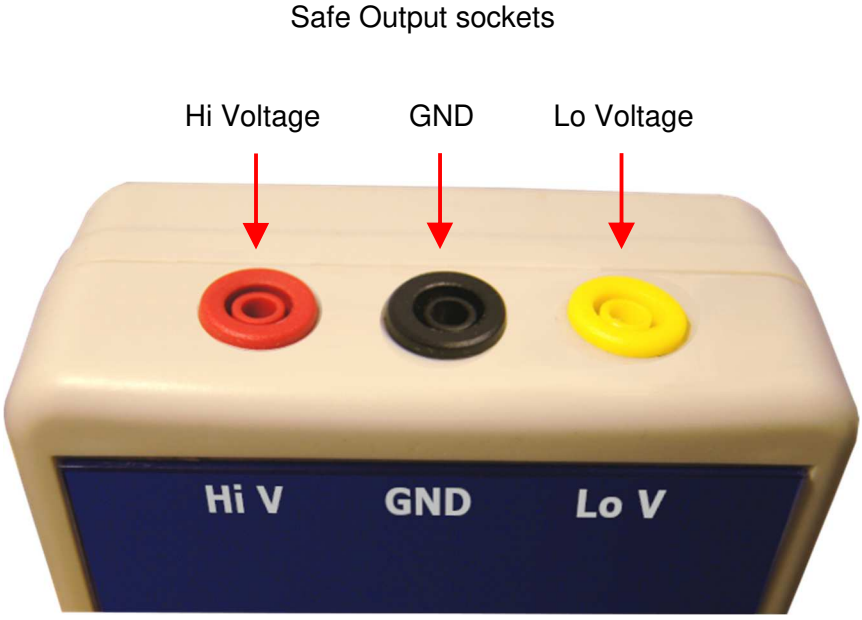


Fig. 1 Top view

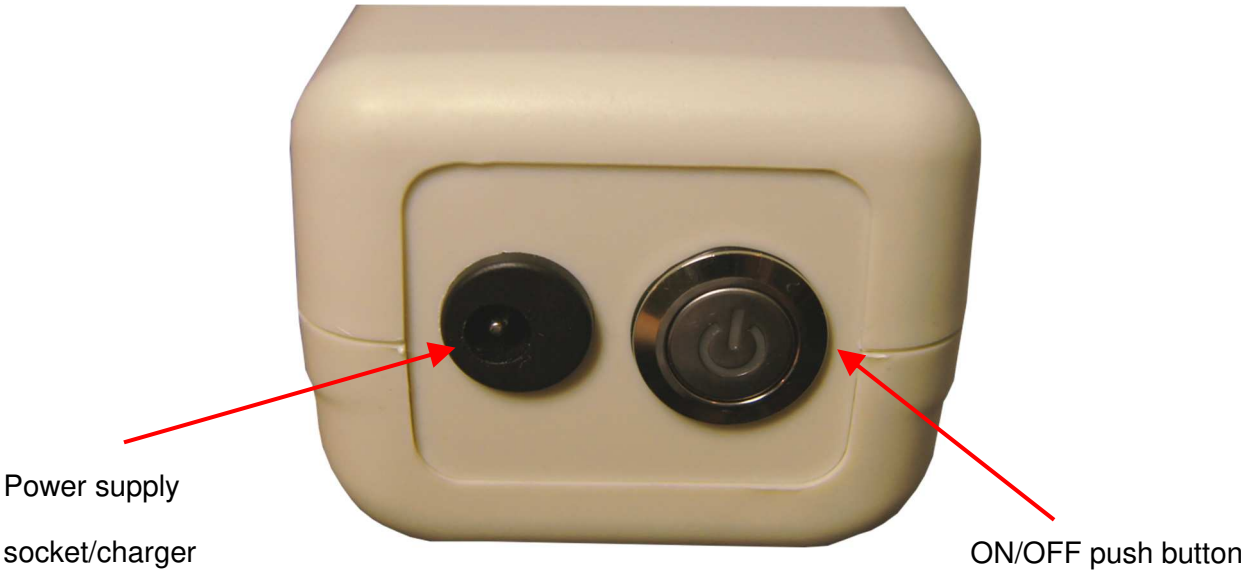


Fig. 2 Rear view

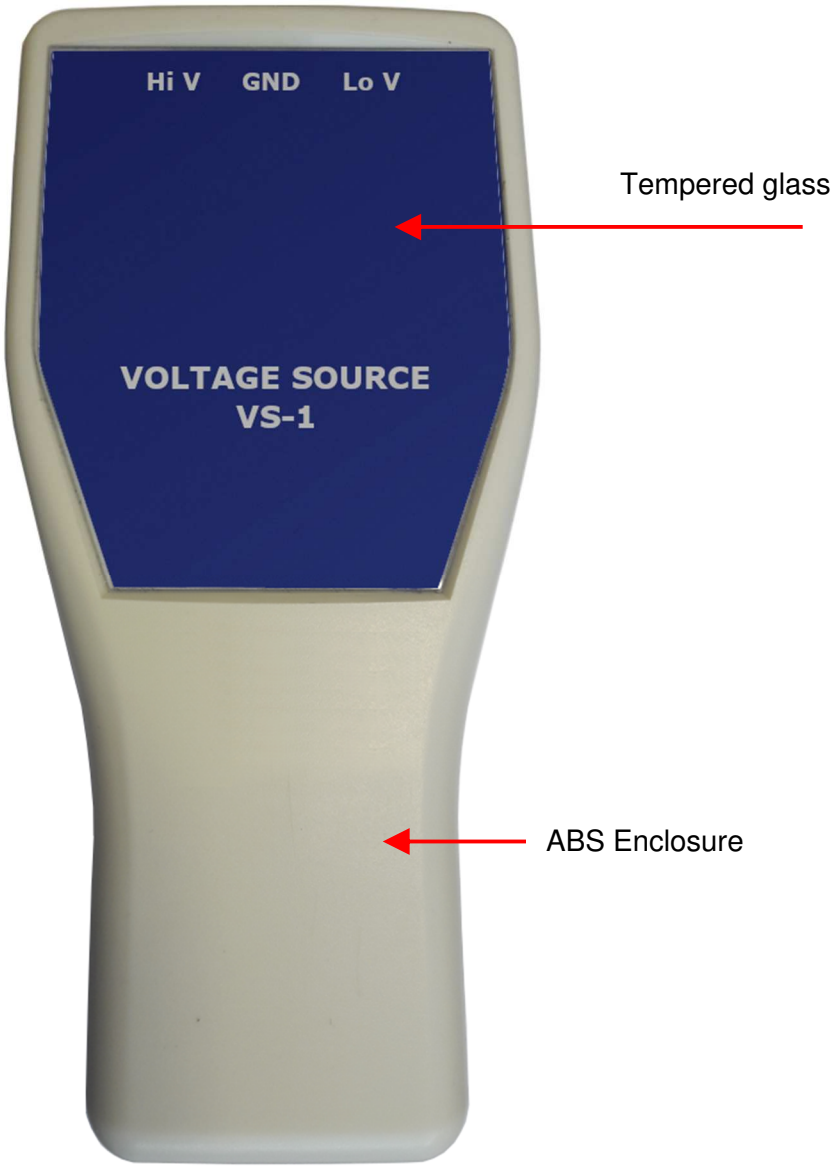


Fig. 3 Front view

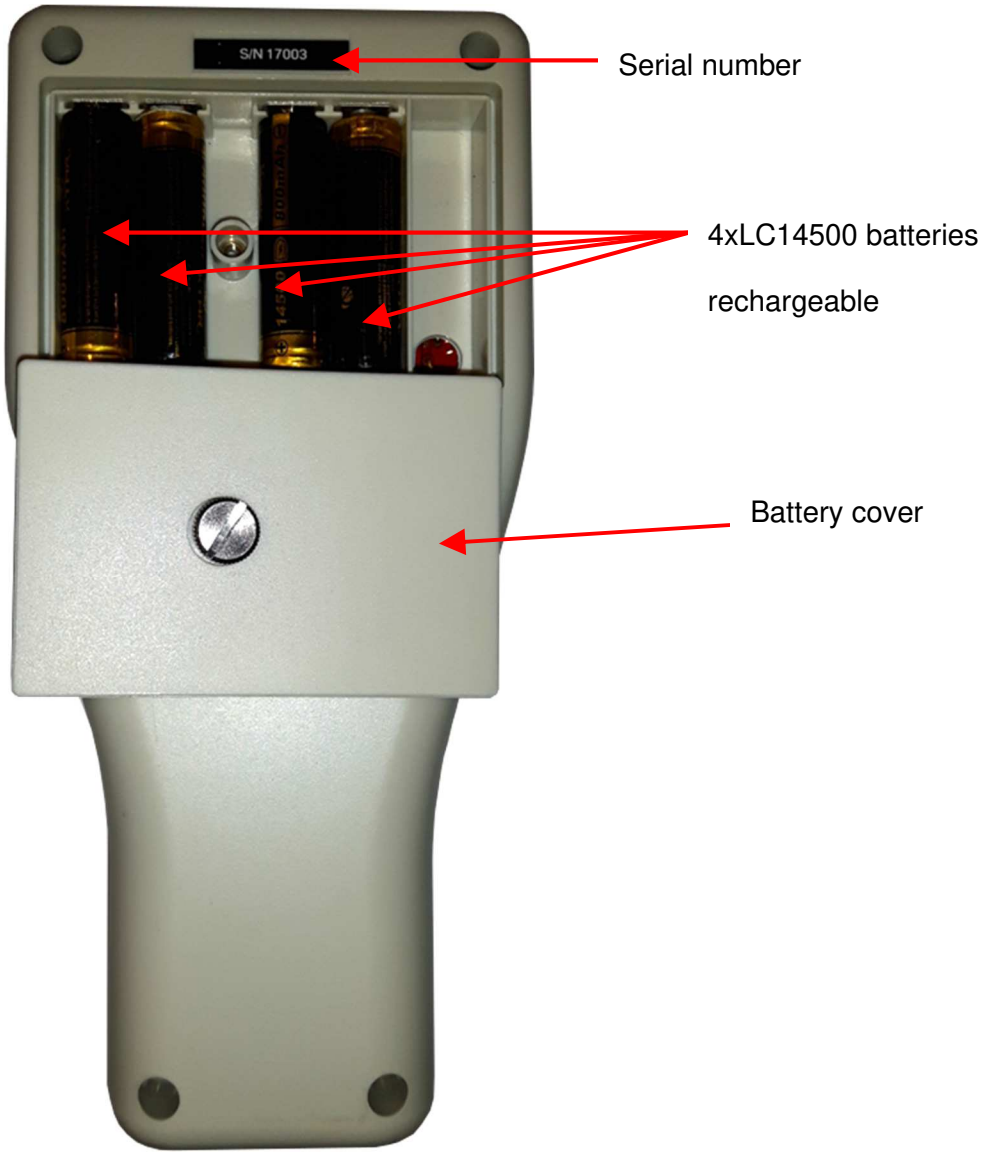


Fig. 4 Back view

# 3 VS-1 Handling description

VS-1 voltage source is designed to battery operation or/and to work with external dedicated power supply, which can be used as a battery charger.

You can not use another power supply to supply device. Using different power supply can damage sensitive internal circuits.


**Ensure that there is no voltage on tested circuits. It can damage internal circuits of VS-1.**

## 3.1 Power on device

**Important - before turn on device**

Insert batteries to battery socket - Fig.4 (use only dedicated 3,7 Li-Ion LC14500 series rechargeable batteries) connect dedicated charger to power supply socket - Fig.2. Charging batteries process will start immediately. Proper charging process is being signaling with red LED on power supply. Power supply LED will change to green as soon as charging process is finished.

