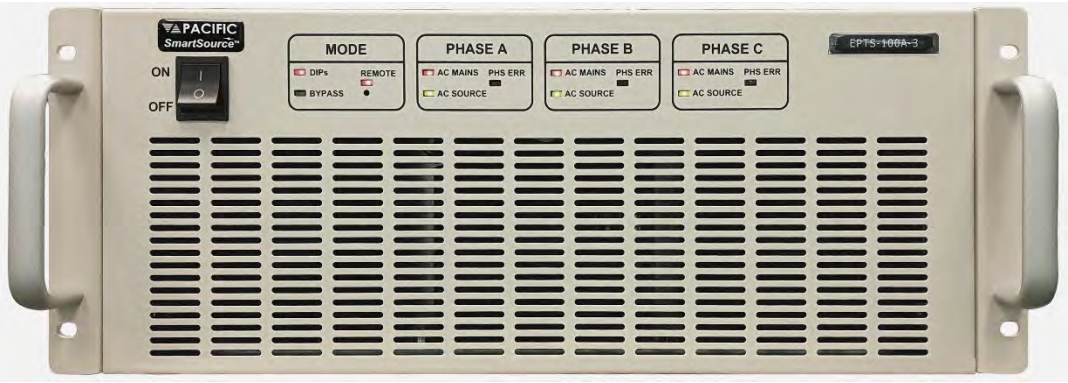
**Operation Manual**

EPTS Series – Rev 1.0.2 P/N 160698-10

# EPTS Series

## Voltage Dips Modules

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# 2 Warranty, Service & Safety Information

## 2.1 General Terms & Conditions

The General Terms & Conditions document defines payment terms, shipping charges, title passage, packaging, indemnification, warranty terms as well as Pacific's Service & Spare Parts Limited Warranty. We encourage you to read these terms and conditions very carefully at www.pacificpower.com/support. Any additional or different terms or conditions in any form presented by you ("the customer") outside of the Pacific Power Source, Inc. General Terms & Conditions are hereby deemed to be material modifications and notice of disapproval to them and rejection of them is hereby delivered.

## 2.2 Safety Information

This chapter contains important information you should read BEFORE attempting to install and power-up PPS Equipment. The information in this chapter is provided for use by experienced operators. Experienced operators understand the necessity of becoming familiar with, and then observing, life-critical safety and installation issues. Topics in this chapter include:

- Safety Notices
- Cautions
- Preparation for Installation
- Installation Instructions

Make sure to familiarize yourself with the **SAFETY SYMBOLS** shown on the next page. These symbols are used throughout this manual and relate to important safety information and issues affecting the end user or operator.

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**SAFETY SYMBOLS**

**Direct current (DC)**

**Alternating current (AC)**

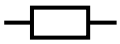
**Both direct and alternating current**

**Three-phase alternating current**

**Protective Earth (ground) terminal**


**On (Supply)**

**Off (Supply)**


**Fuse**

**Caution: Refer to this manual before this Product.**

**Caution, risk of electric shock**

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## 2.3 Safety Notices

**SAFETY SUMMARY**

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Pacific Power Source assumes no liability for the customer's failure to comply with these requirements.

**GENERAL**

This product is a Safety Class 1 instrument (provided with a protective earth terminal). The protective features of this product may be impaired if it is used in a manner not specified in the operation instructions.

**ENVIRONMENTAL CONDITIONS**

This instrument is intended for indoor use in an installation category I, pollution degree 2 environments. It is designed to operate at a maximum relative humidity of 95% and at altitudes of up to 2000 meters / 6560 feet. Refer to the specification tables for the ac mains voltage requirements and ambient operating temperature range.

Keep all ventilation holes on the front and rear free from obstruction.

Do not operate or store under conditions where condensation may occur or where conducting debris may enter the cabinet.

**BEFORE APPLYING POWER**

Verify that the product is set to match the available line voltage and the correct fuse is installed.

**GROUND THE INSTRUMENT**

**CAUTION**

This product is a Safety Class 1 instrument (provided with a protective earth terminal). To minimize shock hazard, the instrument chassis or cabinet must be connected to an electrical safety ground. The instrument must be connected to the AC power supply mains through a properly rated three phase power cable with protective earth. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.

**FUSES**

Only fuses with the required rated current, voltage, and specified type (normal blow, time delay, etc.) should be used. Do not use repaired Fuses or short circuit the fuse holder. To do so could cause a shock or fire hazard.

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**DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE.**

Do not operate the instrument in the presence of flammable gases or fumes.

**KEEP AWAY FROM LIVE CIRCUITS.**

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified service personnel. Do not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power, discharge circuits and remove external voltage sources before touching components.

**DO NOT SERVICE OR ADJUST ALONE.**

Do not attempt to provide service or adjustments unless another person, capable of rendering first aid and resuscitation, is present.

**DO NOT EXCEED INPUT RATINGS.**

The AC inputs are rated at 240V rms L-N. Do not exceed the rated input.

**MAINS POWER DISCONNECT**

**CAUTION**

The AC input connections must include a disconnect device (an external switch or circuit-breaker) as part of the installation. The disconnect device must be suitably located and easily reached and must be marked as the disconnecting device for the equipment. The disconnect device must disconnect all line conductors simultaneously.

An external overcurrent protection device must be provided (by, e.g., fuses or circuit breaker). The breaking capacity of the overcurrent protection device should be compatible with the current rating of the installation.

A minimum of basic insulation is required between mains-connected parts of opposite polarity on the supply side of the overcurrent protection device.

Overcurrent protection devices shall not be fitted in the protective conductor. Fuses or single pole circuit-breakers shall not be fitted in the neutral conductor of multi-phase equipment.

**DO NOT SUBSTITUTE PARTS OR MODIFY INSTRUMENT.**

There are no user serviceable parts inside the instrument – do not attempt to open the instrument, refer service to the manufacturer or his appointed agent.

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the instrument. Return the instrument to a Pacific Power Source Sales and Service Office for service and repair to ensure that safety features are maintained.

Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

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**AIRFLOW**

**CAUTION**

This equipment is air cooled using forced air fans. Air intake is in the front of the unit or cabinet and is exhausted at the back. When installing this equipment, make sure all front panel air intake vents and rear panel exhaust vents are unobstructed and there is at least 2 feet / 60 cm of clearing at the back of the unit or instrument rack. When installed in a 19" width instrument rack, make sure front and rear airflow remains unobstructed. Do not use solid front or rear panels or doors on 19" racks.

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# 3 Product Overview

This chapter describes the general features of the PPS Electronic Power Transfer Switch (EPTS) Modules. It introduces the reader to general operating characteristics of these measurement devices.

## 3.1 General Description

The PPS EPTS power transfer switch modules contain semiconductor switches that are capable of connected either the AC grid power or the output of a programmable AC power source to a single load. The modules switch between the two AC or DC sources under software control for a specific period of time. Default switch position is AC line (grid) or DC power supply connected. When switching the programmable AC power source output, the switches are changed back to the AC grid or DC Supply after this time period ends. For AC, switching can be started at a specific phase angle of the 50Hz or 60Hz AC voltage.

A simplified block diagram of the EPTS Module is shown below.

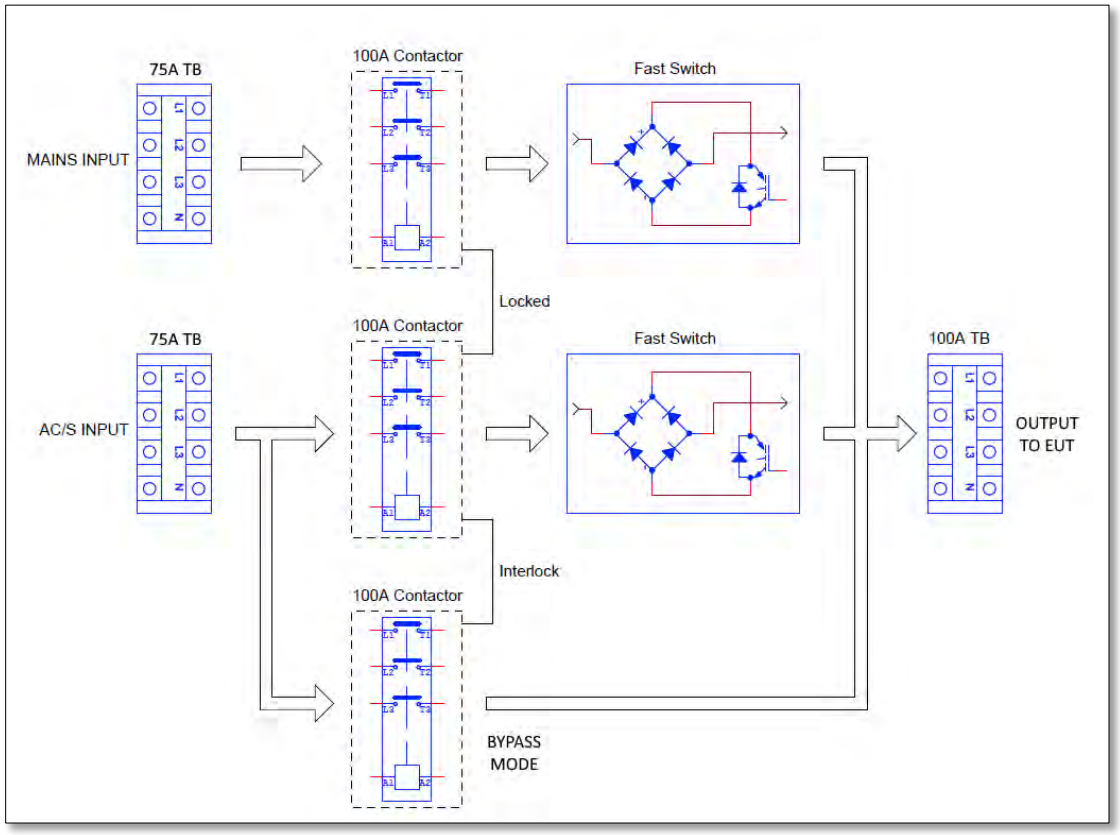


*Figure 3-1: EPTS Block Diagram*

Switching is accomplished fast enough to meet the IEC61000-4-11 and IEC61000-4-34 Voltage Dips compliance test standards. (less than 5 μsec).

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**Note:** To ensure a smooth transition of the load connection to either AC source, both AC power inputs **must be synchronized** and phase aligned. For three phase AC inputs, Phase A **must** be aligned to 0° for both sources and phases B and C **must** have the same offset phase with respect to phase A for both AC source inputs. (Same phase rotations.)

A phase sync adjustment procedure is provided to adjust any phase A offsets between the two AC power sources used for input power.

The EPTS is controlled by the included software using a simple USB-2 or USB-3 connection.

## 3.2 Product Features

The following features and functions are supported by the EPTS Electronic Power Transfer Switch:

- Immunity Test Software for AC Tests:
  - IEC 61000-4-11 Ed. 3.0 : 2020 (< 16 Arms)
  - IEC 61000-4-11 Ed. 2.1 : 2017 (< 16 Arms)
  - IEC 61000-4-11 Ed. 2.0 : 2004 (< 16 Arms)
  - IEC 61000-4-34 Ed. 1.1 : 2009 (> 16 Arms)
  - KS C 9610-4-11 : 2020

  **Note** The EPTS module is only used for Voltage Dips and Interruptions. For voltage variations, the EPTS is placed in Bypass mode and voltage variations are programmed on the programmable AC power source.
- Immunity Test Software for DC Tests:
  - IEC 61000-4-29 Ed. 1.0 : 2000
  - KS C 9610-4-29 : 2020
- Single or Three Phase EPTS Module Configurations available
- Easy to Use Windows Software
- Optional Low Inductance 100 Ohm Resistive Test Load model VDT100R for verification or adjustment.

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## 3.3 Principle of Operation

### 3.3.1 Setup for AC Tests

The EPTS module is placed between the output of a programmable AC source and the equipment to be tested for compliance to IEC 61000-4-11 or IEC 61000-4-34.

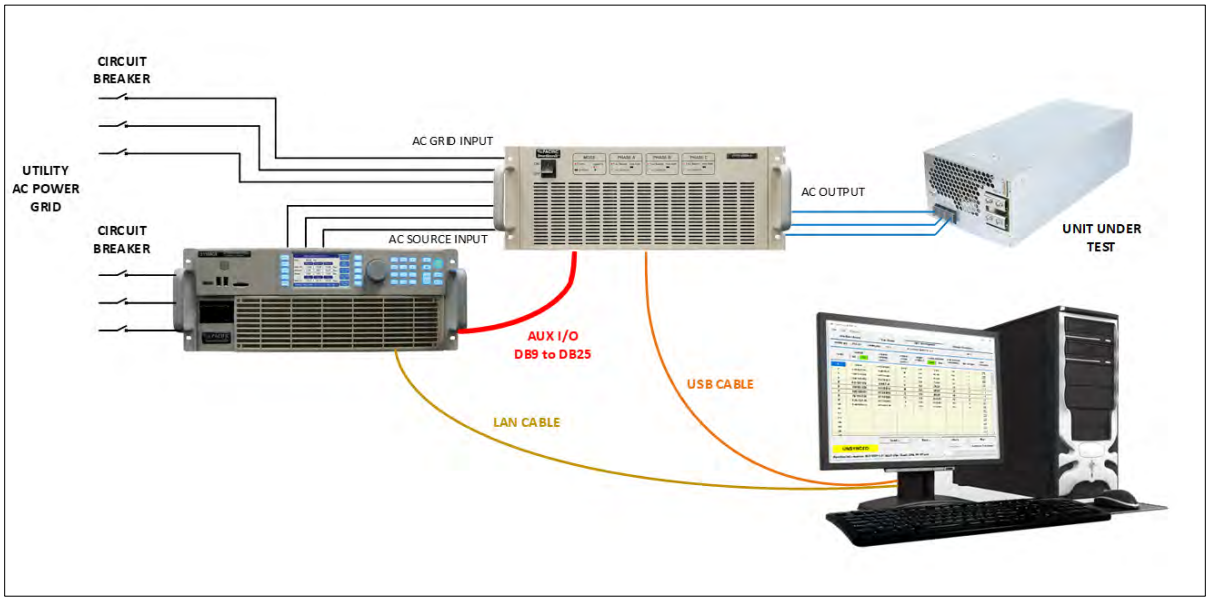


*Figure 3-2: Basic EPTS-3-XX Test Setup for IEC 61000-4-11 or IEC 61000-4-34*

The programmable AC Power Source is programmed to supply the Voltage Dip level called out in the test standard, either 80%, 70%, 40% or 0% of Unom or any other value from 0 Vrms to 240 Vrms.

For Voltage dips and interruption testing, the EPTS switches between the nominal AC line voltage provided by the grid and the output of the programmable AC source for a period determined by the Test Suite control software as programmed per the IEC 61000-4-11/34 standard.

The user can configure specific test voltage dip levels and durations as required by the IEC 61000-4-11/34 product standards and save these settings for future use as needed.

For the optional IEC 61000-4-11/-34 Voltage Variations tests, the EPTS-3-XX switch is placed in BYPASS mode and the programmable AC power source is used only to generate the requisite voltage variation sweeps and timing.

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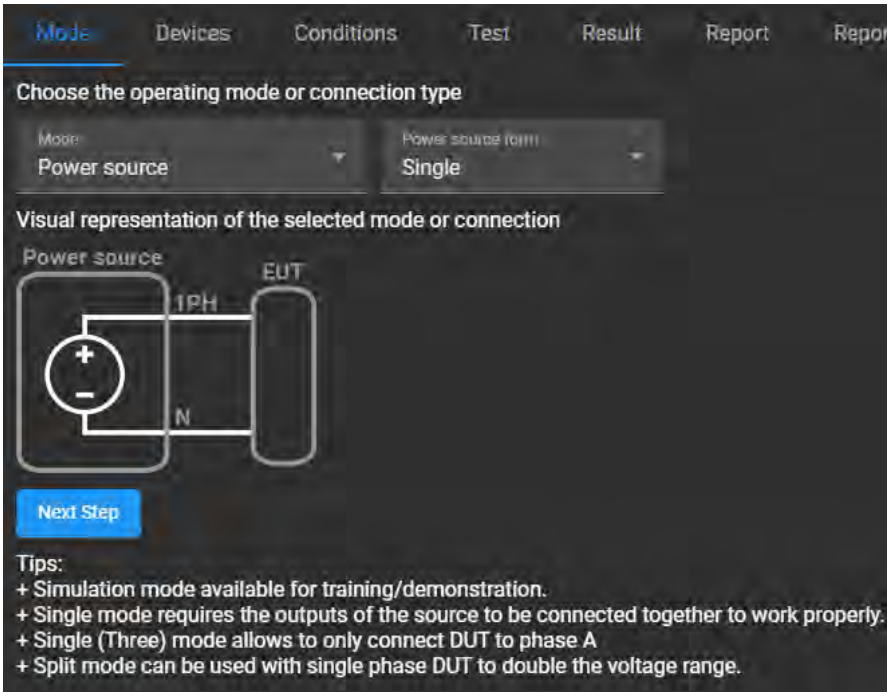
### 3.3.2 Alternative Test Setups

In addition to the basic three phase AC test setup described in the previous paragraphs, alternative setups may be used for either AC tests or DC tests. These alternative setups are briefly described here.

Single Phase/Single Output Power Supply used for Single Phase/Output EUT Test

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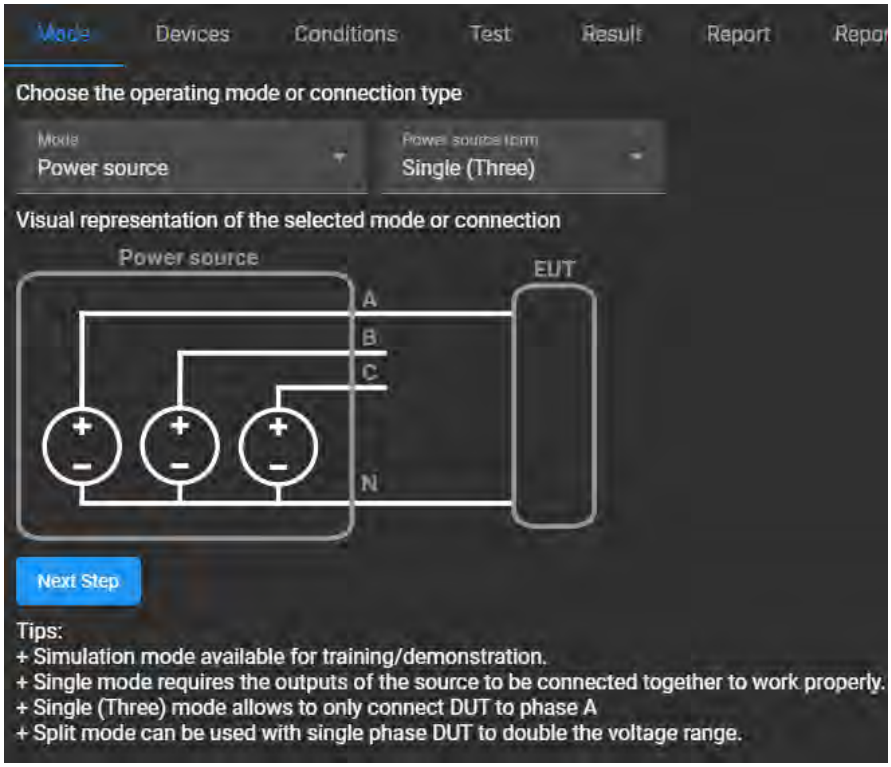
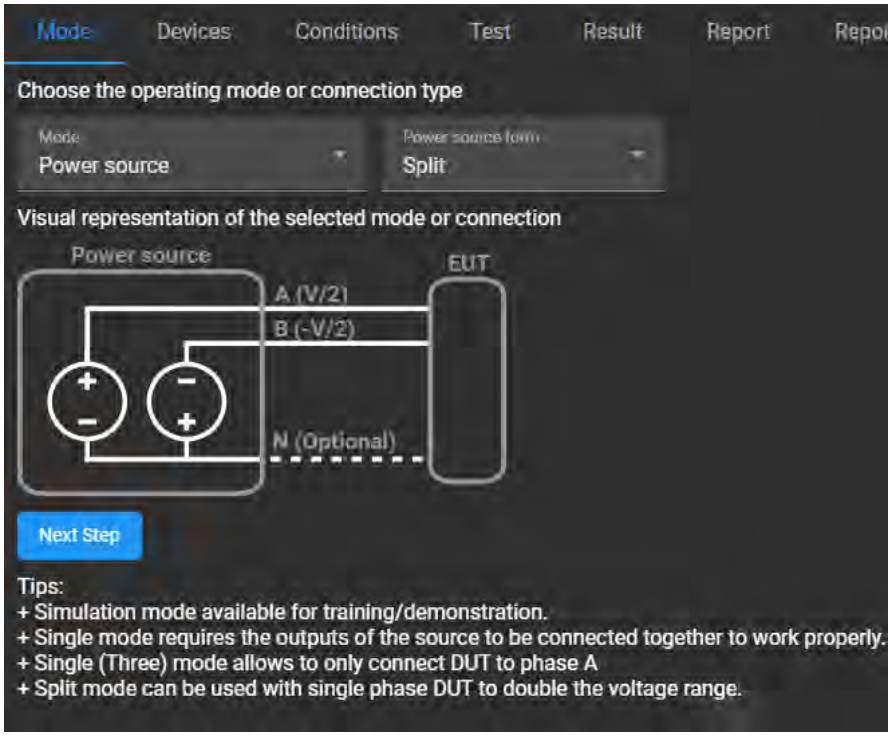
Three Phase/Single Output Power Supply used for Single Phase/Output EUT Test




Split Phase/Dual Output Power Supply used for Split Phase/Output EUT Test

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## 3.4 Accessories Included

The following accessories are included with each EPTS Module. If one or more of these is missing upon incoming inspection of the product, please contact Pacific Power Source customer service.

| Item | Quantity |
|---|---|
| **AC Line Cord** | 1 |
| **Interface Cables - USB** | 1 |
| **AUX I/O Cable pass-through Adapter DB25-DB9 for use with AFX Series AC Source** | 1 |
| **Software** | CD ROM or Download from Pacific Power website |
| **Documentation in PDF Format** | Download from Pacific Power website |

*Table 3-1: Included Accessories*

## 3.5 Remote Control Interfaces

The following remote control interface is standard on the EPTS Series.

| Standard Interfaces – EPTS Chassis | |
|---|---|
| **USB Interface** | Control Interface |

*Table 3-2: Available Remote Control Interface*

## 3.6 Auxiliary I/O Interface

The AUX I/O DB9 connector provides the following input and output control signals.

| PIN | SIGNAL | SIGNAL |
|---|---|---|
| **1** | SYNC1 | AC Grid Phase A Sync Output |
| **2** | SYNC2 | AC Grid Phase B Sync Output |
| **3** | SYNC3 | AC Grid Phase C Sync Output |
| **4** | SYNC4 | AC Power Source Phase A Sync Output |
| **5** | SYNC5 | AC Power Source Phase B Sync Output |
| **6** | SYNC6 | AC Power Source Phase C Sync Output |
| **7, 8 , 9** | Ground | Ground |

*Table 3-3: Auxiliary I/O Interface Pins*

**Note:** The SYNC1 output (pin 1) and Ground (pin 7) of the EPTS-3-XX unit DB9 must be connected to the AUX I/O DB25 connector SYNC IN (pin 8) and Ground (pin 9) of the AFX AC Power source. Use the provided interconnect adaptor for this purpose.

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# 4 Technical Specifications

Technical specifications apply at an ambient temperature of 25° C ± 5°.

## 4.1 Available Models

| VERSION | SINGLE PHASE | THREE PHASE | MAX. CURRENT |
|---|---|---|---|
| EPTS-16A Versions: | EPTS-16A-1 | EPTS-16A-3 | 16 A |
| EPTS-32A Versions: | EPTS-32A-1 | EPTS-32A-3 | 32 A |
| EPTS-75A Versions: | EPTS-75A-1 | EPTS-75A-3 | 75 A |
| EPTS-100A Versions: | EPTS-100A-1 | EPTS-100A-3 | 100 A |

## 4.2 Compliance

| PARAMETER | IEC REQUIREMENT | EPTS-xxA |
|---|---|---|
| AC Voltage Range | 230Vac (Europe)<br>300Vac (Japan) | 240Vac max. for CE mark<br>277Vac max. for US/Canada |
| Accuracy | < 5% | < 0.25% |
| Rise / Fall Time | 1 to 5 µsec | < 5 µsec |
| Frequency | 50.0 or 60.0 Hz ±2% | 45.0 - 65.0 Hz |
| Phase error (3 phase) | < 5° | ± 0.5° |
| AC Current | | |
| IEC 61000-4-11, Max. | 16A / Ph | 100A / Ph |
| IEC 61000-4-34, Max. | 75A / Ph | 100A / Ph |
| DC Mode Restrictions | When operating with DC, the following situations must be avoided to prevent potential damage in the internal contactors:<br>a) Turn the EPTS module bias supply **off**.<br>b) Change to/from BYPASS/DIPS modes. | |
| DC Voltage Range | 360 Vdc max. | 360Vdc max. |
| DC Current | 25 Adc | 100 Adc |

## 4.3 AC Input (Bias Supply)

| AC INPUT | |
|---|---|
| AC Voltage (Bias) | 120Vac ~ 240Vac ±10%, 2W+G |
| Input Current | 3 A |
| Internal Fuse Rating | 2 A @ 240Vac |
| Detachable Line Cord | IEC C13, 300/500V, 3 * 1.0 mm² |
| Frequency | 50 / 60 Hz ± 3Hz |

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## 4.4 Test Standards

| TEST STANDARDS SUPPORTED | |
|---|---|
| IEC 61000-4-11 | AC - Voltage Dips and Interruptions |
| KS-C-9610-4-11 | AC - Voltage Dips and Interruptions, Korean Version |
| IEC 61000-4-34 | AC - Voltage Dips and Interruptions |
| KS-C-9610-4-34 | AC - Voltage Dips and Interruptions, Korean Version |
| IEC 61000-4-29 | DC - Voltage Dips and Interruptions |

## 4.5 Interface, Indicators and Controls

| INTERFACES, INDICATORS & CONTROLS | |
|---|---|
| Connectors - Rear Panel | |
| Power Input | AC Mains, 1 or 3 Phases + Neutral<br>AC Source, 1 or 3 Phases + Neutral |
| Power Output | To EUT, 1 or 3 Phases + Neutral |
| Control Interface | USB Device Type B, Rear panel |
| Line Sync | From AC Mains or Generator |
| Auxiliary I/O | DB9 Connector, Female, Rear panel |
| LED Indicators - Front Panel | |
| Mode | DIPS or Bypass |
| Phase Status | Mains or Source |
| Phase Error | For each Phase |
| Controls - Front Panel | |
| Power On/Off | Toggle Switch, Front panel |

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## 4.6 Dimensions & Weight

| MECHANICAL & ENVIRONMENTAL | |
|---|---|
| Dimensions | |
| **All Models** | |
| (H x W x D)<br>See drawing below | 178 x 432 x 670 mm<br>7” x 17” x 26.4” |
| Weight | 42.5 Kg / 93.7 lbs |
| Temperature | 0 - 40° / 32 - 104° |
| Humidity | 0-95 % non-condensing |
| Altitude | 6500 ft / 2000 m (operating) |
| Insulation, Line / Neutral to chassis | 2500 Vdc |

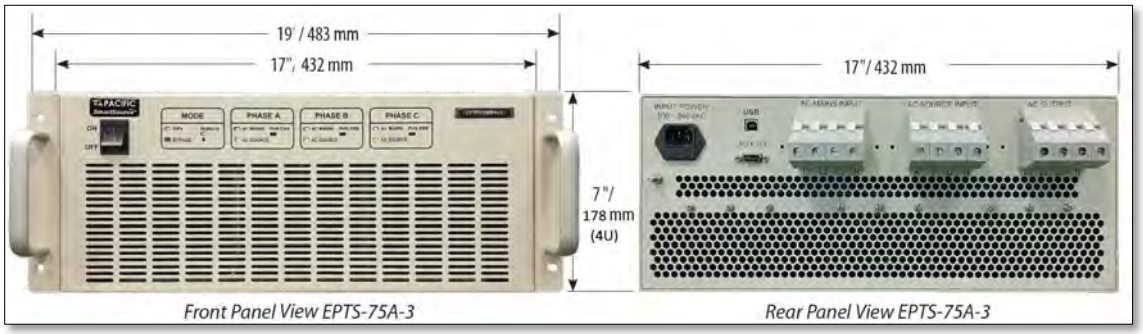


*Figure 4-1: Dimension Drawing EPTS Module Series all Models*

## 4.7 Environmental

| ENVIRONMENTAL | |
|---|---|
| Cooling | Fan Cooled |
| Operating Temperature | 0 to 40 °C / 32 to 104 °F |
| Storage Temperature | -20 to 70 °C / -4 to 158 °F |
| Humidity | < 95%, non-condensing |
| Altitude (max.) | 2000 m / 6550 feet |
| Equipment ingress protection rating per IEC 60529 | IP20 |

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# 5 Unpacking and Installation

## 5.1 Inspection & Protective Earth Connection

The EPTS Modules are carefully inspected before shipment. If instrument damage has occurred during transport, please inform Pacific Power Source' nearest sales and service office or representative.

The EPTS Module chassis is shipped ready for use –complete with an appropriate power cord. Prior to use, the phase A adjustment between both AC input sources (AC grid and AC source or two AC sources) must be performed.

**CAUTION**

**THIS UNIT MUST BE GROUNDED.**

The unit is grounded via the bias supply AC Input. A line cord with proper Earth Ground must be used at all times. Furthermore, a high current rated grounding stud is located in the lower left bottom corner of the EPTS chassis. This ground stud must be connected to earth ground using a 75A rated ground wire. Correct grounding of your electrical system infrastructure according to applicable national standards must also be observed.

## 5.2 Rack Mount Installation

**CAUTION**

**THIS UNIT IS HEAVY.** Two persons are required to lift or carry this unit. DO NOT attempt to lift alone. DO NOT use the front panel rack handles alone to lift this unit. The unit must be supported in front and back when carrying.

If the unit is to be installed in an instrument rack, a suitable lift must be used to position the unit at the desired rack height and pushed in place using L-brackets (not included with the unit). The front panel handles may be used to pull or push the unit in or out of a rack space only.

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## 5.3 Ship Kit Contents

Inside the packaging, there should be the following ship kit items:

| Item | Quantity |
|---|---|
| EPTS unit | 1 |
| AC Line Cord | 1 |
| Interface Cables - USB | 1 |
| AUX I/O Cable pass-through Adapter DB25-DB9 for use with AFX Series AC Source | 1 |
| Software | USB Stick or Download from Pacific Power website |
| Documentation in PDF Format | Download from Pacific Power website |

*Figure 5-2: Ship Kit Content Hardware Items*

## 5.4 Software Installation

With the introduction of the comprehensive Test Suite software platform for Windows 11™, the installation process has been simplified to require only a single installation. Running the setup for Test Suite will install all necessary application software, device drivers and other support elements needed to operate the EPTS hardware.

In the absence of the EPTS hardware, the Test Suite can still be used to run Voltages dips, interruptions and variation with just the programmable AC and DC power source, although some full compliance requirements may not be met in this mode.

Refer to Section 9, “Software Installation Instructions” on page 112 for details on installing Test Suite software on a Windows PC or laptop.

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## 5.5 Hardware Installation

The hardware connections are very straightforward and shown in *Figure 5-3* and *Figure 5-4*. The following devices connect to the rear panel of the EPTS Chassis:

1. AC grid power to provide bias power supplies to the EPTS circuits,
2. AC Power Output connections from a programmable AC and DC power source. The maximum amount of current that can be routed through the EPTS chassis depends on the model and current rating. See Section 4, ”Technical Specifications”.
3. USB interface connection to control the EPTS Electronic Power Transfer switch hardware using the Test Suite software.
4. Connect the DB9 AUX I/O connector of the EPTS-3-XX unit to the DB25 AUX I/O connector of the AFX Series AC Power Source using the provided pass-through adapter. This allows the AC source to be synchronized to Phase L1 of the AC grid.

See system schematic on next page for interconnections between various components.

## 5.6 System Schematic

The schematic below applies to AC Mode testing. For DC testing, the AC grid connection is replaced by either a second DC power supply or by phase B output from the AFX so the interconnections are different between AC and DC modes. Refer to section 3.3 on page 14 for more details.

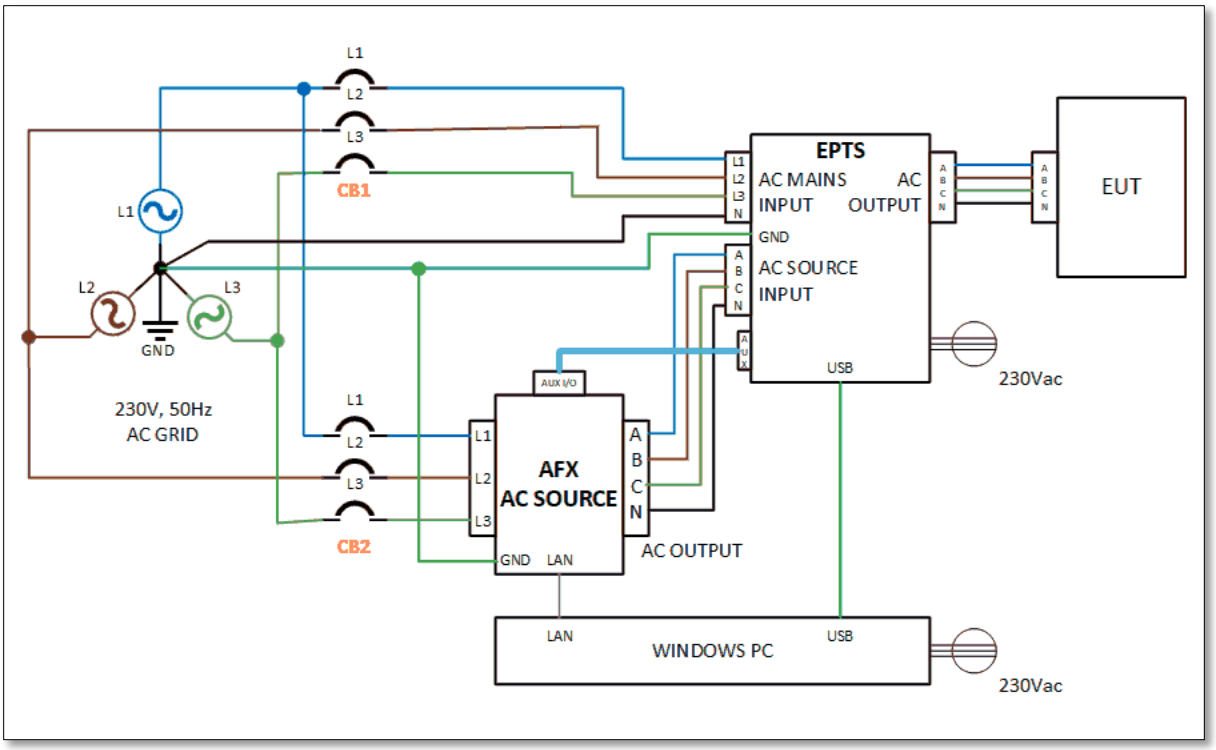


*Figure 5-3: EPTS System Schematic for AC Test Mode*

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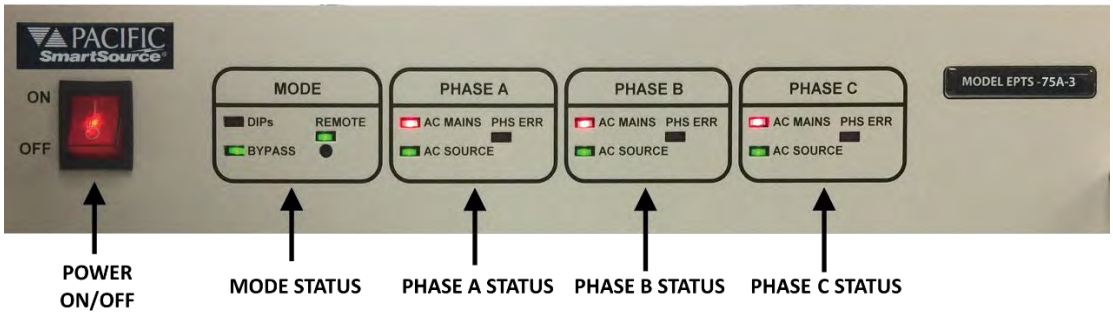
## 5.7 Front Panel Operation

The front panel of the EPTS chassis has the following controls, indicators and power connectors:




1. Power On/Off Switch. Turns internal control circuits on or off.
2. Mode Status of Transfer Switch Operation: DIPs Mode or BYPASS Mode. In Power OFF state, Mode is always BYPASS.
   Remote Control Active Status Indicator
3. PHASE A AC Mains and AC Source input present and Phase Sync Error Indicator
4. PHASE B AC Mains and AC Source input present and Phase Sync Error Indicator
5. PHASE C AC Mains and AC Source input present and Phase Sync Error Indicator

All other connections are made at the rear panel as described in the next several sections.

## 5.8 AC Bias Power

The EPTS requires only single-phase bias AC power. It has a standard IEC13 line cord connection at the rear. Total power consumption is less than 400W. AC input voltage is 120 Vac ~ 240Vac ± 10%, 50 Hz or 60 Hz.

**CAUTION**

DO NOT replace the included detachable AC Line cord with an inadequately rated line cord. Line cord used must meet or exceed voltage and current ratings as specified in section 4.2, page 18.

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## 5.9 AC Power Input Sources

The EPTS needs two AC power input sources:

1. Fixed nominal AC voltage and frequency for required test. For European CE mark requirements, this will be 230Vac LN/400Vac LL, 50Hz. For US/Canada, testing to 277Vac LN/480Vac LL is available. In countries where this is the nominal grid voltage, the public utility grid can be used. For countries where the voltage and or frequency is not correct, a generator or additional programmable AC power source of sufficient current rating may be used instead.
2. A programmable AC power source with a 0 to 240Vac LN RMS programmable output voltage and 50Hz or up to 277Vac LN at 60Hz frequency setting. The current at the voltage dip levels available from the AC power source must be sufficiently high to support the levels called out in the IEC 61000-4-11 and IEC 61000-4-34 test standards.

These two AC power inputs are routed in through the real panel terminal blocks marked AC MAINS INPUT~ and AC SOURCE INPUT~ respectively. For single phase EPTS-1 models, only Phase A and Neutral are required on each input. For three phase applications, three phase power input is required for both AC inputs.

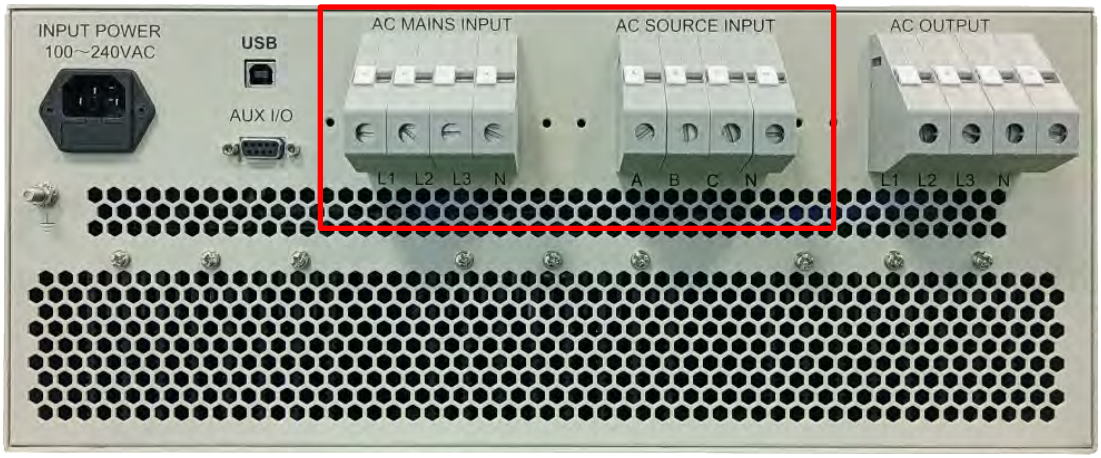


*Figure 5-4: EPTS-3 Three Phase Connection Locations*

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### 5.9.1 AC Input & Output Wire Sizes

Required AC input and output wire sizes vary by EPTS model. The table below list recommended AC wires size by EPTS model. Wire size per phase is the same for single and three phase LFZ models.

**CAUTION**

**Consult a certified electrician to determine require AC Input and Output wiring type and size in accordance with local electrical codes.**

Wires size recommendations shown are for single copper wire, both AC input and AC output connections and are per phase.

| Single Core Copper | EPTS-16A-x | EPTS-32A-x | EPTS-75A-x | EPTS-100A-x |
|---|---|---|---|---|
| **US AWG Size** | 14 | 10 | 6 | 4 |
| **Metric diameter** | 1.6 mm | 2.6 mm | 4.1 mm | 5.2 mm |

## 5.10 EUT Power Connections

The product to be tested (EUT) must be connected to the AC OUTPUT~ terminal of the EPTS module. On ECTS2 Cabinet systems, an IEC style female connector is provided on the front of the cabinet for the EUT connection. A mating male connector is provided in the ship kit.

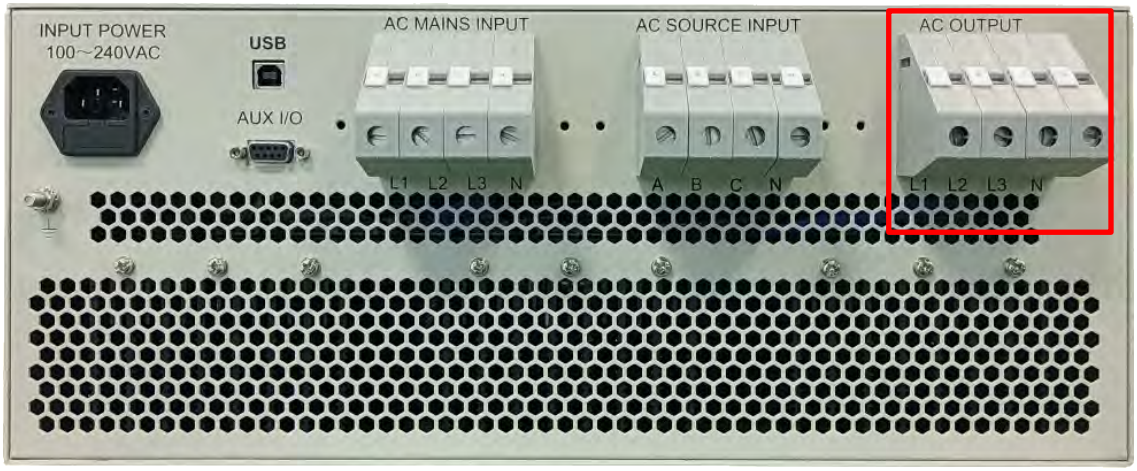


*Figure 5-5: EPTS-3 Chassis Rear Panel EUT OUTPUT POWER Connector*

## 5.11 USB Connection to Computer

The EPTS chassis has a single USB Device port on the rear panel. This USB port needs to be connected to the controller computer using the provided USB cable or equivalent.

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## 5.12 DB9 AUX I/O Connection to AC Power Source

The DB9 AUX I/O connector must be connected to the programmable AC power source used to provide the voltage dip levels. (AC SOURCE INPUT connection). This output provided the mains synchronization signal to the AC power source. The required cable in provided in the ship kit.

**Note:** This DB25 Connector adaptor cable between the EPTS units and the AC Power Source or ECTS2 H&F test system **MUST** always be connected to ensure phase synchronization between the EPTS and the AC source. This connection also ensures the AC Source output voltage and current are limited to a maximum levels that are within the specification range of the EPTS hardware. (Applies to Pacific Power Source model series AFX, AGX, AZX, LSX and LMX).

**Note:** If the AC power source is not used with the EPTS hardware, original maximum output ranges can be restored to normal by sending the following command:

**SOUR:ECTS 0**

This restores normal output ranges to the AC power source.

## 5.13 Powering Up

Before connecting the EPTS to a unit to be tested, first connect the mains cord from a properly grounded supply outlet to the inlet on the rear panel of the EPTS chassis.

In the event of any problem, please contact customer service or your local authorized representative. See Section 1.

## 5.14 Phase Synchronization Adjustment

Before the EPST-3-XX unit can be used, the AC source must be phase adjusted to the same phase angle as the AC mains used. This is done using the Test Suite software. Refer to Section 9, “Adjustment Information” on page 123 for details.

## 5.15 In Case of Malfunction

In the unlikely event of an instrument malfunction or if the instrument does not turn on despite the presence of the correct AC line voltage, please attach a warning tag to the instrument to identify the owner and indicate that service or repair is required. Contact Pacific Power Source or its authorized representative to arrange for service.

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## 5.16 Cleaning

**CAUTION**

BEFORE you clean the unit, switch the unit off at the front panel AND remove all mains power using the MAINS disconnect.

- Please do NOT use any organic solvent capable of changing the nature of the plastic such as benzene or acetone.
- Please ensure that no liquid is allowed to penetrate this product.

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# 6 Test Suite Software Operation

## 6.1 Preface

Operation of the EPTS-3-XX unit requires the use of the Test Suite software. This section describes operation and use of the Test Suite software to perform AC or DC voltage dips, interruptions and variations tests.

## 6.2 Test Library Tab

The defaults screen displayed upon the Test Suite program launch will be the Test Library screen shown below. This screen shows the available test standards for which a software license was installed. Both AC and DC IEC tests will be displayed. For DC tests, the AC source must have DC output mode.

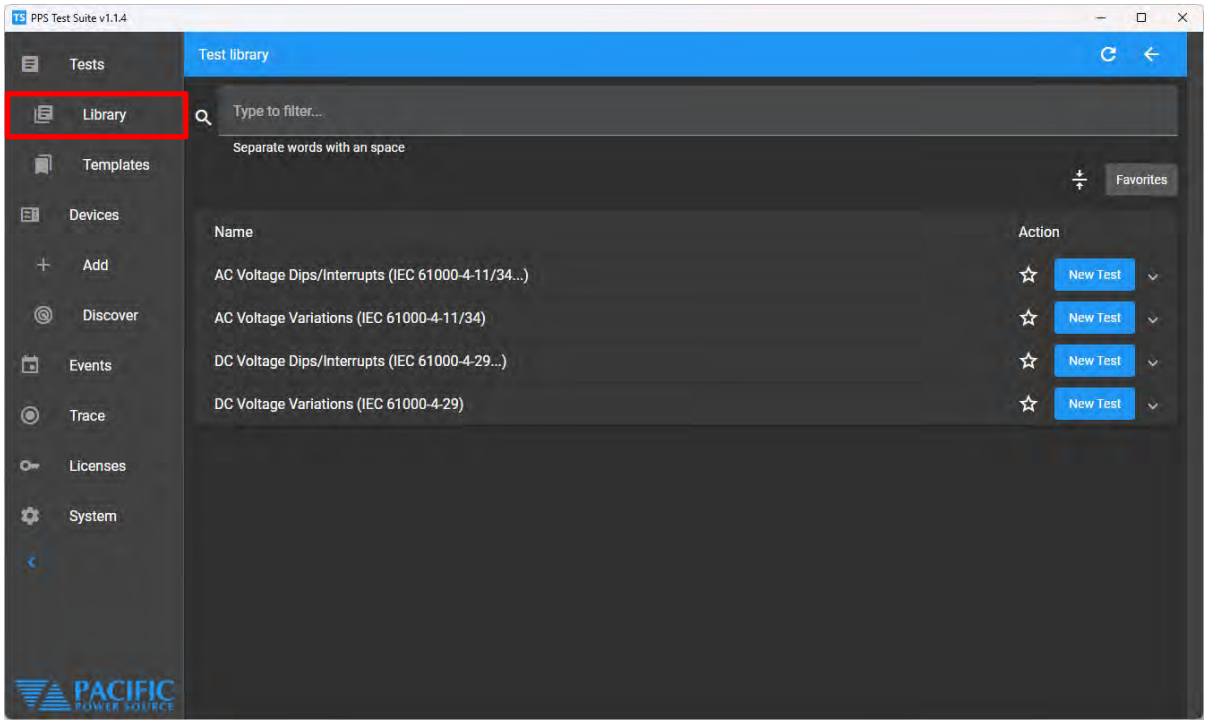


*Figure 6-1: Test Suite Graphical User Interface Test Library Screen*

## 6.3 Voltage Dips Tests

Voltage Dips require the use of the EPTS hardware to ensure compliant voltage rise and fall times. This is accomplished by using fast solid state electronic switches to transition between two distinct voltage levels very quickly. This is a function of the EPTS hardware and firmware working in conjunction with two AC or DC power sources.

This setup supports up to 37 test mode configurations, depending on available hardware, phase mode and other factors.

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## 6.4 Supported Voltage Dips Test Configurations

The first table below describes the possible test setup configuration selections available. The second table below summarizes the available settings for test configurations supported by the Test Suite software and the EPTS hardware. Up to four fields are available to select each component of your test system configuration.

| Selection | Description |
|---|---|
| **Mode** | Selected either single Source setup, dual source setup, source and mains setup or Simulation mode. |
| **EPTS Model** | Selects Single Phase EPTS unit (EPTS-1) or Three Phase EPTS unit (EPTS-3) |
| **Power Source Form** | Selects between following programmable AC source modes:<br>Single phase test on phase A with AC source in single phase mode<br>Single phase test on phase A with AC source in three phase mode<br>Split phase test on phase A&B with AC source in split phase mode<br>Three phase test with AC source in three phase mode<br>Dual single phase test on phase A&B with AC source in three phase mode |
| **Power Source Mains Form** | Selects between following programmable AC source modes:<br>Single phase test on phase A with AC source in single phase mode<br>Single phase test on phase A with AC source in three phase mode<br>Split phase test on phase A&B with AC source in split phase mode<br>Three phase test with AC source in three phase mode |

This provides for the following 37 permutations of test configurations:

| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **1** | N/A | Single Phase | N/A | |

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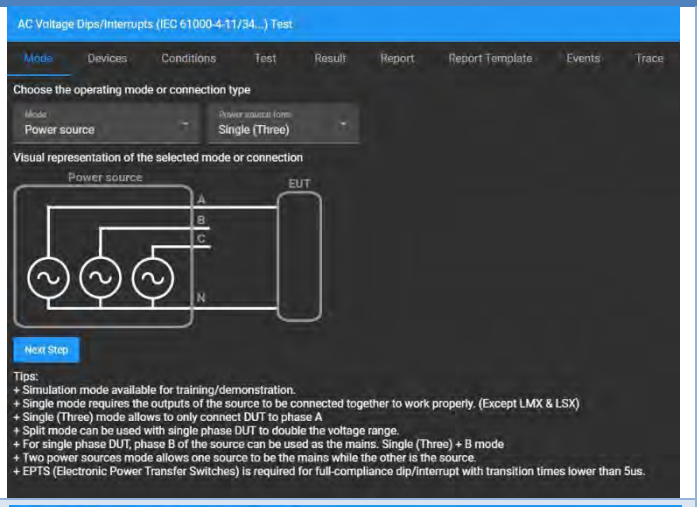
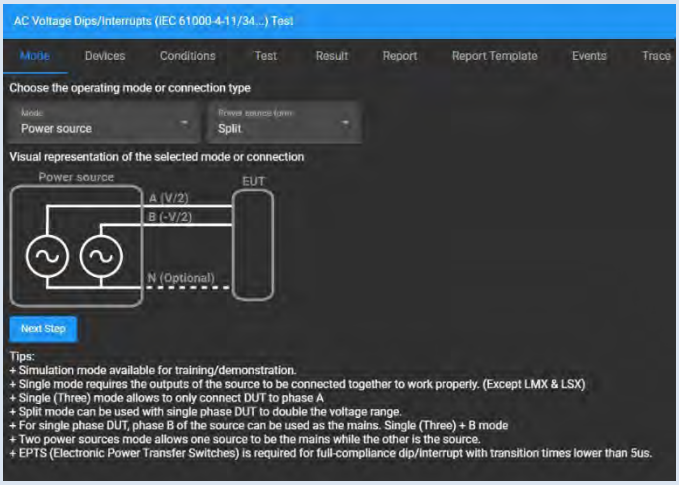
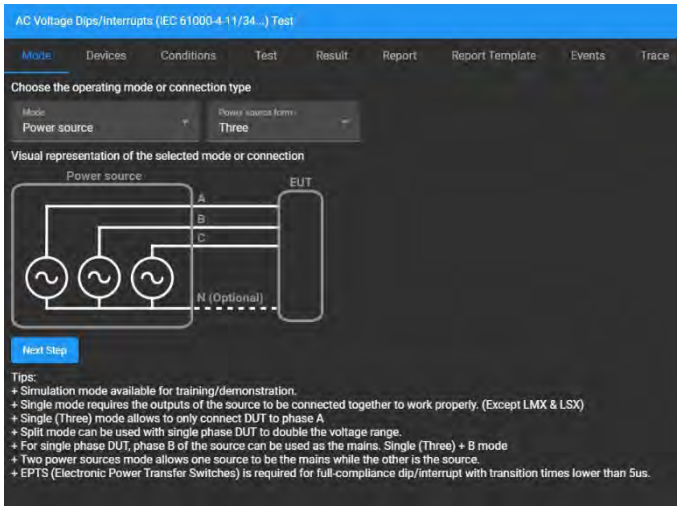
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **2** | N/A | Single Phase (Using Three Phase AC Source phase A) | N/A |  |
| **3** | N/A | Split Phase | N/A |  |
| **4** | N/A | Three Phase | N/A |  |

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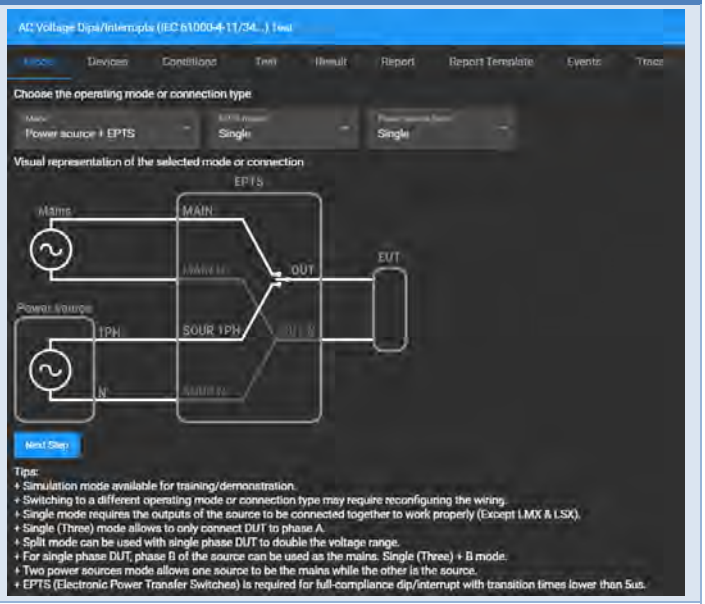
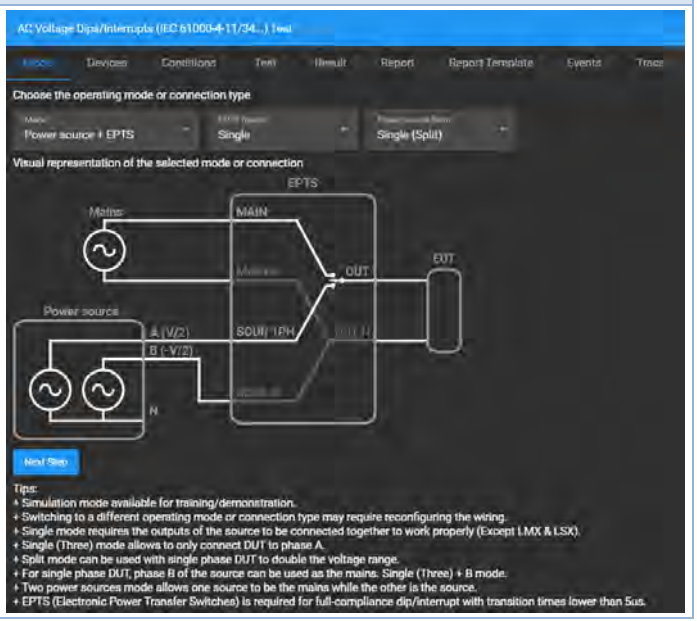
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **5** | EPTS-1 | Single Phase | N/A |   |
| **6** | EPTS-1 | Split Phase | N/A |   |

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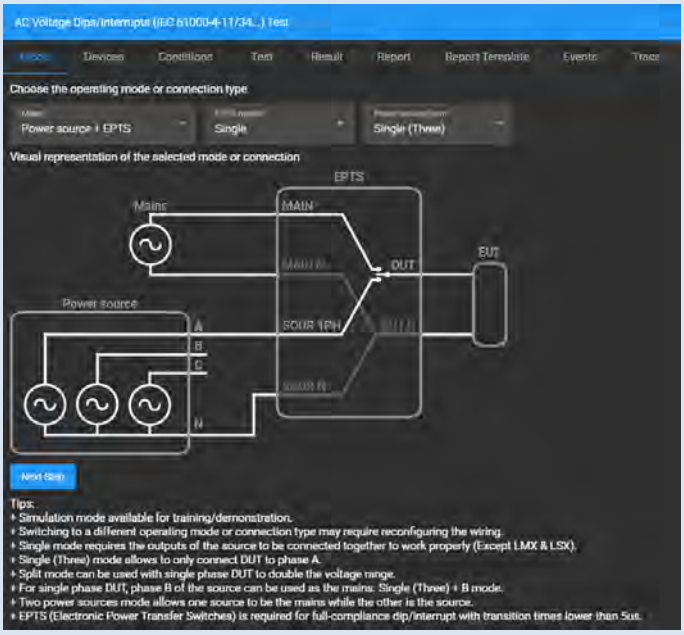
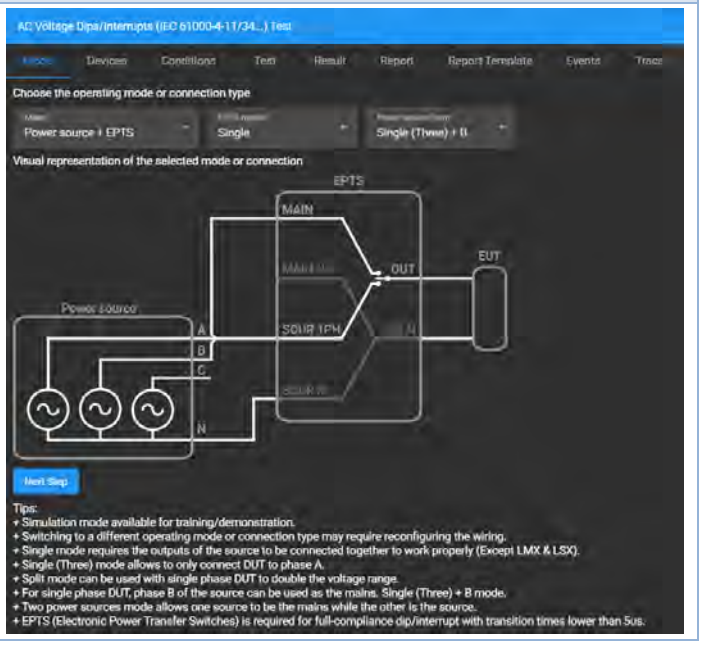
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **7** | EPTS-1 | Single Phase (Using Three Phase AC Source phase A) | N/A |  |
| **8** | EPTS-1 | Single Phase (Using Three Phase AC Source phase A) | Single Phase (Using Three Phase AC Source phase B) |  |

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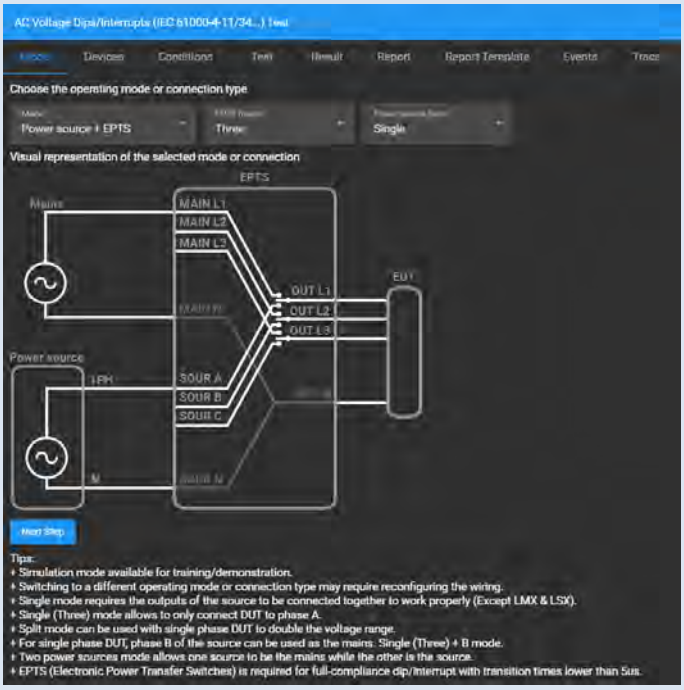
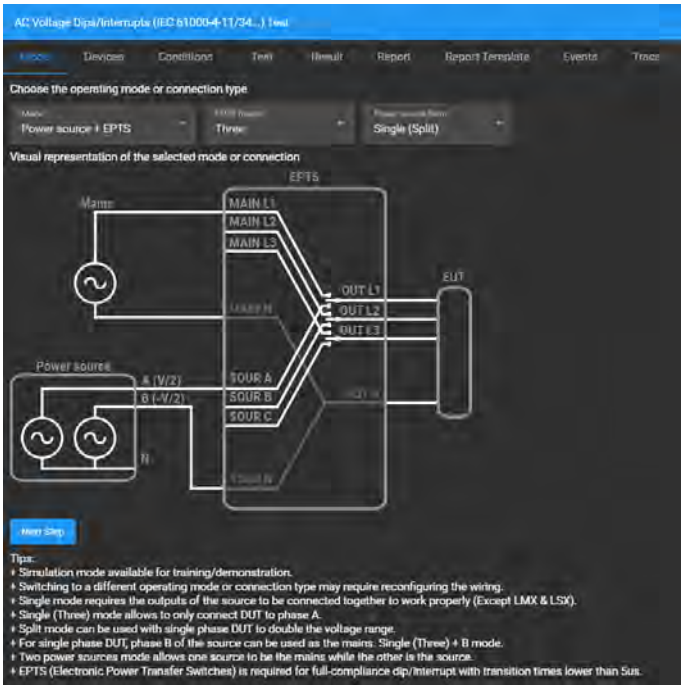
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **9** | EPTS-3 | Single Phase | N/A |  |
| **10** | EPTS-3 | Split Phase | N/A |  |





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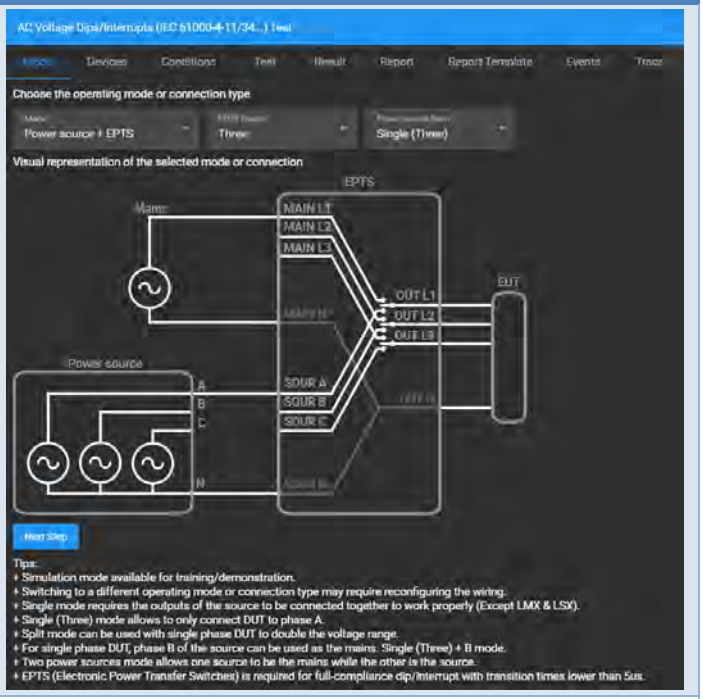
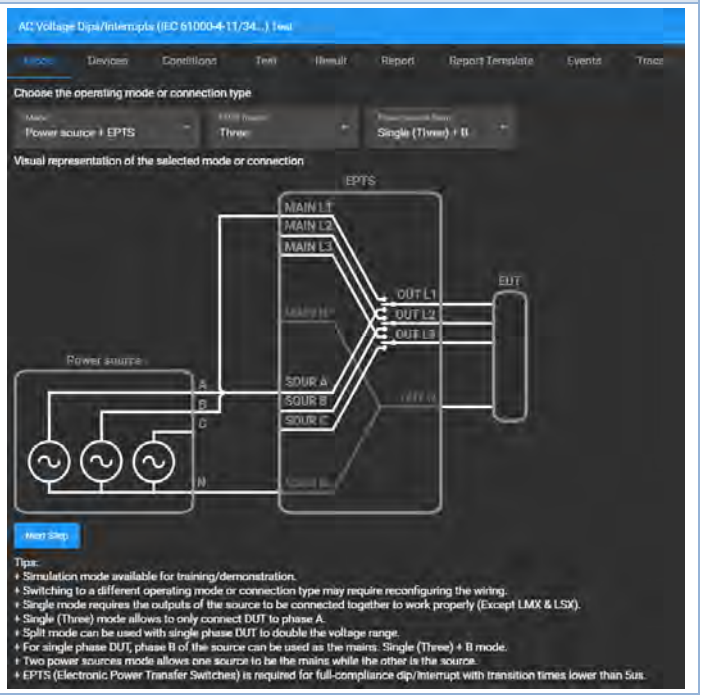
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **11** | EPTS-3 | Single Phase (Using Three Phase AC Source phase A) | N/A |  |
| **12** | EPTS-3 | Single Phase (Using Three Phase AC Source phase B) | Single Phase (Using Three Phase AC Source phase B) |  |

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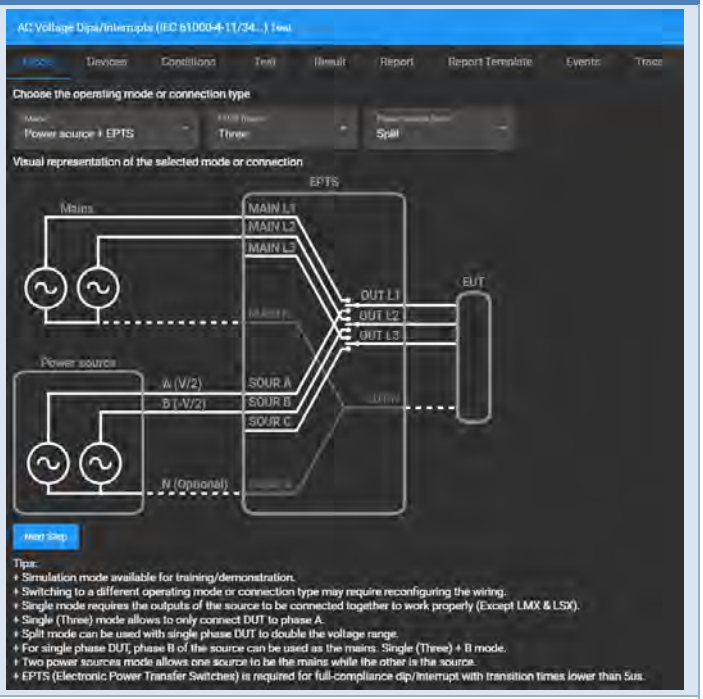
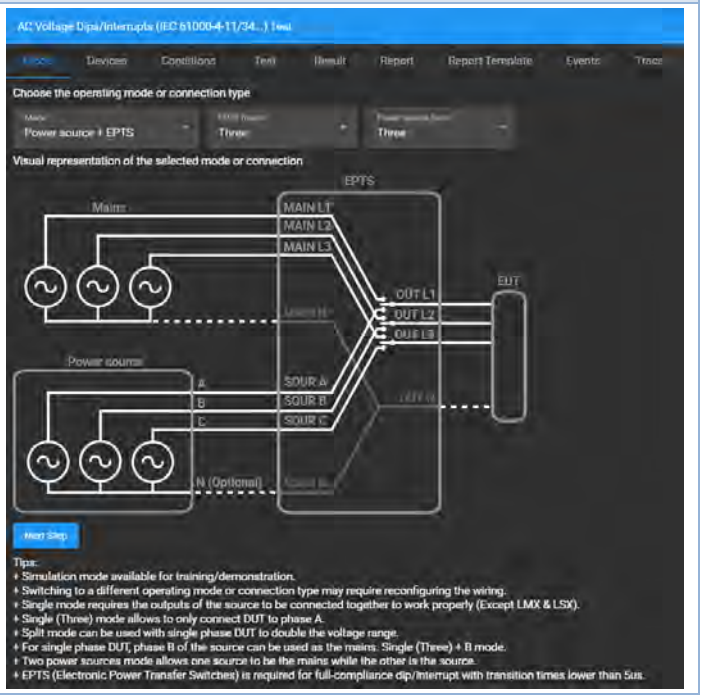
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **13** | EPTS-3 | Split Phase | N/A |  |
| **14** | EPTS-3 | Three Phase | N/A |  |



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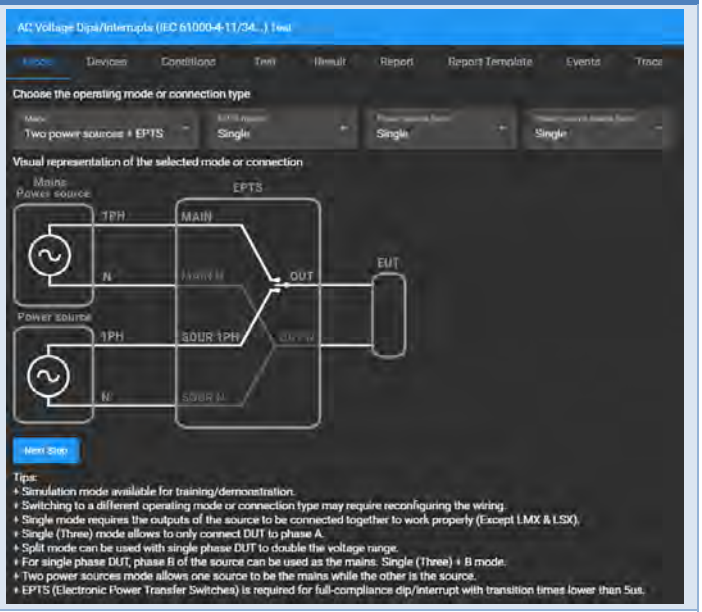
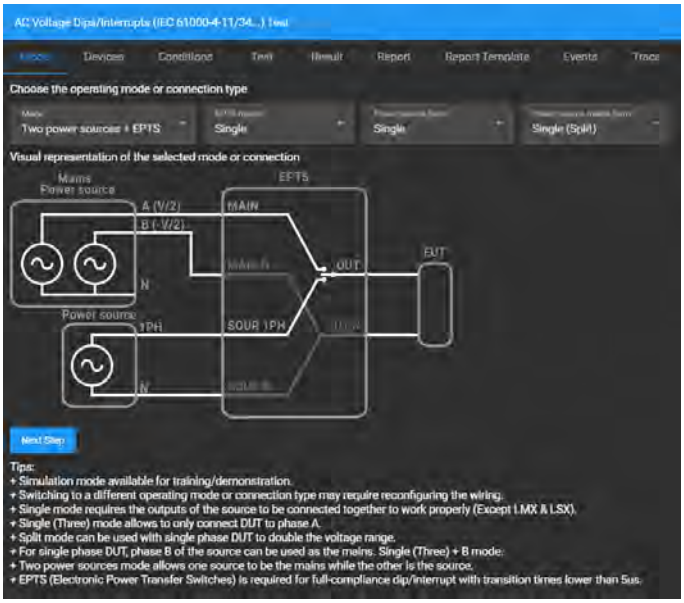
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **15** | EPTS-1 | Single Phase | Single Phase |  |
| **16** | EPTS-1 | Single Phase | Split Phase |  |





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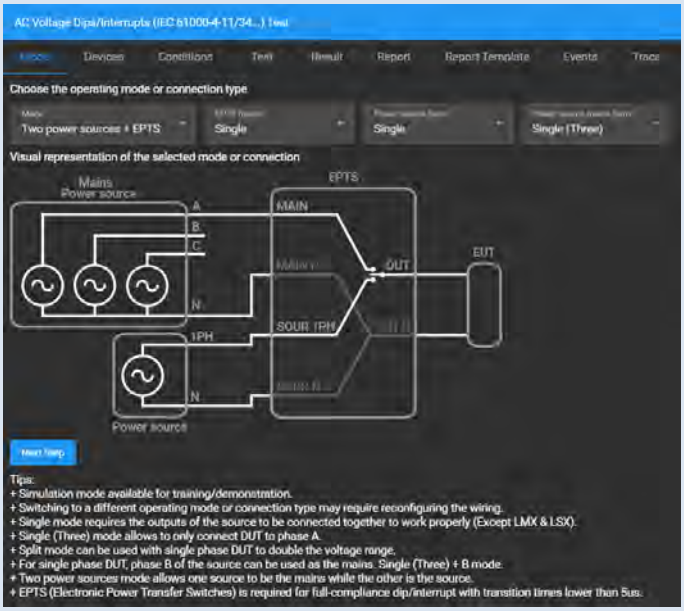
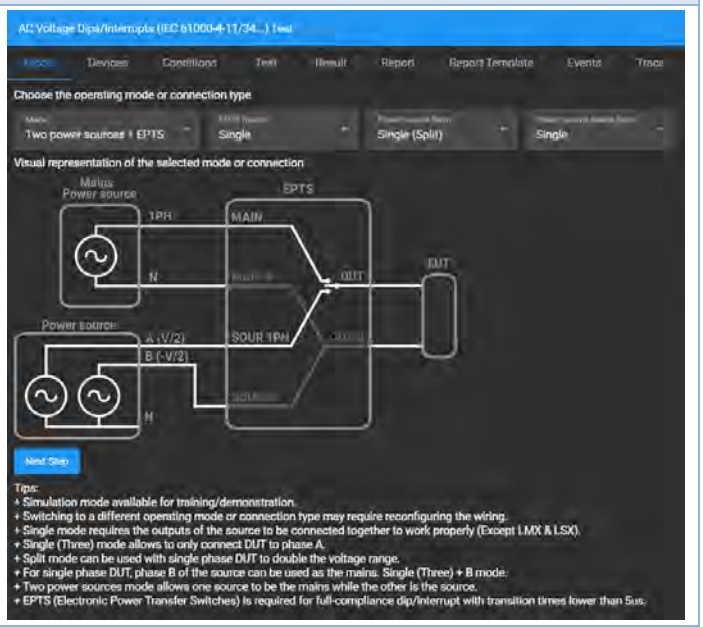
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **17** | EPTS-1 | Single Phase | Single Phase (Using Three Phase AC Source phase A) |  |
| **18** | EPTS-1 | Split Phase | Single Phase |  |

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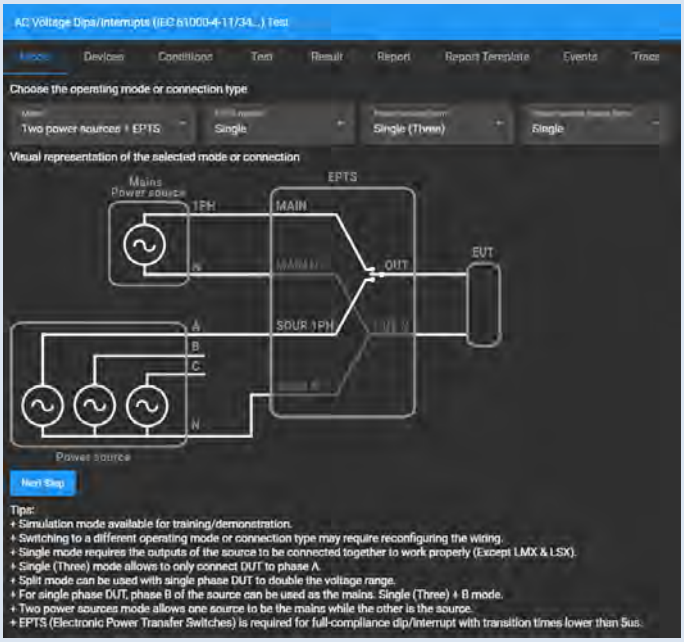
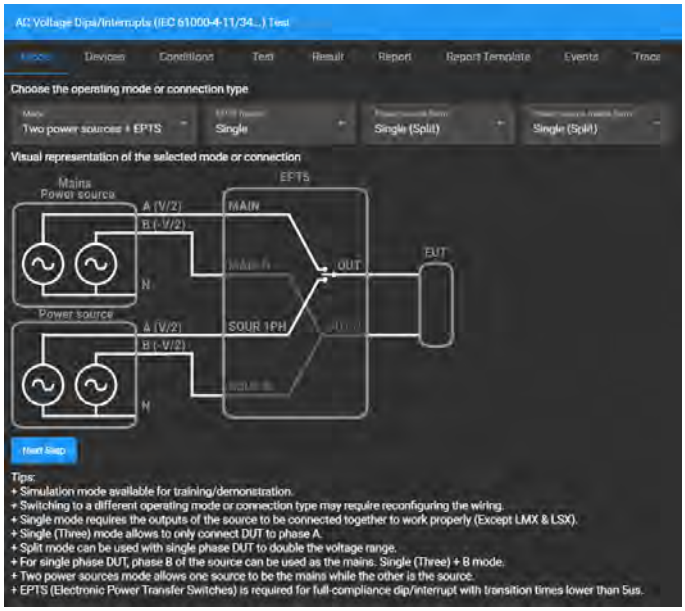
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **19** | ETPS-1 | Single Phase (Using Three Phase AC Source phase A) | Single Phase |  |
| **20** | EPTS-1 | Split Phase | Split Phase |  |

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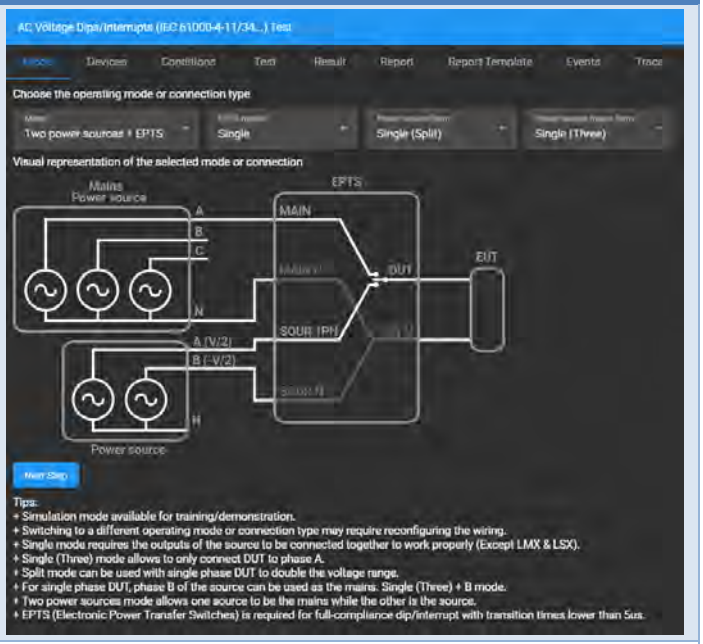
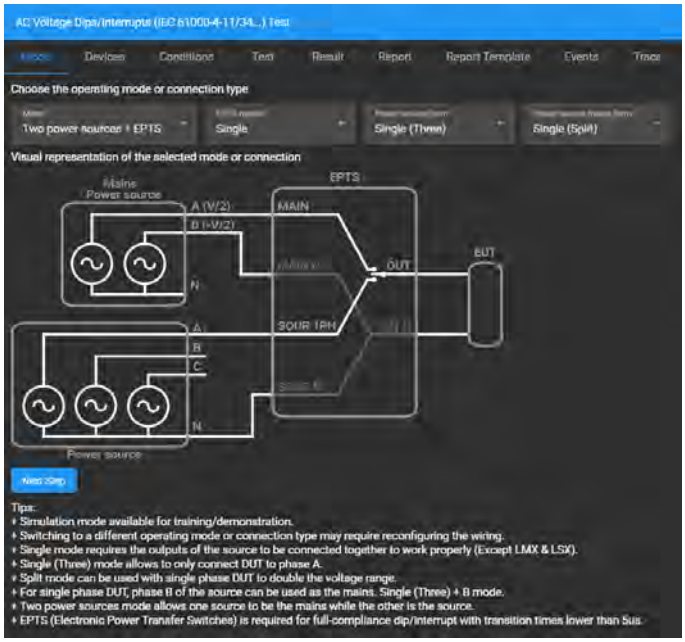
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **21** | EPTS-1 | Split Phase | Single Phase (Using Three Phase AC Source phase A) |  |
| **22** | EPTS-1 | Single Phase (Using Three Phase AC Source phase A) | Split Phase |  |



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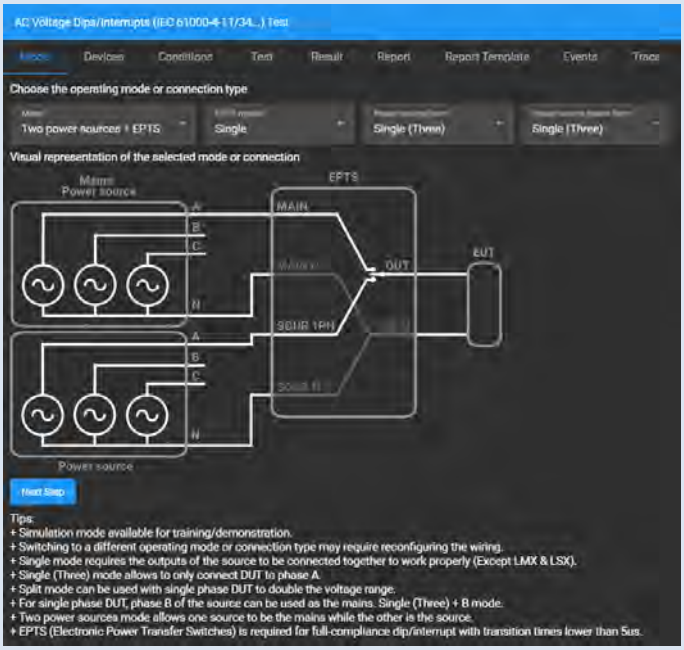
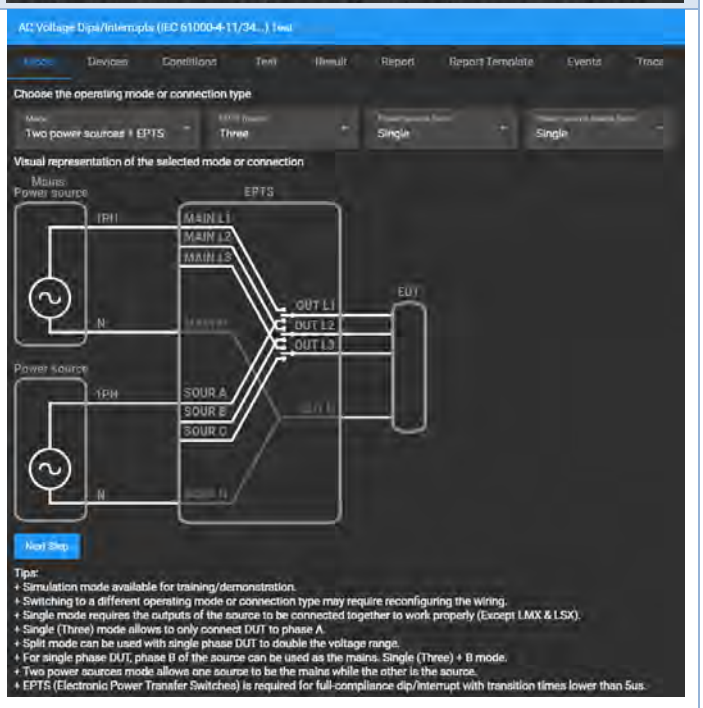
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **23** | EPTS-1 | Single Phase (Using Three Phase AC Source phase A) | Single Phase (Using Three Phase AC Source phase A) |  |
| **24** | EPTS-3 | Single Phase | Single Phase |  |

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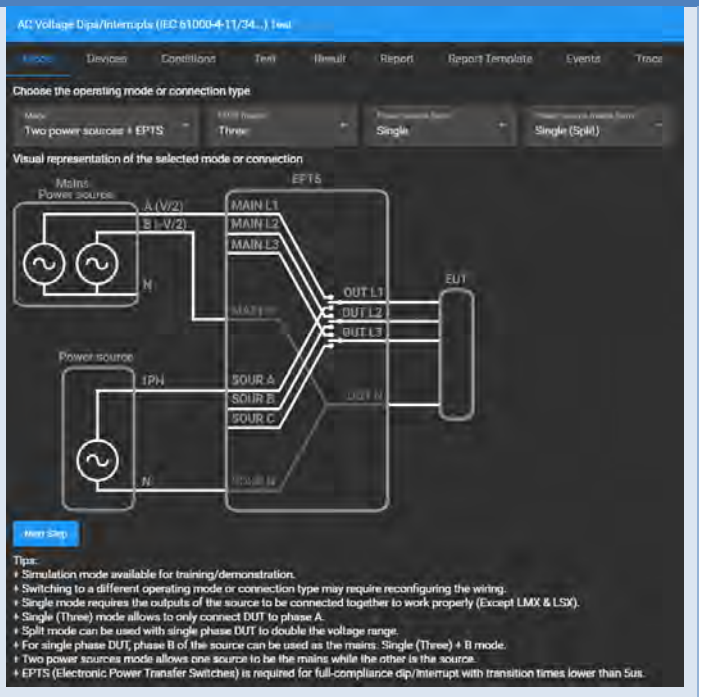
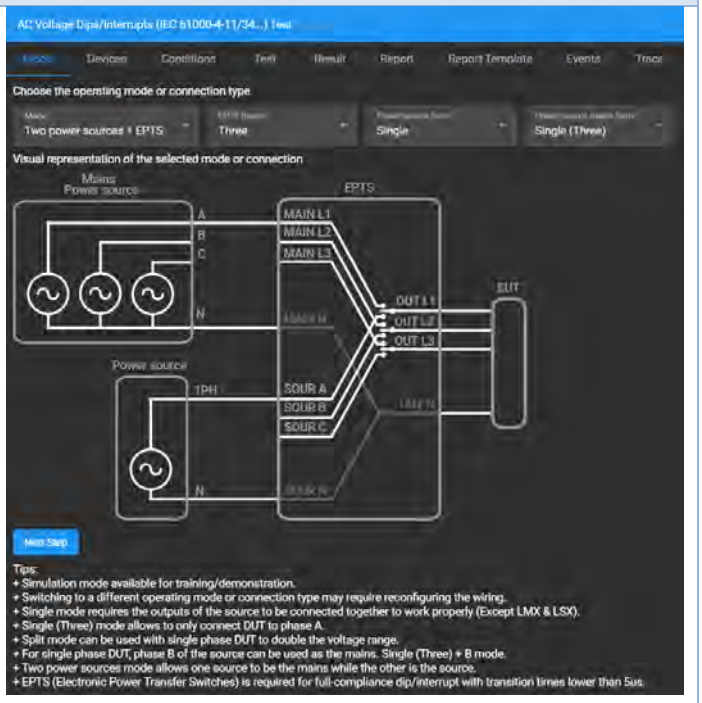
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **25** | EPTS-3 | Single Phase | Split Phase |  |
| **26** | EPTS-3 | Single Phase | Single Phase (Using Three Phase AC Source phase A) |  |