Please pay attention to the polarity when inserting battery to socket. Wrong battery polarity can destroy tester.
You can use the device immediately when power supply is connected to the power supply socket - Fig. 2. Battery charger allows to use VS-1 during charging process.

Press ON/OFF button to turn device on - Fig.2

When device is ON led indicator light on – Fig.5.

Fig. 5 Bottom view

# 4 Schematics of test circuits.

## 4.1 Wiring test of teleprotection

This method allow you to test wiring and configuration of inputs and relay outputs of Teleprotection device (Fig 6). To make this test you need additional multimeter in short detection mode and digital loopback.

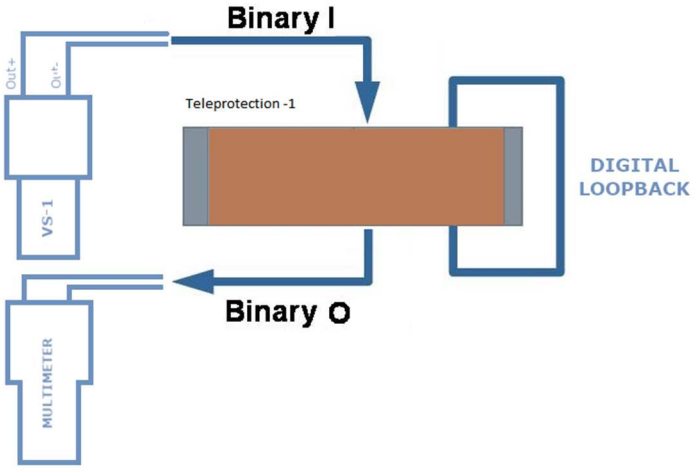


Fig. 6 Wiring test of teleprotection, diagram with voltage source VS-1 and multimeter

## 4.2 Time response measurement diagrams

This method is called loopback measurement method. This method needs supply on remote site via another TPC-1 tester or voltage source module VS-1 (Fig 7).

In case od using VS-1 additional wire loopback need to be made between teleprotection input and output.

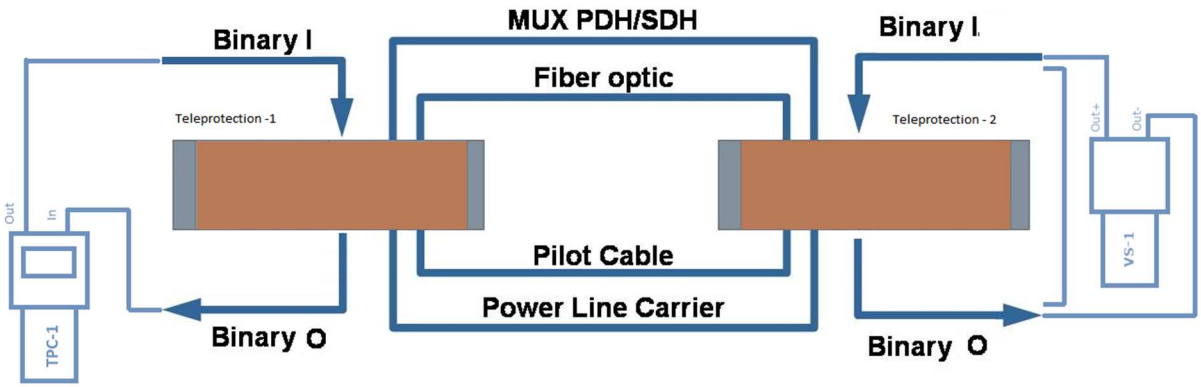


Fig. 7 Loopback measurement method diagram with voltage source VS-1 on remote side

## 4.3 Sample terminal block connection


There should be no external voltages on VS-1 terminal block. If terminal block are equiped with knife-disconect it should be open.