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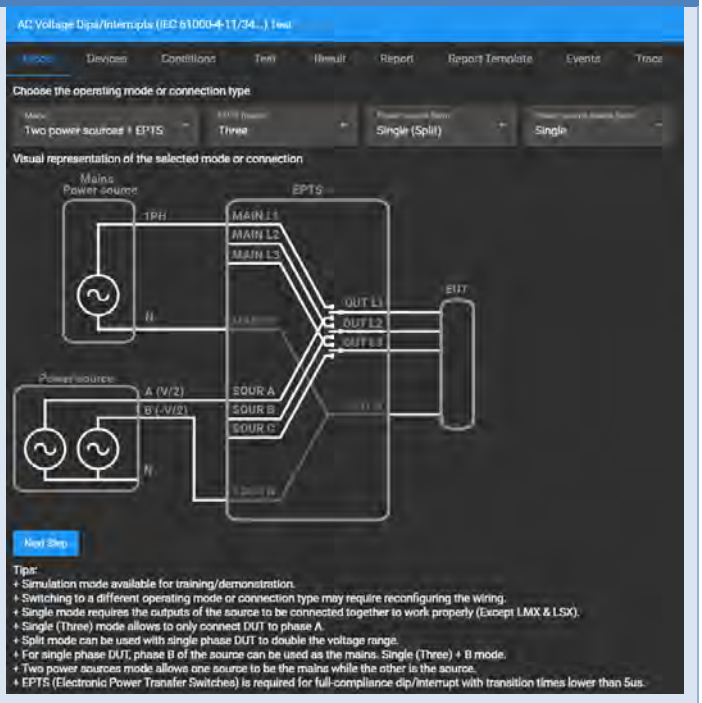
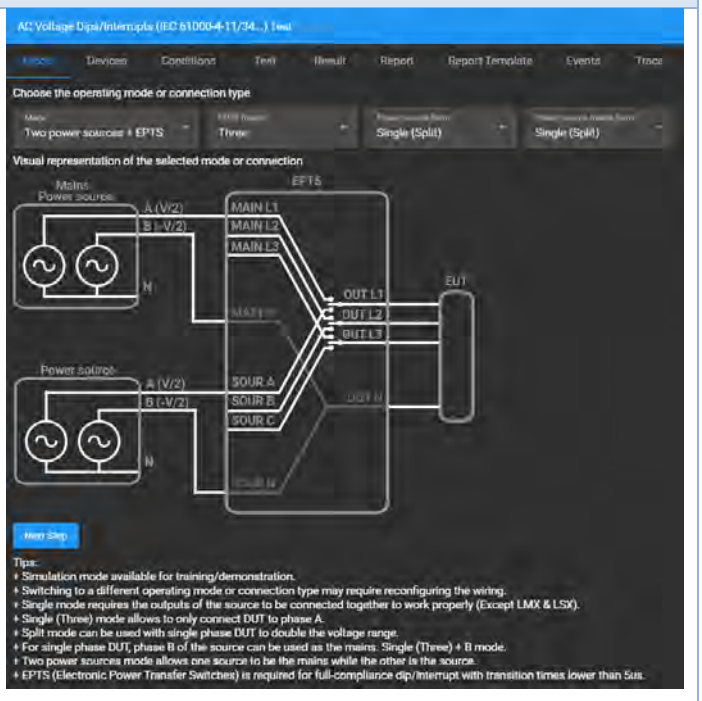
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **27** | EPTS-3 | Split Phase | Single Phase |  |
| **28** | EPTS-3 | Split Phase | Split Phase |  |



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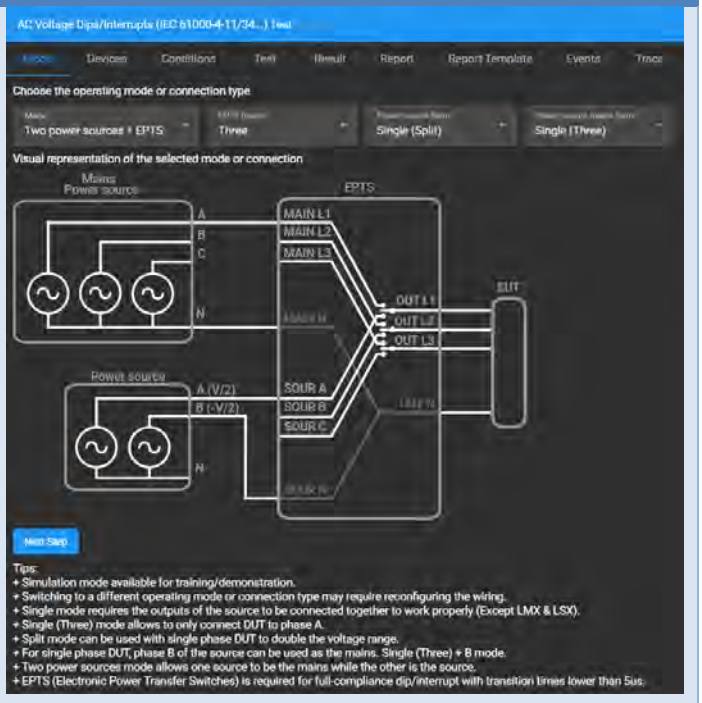
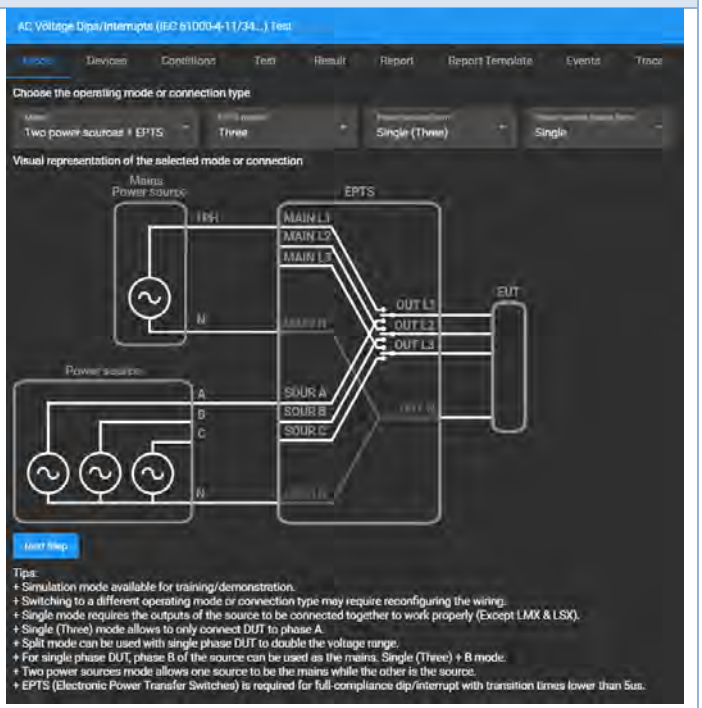
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **29** | EPTS-3 | Split Phase | Single Phase (Using Three Phase AC Source phase A) |  |
| **30** | EPTS-3 | Single Phase (Using Three Phase AC Source phase A) | Single Phase |  |



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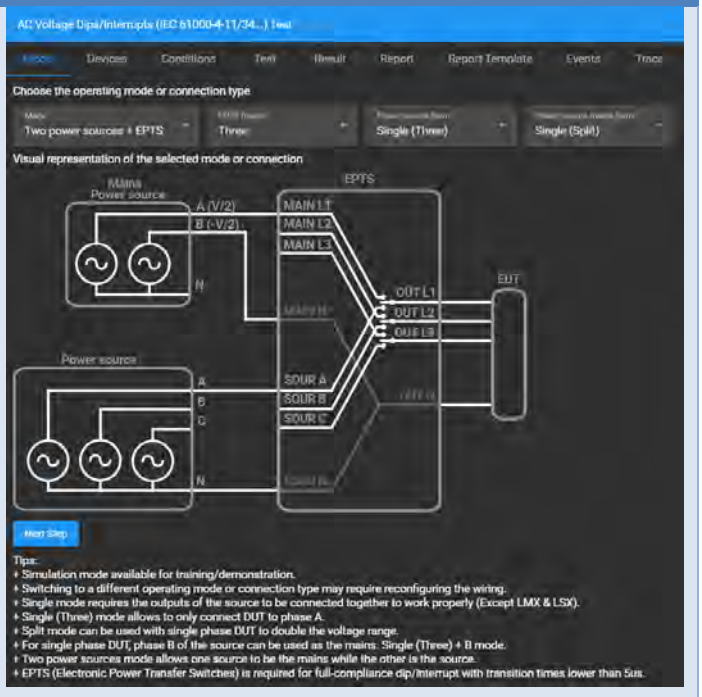
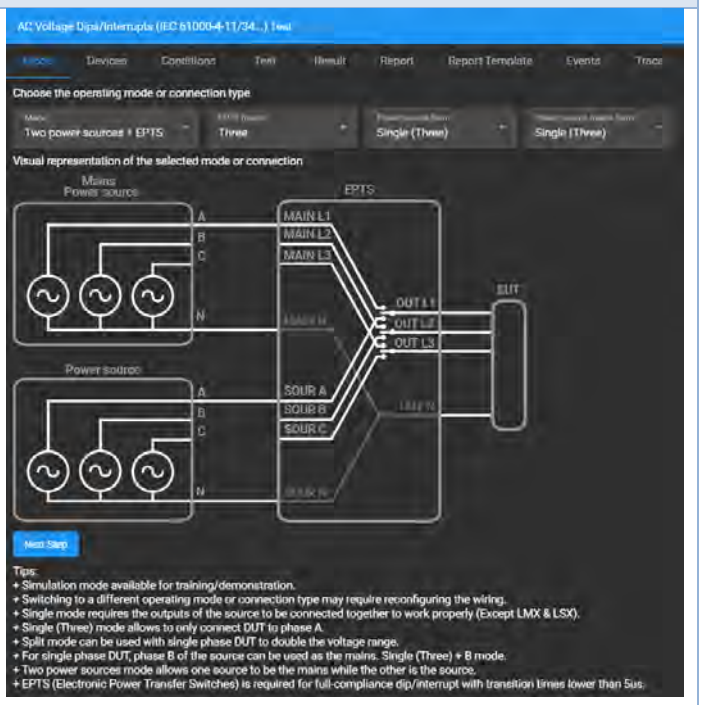
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **31** | EPTS-3 | Single Phase (Using Three Phase AC Source phase A) | Split Phase |  |
| **32** | EPTS-3 | Single Phase (Using Three Phase AC Source phase A) | Single Phase (Using Three Phase AC Source phase A) |  |



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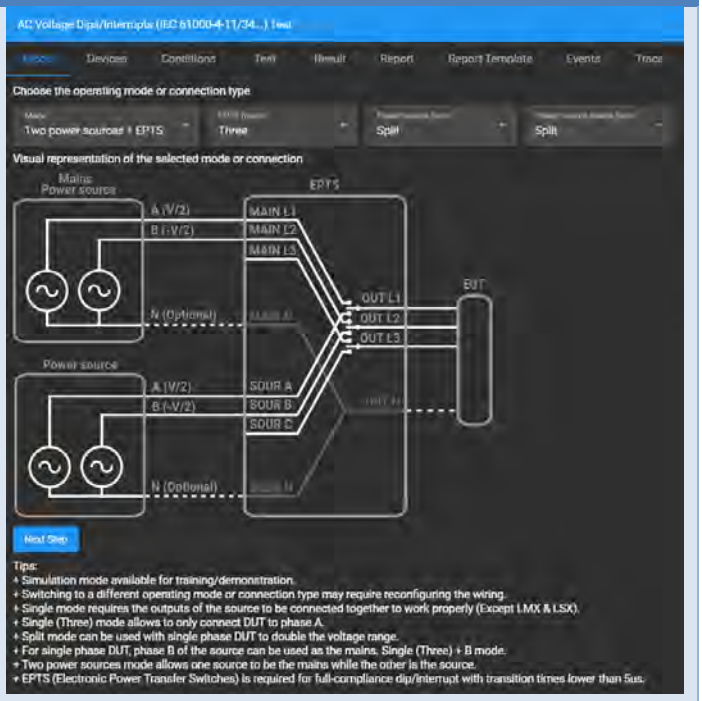
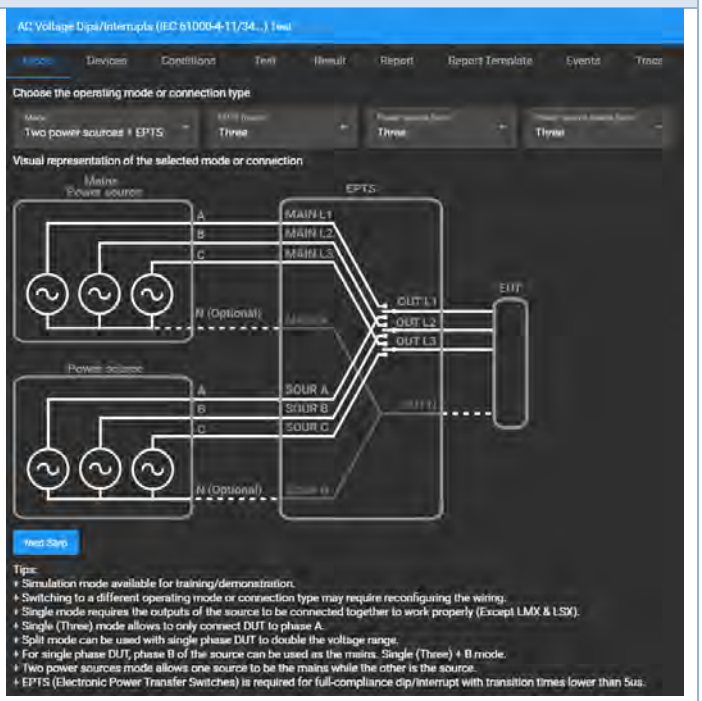
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **33** | EPTS-3 | Split Phase | Split Phase |  |
| **34** | EPTS-3 | Three Phase | Three Phase |  |

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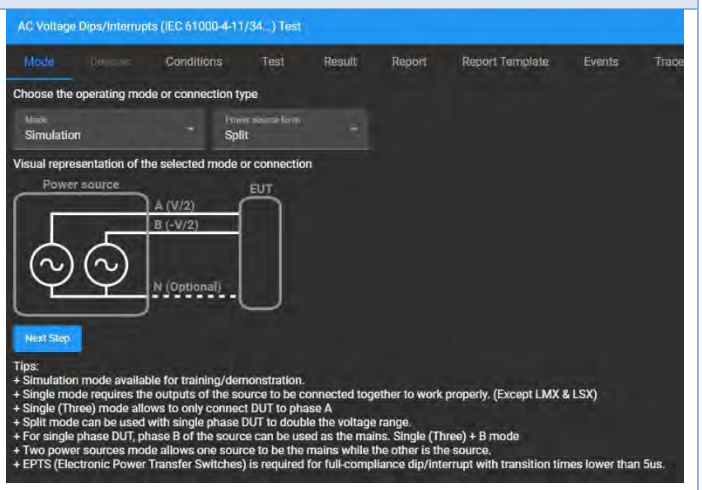
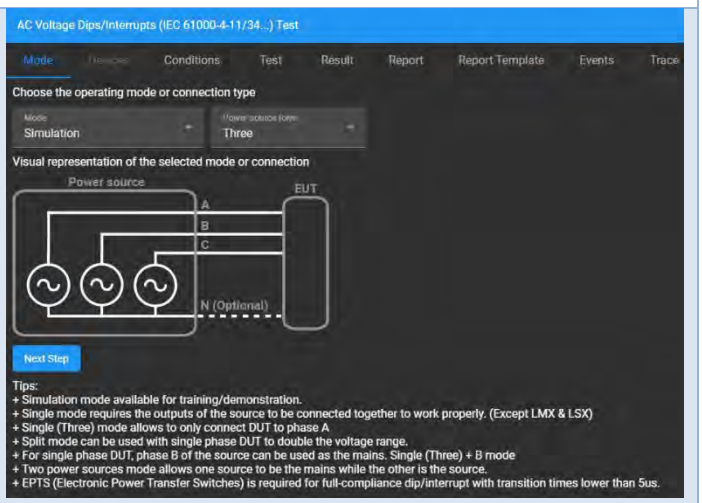
| Mode | EPTS Model | Power Source Form | Power Source Mains Form | Schematic Test Setup |
|---|---|---|---|---|
| **35** | N/A | Single Phase - Simulation | N/A | |
| **36** | N/A | Split Phase -Simulation | N/A |  |
| **37** | N/A | Three Phase - Simulation | N/A |  |

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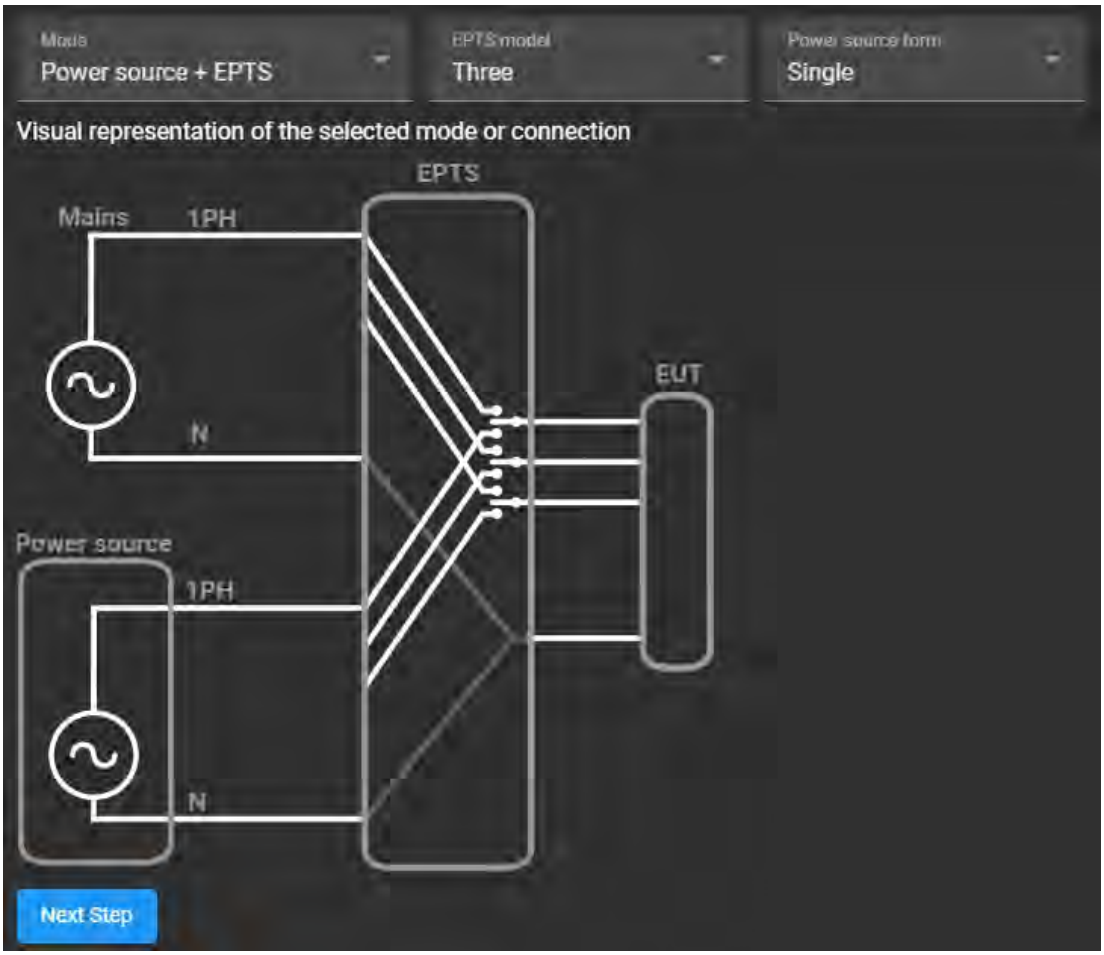
## 6.5 Test Setup Examples – Voltage Dips

Of these available test configurations, the single phase setup using phase A of the EPTS switch or the three phase setup are most common but all modes are available to cover the test hardware available. The examples provided here are for single or three phase tests using the EPTS switch for dip voltage levels and AC mains for the nominal voltage but the software operation shown generally applies to all modes.

### 6.5.1 Single Phase Voltage Dips Test Example

In this example, we are using a three phase EPTS unit for a single phase EUT test (Configuration #9). This means phases B and C are not used. The same could be accomplished with a single phase EPTS-1 unit (Configuration #5).

In this setup, the actual local AC Grid phase A (L1) is used to provide the nominal AC voltage and frequency to the EUT. For lab locations that don't have a 50Hz AC grid, a second programmable AC power source is needed to provide a 50Hz 'grid' connection to the EPTS Mains input. See setup mode #15 in prior section for reference. Since this involves a single phase EUT, a three phase AC source setup may be used to provide both AC input as well as shown in Configuration #12. The Configuration #9 setup selection is shown here:

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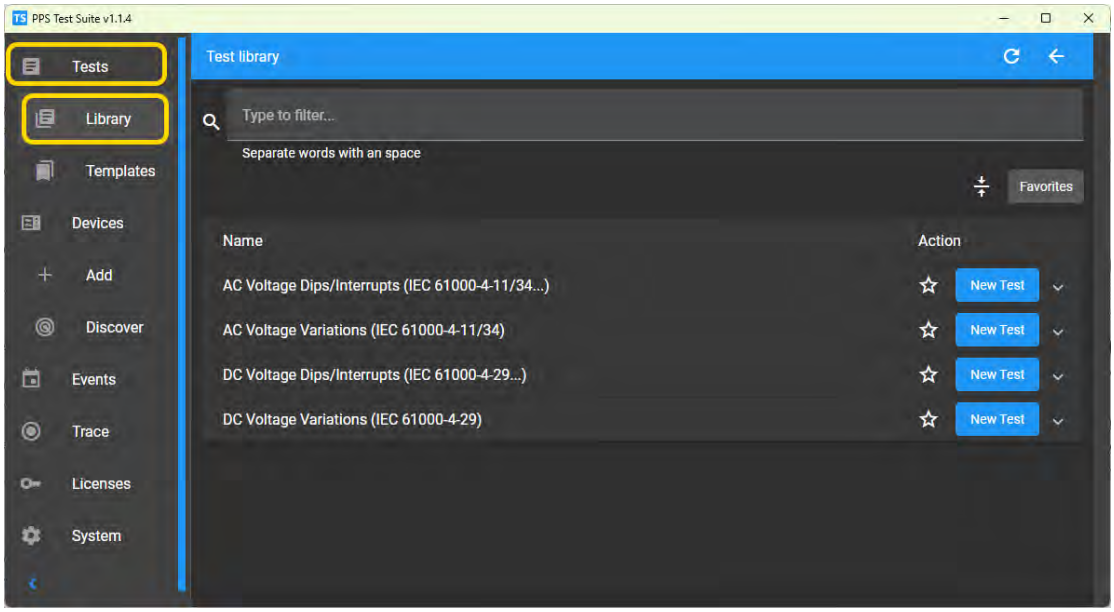
The programmable AC source Phase A output connects to the EPTS AC Source input terminal and will provide the programmable Voltage dip levels. A single, split or three phase programmable AC source may be used as well but only phase A would need to be connected to the EPTS. It is permissible to connect all three phases of course if the EPTS is a three phase model and will be used for testing 3 phase EUTs as well using a three phase test configuration. For this case, only phase A will be used, however.

To select this test configuration, proceed as follows:

From the main Test Suite screen, select Tests -> Library




From the Test Library (right hand side), click on AC Voltage Dips/Interrupts (IEC 61000-4-11/34). This will show the supported IEC test standards.

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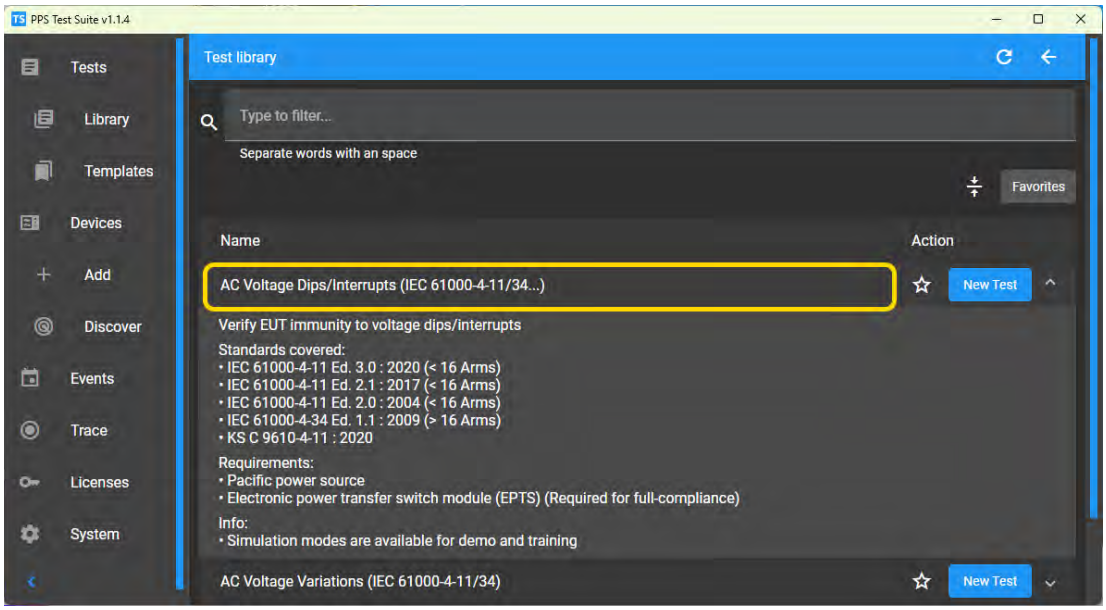
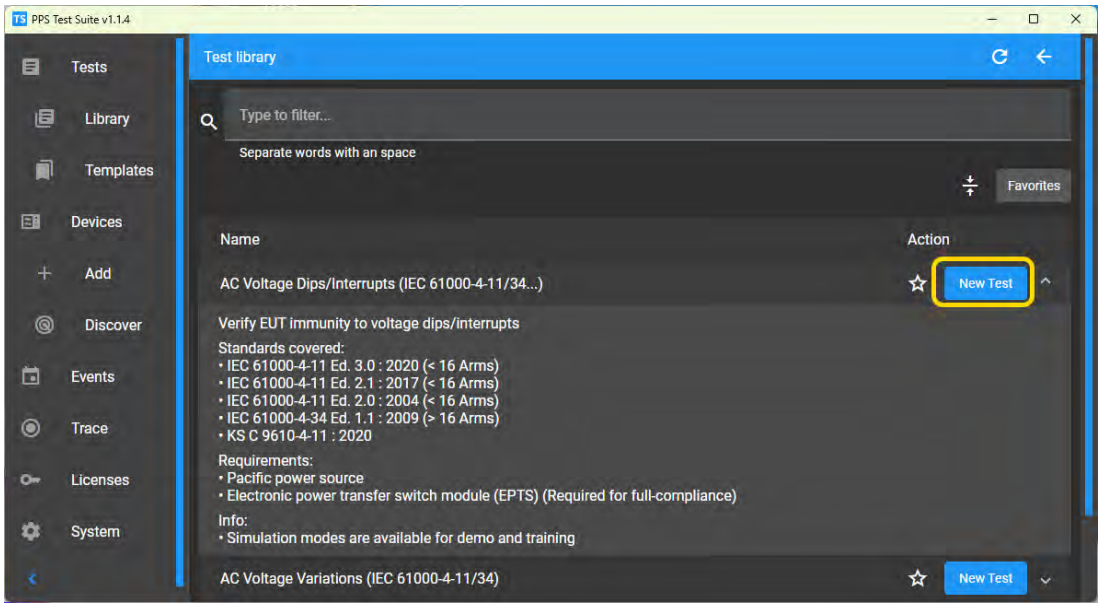



Click on the New Test button on the right.




This will show the test setup selection screen. Click on the Mode selection at the top of the screen and select the “Power Source + EPTS” configuration selections as shown below.

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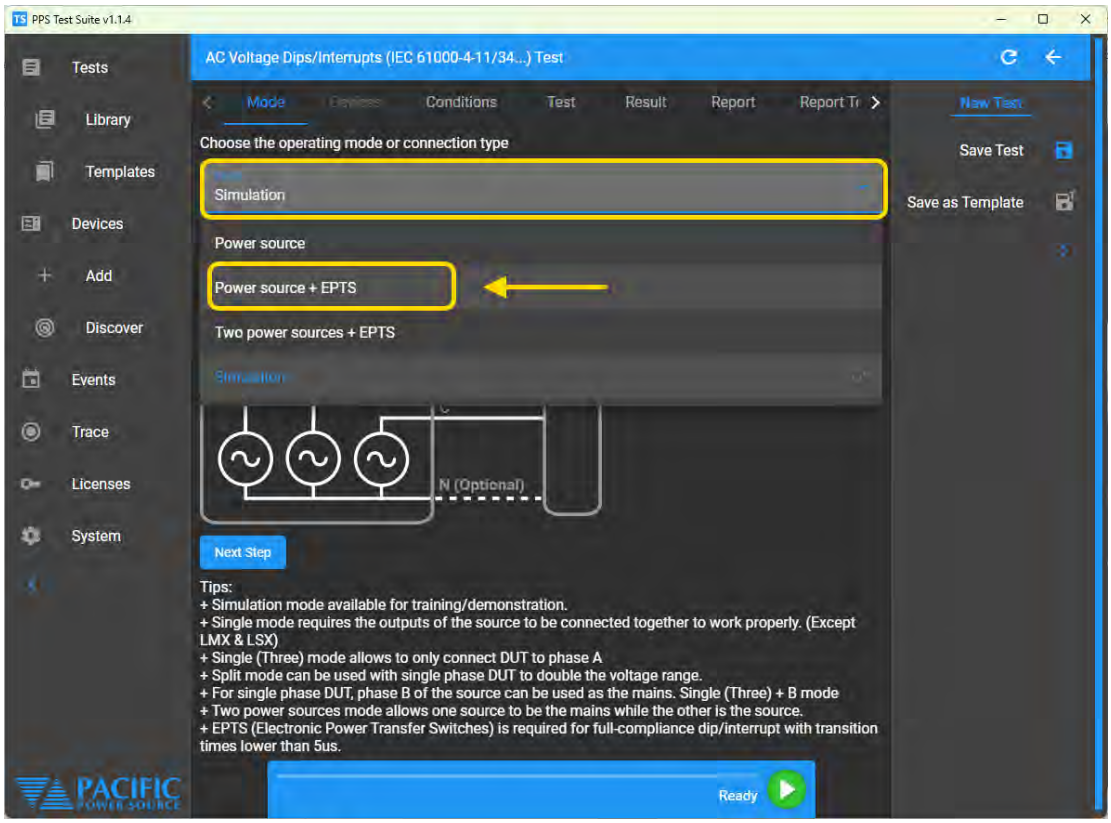


This will display the test setup screen allowing you to make the desired test setup selections.

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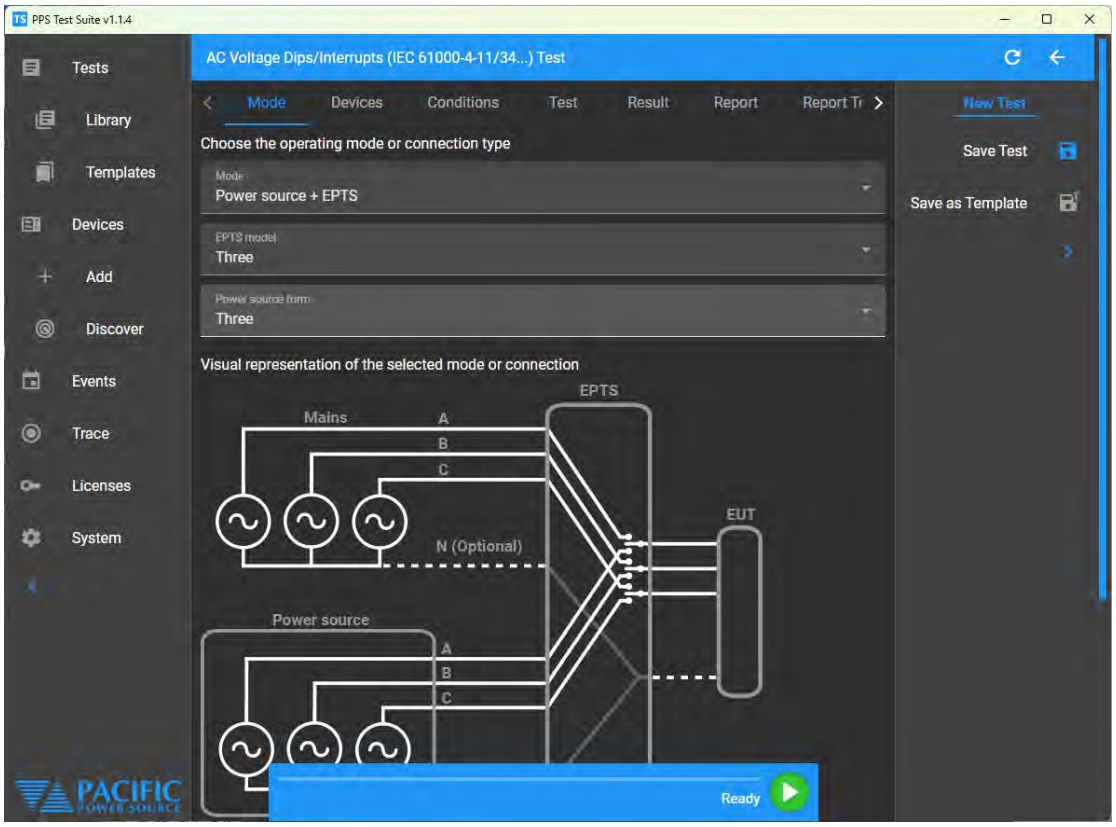


The default will show three phase settings but for our example, we will select a single phase test setup configuration despite using a three phase EPTS unit. Select the third control from the top labelled “Power source form” and select the single phase AC source mode.

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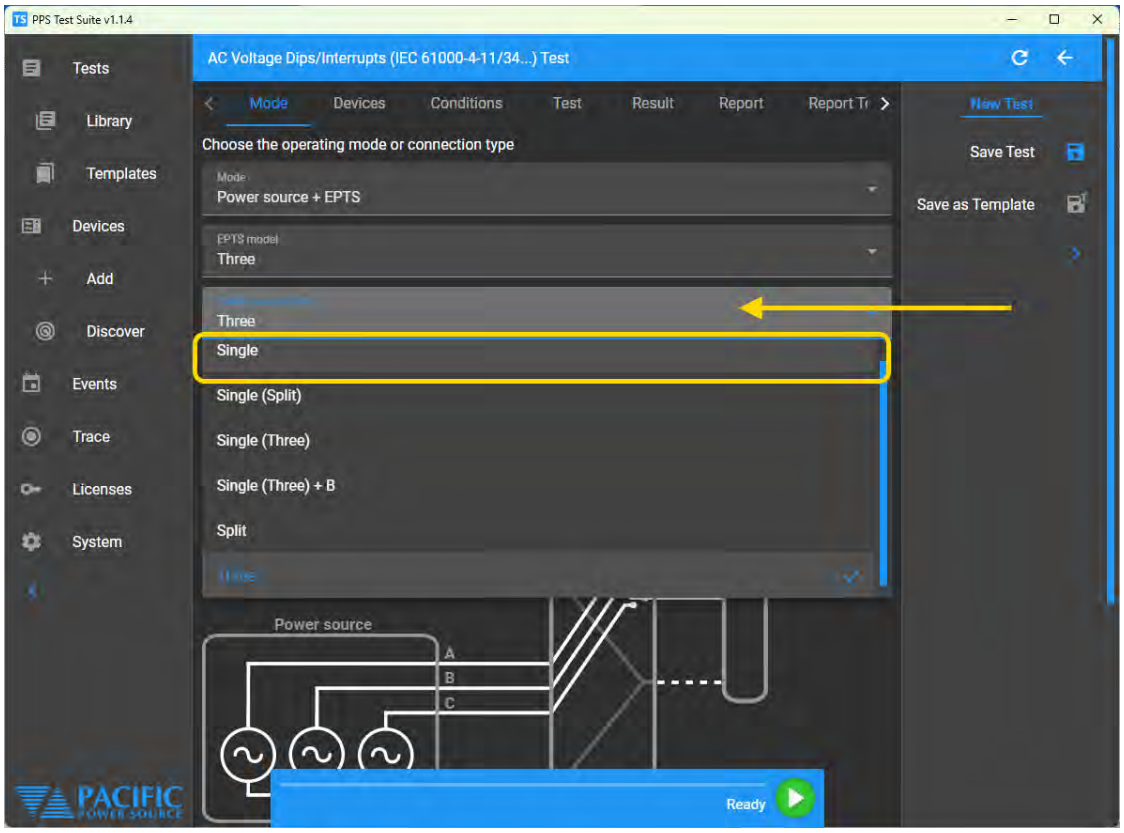


This will configure the test for the run with a single phase AC source to the Phase A input of the three phase EPTS switch. The single phase EUT should be connected the Phase Output connection of the EPTS hardware unit.

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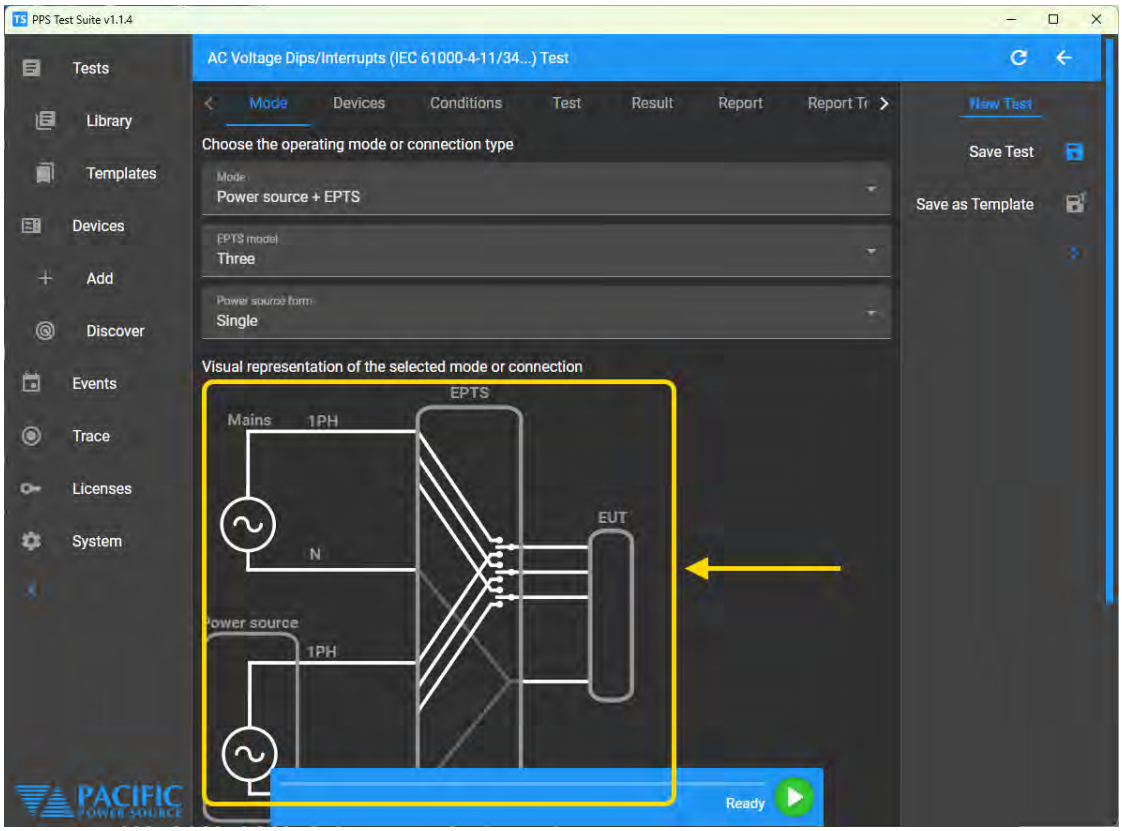


The test setup and control software is now correctly configured for our unit under test.

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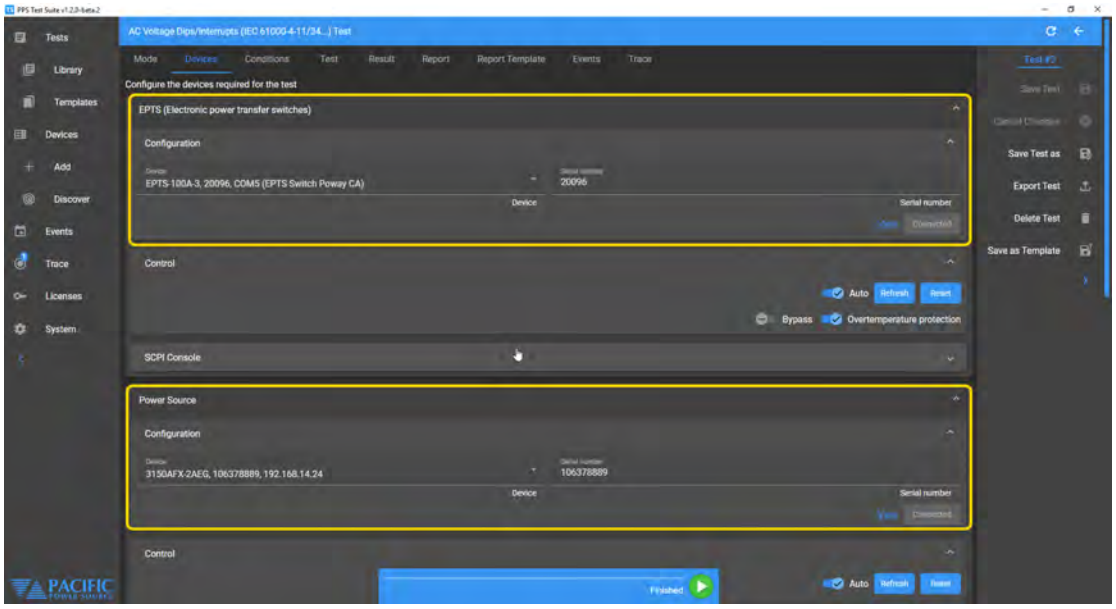
Before starting a test, make sure the EUT information and test condition are set correctly. This is done by selecting the Devices and Conditions tabs at the top of the test screen respectively. Make sure the correct EPTS unit and AC power source is selected in this setup screen. For most EPTS systems, there will only be one to choose from but if more than one EPTS or more than one AC power source is connected to the Windows PC, it is important to select the right ones.

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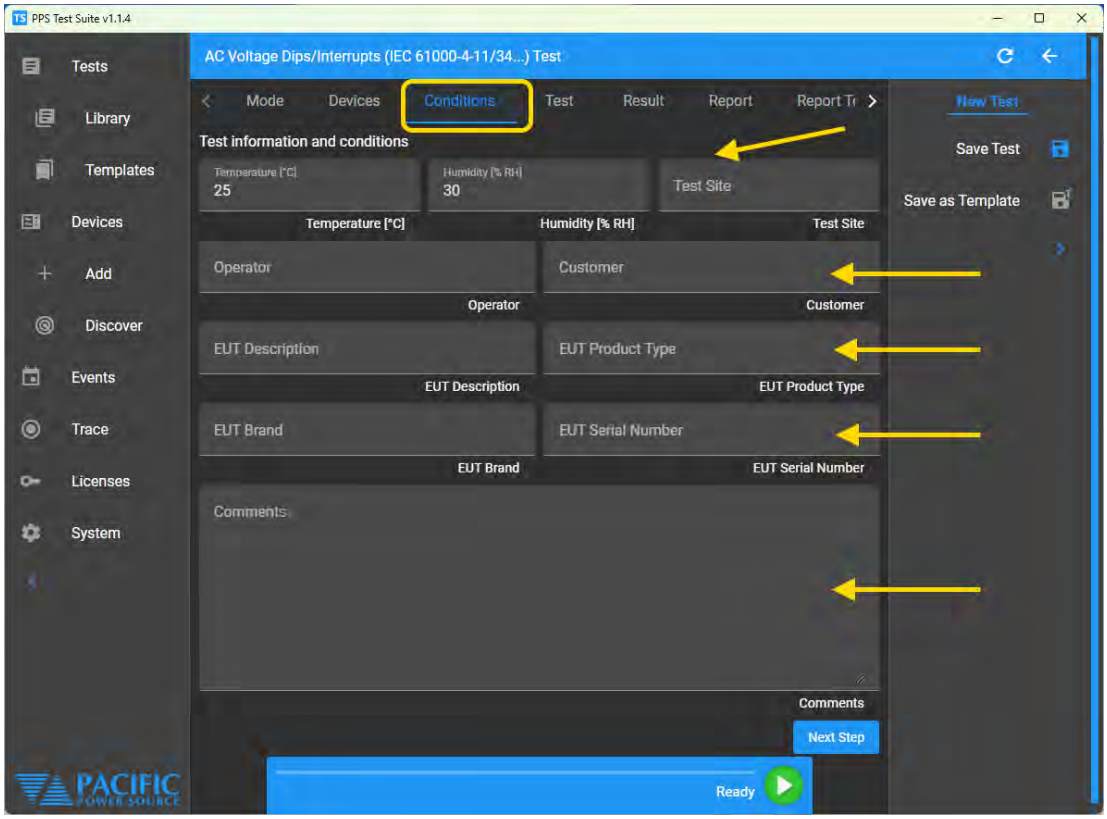
Next, set the lab environment conditions and EUT information in the Conditions tab. All this information will be included in the test report after performing all EUT tests.

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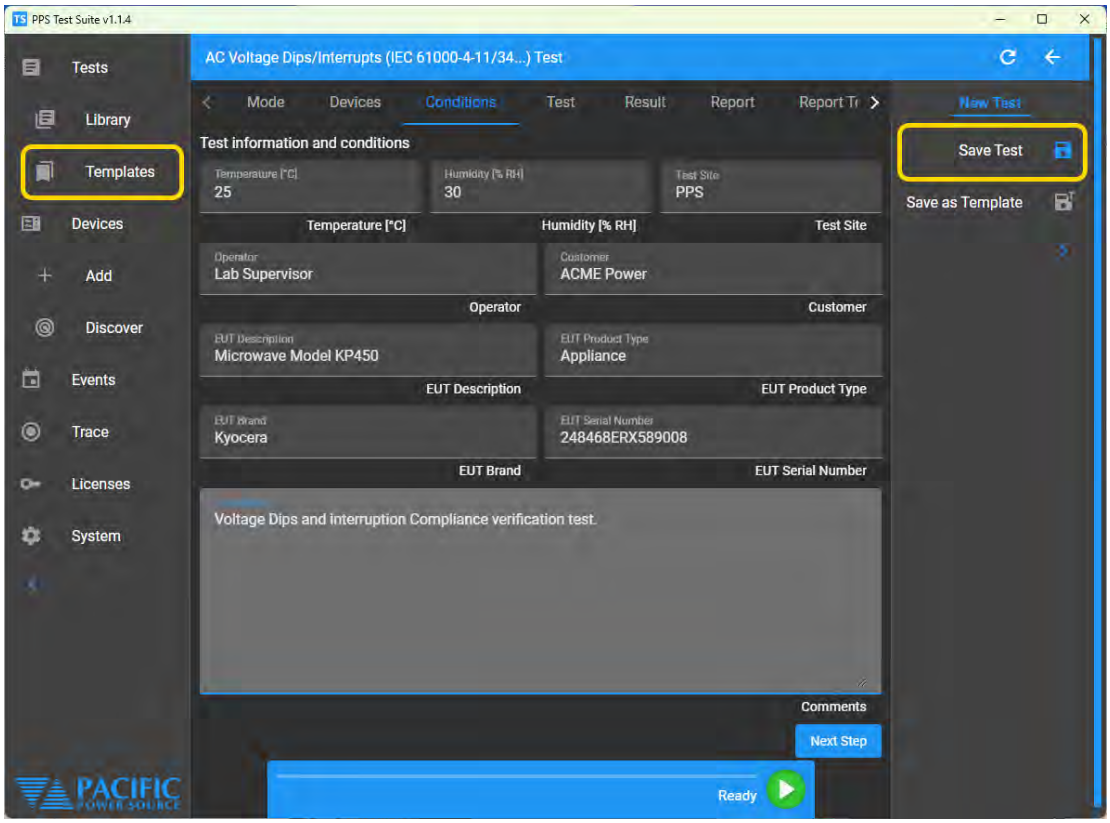
If the same EUT will be tested again or multiple times, it is important to Save the test setups under a relevant name using the Save Test control shown to the right. If the test setup is used often, it may be worthwhile to save it as a test template using the "Save as Template" control on the right. Templates saved will be available for recall from the Templates selection under the Tests menu entry in the left hand side vertical control bar.

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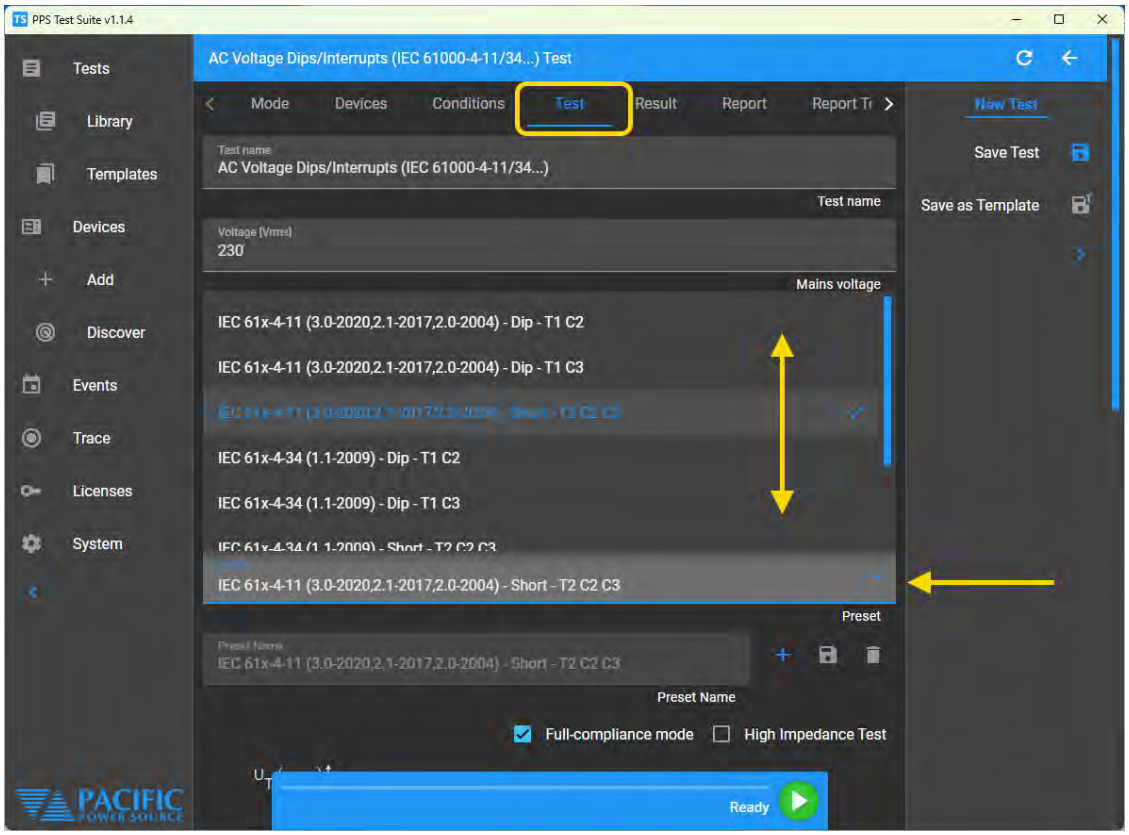
Now that the setup configuration, test equipment used, EUT information and test conditions have been set, the actual tests can begin. Select the Test tab to see the available tests. Since we selected IEC 61000-4-11/-4-34, all supported versions of these tests are available to choose from in the Test screen. Select the appropriate type and revision before using the RUN control at the bottom of the screen.

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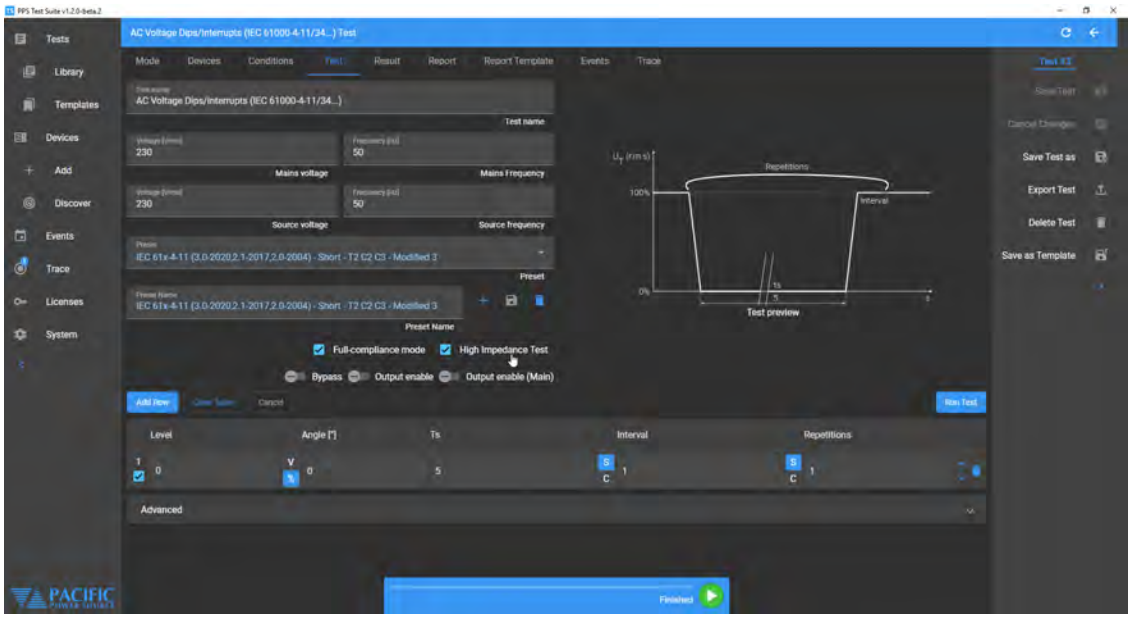
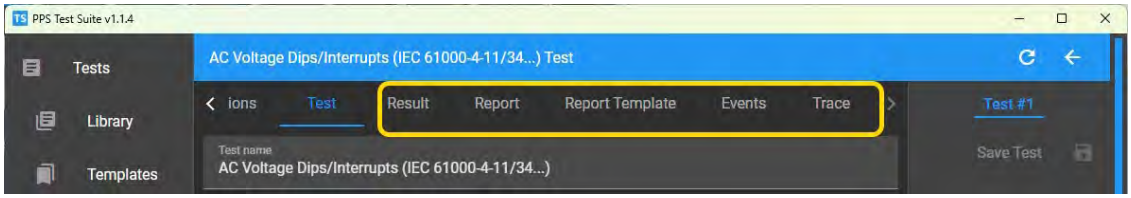
Once a test revision is selected, the specific test sequence needed to implement this test will be displayed as shown below.




The user can now start the test using the Run button at the bottom of the screen. The test will commence and progress will be shown at the bottom of the screen during the test run.




Once the test is completed, test results and reports are available from the top menu. This includes:

| | |
|---|---|
| Result | Final Pass or Fail determination made by the operator. |
| Report | Test Report ready to either save and or print. |
| Report Template | The report template used to generate the report which may be customized as needed. |
| Events Log | Events logged during the test such as status information, errors, or exceptions. |
| Trace Info | Events and trace information including executed commands, query responses, and errors with date and time stamps. |

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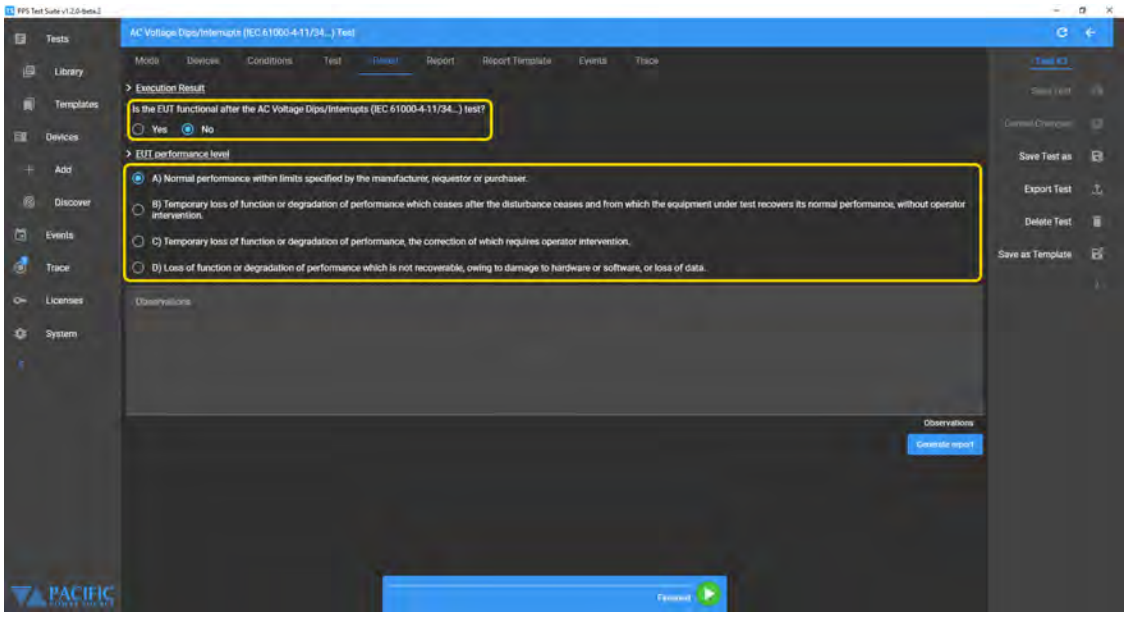
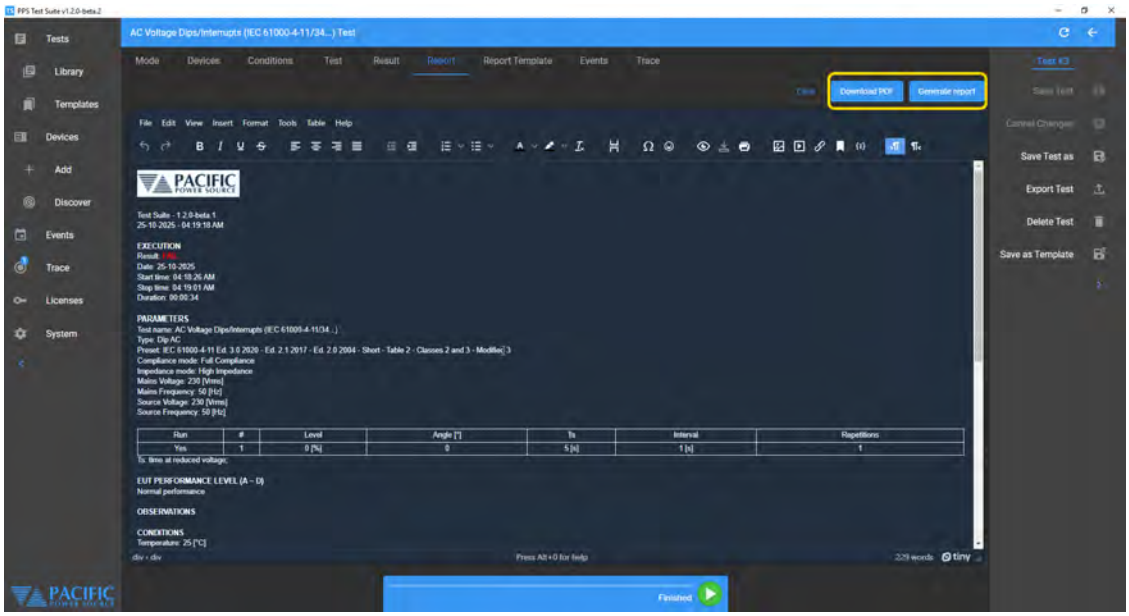
## Test Result

The operator is responsible for evaluating the impact of the voltage dip or variation on the EUT. Four levels of pass or fail are established by the IEC standard. The overall pass or fail is a function of the EUT class or type and the level deemed acceptable or a pass in the product category specific IEC standard.




## Report

The test report tab provides a preview of the test report. From this screen, it can be printed if a Windows printer is available or saved in PDF or DOCX format.

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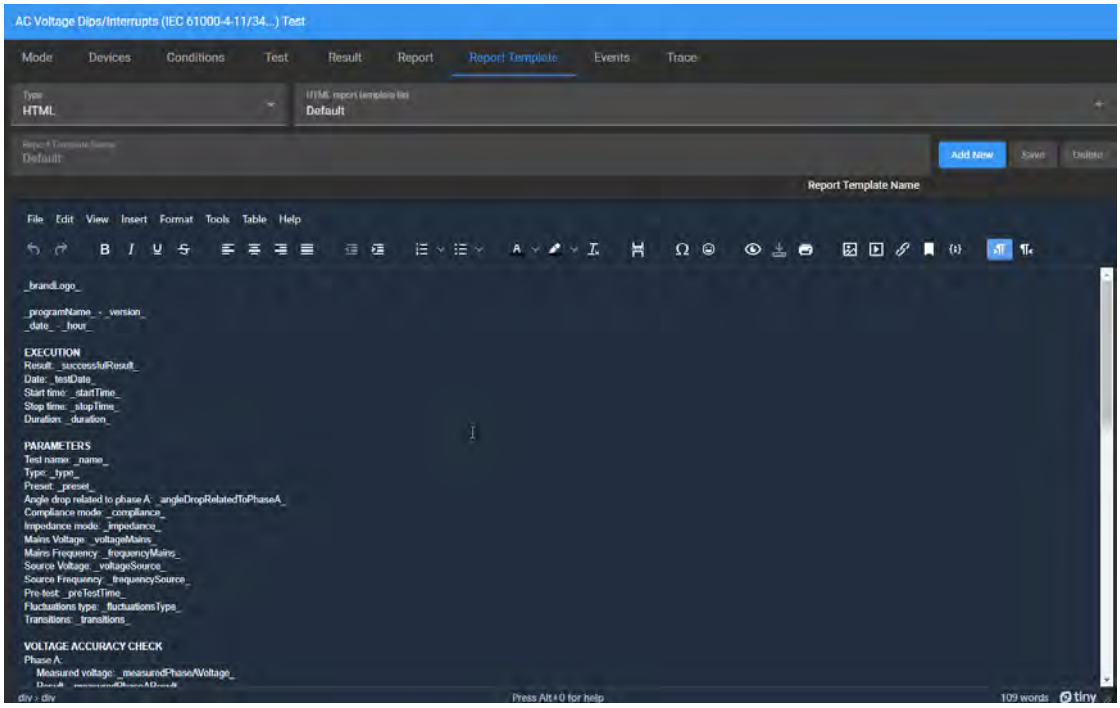
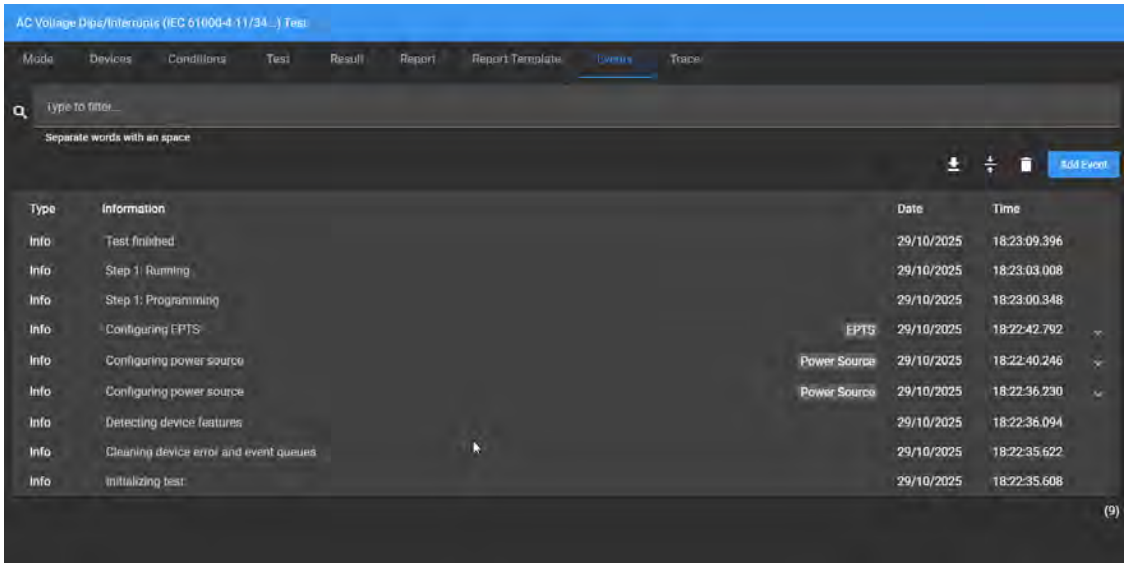
## Report Template

The report template tab may be used to edit the layout and location of fields in the final report. When making changes, it is recommended make a backup of the original report template first.




## Events Log

The event log provides a history of significant events that occurred during test execution. It is for informational purposes only but may be attached to the test report if deemed relevant.

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### Trace Info

The Trace screen contains a history of SCPI control commands sent to the AC power source and / or EPTS unit during the test run. It may be used for troubleshooting. Pacific Power source may request a copy of this trace to assist in any support issues as needed.

A small sample section of the csv format trace content export function is shown here for reference.

```
1,1761787355608,18:22:35.608 29/10/2025,1,"Initializing test","",2,AC
Voltage Dips/Interrupts (IEC 61000-4-11/34...),3,1759869944018,0,-
1,-,1,1

2,1761787355622,18:22:35.622 29/10/2025,1,"Cleaning device error and
event queues","",2,AC Voltage Dips/Interrupts (IEC 61000-4-
11/34...),3,1759869944018,0,-1,-,1,1

3,1761787355757,18:22:35.757 29/10/2025,3,"*CLS","",2,AC Voltage
Dips/Interrupts (IEC 61000-4-
11/34...),3,1759869944018,0,2,106378889,0,1

4,1761787355873,18:22:35.873 29/10/2025,3,"*CLS","",2,AC Voltage
Dips/Interrupts (IEC 61000-4-
11/34...),3,1759869944018,0,3,109362182,0,1

5,1761787355905,18:22:35.905 29/10/2025,3,"*CLS","",2,AC Voltage
Dips/Interrupts (IEC 61000-4-11/34...),3,1759869944018,2,1,20096,0,1

6,1761787356059,18:22:36.059 29/10/2025,3,"SYST:ERR? - 0,No
error","",2,AC Voltage Dips/Interrupts (IEC 61000-4-
11/34...),3,1759869944018,2,1,20096,0,1

7,1761787356094,18:22:36.094 29/10/2025,1,"Detecting device
features","",2,AC Voltage Dips/Interrupts (IEC 61000-4-
11/34...),3,1759869944018,0,-1,-,1,1
```

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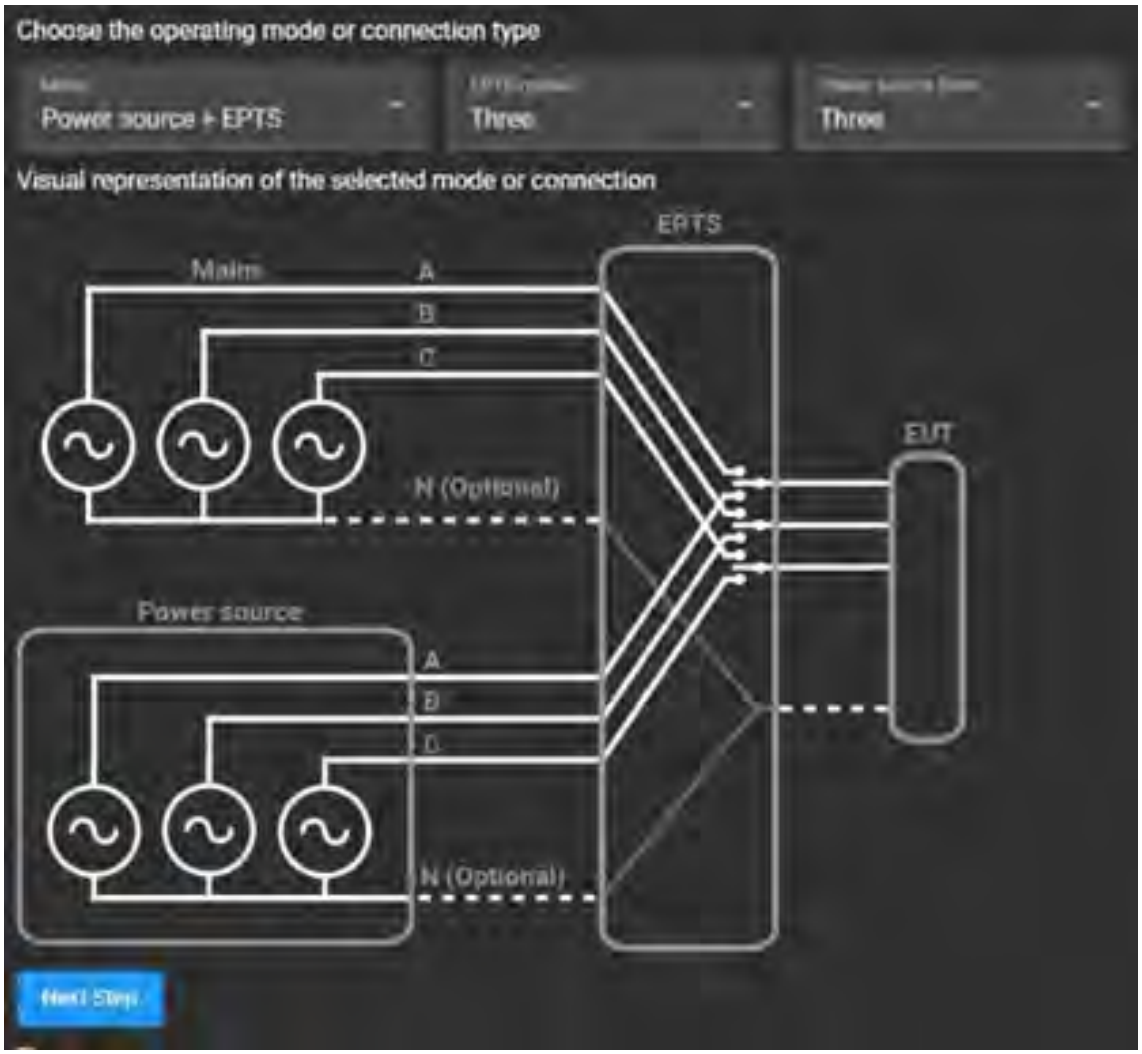
### 6.5.2 Three Phase Voltage Dips Test Example

For this example, we obviously have to use a three phase EPTS unit in order to run a three phase EUT test but will use the available 230Vac L-N, 50Hz three phase Mains to provide the nominal European grid voltage and frequency (Configuration #14).

For lab locations that don't have a 50Hz, 230V AC grid, a second programmable AC power source is needed to provide a 50Hz 'grid' connection to the EPTS Mains input. See setup Configuration #32 in section 6.4 for reference.




The programmable AC source outputs connect to the EPTS AC Source input terminals and will provide the programmable Voltage dip levels. A three phase programmable AC source is used with all three phases connected to the EPTS. It is permissible to connect all three phases of course if the EPTS is a three phase model and will be used for testing 3 phase EUTs as well using a three phase test configuration.

To select this test configuration, proceed as follows:

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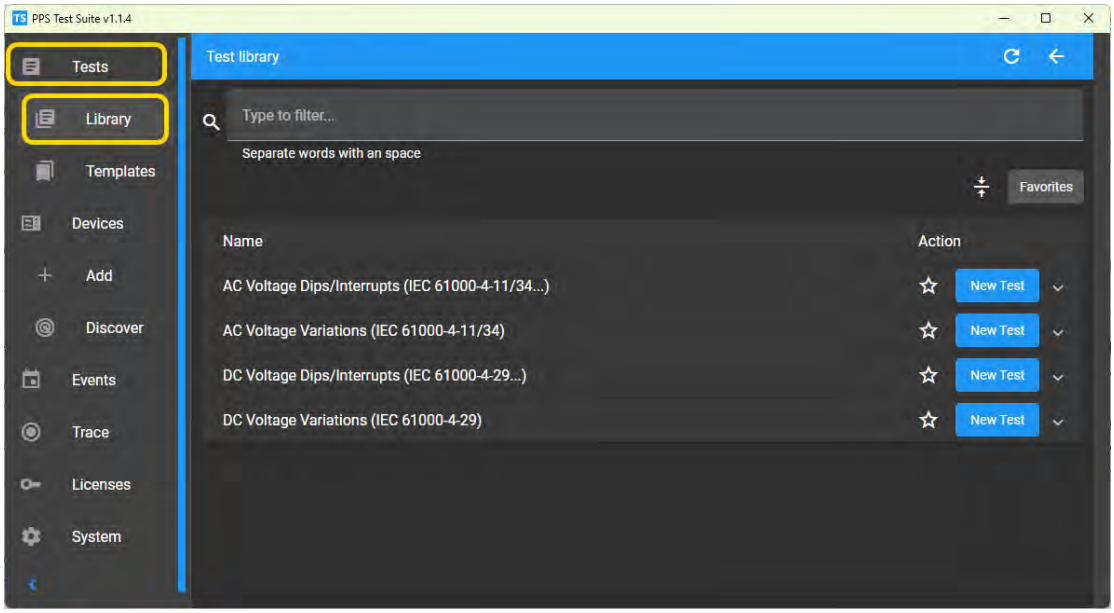
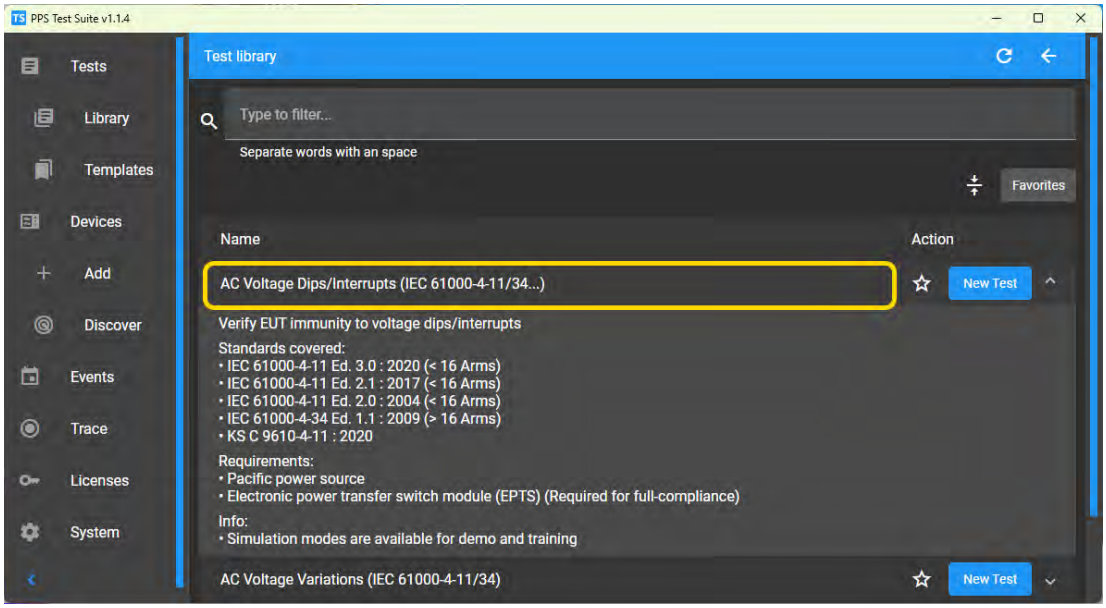
From the main Test Suite screen, select Tests -> Library




From the Test Library (right hand side), click on the AC Voltage Dips/Interrupts (IEC 61000-4-11/34) **New Test** button. This will show the supported IEC test standards.




Click on the New Test button on the right.

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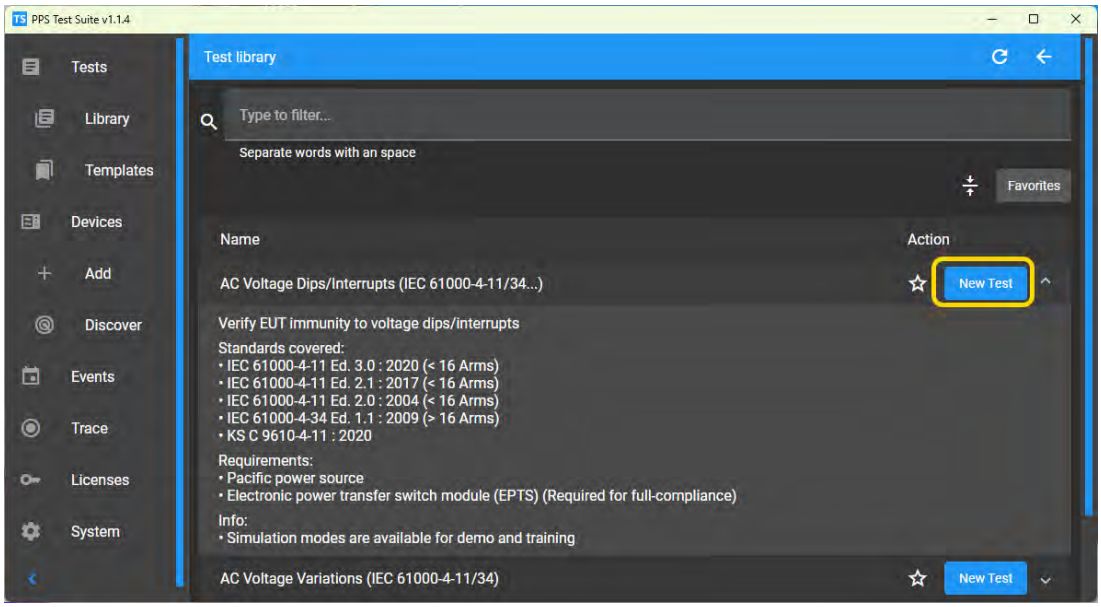
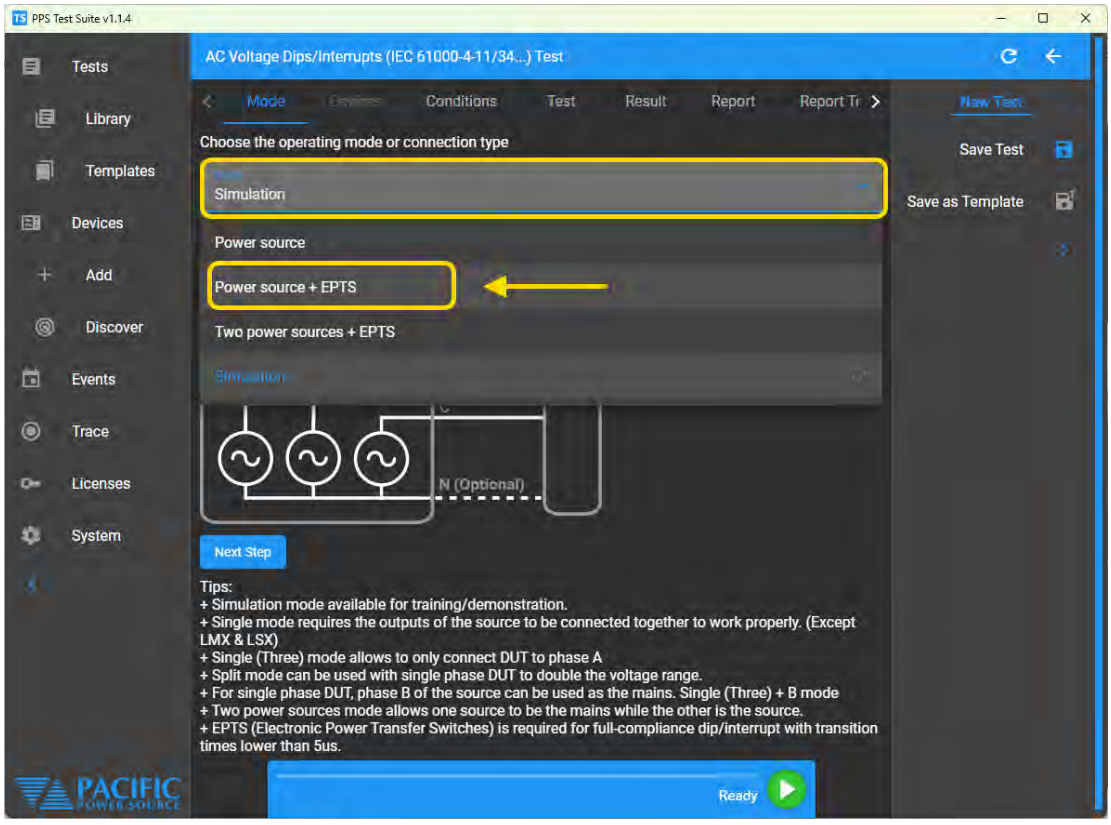



This will show the test setup selection screen. Click on the Mode selection at the top of the screen and select the “Power Source + EPTS” configuration selections as shown below.




This will display the test setup screen allowing you to make the desired test setup selections.

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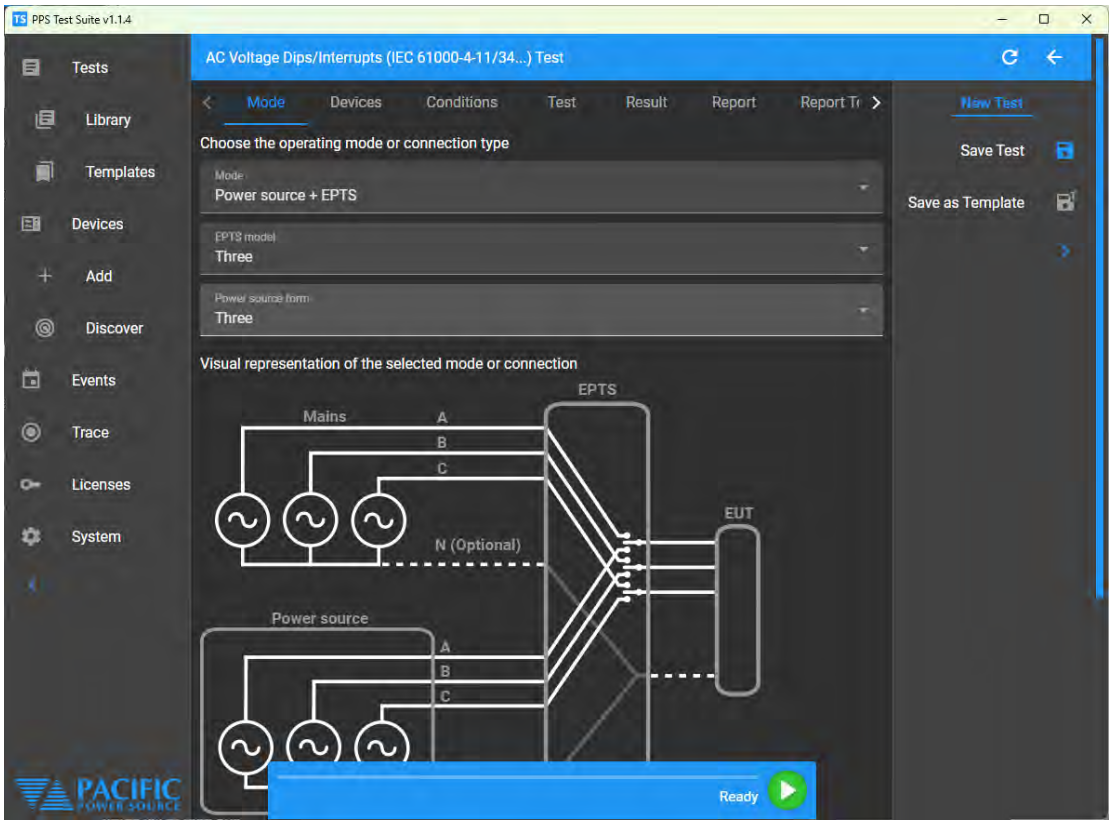


The default will show three phase settings already so we can just proceed with the choices shown.

Before starting a test, make sure the EUT information and test condition are set correctly. This is done by selecting the Devices and Conditions tabs at the top of the test screen respectively. Make sure the correct EPTS unit and AC power source are selected in this setup screen. For most EPTS systems, there will only be one to choose from but if more than one EPTS or more than one AC power source is connected to the Windows PC, it is important to select the right ones.