### 4.3.1 SWT 3000 device with IFC-D/P module

In SWT3000 device input and output circuits of IFC-D/P modules are not polarized. Sample connection of VS-1 to terminal block is show on fig. 7. Red and black wire are connected to VS-1, green wire connect input and output of SWT3000

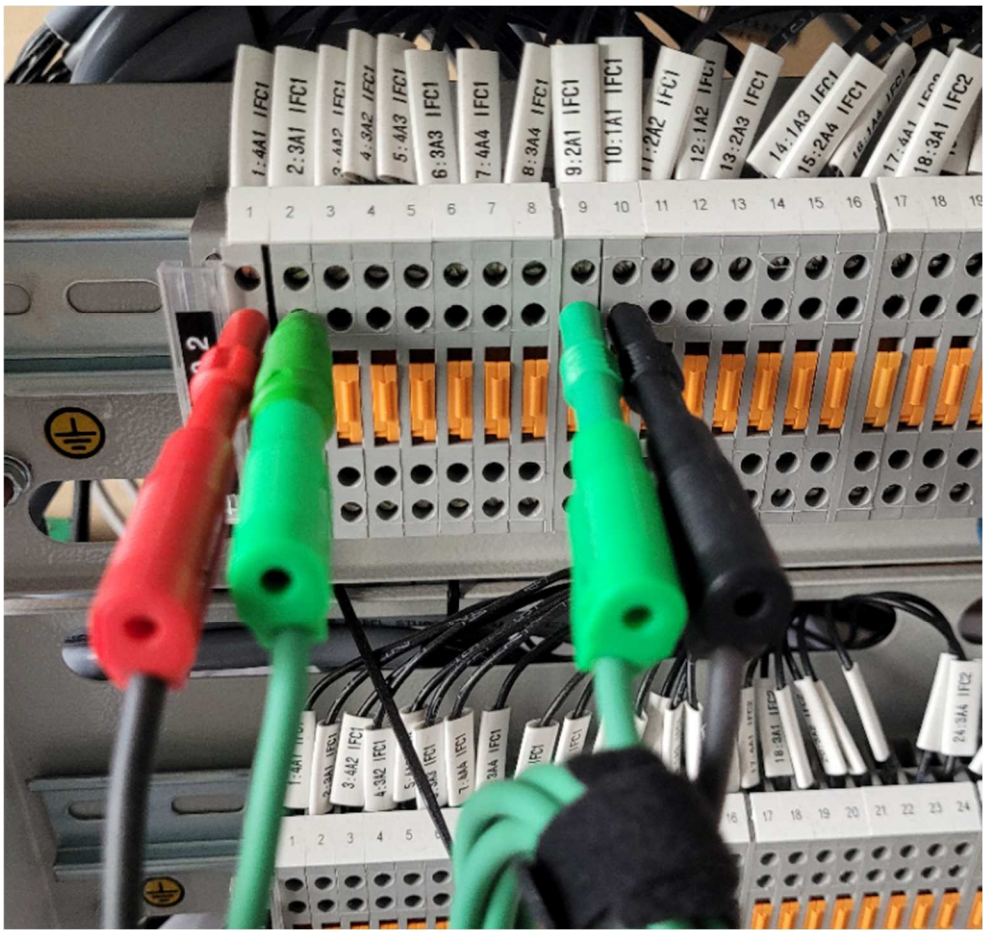

Fig. 8 Connection to SWT3000 with single IFC D/P module (1-8 4x input, 9-16 4x output)

### 4.3.2 FOX515 device with TEBIT card

Input and output circuits of TEBIT card in FOX515 devices are polarized. Sample connection of TPC-1 to terminal block is show on fig. 8. Red and black wire are connected to VS-1, green wire connect input and output of FOX515.