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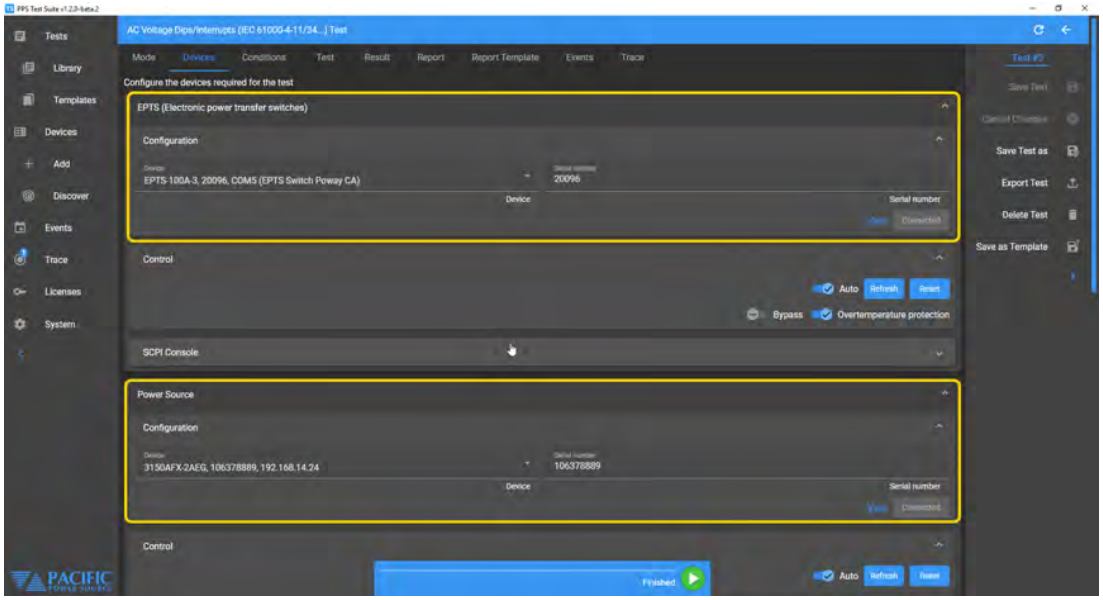
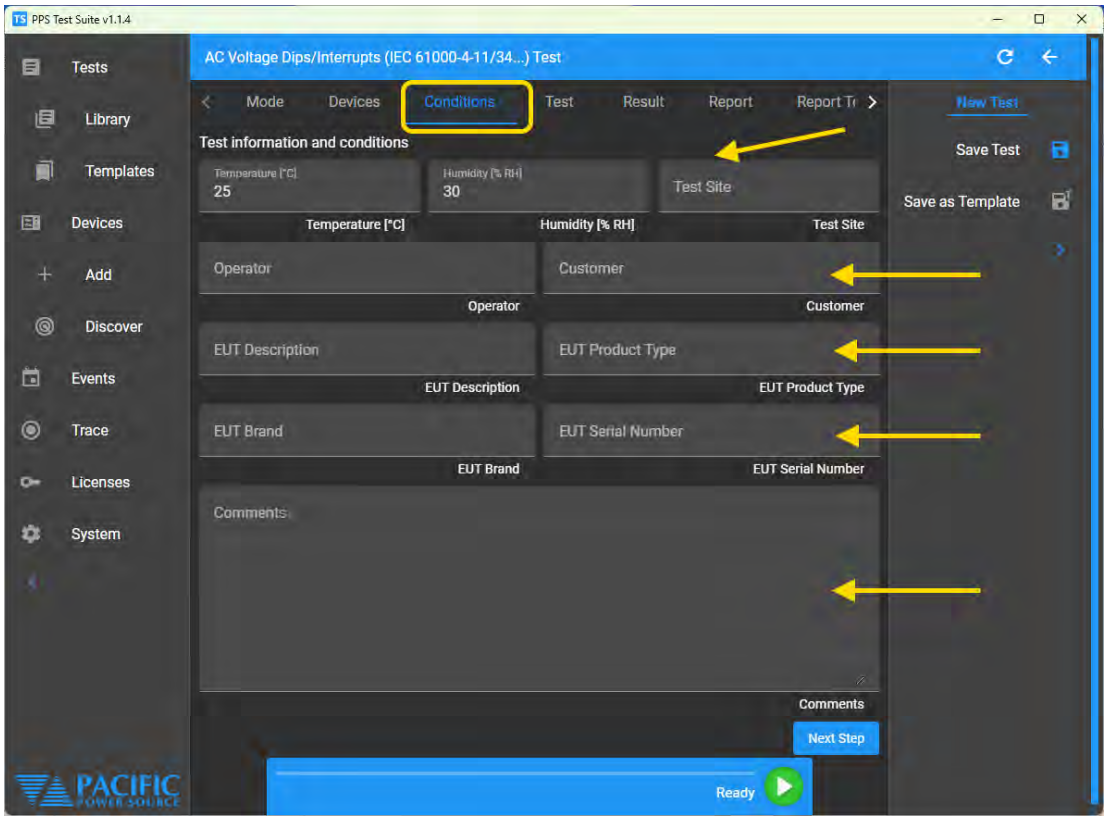



Next, set the lab environment conditions and EUT information in the Conditions tab. All this information will be included in the test report after performing all EUT tests.

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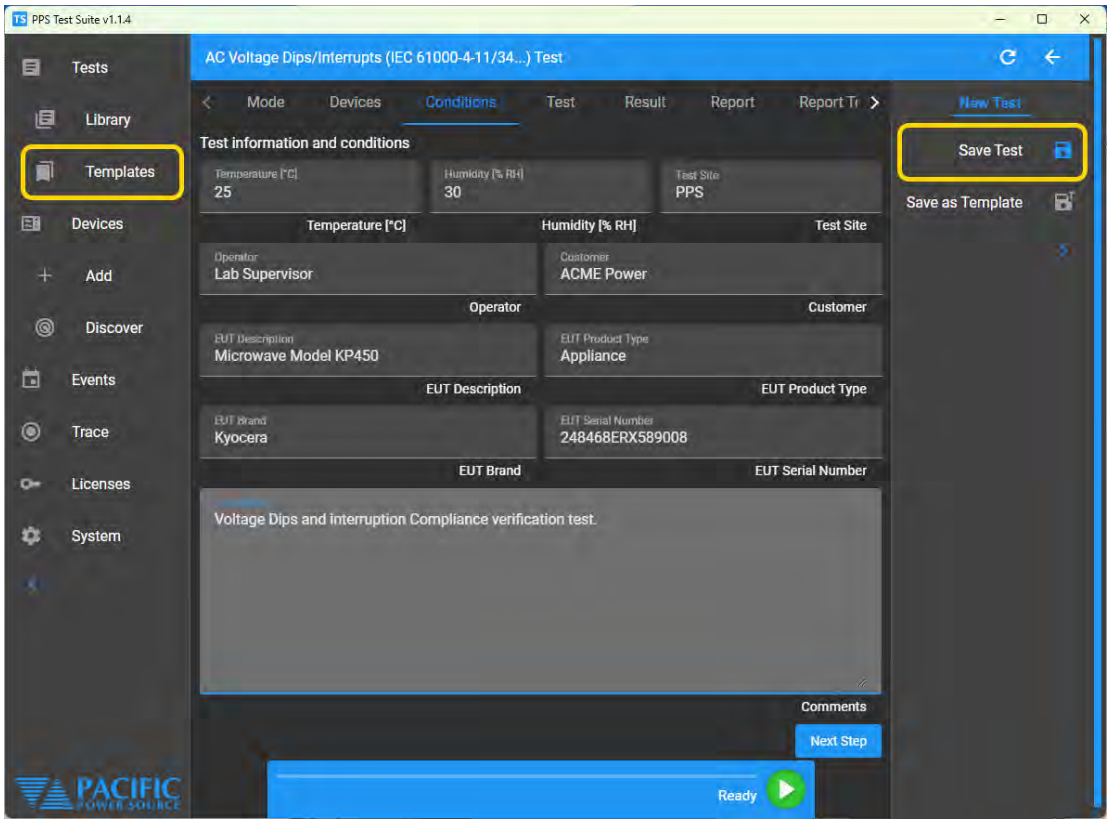
If the same EUT will be tested again or multiple times, it is important to Save the test setups under a relevant name using the Save Test control shown to the right. If the test setup is used often, it may be worthwhile to save it as a test template using the "Save as Template" control on the right. Templates saved will be available for recall from the Templates selection under the Tests menu entry in the left hand side vertical control bar.

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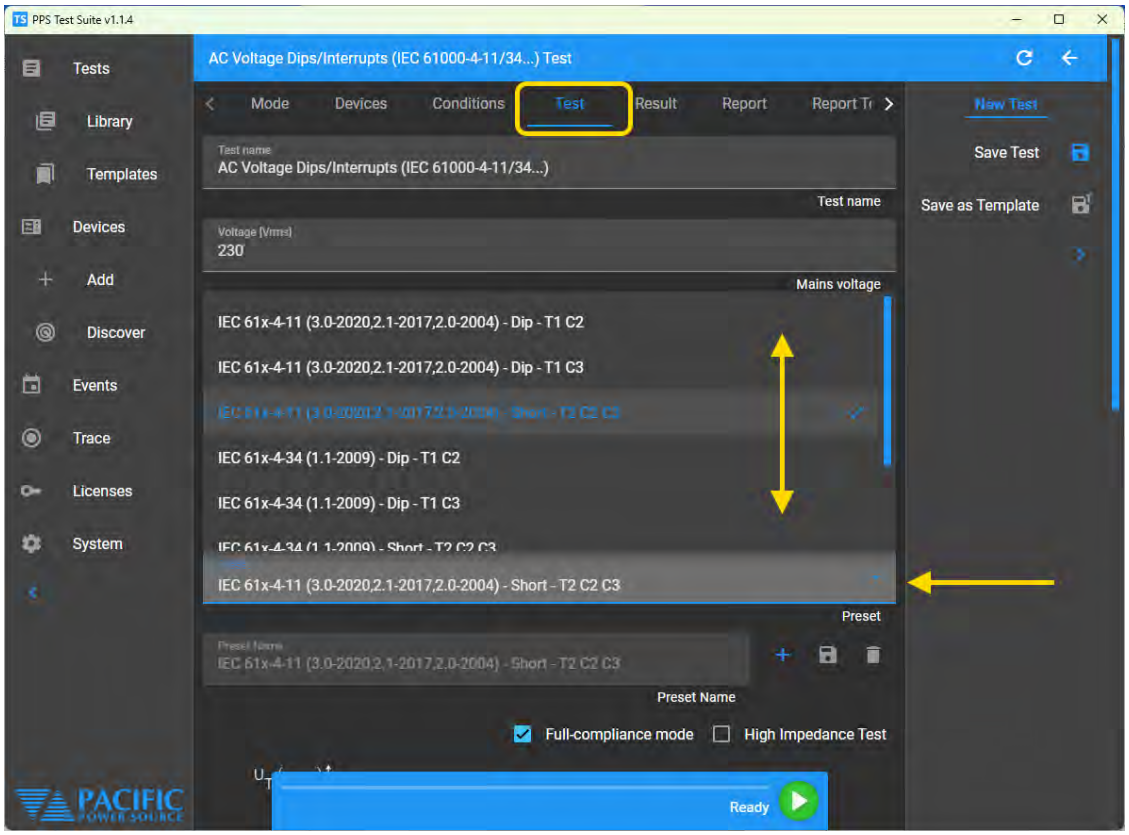
Now that the setup configuration, test equipment used, EUT information and test conditions have been set, the actual tests can begin. Select the Test tab to see the available tests. Since we selected IEC 61000-4-11/-4-34, all supported versions of these tests are available to choose from in the Test screen. Select the appropriate type and revision before using the RUN control at the bottom of the screen.

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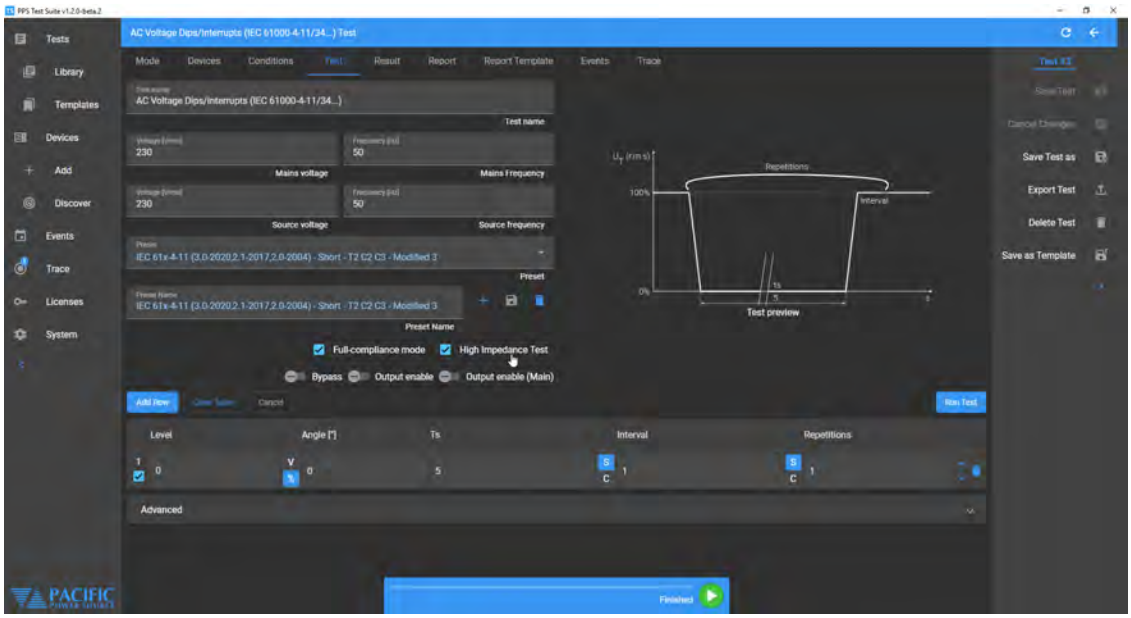
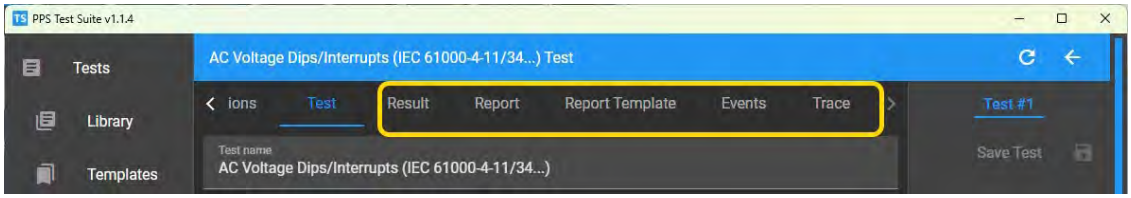
Once a test revision is selected, the specific test sequence needed to implement this test will be displayed as shown below.




The user can now start the test using the Run button at the bottom of the screen. The test will commence and progress will be shown at the bottom of the screen during the test run.




Once the test is completed, test results and reports are available from the top menu. This includes:

| | |
|---|---|
| Result | Final Pass or Fail determination made by the operator. |
| Report | Test Report ready to either save and or print. |
| Report Template | The report template used to generate the report which may be customized as needed. |
| Events Log | Events logged during the test such as status information, errors, or exceptions. |
| Trace Info | Events and trace information including executed commands, query responses, and errors with date and time stamps. |

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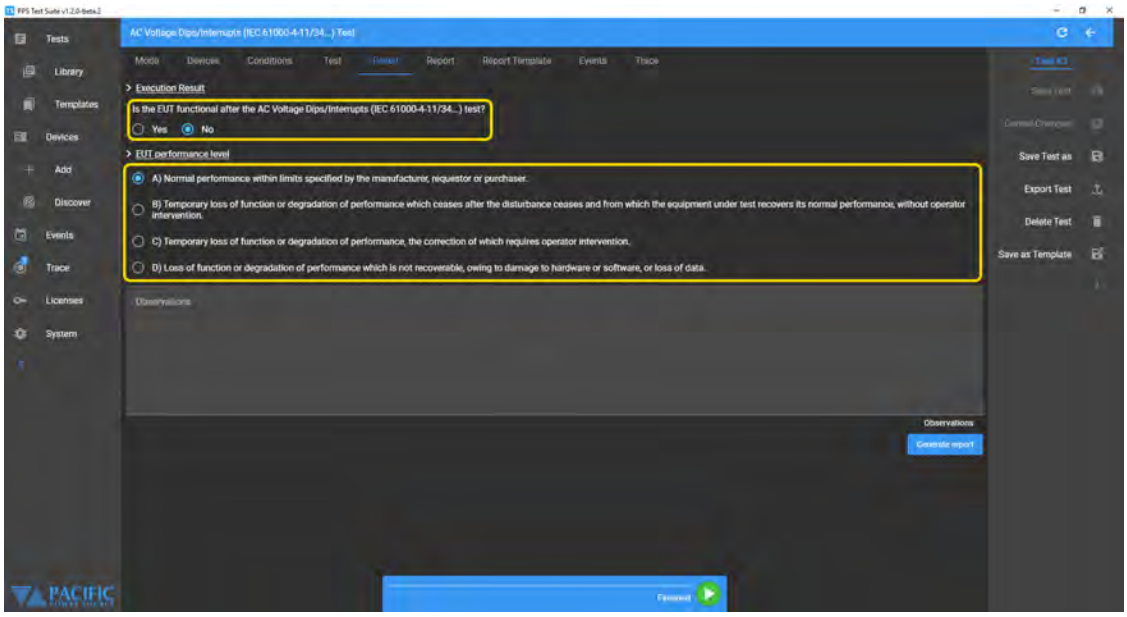
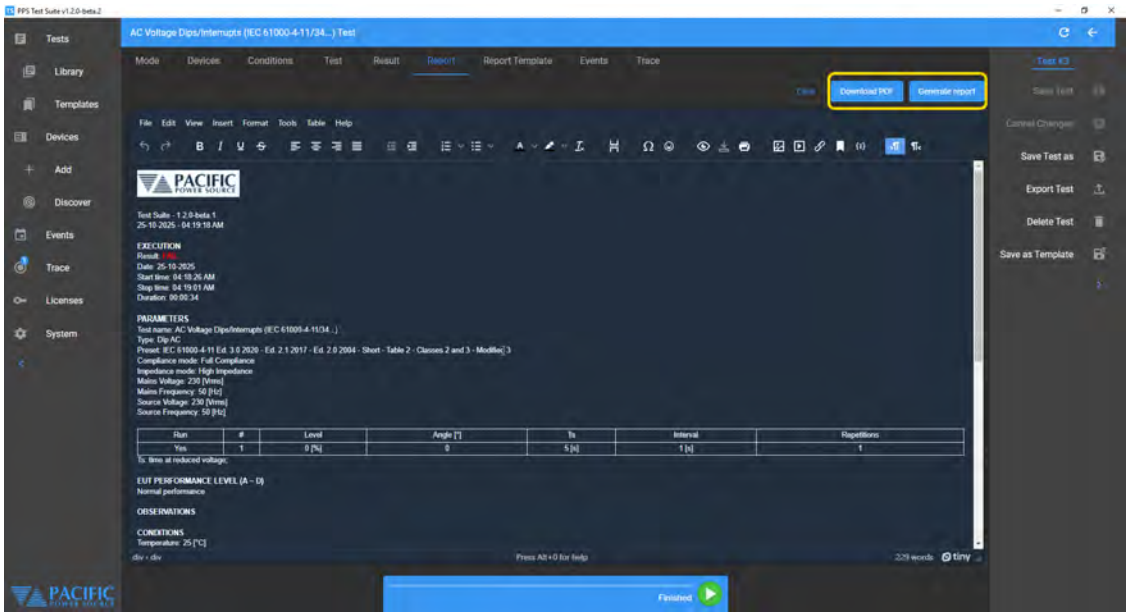
## Test Result

The operator is responsible for evaluating the impact of the voltage dip or variation on the EUT. Four levels of pass or fail are established by the IEC standard. The overall pass or fail is a function of the EUT class or type and the level deemed acceptable or a pass in the product category specific IEC standard.




## Report

The test report tab provides a preview of the test report. From this screen, it can be printed if a Windows printer is available or saved in PDF or DOCX format.

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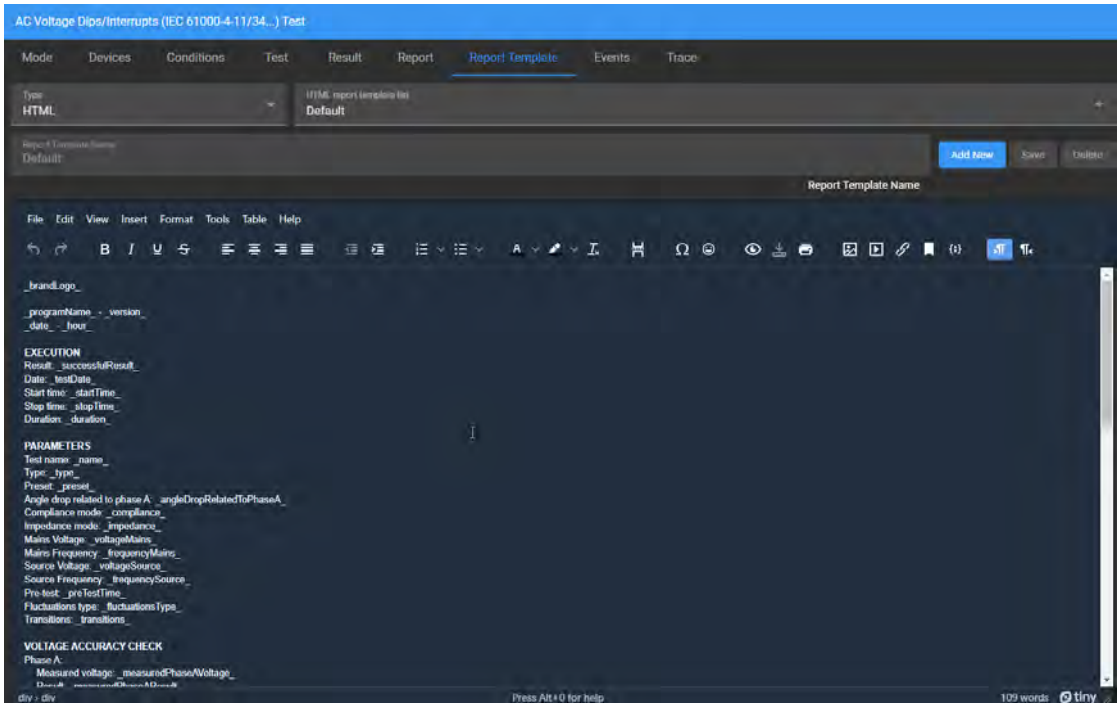
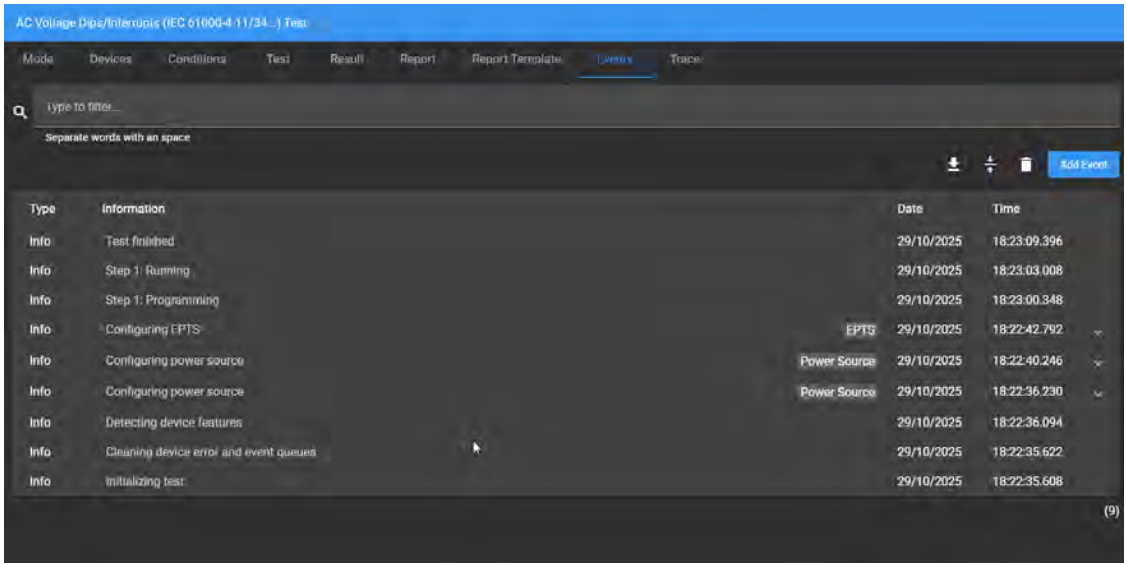
## Report Template

The report template tab may be used to edit the layout and location of fields in the final report. When making changes, it is recommended make a backup of the original report template first.




## Events Log

The event log provides a history of significant events that occurred during test execution. It is for informational purposes only but may be attached to the test report if deemed relevant.

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### Trace Info

The Trace screen contains a history of SCPI control commands sent to the AC power source and / or EPTS unit during the test run. It may be used for troubleshooting. Pacific Power source may request a copy of this trace to assist in any support issues as needed.

A small sample section of the csv format trace content export function is shown here for reference.

```
1,1761787355608,18:22:35.608 29/10/2025,1,"Initializing test","",2,AC
Voltage Dips/Interrupts (IEC 61000-4-11/34...),3,1759869944018,0,-
1,-,1,1

2,1761787355622,18:22:35.622 29/10/2025,1,"Cleaning device error and
event queues","",2,AC Voltage Dips/Interrupts (IEC 61000-4-
11/34...),3,1759869944018,0,-1,-,1,1

3,1761787355757,18:22:35.757 29/10/2025,3,"*CLS","",2,AC Voltage
Dips/Interrupts (IEC 61000-4-
11/34...),3,1759869944018,0,2,106378889,0,1

4,1761787355873,18:22:35.873 29/10/2025,3,"*CLS","",2,AC Voltage
Dips/Interrupts (IEC 61000-4-
11/34...),3,1759869944018,0,3,109362182,0,1

5,1761787355905,18:22:35.905 29/10/2025,3,"*CLS","",2,AC Voltage
Dips/Interrupts (IEC 61000-4-11/34...),3,1759869944018,2,1,20096,0,1

6,1761787356059,18:22:36.059 29/10/2025,3,"SYST:ERR? - 0,No
error","",2,AC Voltage Dips/Interrupts (IEC 61000-4-
11/34...),3,1759869944018,2,1,20096,0,1

7,1761787356094,18:22:36.094 29/10/2025,1,"Detecting device
features","",2,AC Voltage Dips/Interrupts (IEC 61000-4-
11/34...),3,1759869944018,0,-1,-,1,1
```

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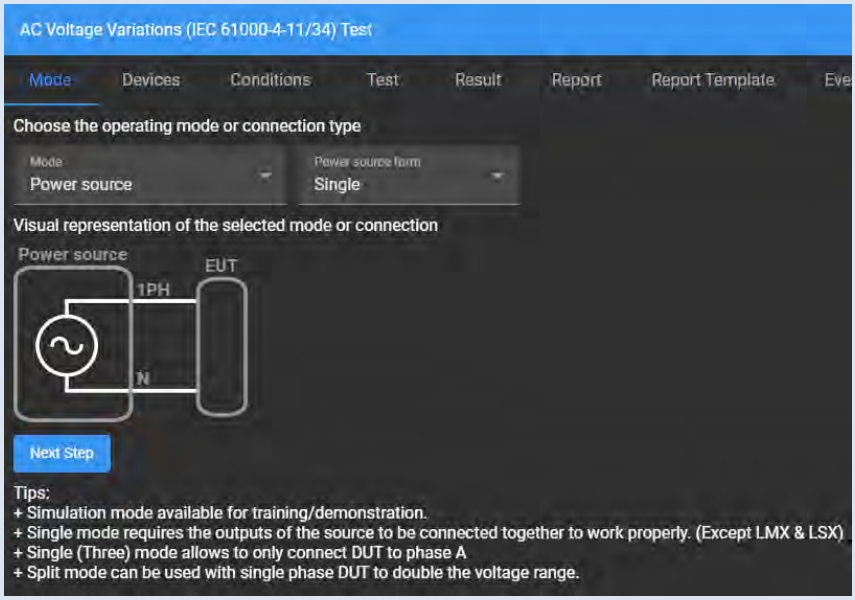
## 6.6 Voltage Variations Tests

## 6.7 Supported Voltage Variations Test Configurations

Voltage variations tests **DO NOT** require the use of the EPTS hardware so if the power source is connected to the EPTS input, the EPTS shall be configured in bypass mode via the Devices menu by opening the EPTS screen and accessing the Control tab.

This setup supports up to four test mode configurations, depending on available hardware, phase mode and other factors. In simulation mode, either 1, 2 or 3 phase tests can be simulated.

| Selection | Description |
|---|---|
| **Mode** | Selects Power Source used or Simulation mode. |
| **Power Source Form** | Selects between following programmable AC source modes:<br>Single phase test on phase A with AC source in single phase mode<br>Single phase test on phase A with AC source in three phase mode<br>Split phase test on phase A&B with AC Source in split phase mode<br>Three phase test with AC Source in three phase mode |

| Mode | EPTS Model | Power Source Form | Schematic Test Setup |
|---|---|---|---|
| 1 | N/A | Single Phase |  |



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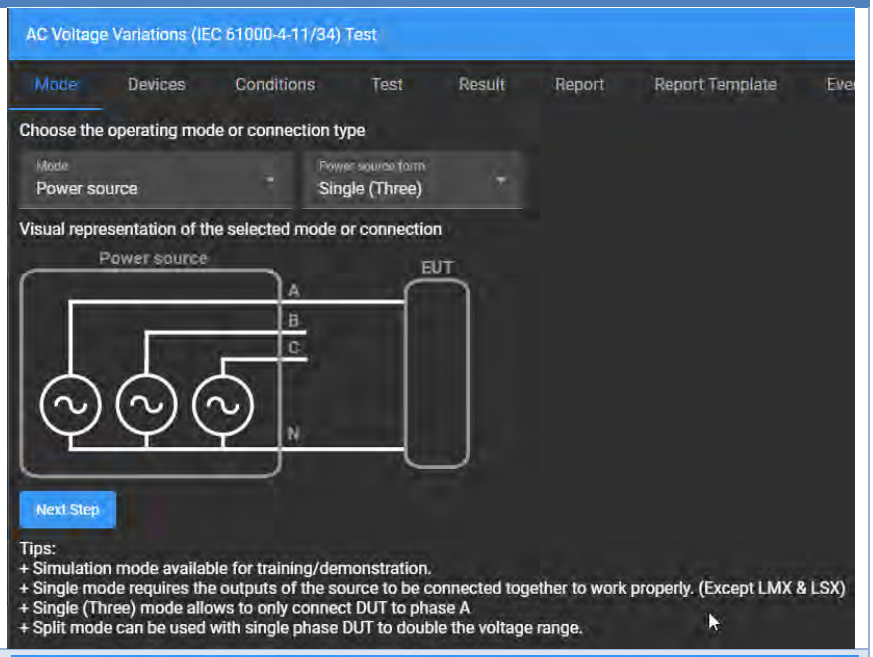
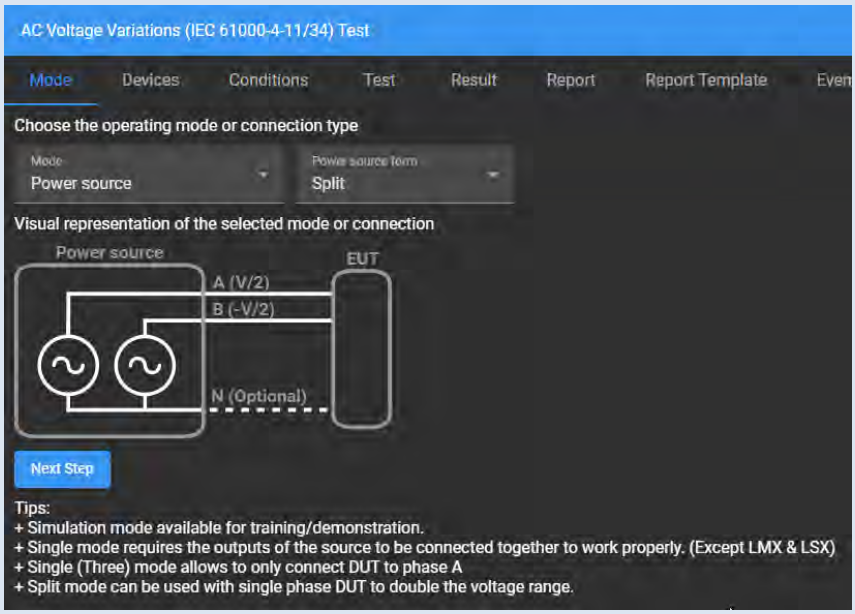
| Mode | EPTS Model | Power Source Form | Schematic Test Setup |
|---|---|---|---|
| **2** | N/A | Single Phase (Using Three Phase AC Source phase A) |  |
| **3** | N/A | Split Phase |  |

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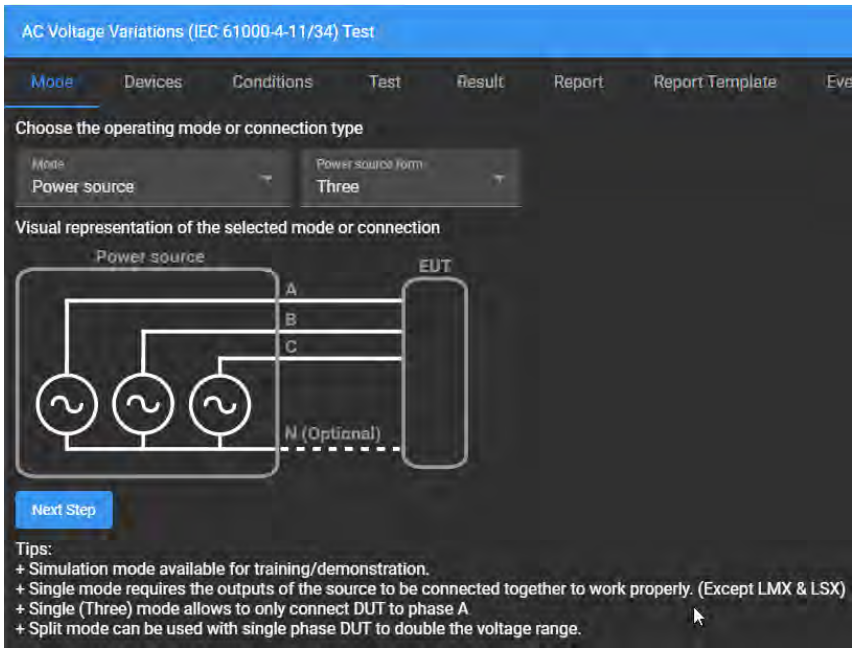
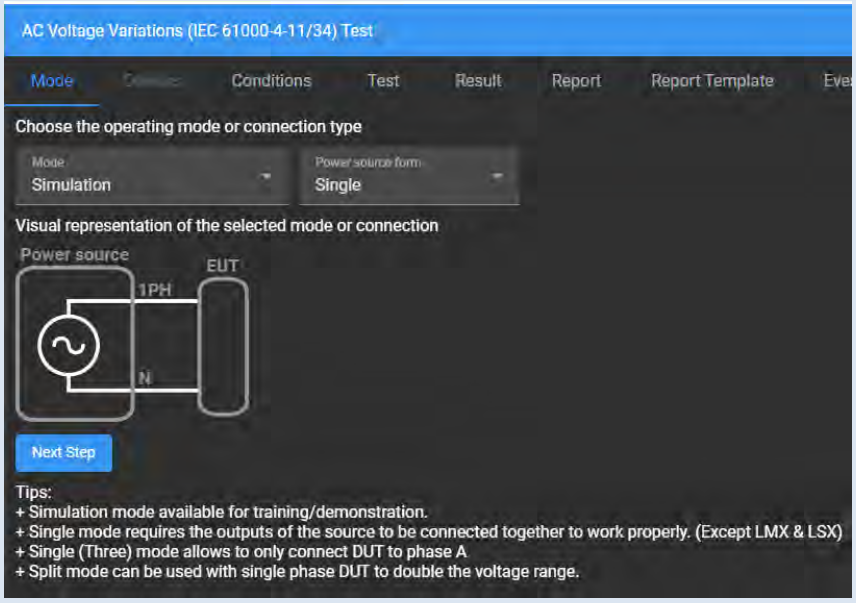
| Mode | EPTS Model | Power Source Form | Schematic Test Setup |
|---|---|---|---|
| **4** | N/A | Three Phase |  |
| **5** | N/A | Single Phase – Simulation |  |

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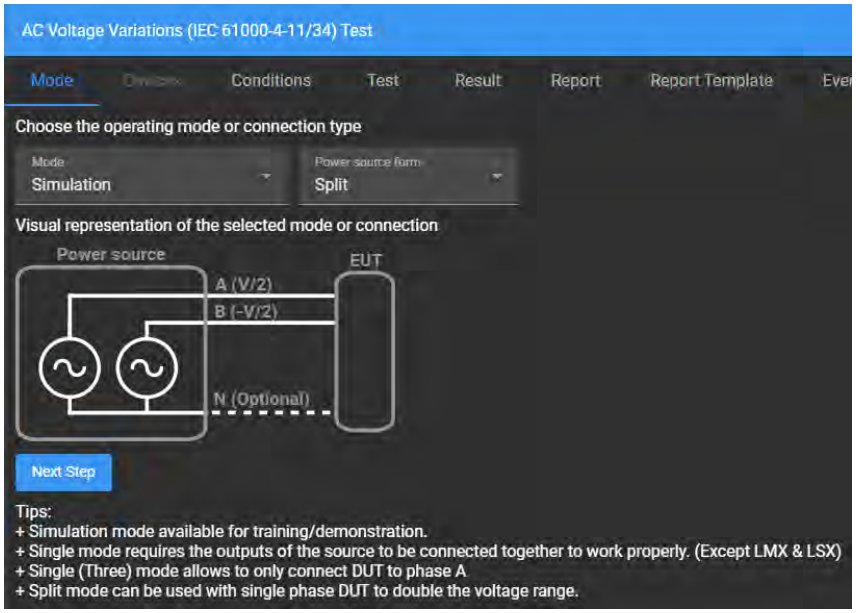
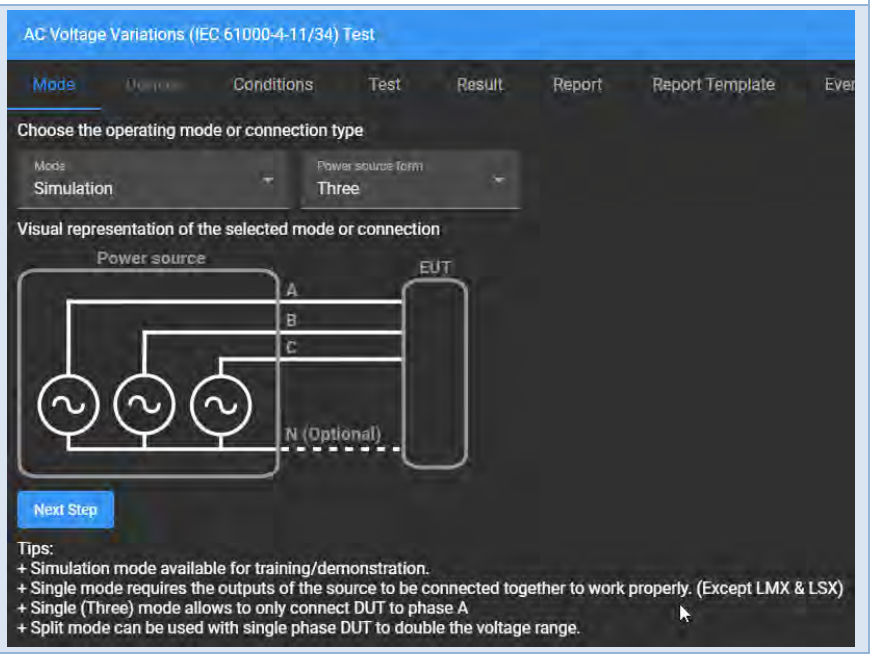
| Mode | EPTS Model | Power Source Form | Schematic Test Setup |
|---|---|---|---|
| **6** | N/A | Split Phase – Simulation |  |
| **7** | N/A | Three Phase – Simulation |  |

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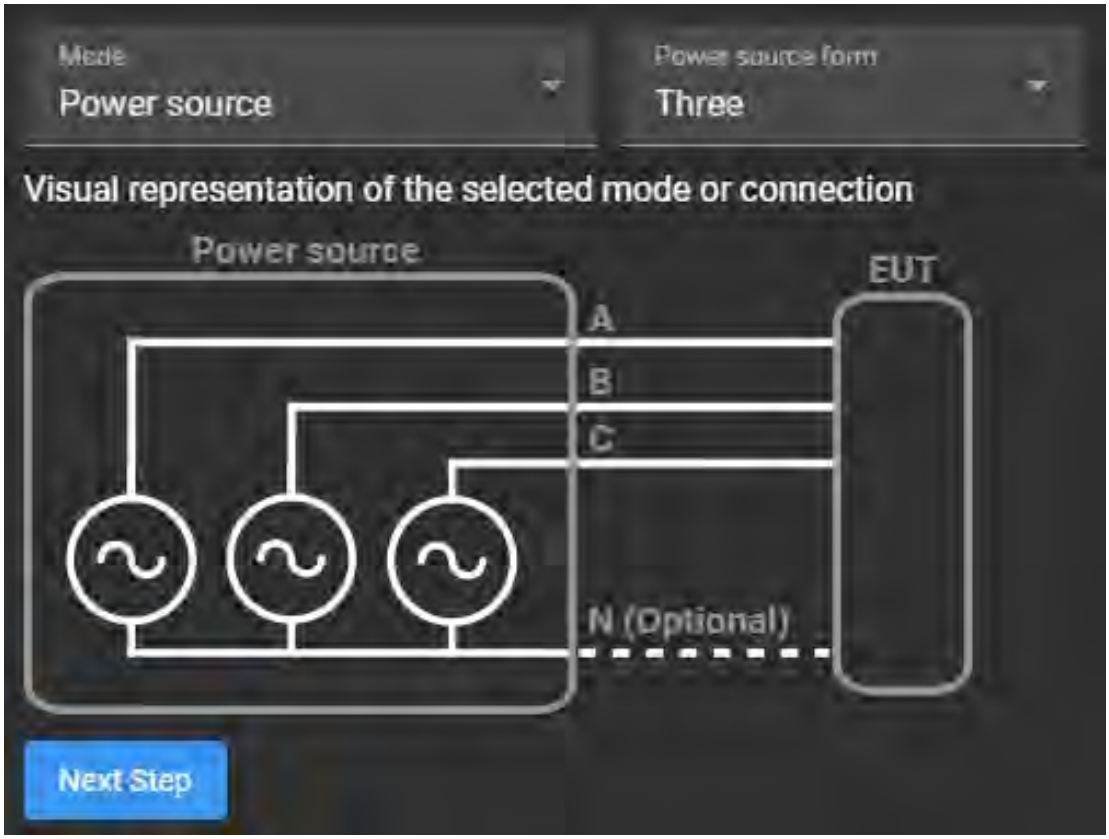
## 6.8 Test Setup Examples – Voltage Variations

Of these available test configurations, the example provided here is for a three phase tests using the programmable AC power source in three phase mode. but the software operation shown applies to all available voltage variations modes.