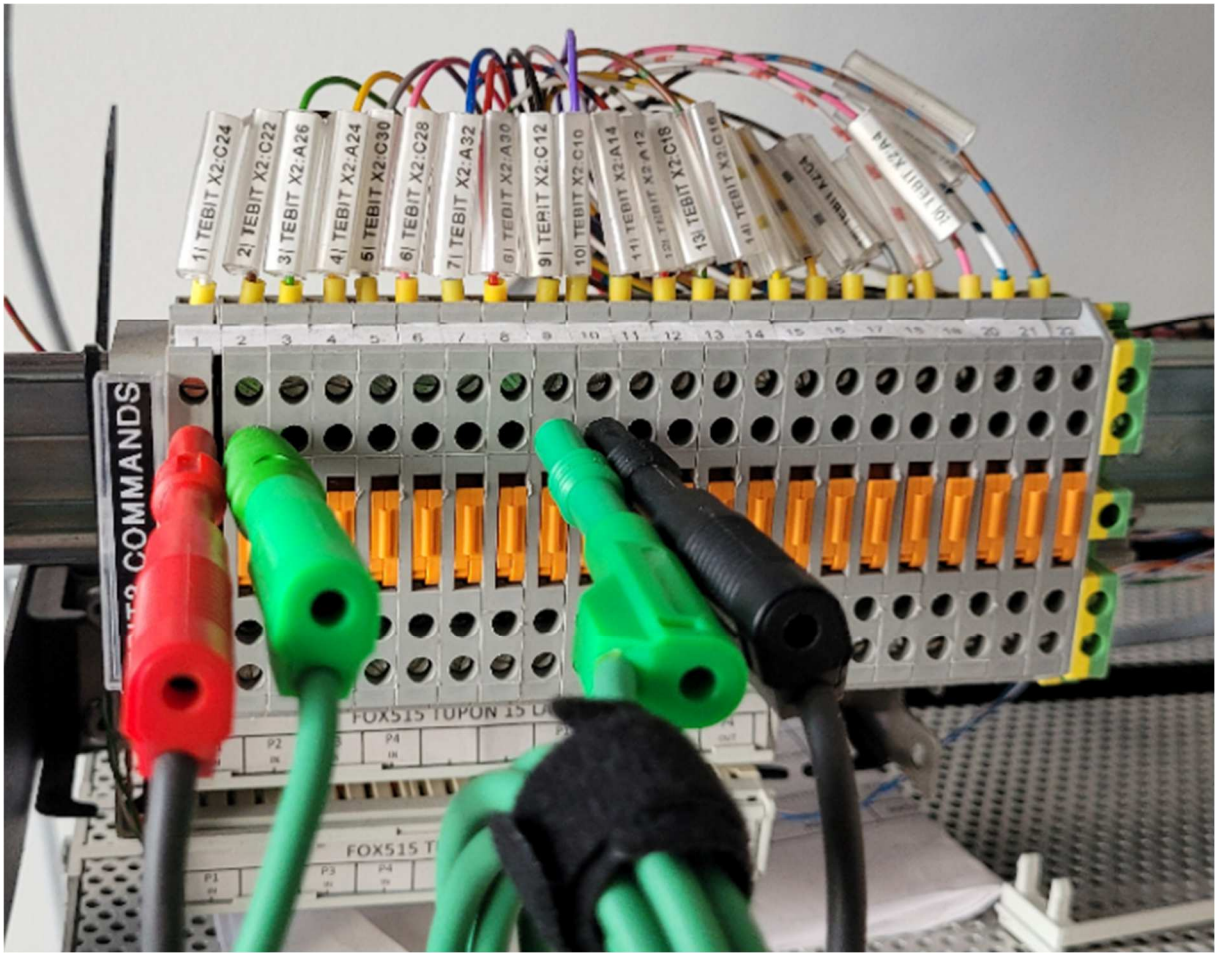


Fig. 9 Connection to FOX515 with TEBIT card (1-8 4 xinput, 9-16 4x output)

# 5 Notes

**For more information contact us**

**www.hvtp.eu**

**hvtp@hvtp.eu**

# MANUAL

# Voltage Source VS-1