### 6.8.1 Three Phase Voltage Variations Test Example

For this example, the programmable AC power source that is part of the EPTS test system is set to 50Hz, 230V to simulate the EU power grid. See setup Configuration #4 in section 6.7 for reference.




The three phase EUT is connected to the AC source which will provide the required Voltage variation levels and durations.

To select this test configuration, proceed as follows:

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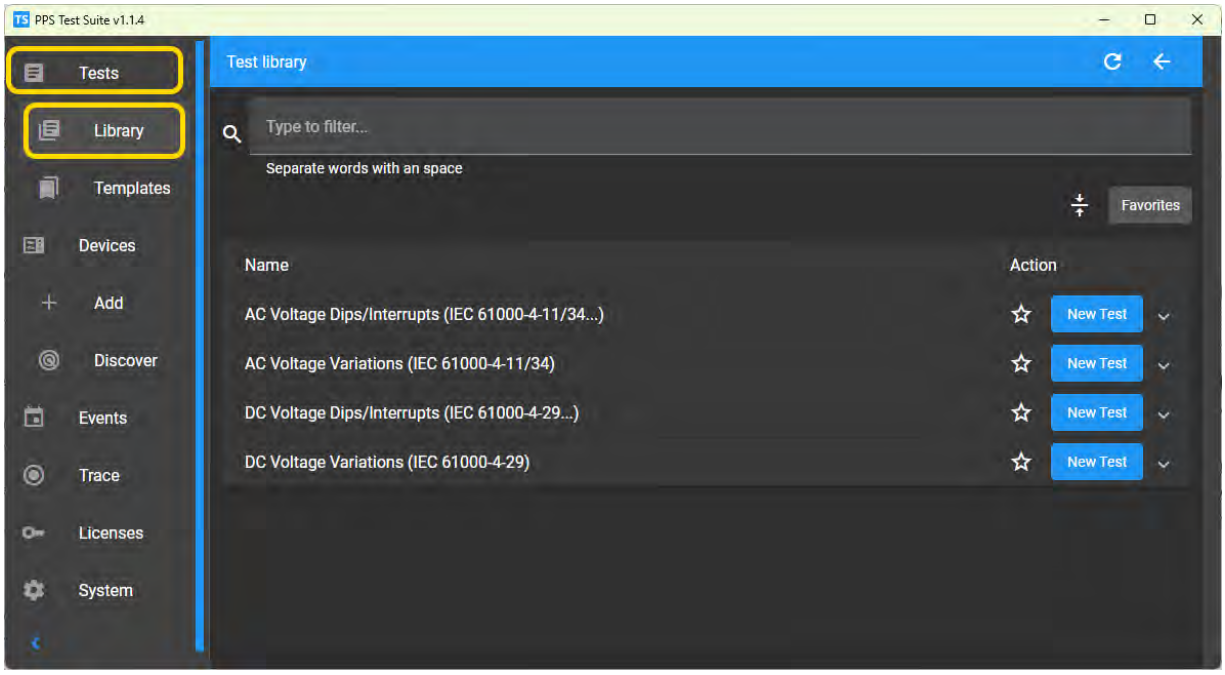
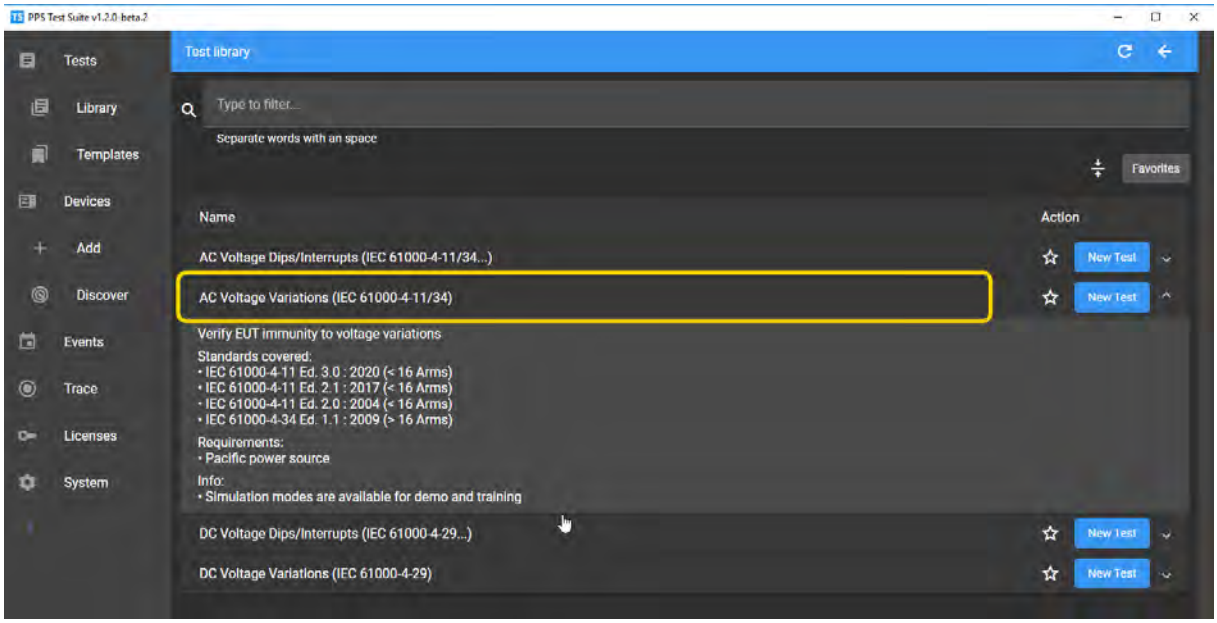
From the main Test Suite screen, select Tests -> Library




From the Test Library (right hand side), click on the AC Voltage Variations (IEC 61000-4-11/34) entry. This will show the supported IEC test standards.

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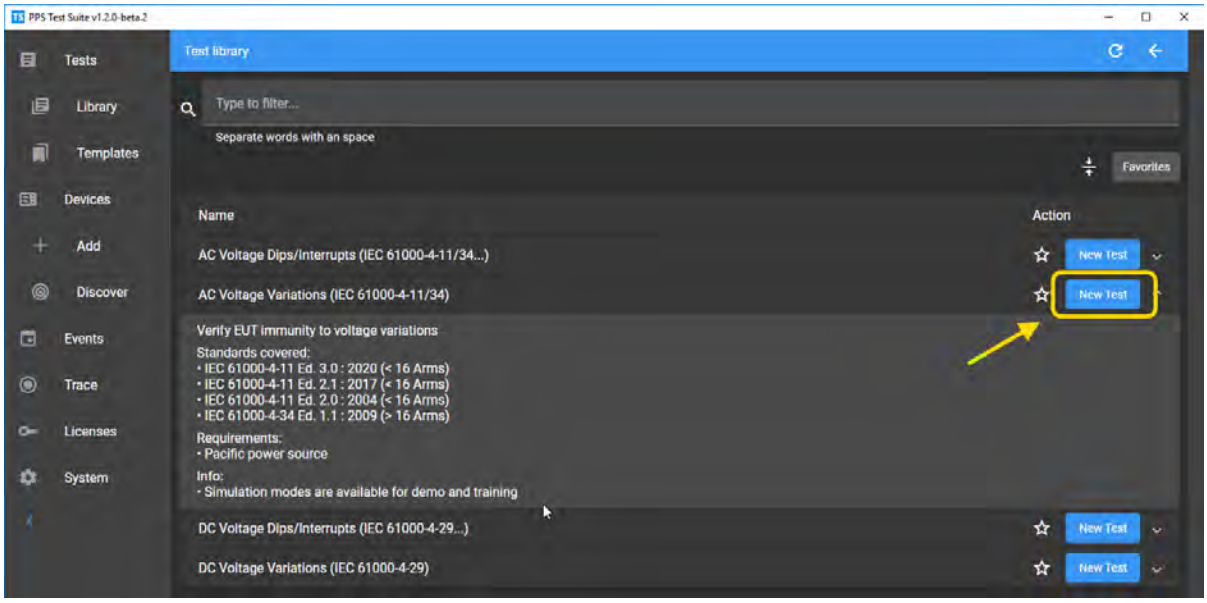
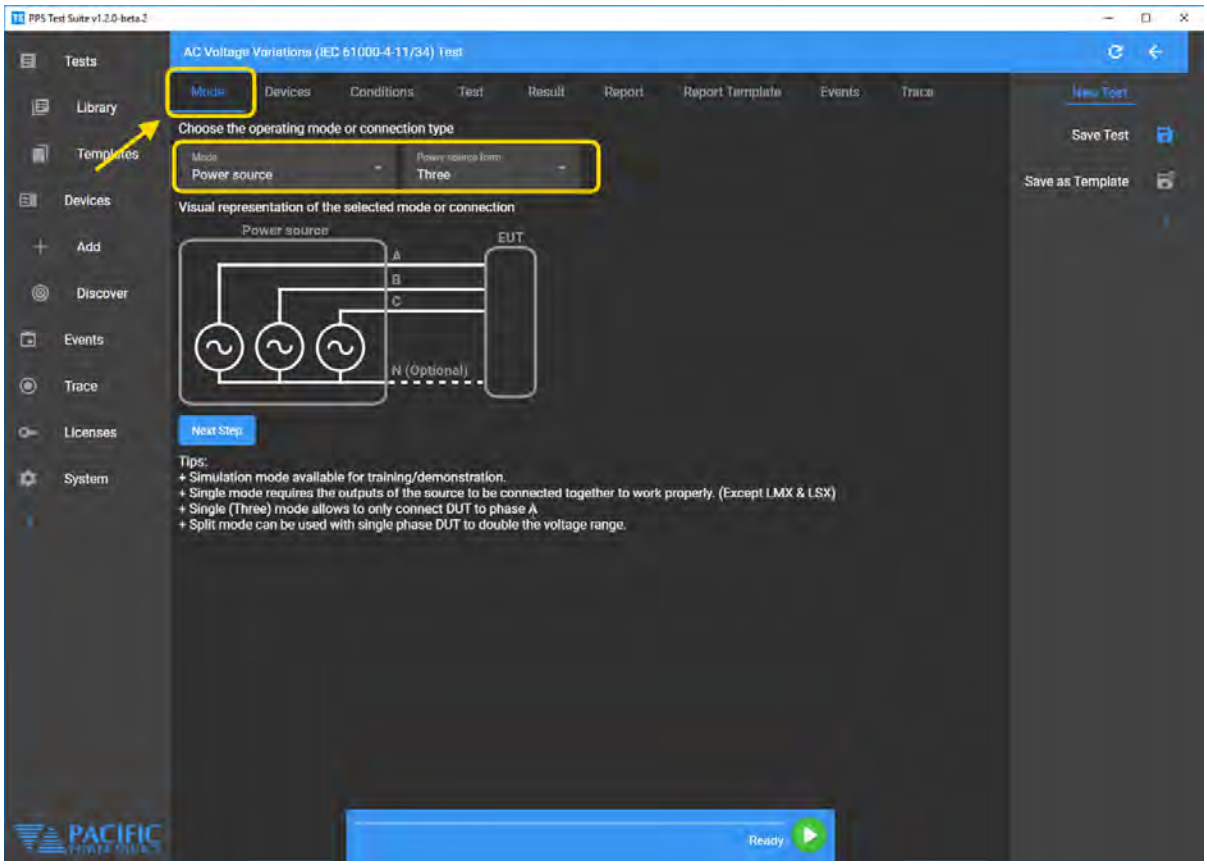
Next, Click on the New Test button on the right:




This will show the test setup selection screen. Click on the Mode selection at the top of the screen and select the “Power Source + EPTS” configuration selections as shown below.




Make sure the three phase mode is selected for this three phase EUT test example.

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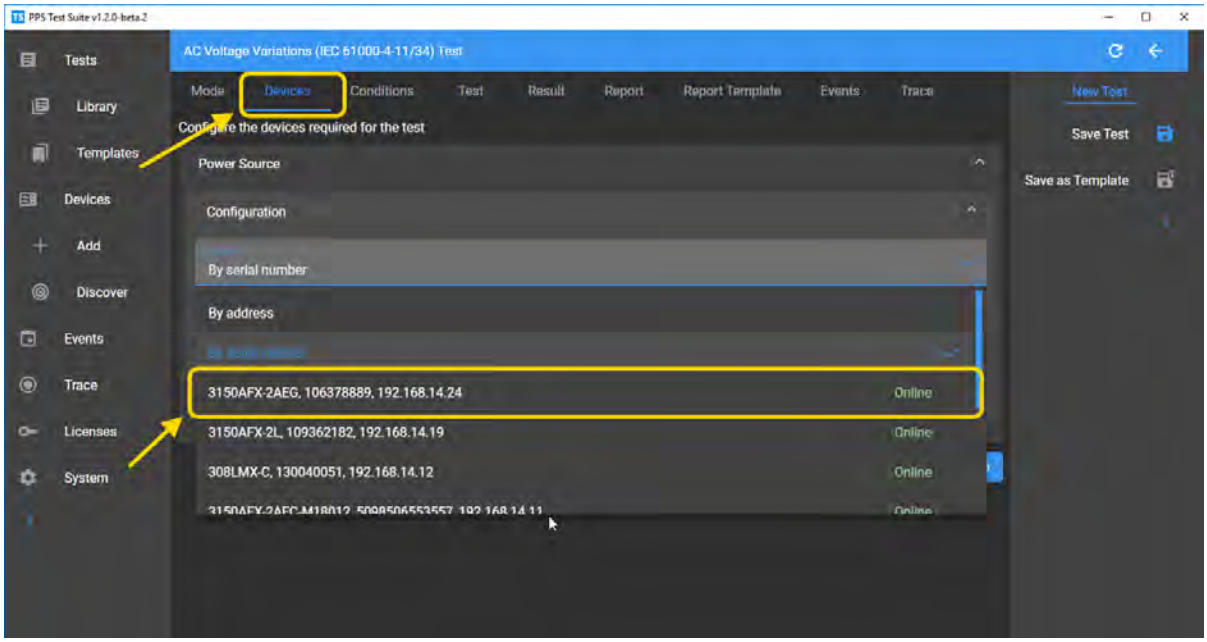
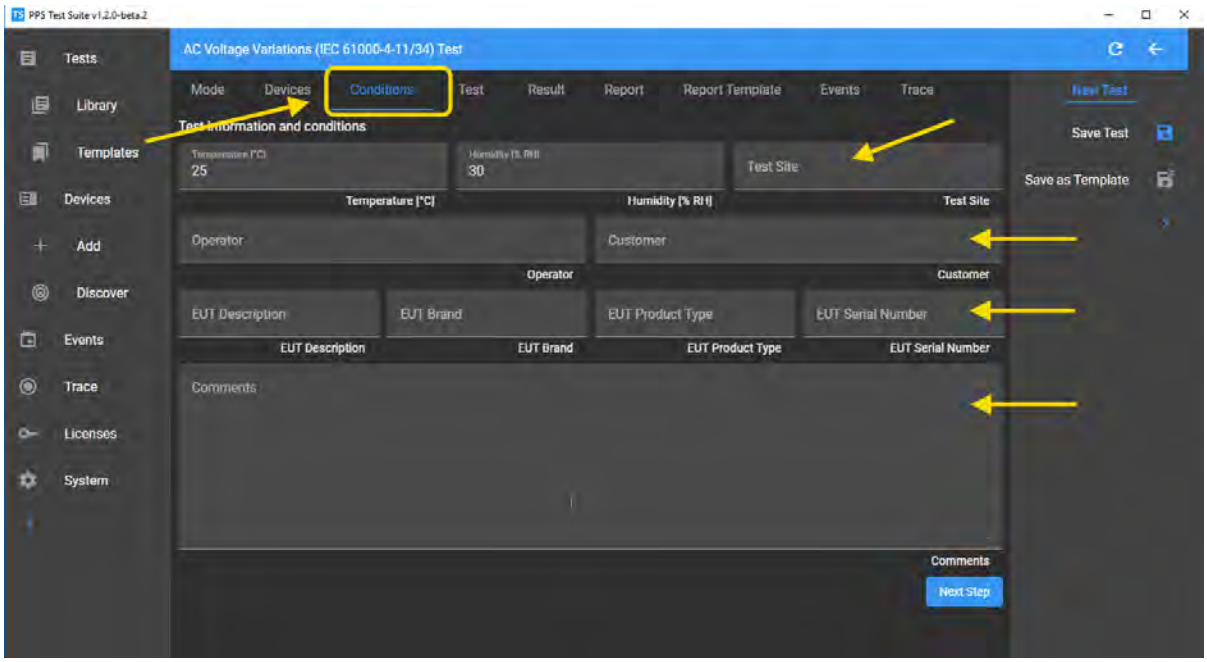
Next, move to the Devices tab and select the correct AC power source if there are more than one. Most EPTS test systems will only have one connected AC power source so select the only available one in that case.

Select the **Power Source** in the Mode field and the **Three** phase mode in the Power source form field as shown in the screen capture above.




Next, set the lab environment conditions and EUT information in the Conditions tab. All this information will be included in the test report after performing all EUT tests.

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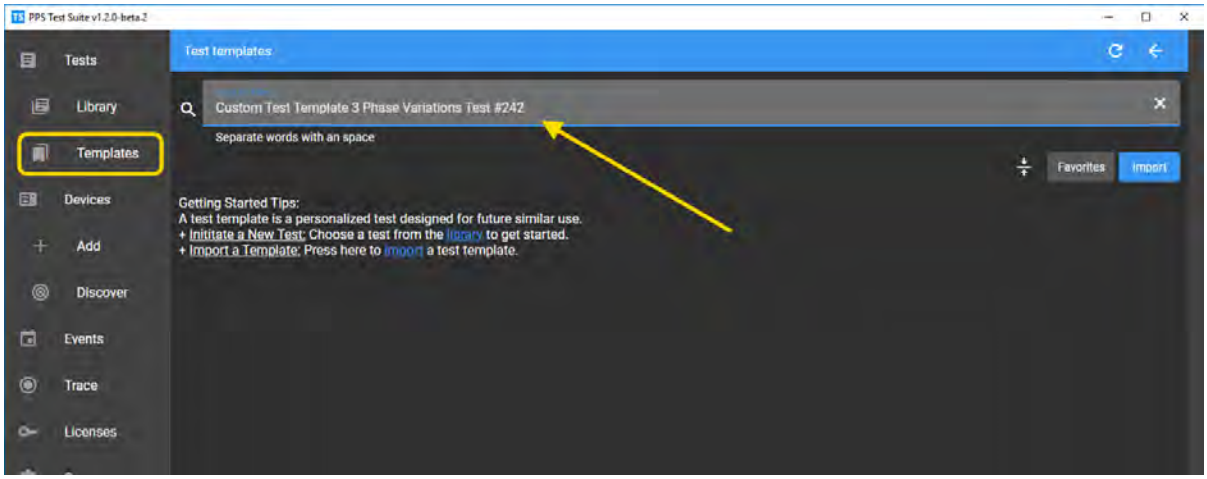
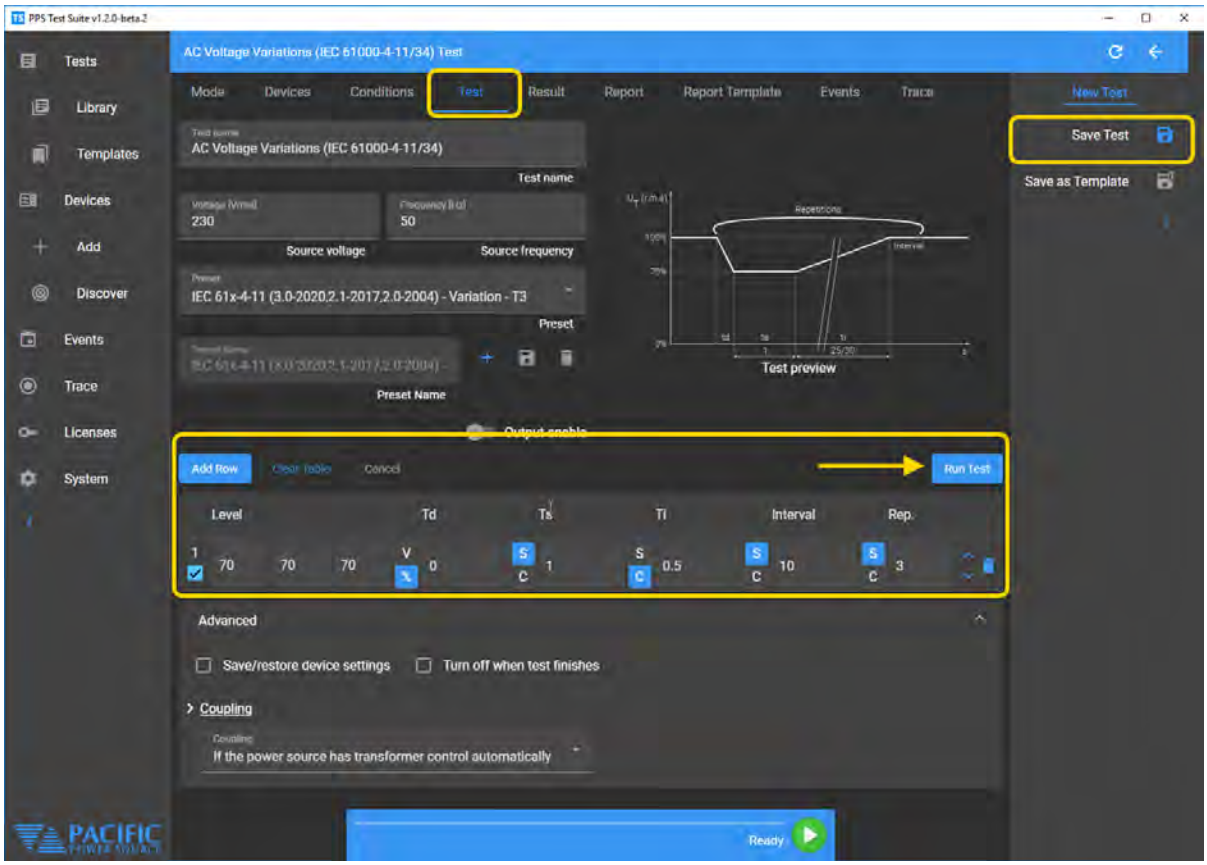
If the same EUT will be tested again or multiple times, it is important to Save the test setups under a relevant name using the Save Test control shown to the right. If the test setup is used often, it may be worthwhile to save it as a test template using the "Save as Template" control on the right. Templates saved will be available for recall from the Templates selection under the Tests menu entry in the left hand side vertical control bar.




The test is now ready to run. Save the setting if the same test may have to be run in the future. For common test setups, you can save the current setup as a test Template as well.

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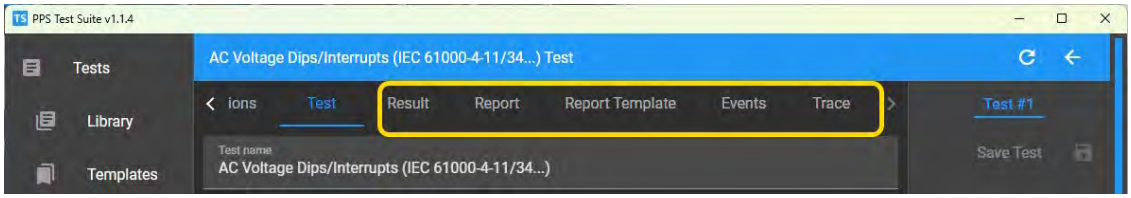
Note that the user can also start the test using the Run button at the bottom of the screen. The test will commence and progress will be shown at the bottom of the screen during the test run.




Once the test is completed, test results and reports are available from the top menu. This includes:

| | |
|---|---|
| Result | Final Pass or Fail determination made by the operator. |
| Report | Test Report ready to either save and or print. |
| Report Template | The report template used to generate the report which may be customized as needed. |
| Events Log | Events logged during the test such as status information, errors, or exceptions. |
| Trace Info | Events and trace information including executed commands, query responses, and errors with date and time stamps. |

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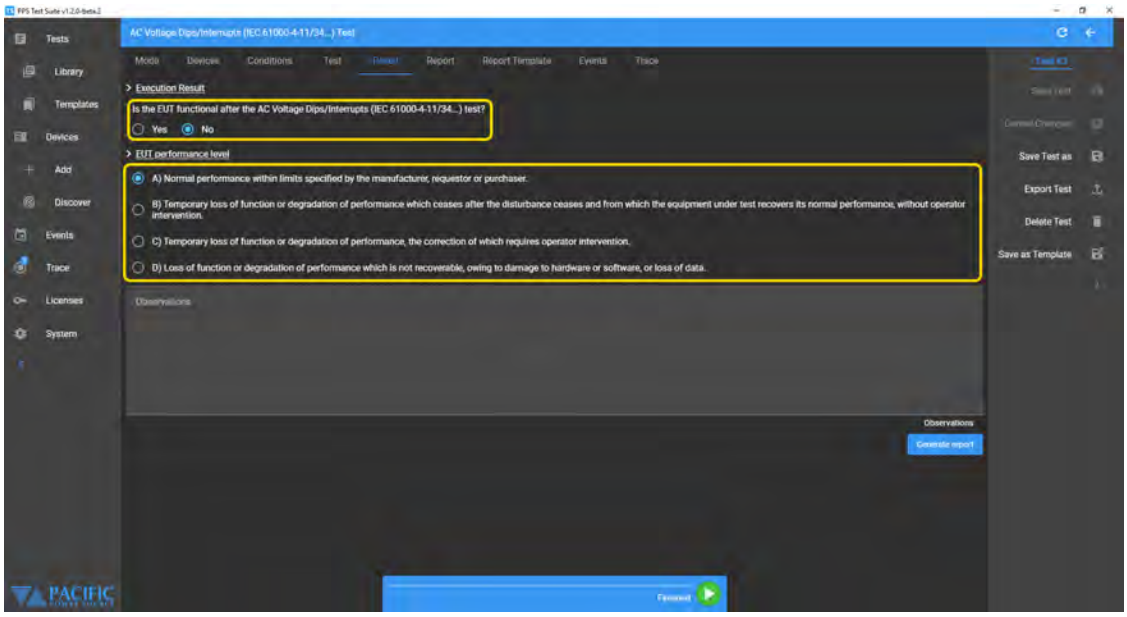
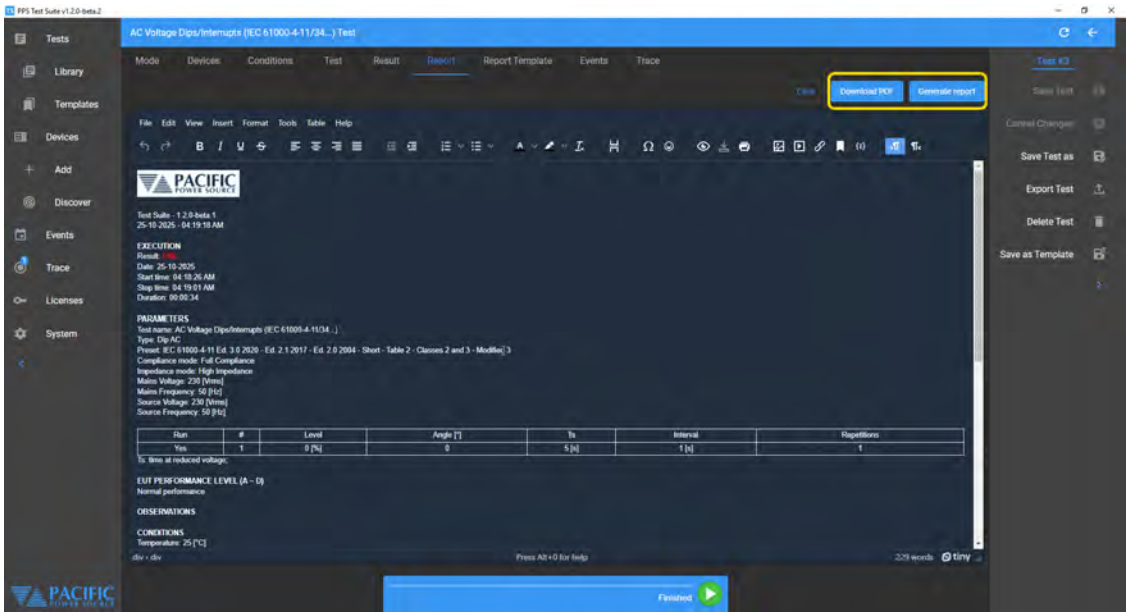
## Test Result

The operator is responsible for evaluating the impact of the voltage dip or variation on the EUT. Four levels of pass or fail are established by the IEC standard. The overall pass or fail is a function of the EUT class or type and the level deemed acceptable or a pass in the product category specific IEC standard.




## Report

The test report tab provides a preview of the test report. From this screen, it can be printed if a Windows printer is available or saved in PDF or DOCX format.

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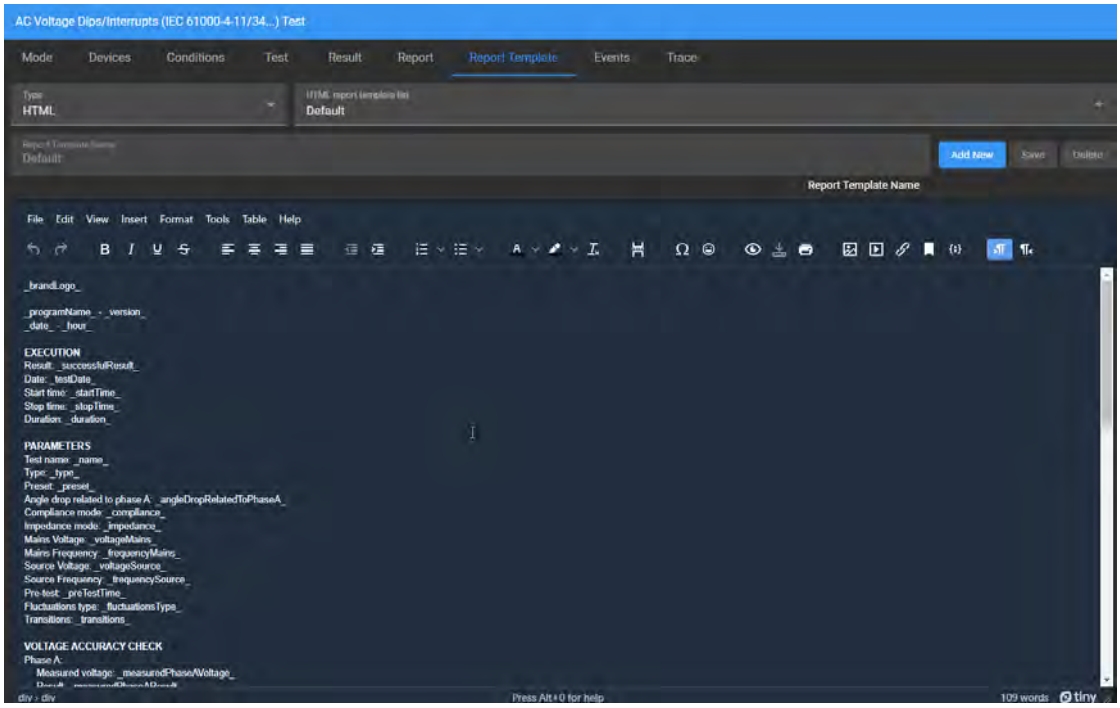
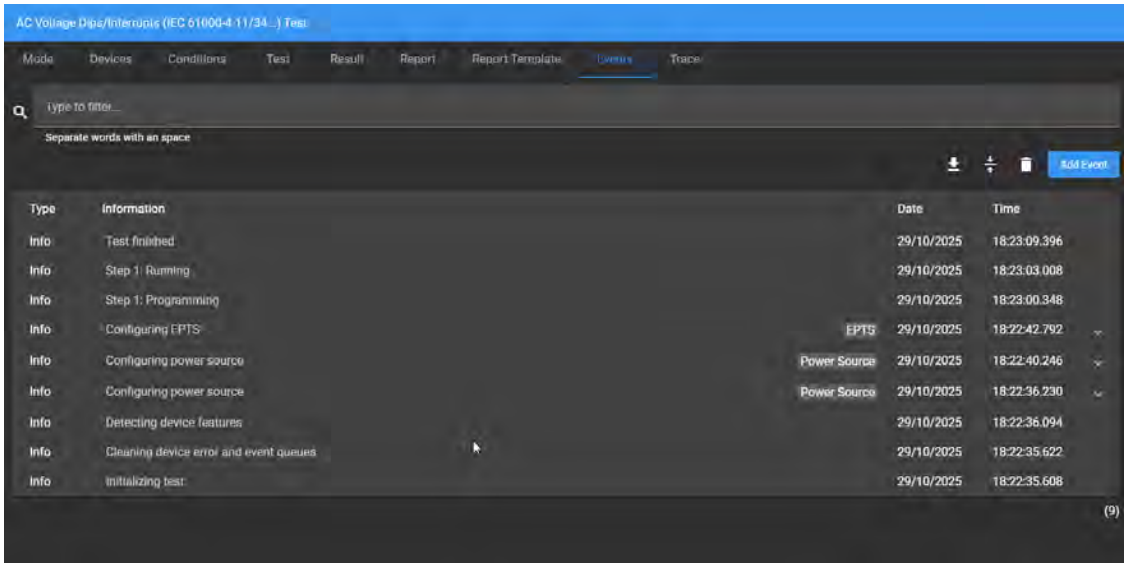
## Report Template

The report template tab may be used to edit the layout and location of fields in the final report. When making changes, it is recommended to make a backup of the original report template first.




## Events Log

The event log provides a history of significant events that occurred during test execution. It is for informational purposes only but may be attached to the test report if deemed relevant.

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### Trace Info

The Trace screen contains a history of SCPI control commands sent to the AC power source and / or EPTS unit during the test run. If may be used for troubleshooting. Pacific Power source may request a copy of this trace to assist in any support issues as needed.

A small sample section of the csv format trace content export function is shown here for reference.

```
1,1761787355608,18:22:35.608 29/10/2025,1,"Initializing test","",2,AC
Voltage Dips/Interrupts (IEC 61000-4-11/34...),3,1759869944018,0,-
1,-,1,1

2,1761787355622,18:22:35.622 29/10/2025,1,"Cleaning device error and
event queues","",2,AC Voltage Dips/Interrupts (IEC 61000-4-
11/34...),3,1759869944018,0,-1,-,1,1

3,1761787355757,18:22:35.757 29/10/2025,3,"*CLS","",2,AC Voltage
Dips/Interrupts (IEC 61000-4-
11/34...),3,1759869944018,0,2,106378889,0,1

4,1761787355873,18:22:35.873 29/10/2025,3,"*CLS","",2,AC Voltage
Dips/Interrupts (IEC 61000-4-
11/34...),3,1759869944018,0,3,109362182,0,1

5,1761787355905,18:22:35.905 29/10/2025,3,"*CLS","",2,AC Voltage
Dips/Interrupts (IEC 61000-4-11/34...),3,1759869944018,2,1,20096,0,1

6,1761787356059,18:22:36.059 29/10/2025,3,"SYST:ERR? - 0,No
error","",2,AC Voltage Dips/Interrupts (IEC 61000-4-
11/34...),3,1759869944018,2,1,20096,0,1

7,1761787356094,18:22:36.094 29/10/2025,1,"Detecting device
features","",2,AC Voltage Dips/Interrupts (IEC 61000-4-
11/34...),3,1759869944018,0,-1,-,1,1
```

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## 6.9 Devices Tab

The Devices tab lists available test equipment resources found on the local area network or connected through USB to the controlling PC. In the example screen below, two power sources are available, a LMX Series AC only source and an AFX Series AC & DC power source. The serial number, LAN or USB connection info and status (online or offline) are displayed for each resource listed.

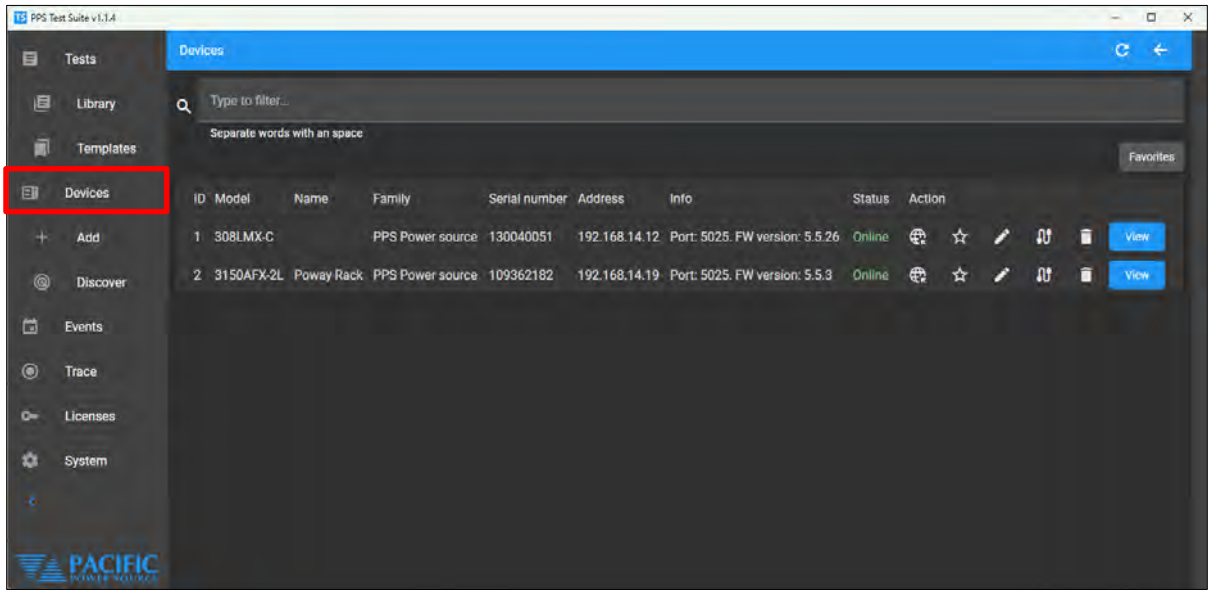


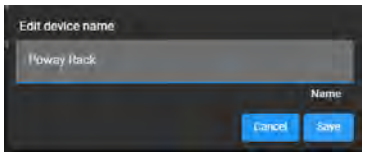

*Figure 6-2: Test Suite Device Tab Display*

Available user actions are shown to the right of each resource and are:

Open device home web page. This allows user control of the devices using it's intern web server. A browser window (default browser set in Windows 11) will open displaying the devices' home page. Other available web pages can be used from there to control the output or settings of the power source. The example below shows the AFX Series home page.

Mark as favorite.

Edit Device Name. This selection brings up a dialog box allowing the user to enter or edit a description for that specific device. Click Save after entering or editing the device name.

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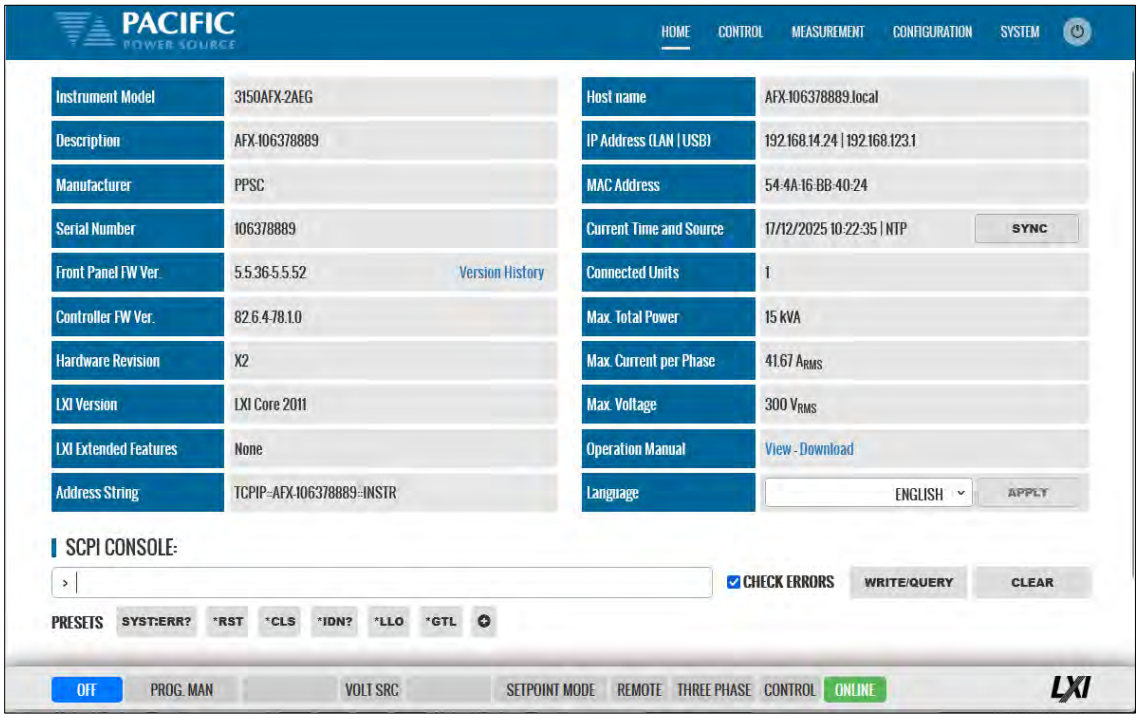
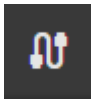
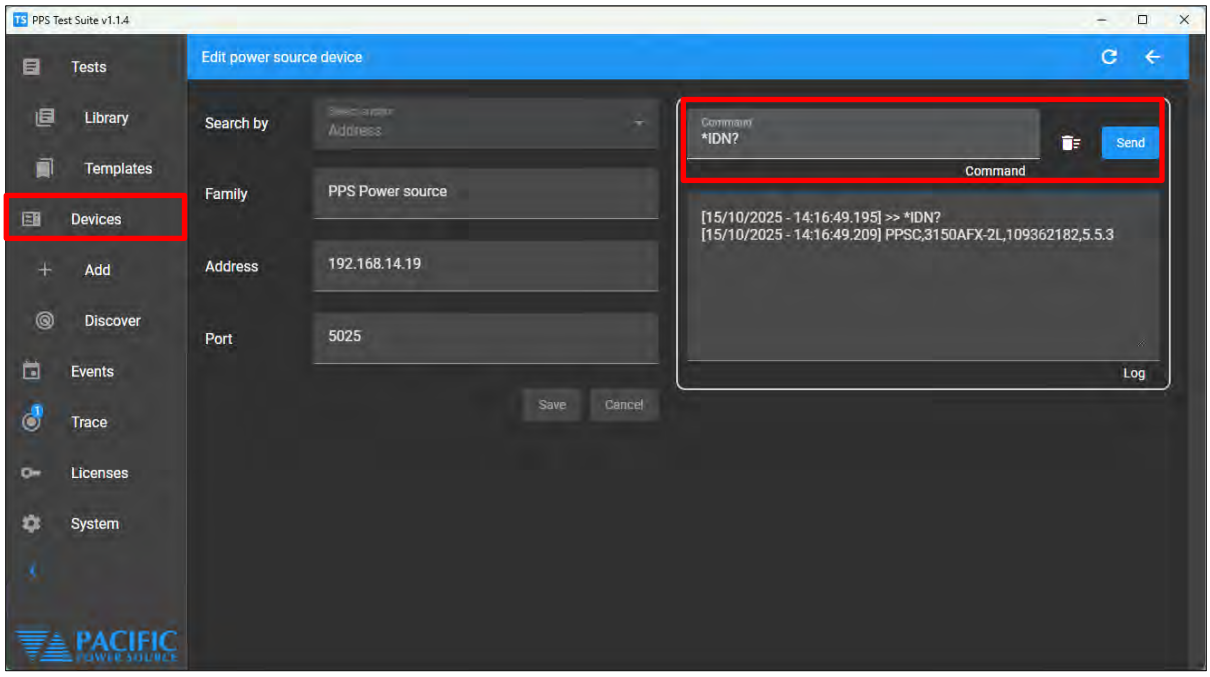



*Figure 6-3: AFX Series AC Source Web Page Home Screen*



Edit Device Connection. This selection will open a device window showing connection parameters as well as command line interface. Default command displayed is *IDN? Query but other SCPI commands may be entered by the user to interact with the instrument. See sample screen below.

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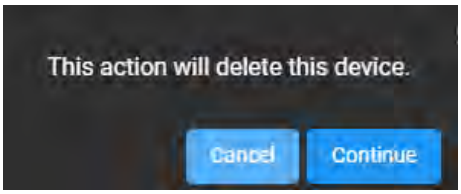
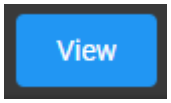
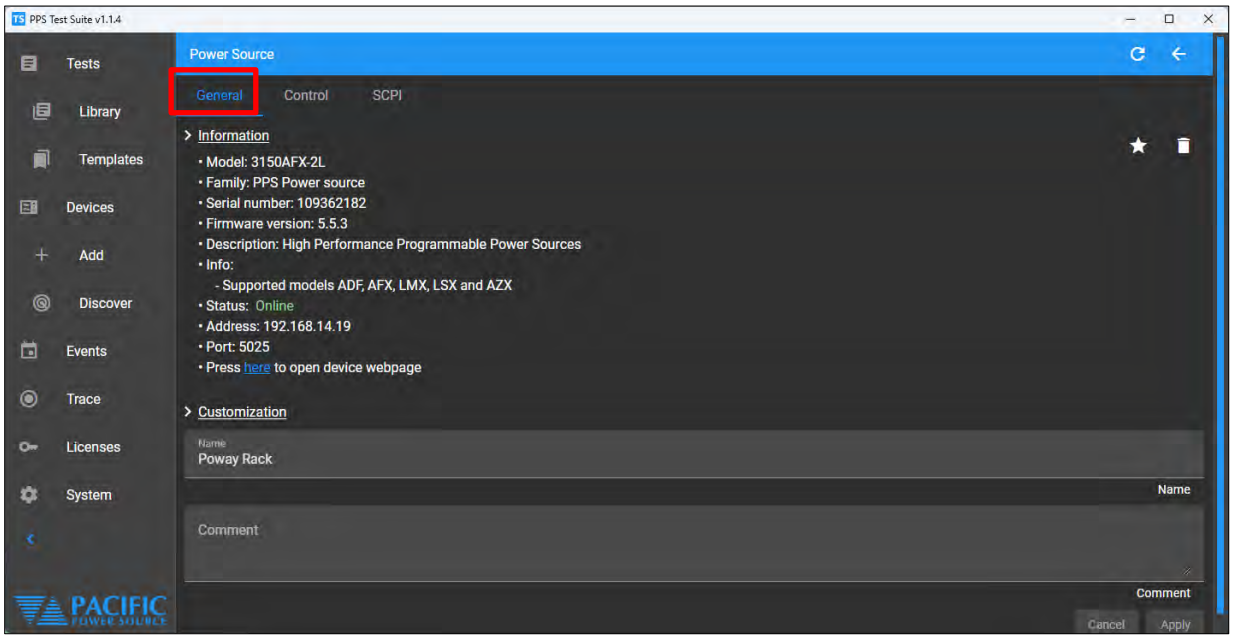
The trashcan icon will allow the user to delete the device from the Devices equipment list. Do not delete by mistake as you will have to re-establish connection to the device. This action may be appropriate if a connected device is not the be used for compliance testing for any reason. Before deletion, a warning dialog will appear to confirm deletion as shown on the right.




or These controls serve the same function depending on available screen width and will allow the user to interact with the power source. The following three display screens are available to view or interact with the device:

General – Provides basic information about the unit, its status and LAN connection.

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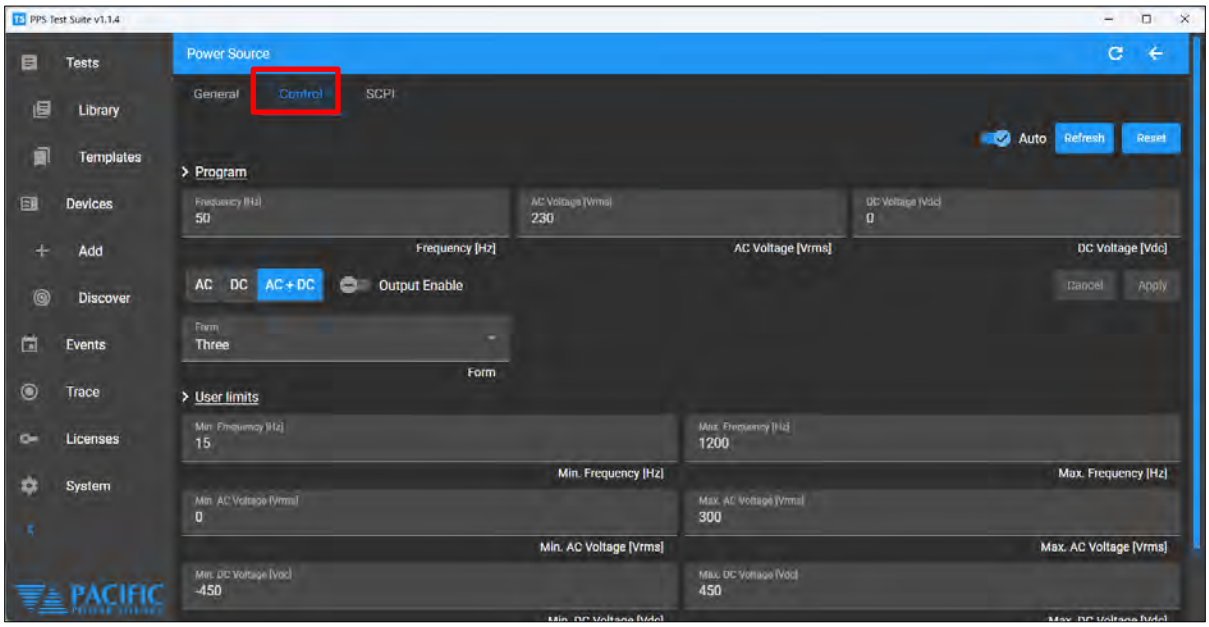
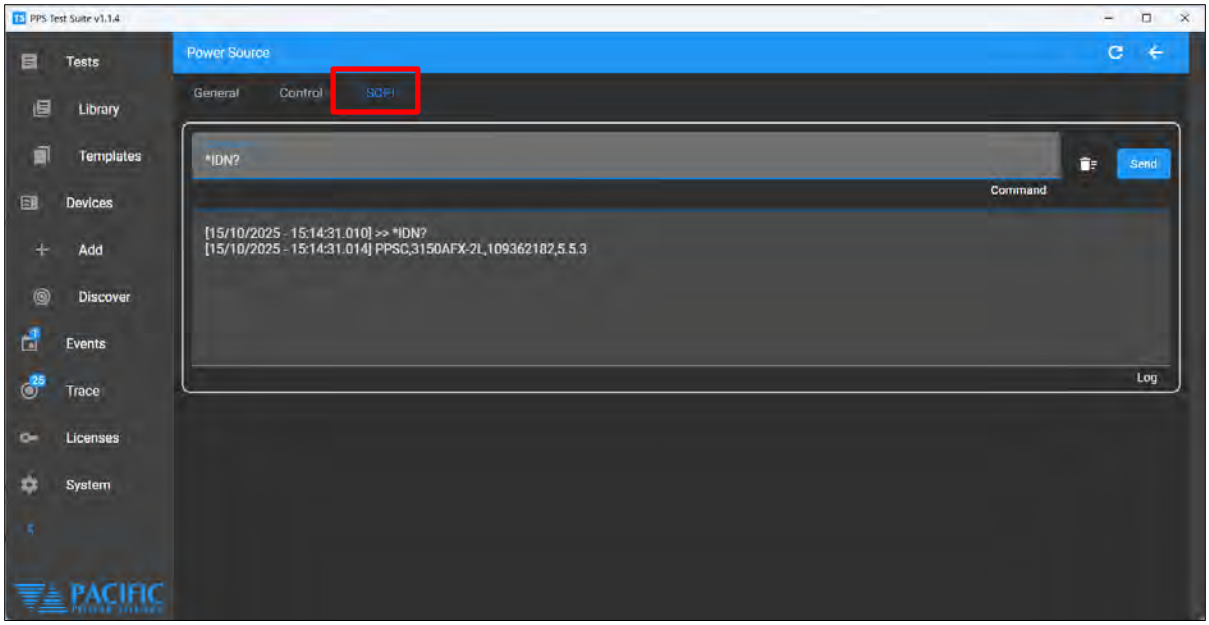
Control – Displays output settings in effect




SCPI - Command Line interface allowing the user to send commands and queries to the instrument.

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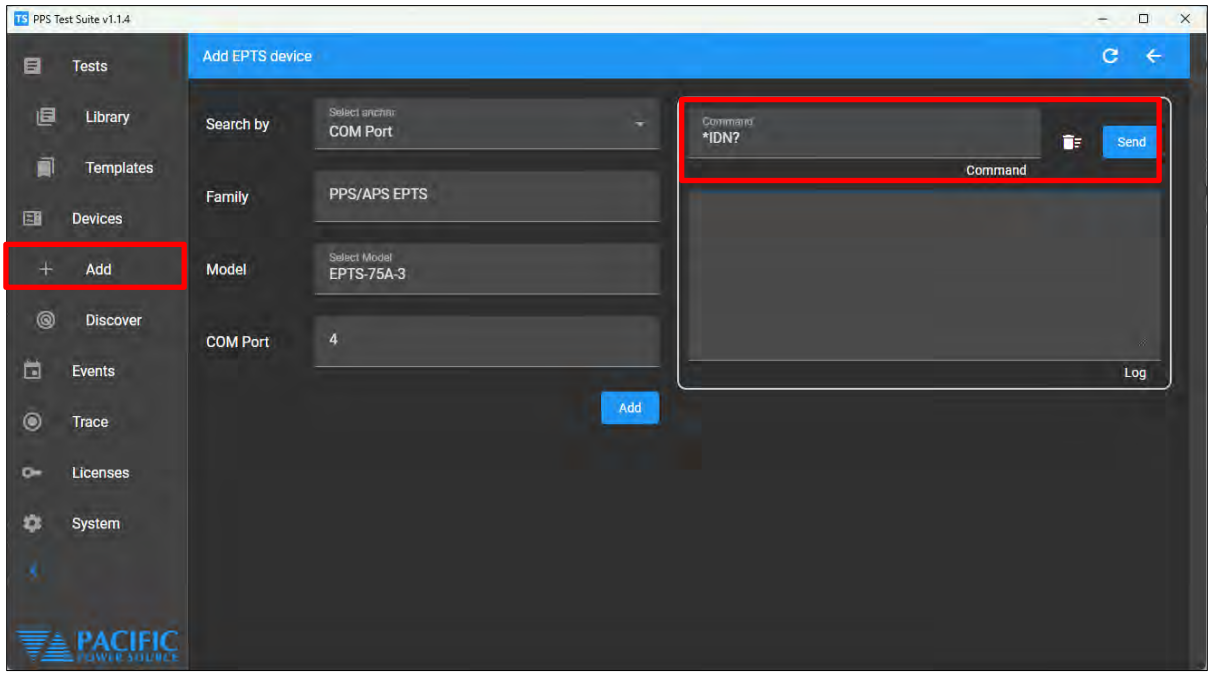
### 6.9.1 Adding New Devices

New devices may be added to the available test setup at any time. To do so, select the "+ Add" entry on the left under Devices. This opens a list of supported test equipment types models that may be added if the hardware is available and connected to an appropriate interface port.




To connect a device, either the PC COM port it is connected to or the Serial number of the unit must be entered in the screen above. Com port numbers can range from 1 through a higher number. The serial number is normally available on the instrument's model tag.

The command line in the upper right hand corner of this screen may be used to verify connection and make sure it is the right unit if more than one the same type instrument is connected to this PC or network.

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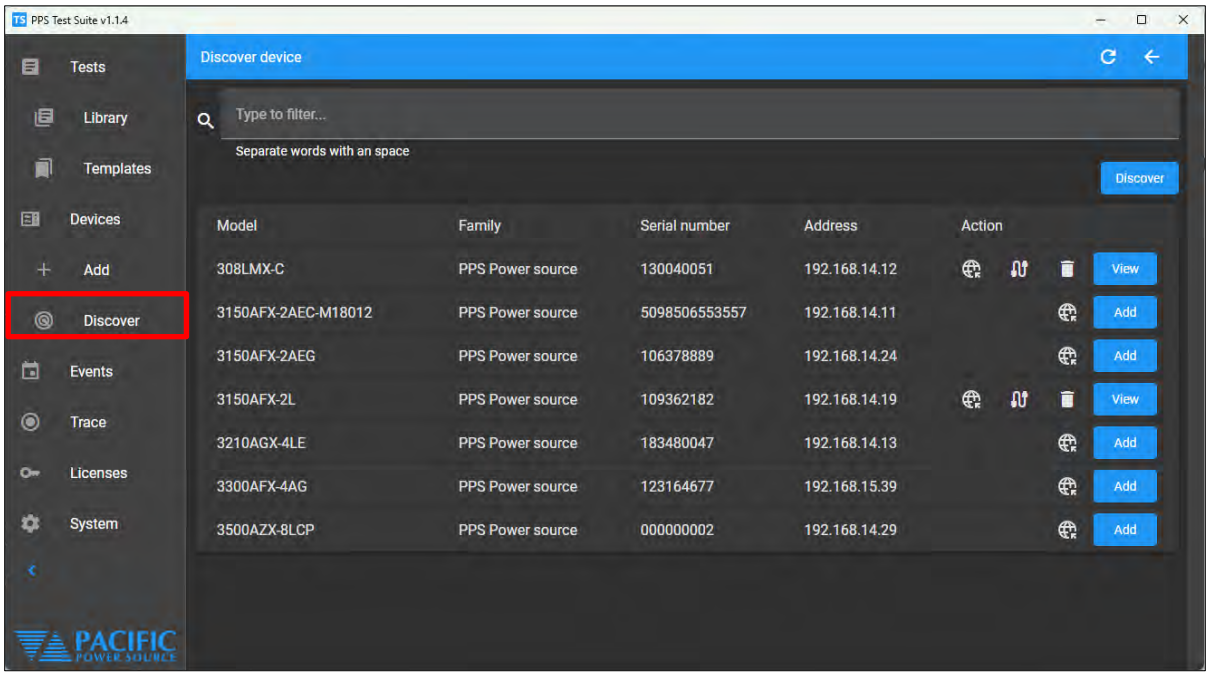
### 6.9.2 Discovering New Devices

Use the Discovery function to look for new devices. This screen will display all devices either connected via USB (showing the COM port) or discovered on the local area network (LAN) and their IP address.




In this example, multiple AC sources are connected on the network, two of which have been selected previously and are available for use.

AC sources that are no longer intended to be used for IEC testing can be removed using the trash can on this screen or on the Devices screen described earlier in section 6.3.

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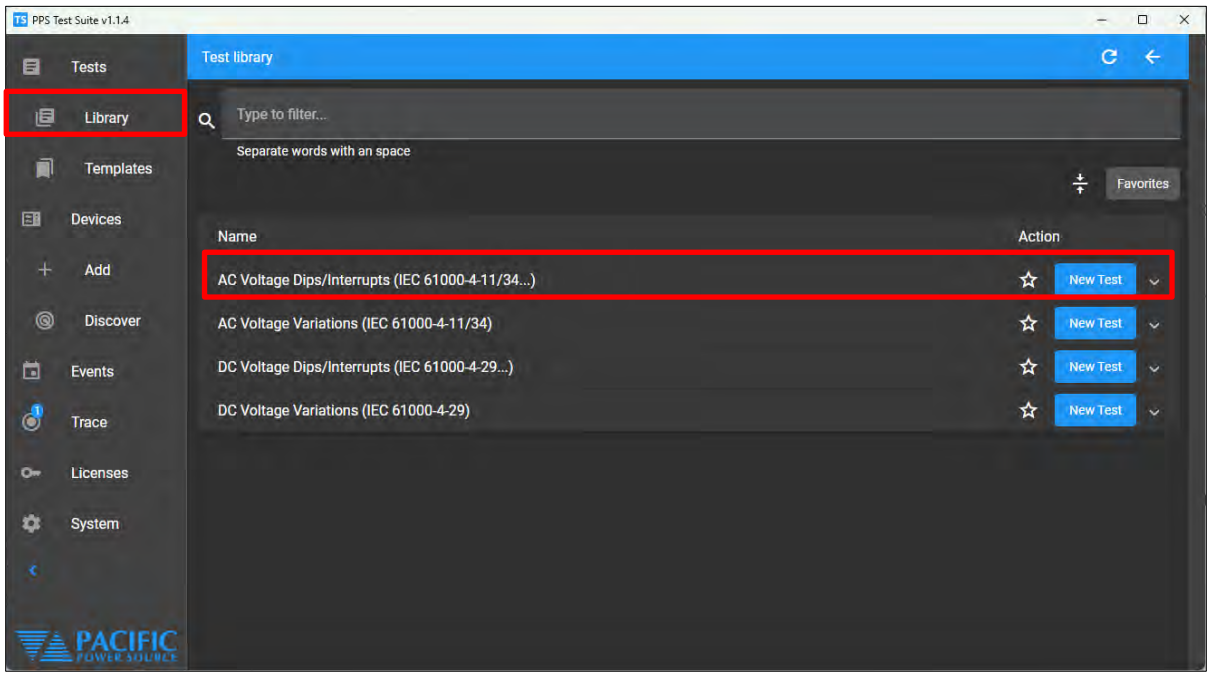
## 6.10 Running a Test

### 6.10.1 Creating a New Test

To start a new test, select the relevant IEC standard from the Library Tab.




To see more details on the type of test covered by the selected IEC Standard, click on the down arrow to the right of the “New Test” button. This will display more details regarding this test. See example screen below. You can also mark this IEC test as a favorite by clicking on the star to the left of the “New Test” button.

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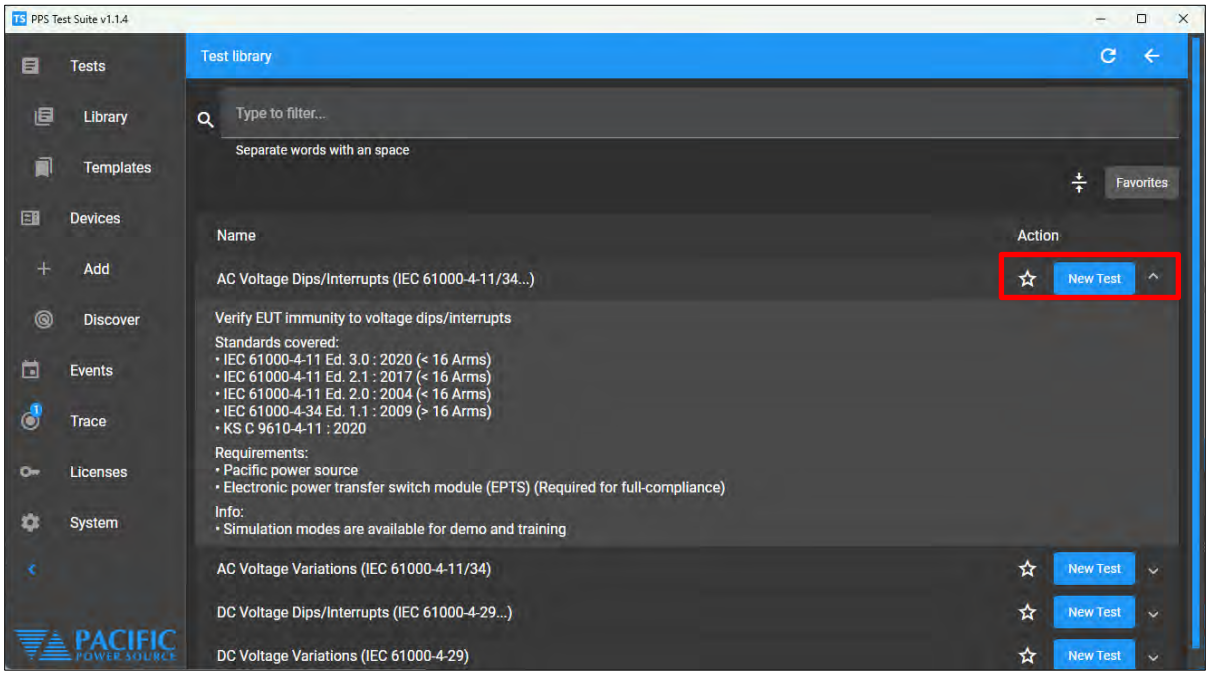
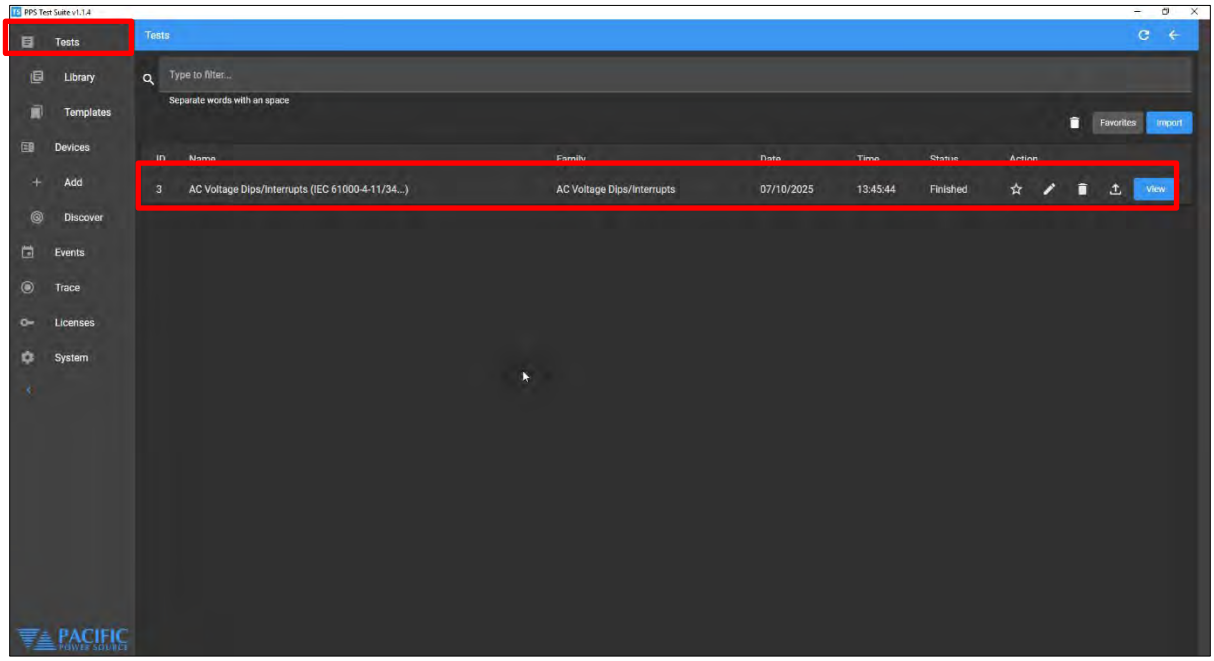



## 6.10.2 Selecting a Previously Run Test

Instead of creating a new test, it is also possible to run a test that was created and executed previously. These tests will be listed in the Tests Tab selected from the upper left hand corner of the left menu column. See figure below. The controls on the right allow selecting this as a favorite, edit the assigned test name, deleting it, exporting it to a test file or Viewing the test.

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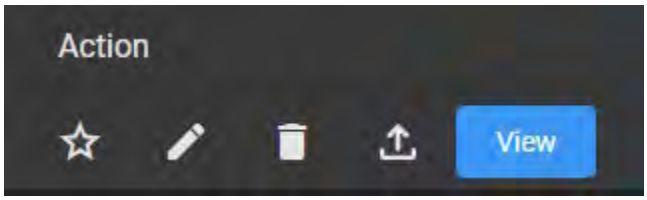
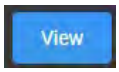


Mark test to Favorite (fills in symbol when set).

Edit previously assigned test name (Default name is IEC test standard name).

Delete this saved test.

Download this test to a file with extension ".tst". These are binary files that can be loaded in Test Suite.




View and re-run test.

To rerun this existing test, select "View". To create a new test, select an IEC test standard from the Test -> Library instead. Newly selected tests must be configured. Opening a previously configured test allows editing and/or execution.

### 6.10.3 Test Execution Screen Tabs 1 through 9

The test execution user interface consists of nine screens which are generally created and used in sequence. The nine screens are:

| Screen # | Description | Content |
|---|---|---|
| **1** | Test Mode | Visual Representation of the selected mode and/or connections |
| **2** | Devices | Configuration of the test equipment devices used for this test. Typically consist of AC or DC source and EPTS unit |
| **3** | Conditions | Test conditions used for the test. Includes nominal voltage and frequency or DC, Test standard preset, Table of Levels, Phase angles, phase selections, Rise/Fall times, repetitions, delays etc. Graphical representation of test sequence. |
| **4** | Test Settings | Includes nominal voltage and frequency or DC, Test standard preset, Table of Levels, Phase angles, phase selections, Rise/Fall times, repetitions, delays etc. Graphical representation of test sequence. |
| **5** | Results | Test Result and selected pass/fail criteria (A, B, C or D) |
| **6** | Report | View of the test report |
| **7** | Report Template | View of the test template used for the report |
| **8** | Events | Test Events Log with date and time stamps |
| **9** | Trace | Log of SCPI commands issued to test equipment during test run with date and time stamps |

These nine screens that make up the information regarding a test run are shown in order for reference on the next pages.

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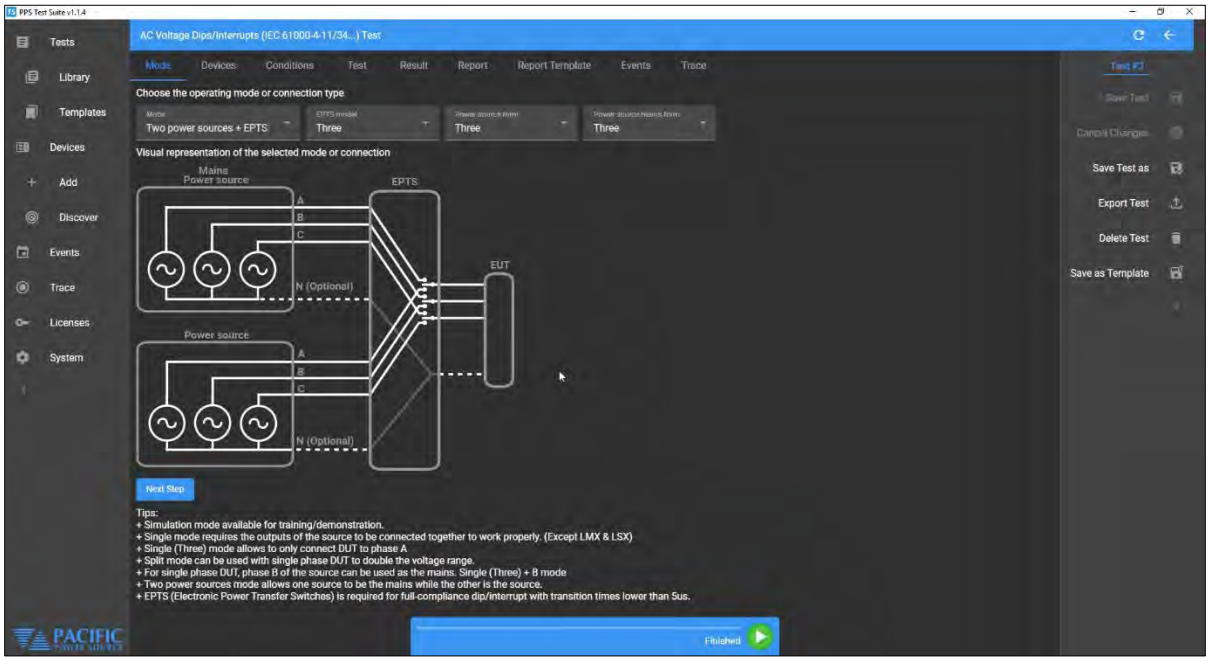


*Figure 6-4: Test Run Screen 1 of 9 - Mode*

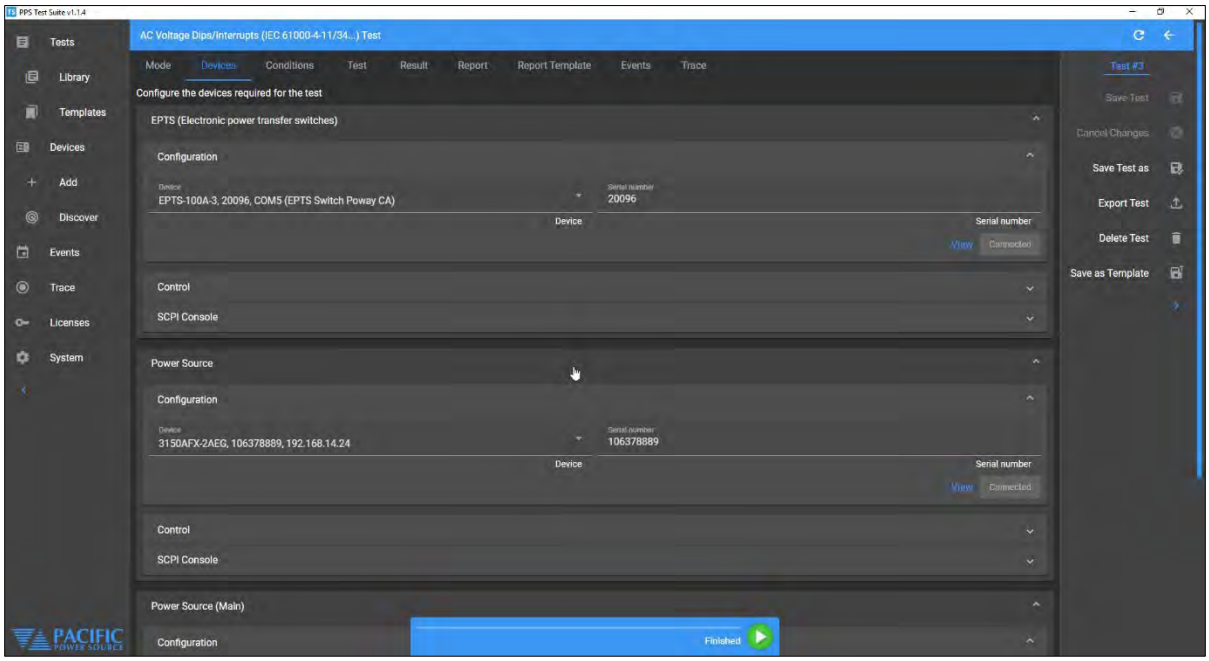


*Figure 6-5: Test Run Screen 2 of 9 - Devices*

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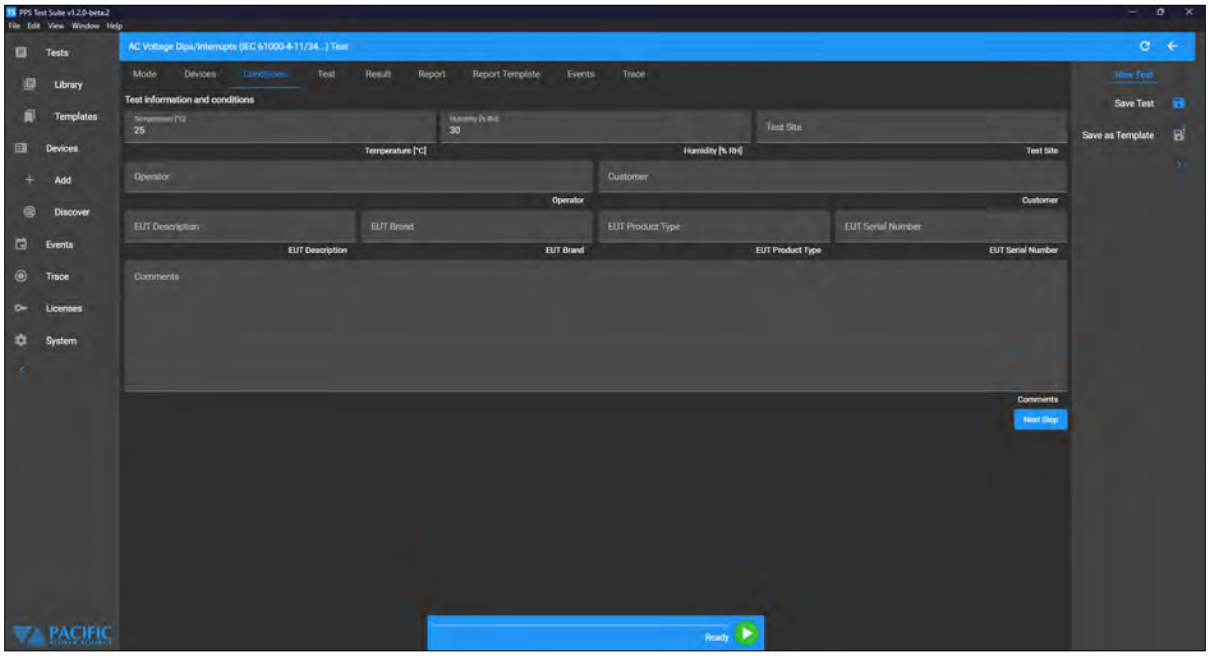


*Figure 6-6: Test Run Screen 3 of 9 - Conditions*

This tab allows entry of user and EUT information that will carry over to any test reports generated. This information includes:

- Ambient temperature (user provided thermometer required)
- Relative Humidity (user provided humidity measurement device required)
- Operator Name
- EUT description and/or serial number
- Test Site or Test Lab Name
- Any comments the operator wants to add before, during or after a test run

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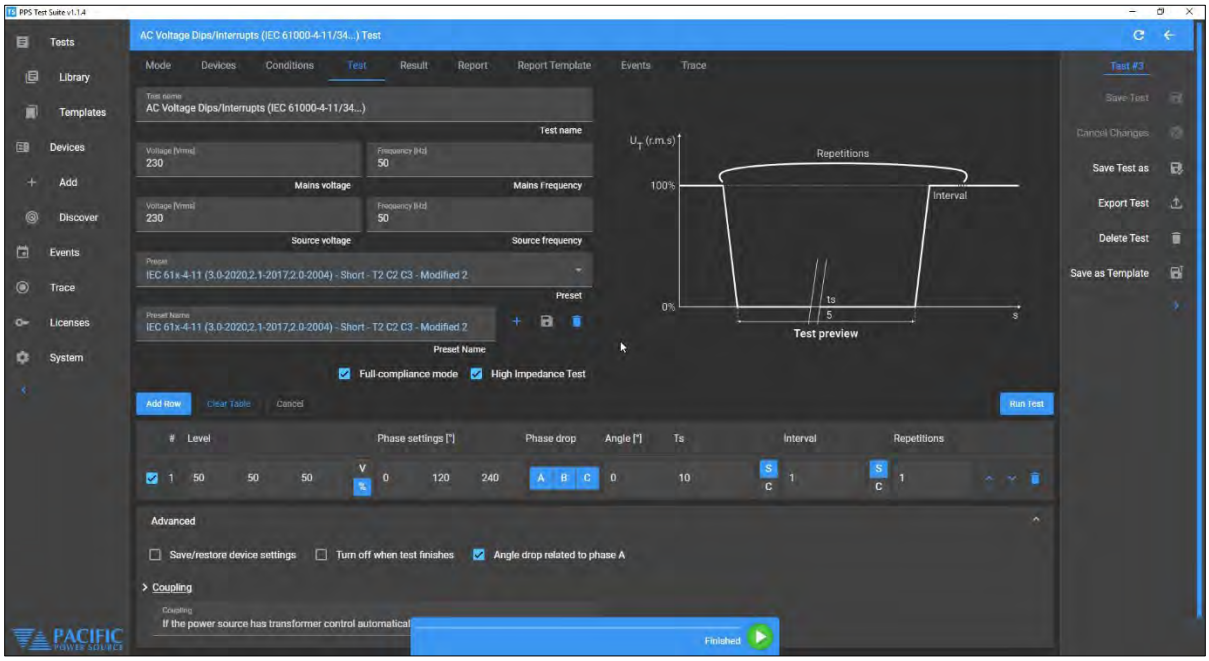


*Figure 6-7: Test Run Screen 4 of 9 - Test Settings*

| Settings | Description |
|---|---|
| Nominal Settings | Voltages (and frequencies for AC tests) can be configured for both the power source and the power source mains. |
| Preset Selection and Customization | The user can select a test standard preset or create a custom one by adding or removing rows in the levels table or modifying its fields. |
| Compliance Mode | Two compliance modes are available:<br>• Pre Compliance mode: The EPTS is configured in bypass mode, and a transient is generated in the power source. Switching duration can range from 50 to 150 µs, depending on the power source model.<br>• Full Compliance mode: Switching between power source and mains (or a second power source acting as mains) occurs in less than 5 µs using the EPTS hardware. |
| Impedance Mode | Impedance control is available only when full compliance mode is checked. Two impedance modes are available:<br>• Low Impedance mode: During a voltage dip, the EPTS hardware switches from mains to source.<br>• * High Impedance mode: During a voltage dip, the EPTS hardware switches from mains to high impedance. |

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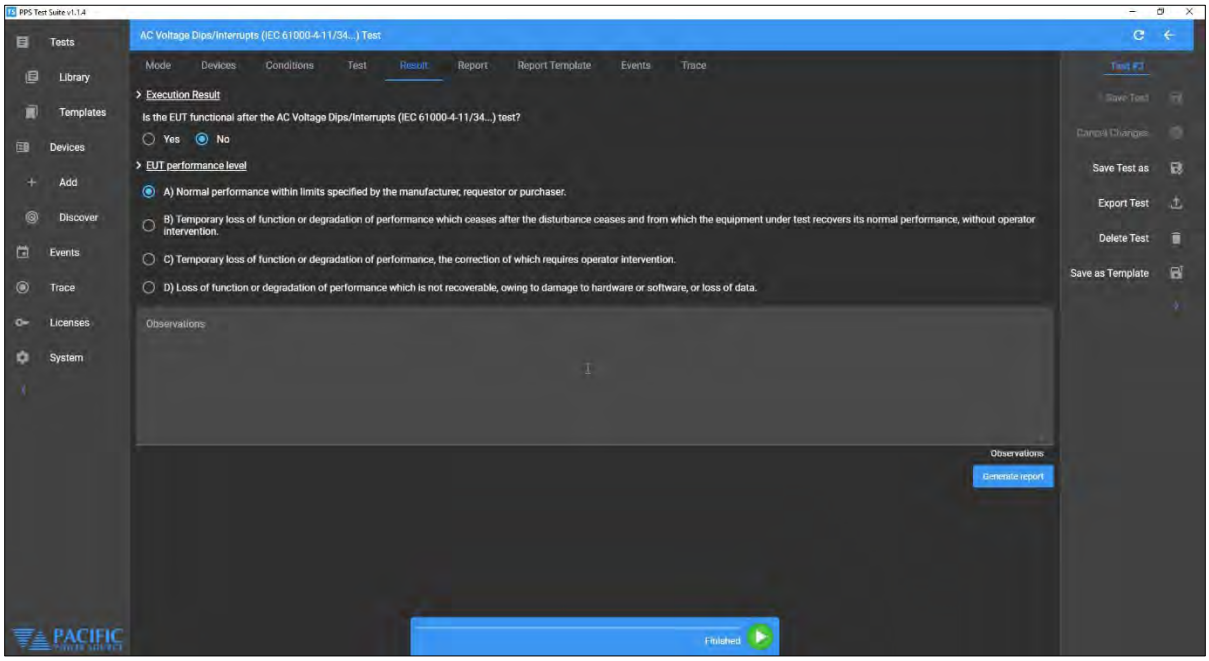


*Figure 6-8: Test Run Screen 5 of 9 - Test Result*

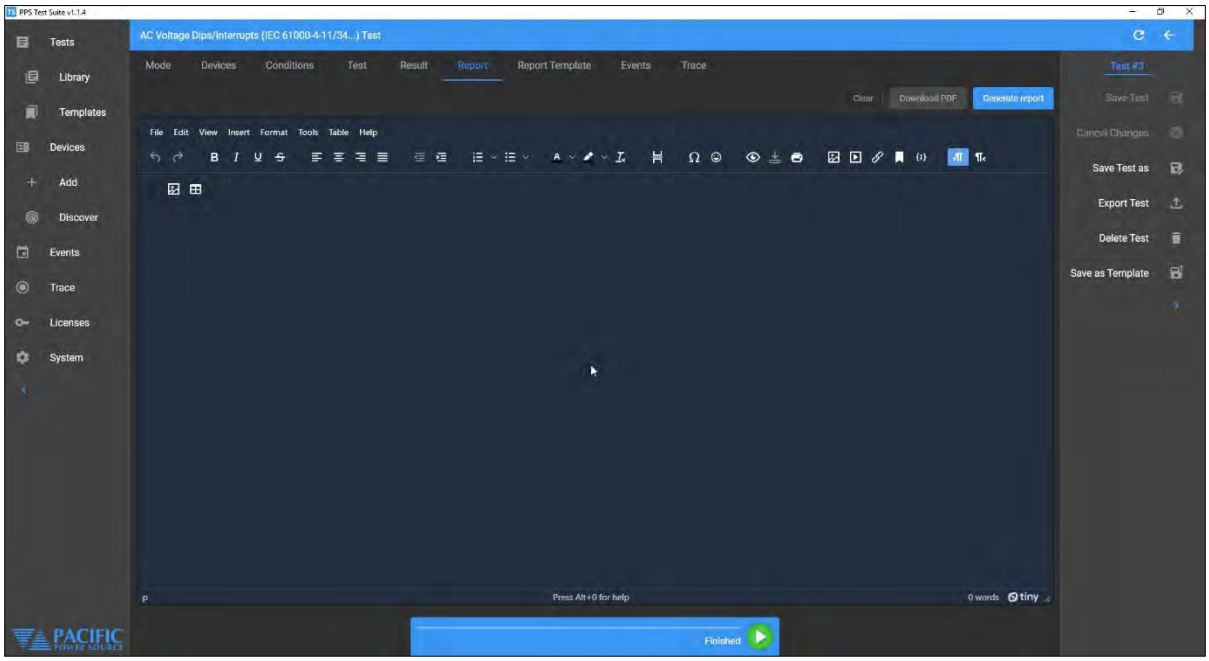


*Figure 6-9: Test Run Screen 6 of 9 - Test Report*

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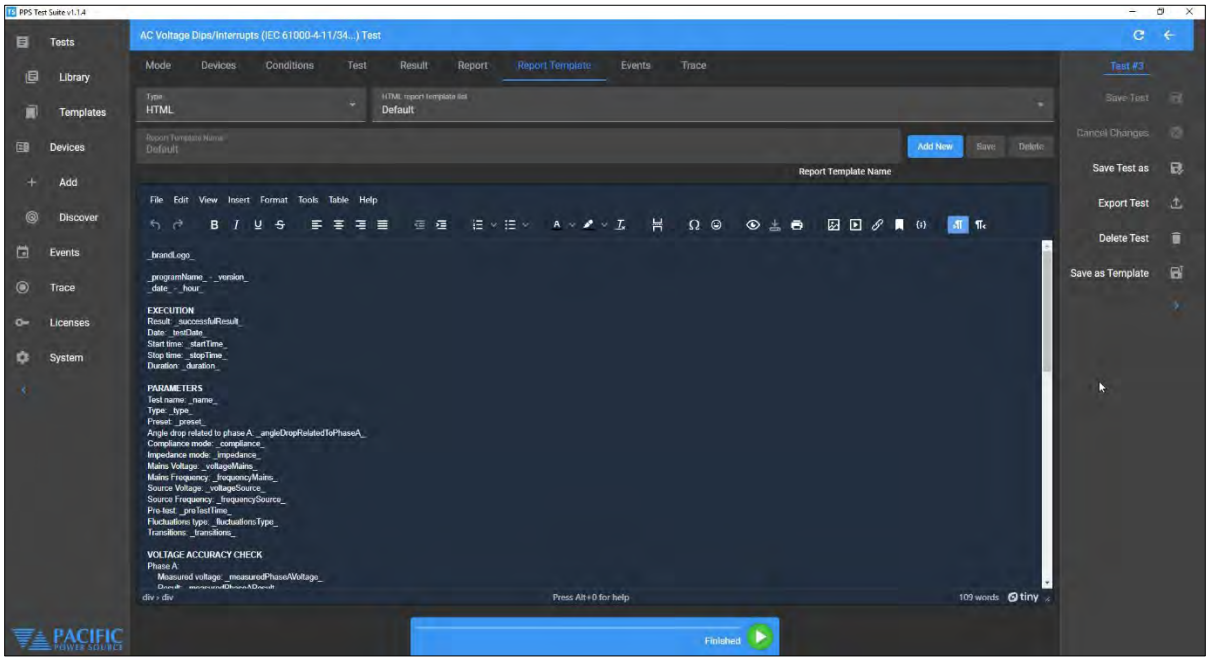


*Figure 6-10: Test Run Screen 7 of 9 - Test Report Template*

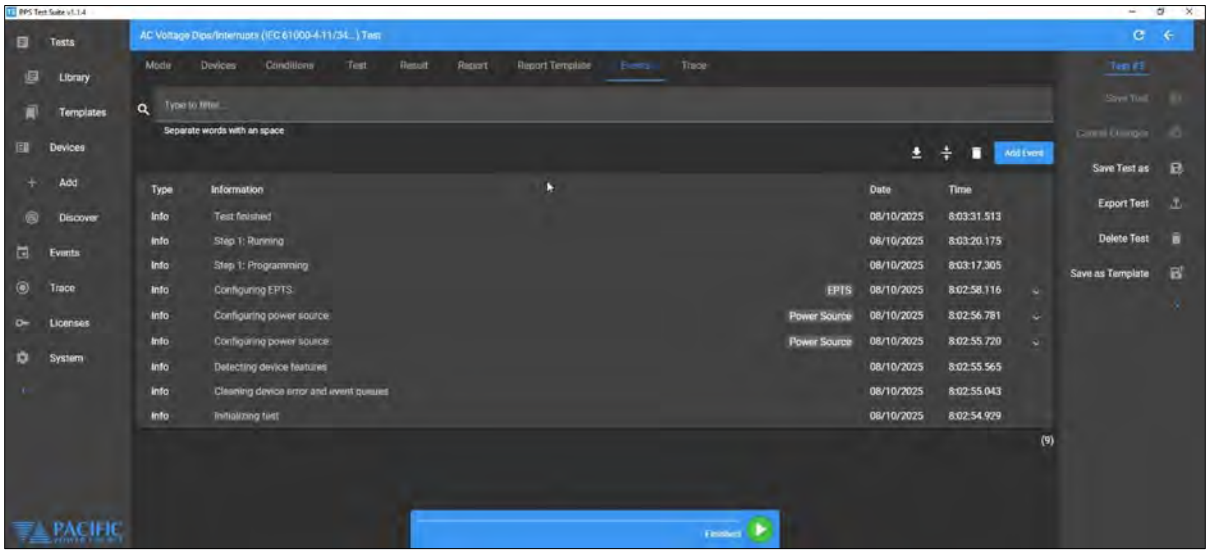


*Figure 6-11: Test Run Screen 8 of 9 – Event Log*

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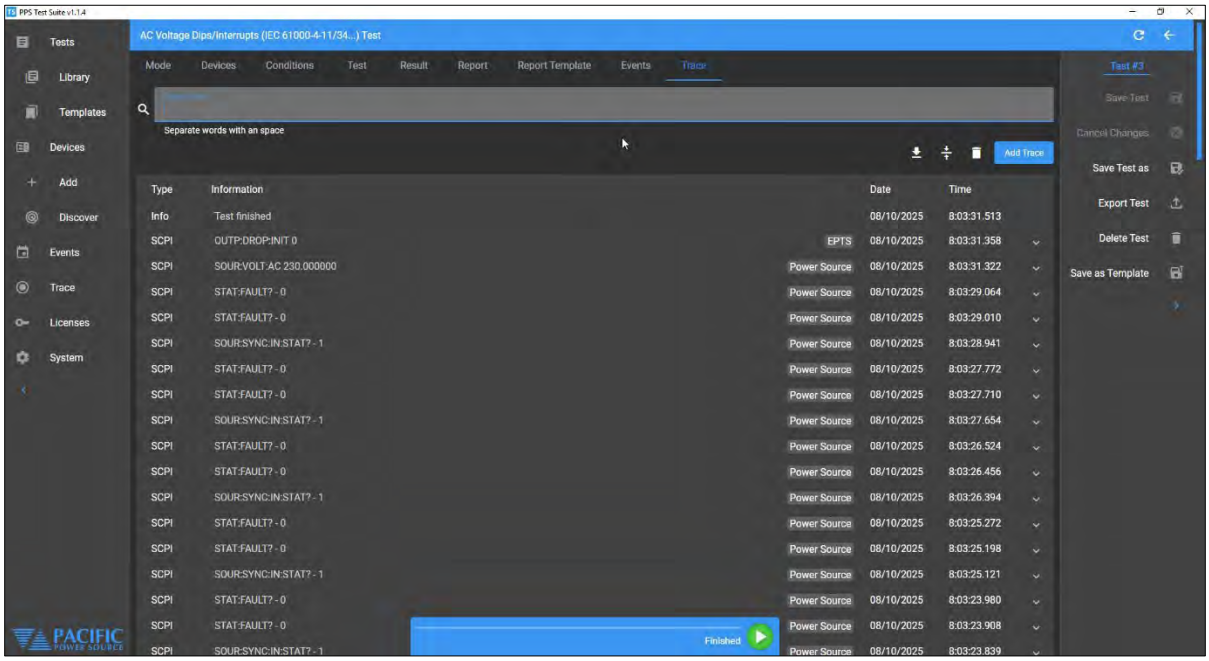


*Figure 6-12: Test Run Screen 9 of 9 – SCPI Commands Trace*

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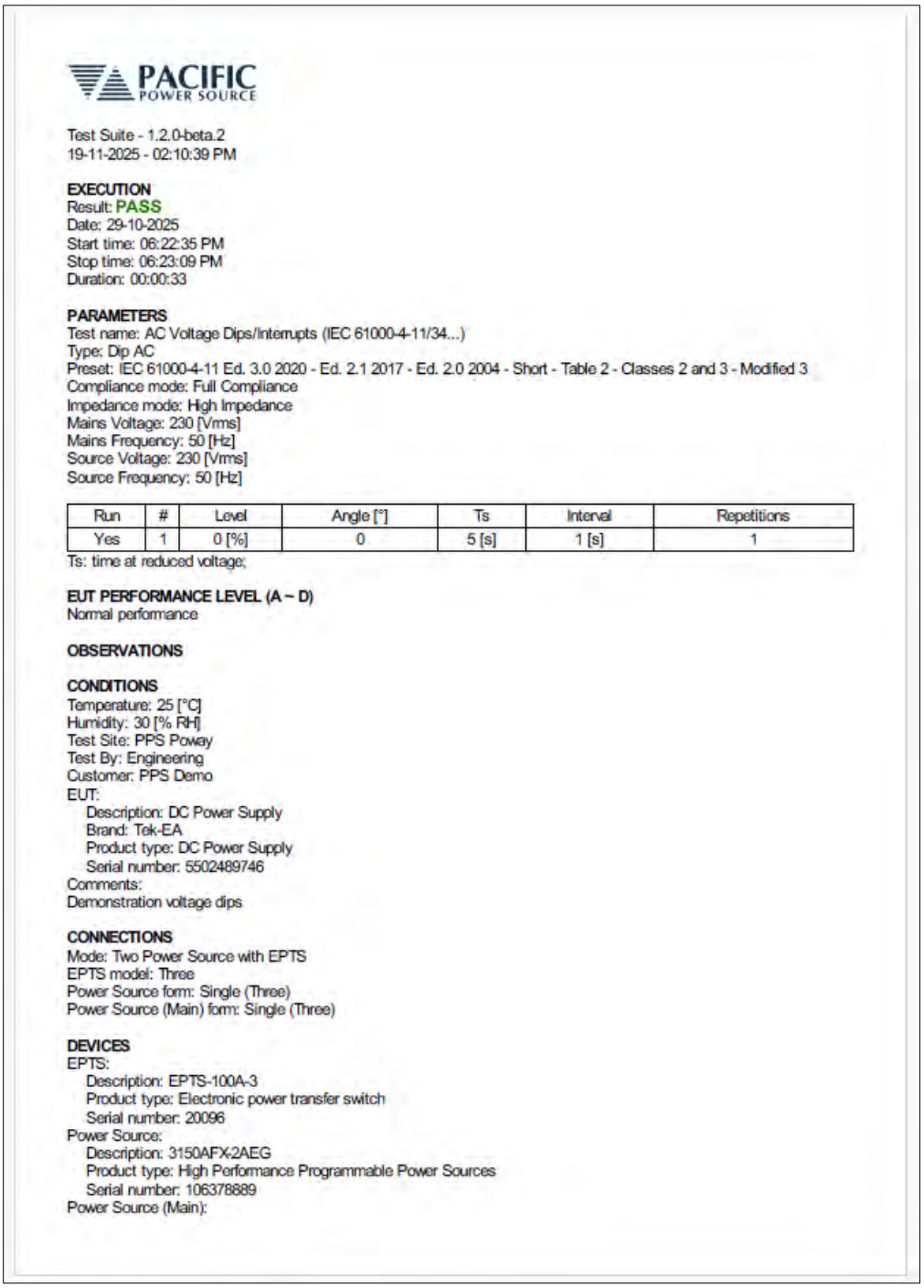
### 6.10.4 Test Reports

Test reports are generated by the Test Suite software in PDF and DOCX Formats to support documenting EUT compliance. This PDF report format can be downloaded and archived as needed. Reports can be generated **after** completion of a test.



PACIFIC POWER SOURCE

Test Suite - 1.2.0-beta.2
19-11-2025 - 02:10:39 PM

**EXECUTION**
Result: **PASS**
Date: 29-10-2025
Start time: 06:22:35 PM
Stop time: 06:23:09 PM
Duration: 00:00:33

**PARAMETERS**
Test name: AC Voltage Dips/Interrupts (IEC 61000-4-11/34...)
Type: Dip AC
Preset: IEC 61000-4-11 Ed. 3.0 2020 - Ed. 2.1 2017 - Ed. 2.0 2004 - Short - Table 2 - Classes 2 and 3 - Modified 3
Compliance mode: Full Compliance
Impedance mode: High Impedance
Mains Voltage: 230 [Vrms]
Mains Frequency: 50 [Hz]
Source Voltage: 230 [Vrms]
Source Frequency: 50 [Hz]

| Run | # | Level | Angle [°] | Ts | Interval | Repetitions |
|---|---|---|---|---|---|---|
| Yes | 1 | 0 [%] | 0 | 5 [s] | 1 [s] | 1 |

Ts: time at reduced voltage;

**EUT PERFORMANCE LEVEL (A ~ D)**
Normal performance

**OBSERVATIONS**

**CONDITIONS**
Temperature: 25 [°C]
Humidity: 30 [% RH]
Test Site: PPS Poway
Test By: Engineering
Customer: PPS Demo
EUT:
Description: DC Power Supply
Brand: Tek-EA
Product type: DC Power Supply
Serial number: 5502489746
Comments:
Demonstration voltage dips

**CONNECTIONS**
Mode: Two Power Source with EPTS
EPTS model: Three
Power Source form: Single (Three)
Power Source (Main) form: Single (Three)

**DEVICES**
EPTS:
Description: EPTS-100A-3
Product type: Electronic power transfer switch
Serial number: 20096
Power Source:
Description: 3150AFX-2AEG
Product type: High Performance Programmable Power Sources
Serial number: 106378889
Power Source (Main):

*Figure 6-13: Sample IEC 61000-4-11 Voltage Dips PDF Report*

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### 6.10.5 Additional Test Sequence Settings

The bottom of the Test screen offers additional advanced setting controls that can be displayed by clicking on the **down arrow** in the lower right corner.

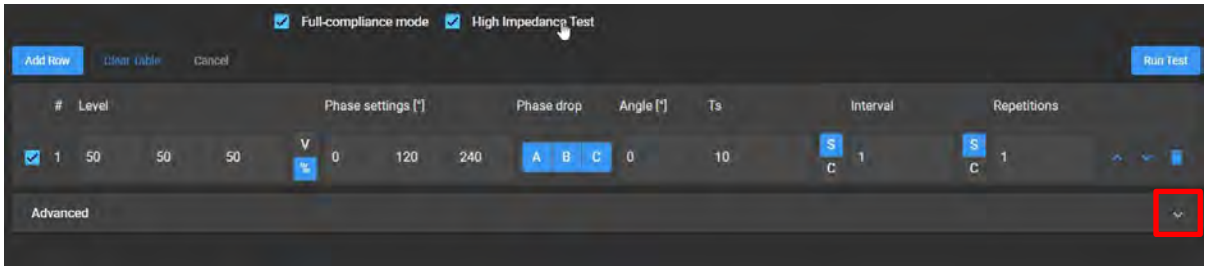
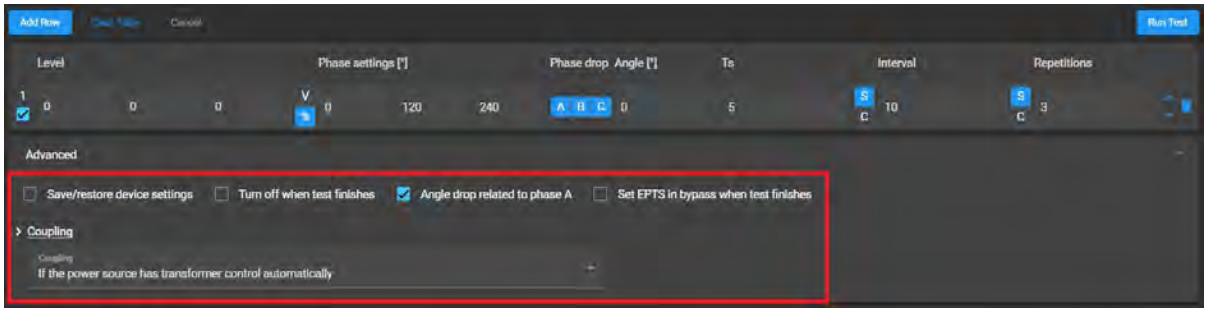



*Figure 6-14: Additional Controls Display*

This provides access to the following Advanced features and settings:




| | |
|---|---|
| Save/restore device settings | Save settings that are in effect. |
| Turn off when test finishes | When selected, the AC source or DC supply output will be disable by the test software. In One Power Source + EPTS or Two Power Source + EPTS modes, the EPTS will be set to bypass mode. |
| Angle drop related to phase A | When enabled, the Phase B/C angle drop is referenced to the zero crossing of Phase A.<br>When disabled, the Phase B/C angle drop is referenced to their respective zero crossings. |
| Transformer coupling | Determines if Transformer coupled mode of the AC source – if configured – is selected automatically or set to on. Auto means transformer coupling will be selected if required to support the nominal test voltage set value. See image below for dropdown selections. This only applies to AC source models with a “T” option. |
| Set EPTS in bypass when test finishes | Available only in full compliance mode with EPTS present, the EPTS is automatically set to bypass mode at the end of a test without turning off the power sources. |

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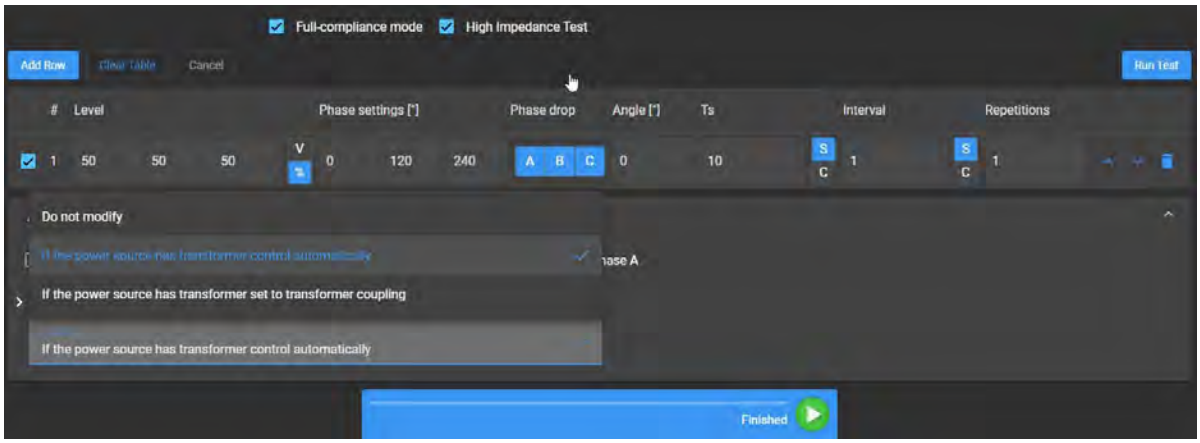


*Figure 6-15: AC Source Transformer mode selection*

## 6.10.6 Editing a Test Sequence

Although the Test Suite software offers pre-written test sequences for standard Voltage Dips, Interruptions and Variations, the user can also create his own sequences or edit an existing test sequence from within the Test Suite application.

To do so, proceed to the Test tab and look for the blue “Add Row” button in the lower left corner of the screen.

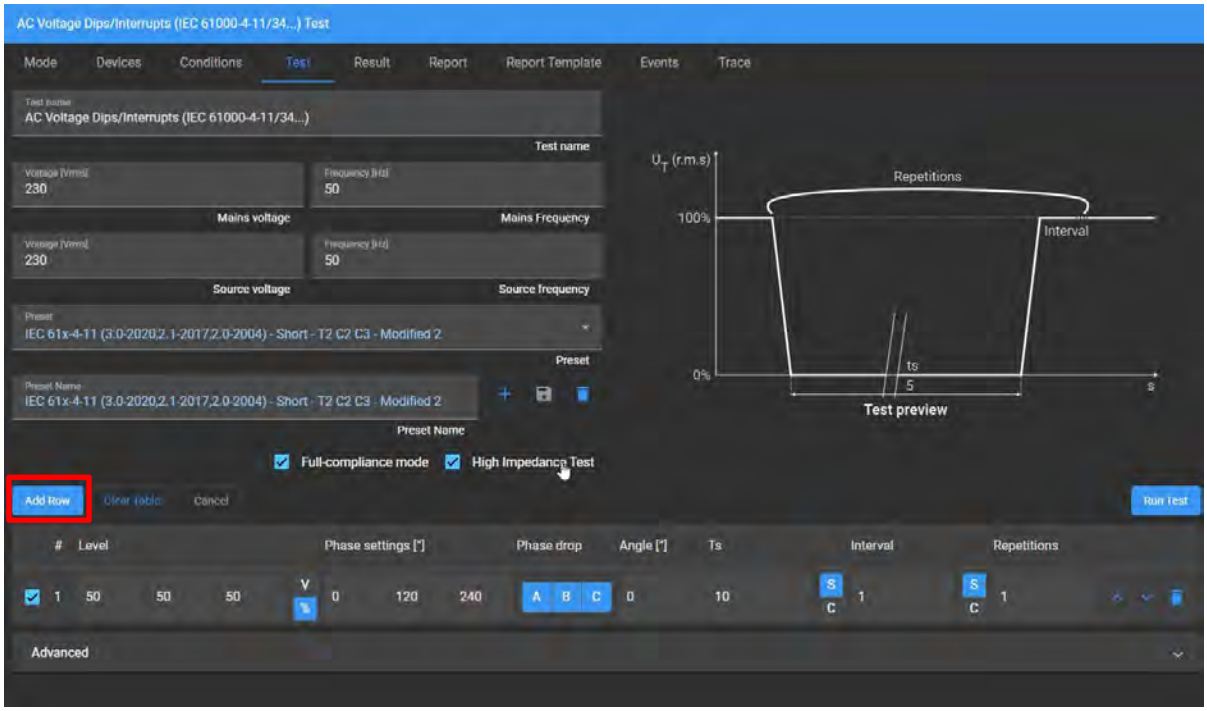


*Figure 6-16: Adding custom test steps*

Clicking the Add Row button will insert a new row at the end of the sequence table. The screen below shows a couple of new entries added. These can be edited as needed. They can also be re-ordered by using the Up/Down

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arrows next to each row which will move that row up or down in the sequence of rows. To delete a row, use the trashcan symbol on the right for any given row.

Once complete, use the controls in the upper right corner of the same screen to either save these changes under a new name, user same name to overwrite or discard. Available choices are:

| | |
|---|---|
| Save Test | Overwrites existing test sequence of same name |
| Cancel Changes | Aborts any changes made |
| Save Test As | Save test under a different name (recommended) |
| Export Test | Export to Test Suite proprietary .tst file format. Exported tests can be imported and use to transfer tests developed on one ECTS2 system to another system. |
| Delete Test | Delete selected test sequence |
| Save as Template | Use a template for future tests |

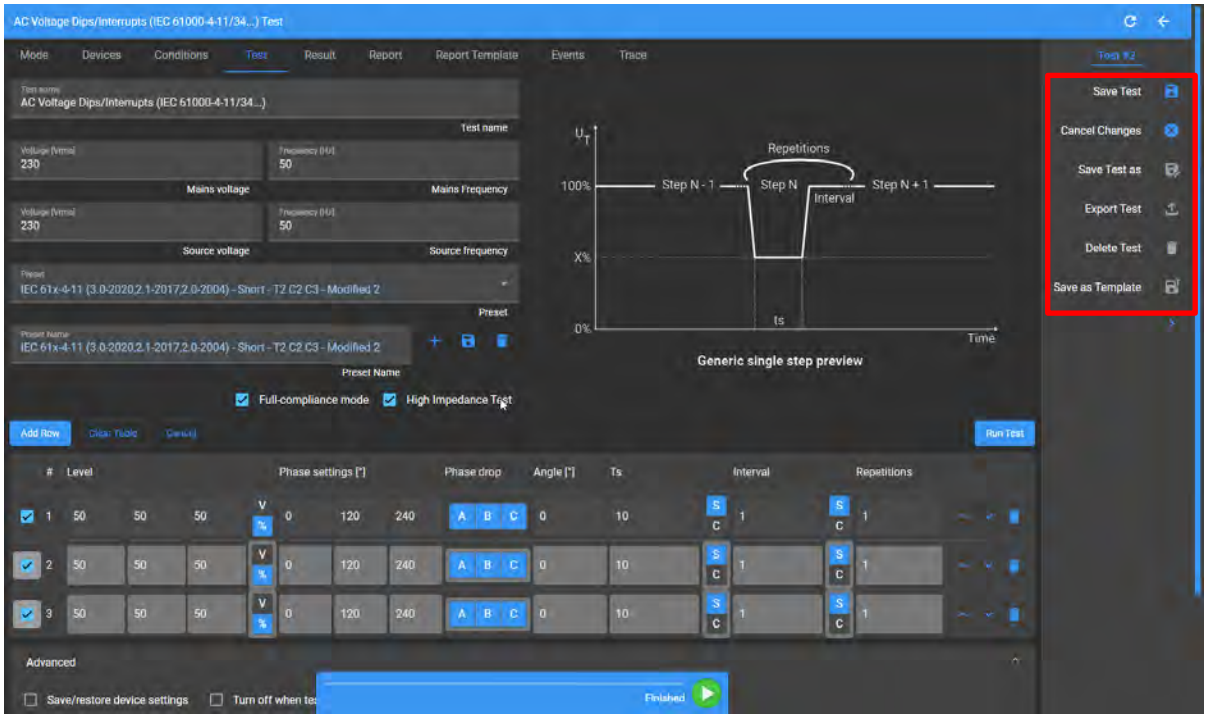


*Figure 6-17: Sequence in Edit mode with Controls on right*

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## 6.11 Events Tab

The event tab provides a history of significant events that occurred during test execution. It is for informational purposes only but may be attached to the test report if deemed relevant.

An example of the Events tab content after running a complete test sequence is shown below.

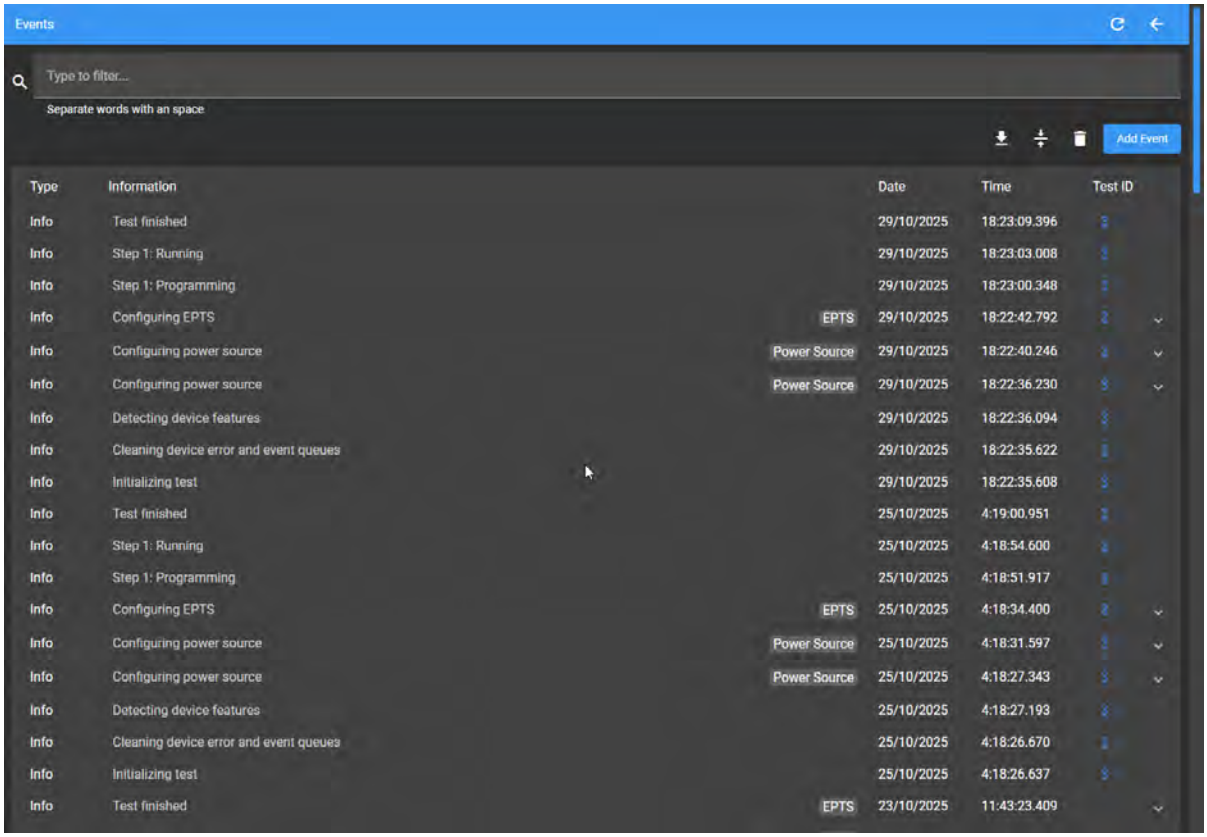


*Figure 6-18: Events Tab Example Content*

All entries by a type, relevant information field, Device source (i.e. EPTS switch or Power source related event) and a Date and Time stamp.

If needed, the operator can create a custom event entry to document a significant event or results that occurred during or after a test by clicking on the “Add Event” button in the upper right hand corner of the Events tab. See image below.

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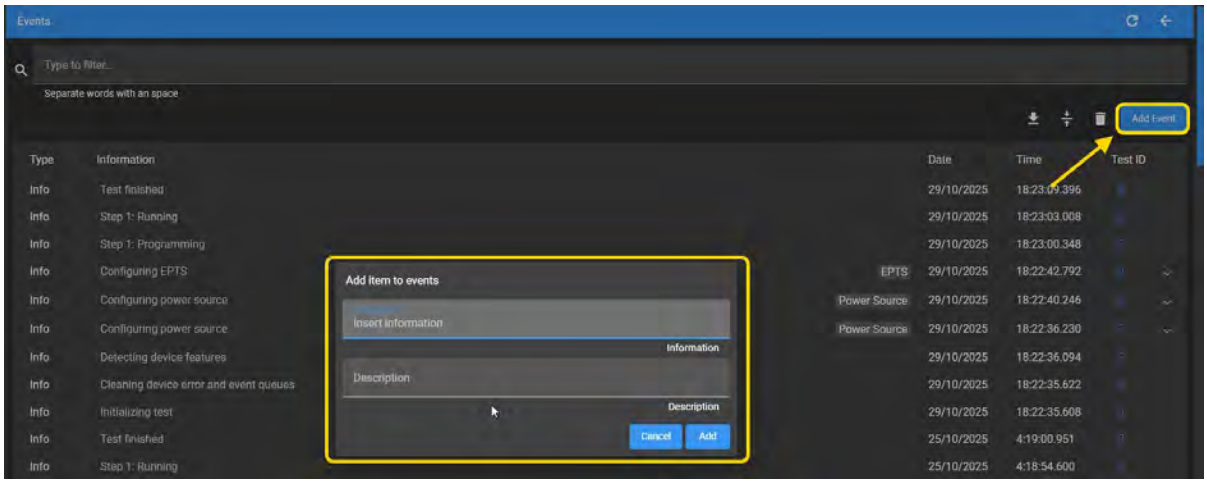
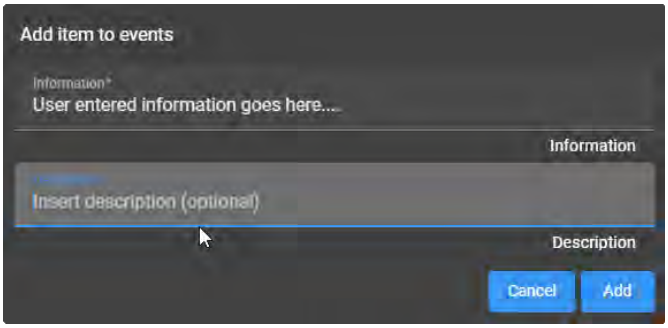



*Figure 6-19: User Created Event Data Entry Dialog*

Information and description can be entered in this dialog and saved to the Event log by clicking on the “Add” button.



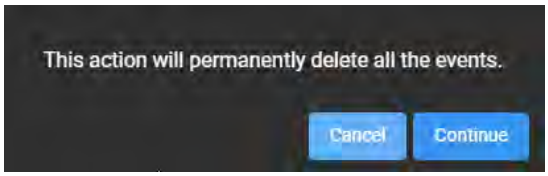

User created events are marked as “User” types in the Type column.

Other user controls located in the upper right hand corner of the Event tab are:

Download Event log to a comma delimited text files with extension “.cvs” for archiving.

Collapse all entries.

Delete All Events. A confirmation dialog will appear to confirm deleting. Once deleted, all log entries are erased and cannot be retrieved.

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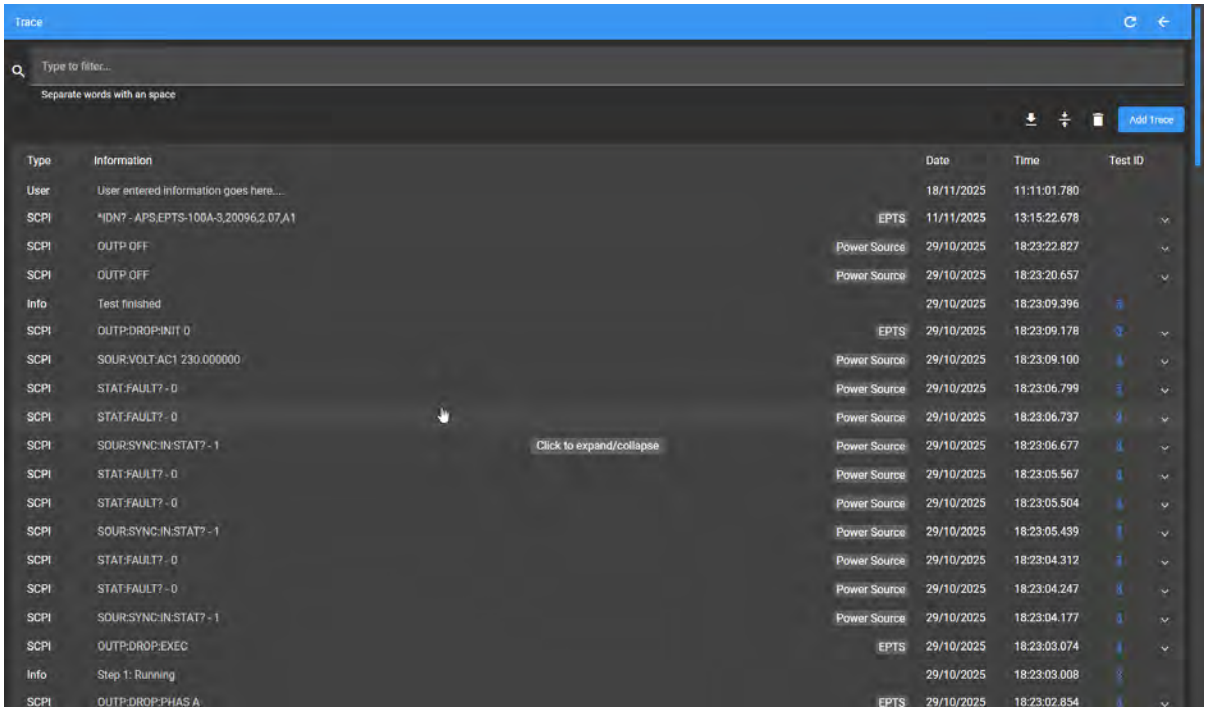
## 6.12 Trace Tab

The Trace tab contains a log of the SCPI Commands sent to the programmable power source(s) and / or the Electronic Switch unit (EPTS). All entries are date and time stamps and this information may be helpful when troubleshooting setup or operational issues.

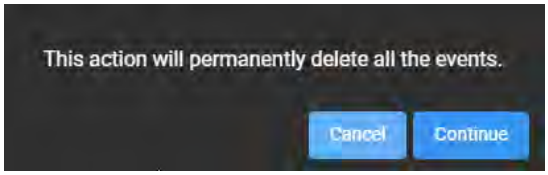



User controls are similar to those in the Events log and located in the upper right hand corner of the Trace tab. They are:

Download Trace log to a comma delimited text files with extension ".cvs" for archiving.

Collapse all entries.

Delete All Events. A confirmation dialog will appear to confirm deleting. Once deleted, all log entries are erased and cannot be retrieved.

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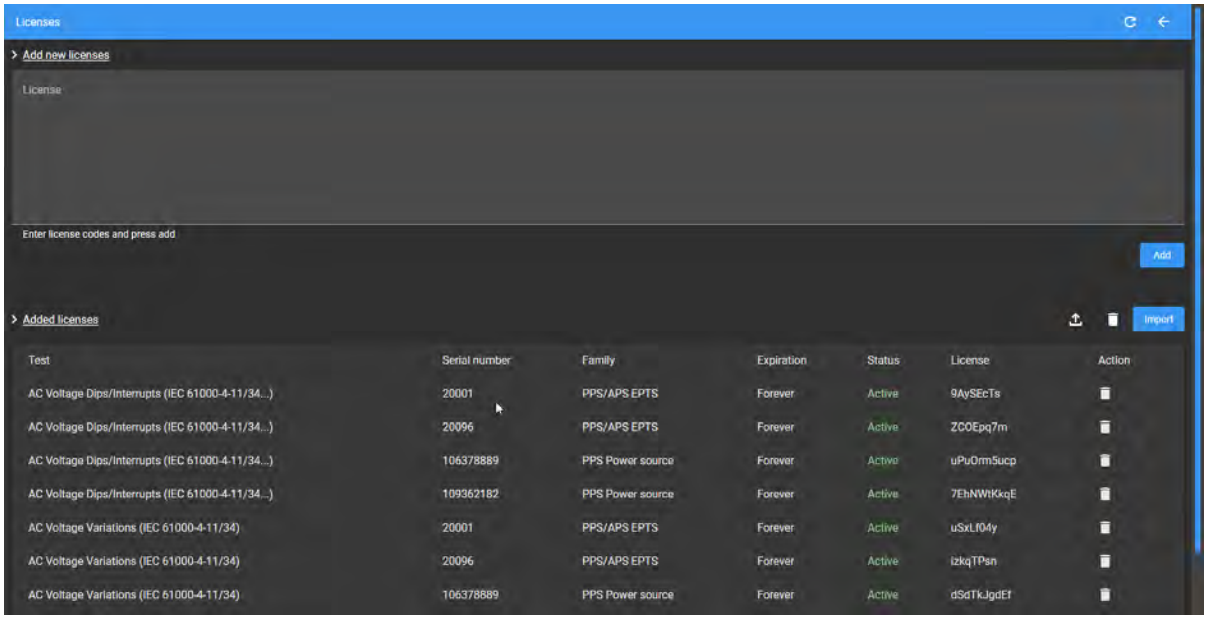
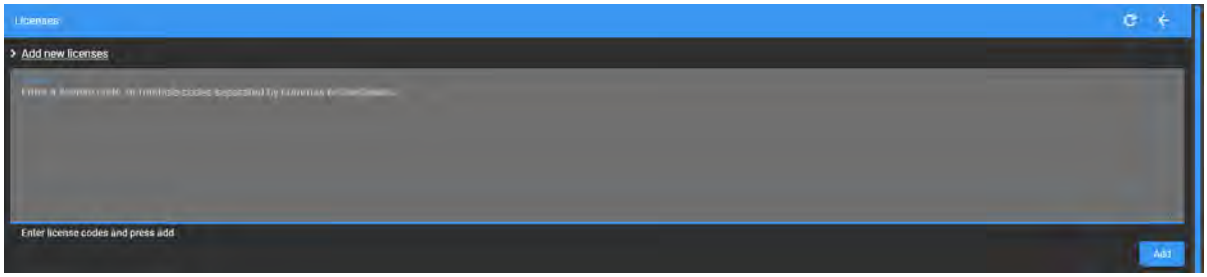
## 6.13 Licenses Tab

The Licenses Tab displays all user licenses for tests available in Test Suite. It also allows new licenses to be entered so any new test sequence can be activated.

Each license is linked to a specific test and to a single device, identified by its unique serial number. To run different tests using the same device, separate licenses are required for each test. Additionally, some tests require multiple devices, so a separate license is needed for each device involved in the test.




To enter a new license code, click anywhere inside the “Add new licenses” top window. You can now enter one or more license codes separated by comma’s and click on the blue “Add” button in the lower right corner below the data entry window as shown below.




Once entered, the new test standard sequence is available to use. The list of installed test sequences is shown in the lower window.

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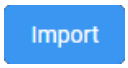
Additional controls available are:

This button exports all licenses to a text file on the host computer. Default target directory is the Windows “Downloads” directory. This may be used to archive existing license information for your test system.

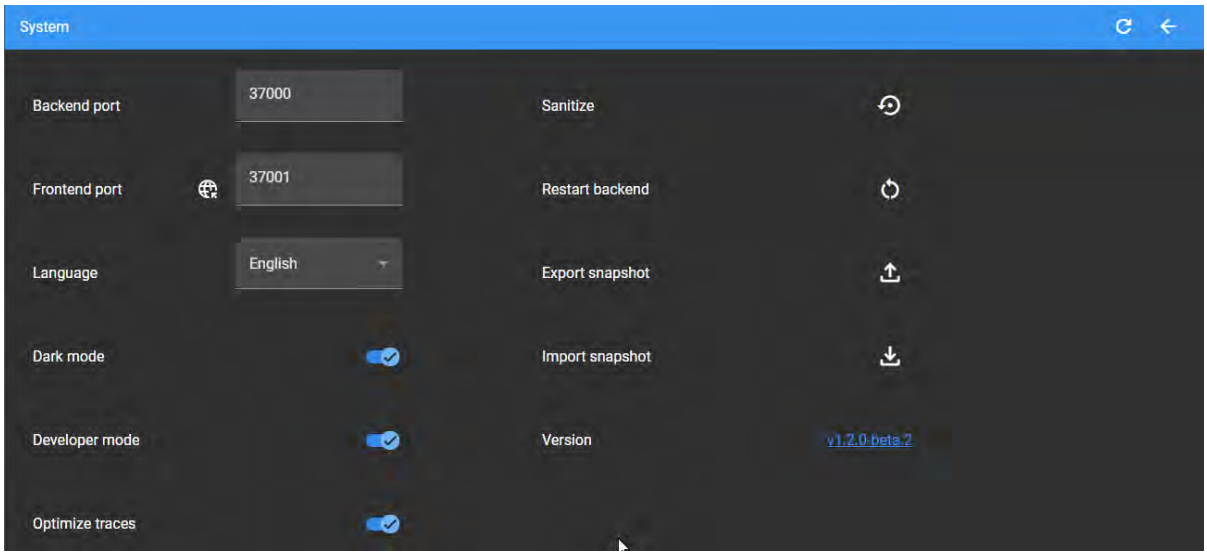
Sanitize an existing test sequence license. Once confirmed, the license will be removed from the test system.




Licenses can also be imported from a provided text file using the “Import” button located directly above the license list window. A File Open dialog box will appear. Select a previously save license .txt file for import and click “Open” to load.

Even if no licenses are installed, all tests in the Test Library Menu can be executed, and their corresponding reports generated.

## 6.14 System Tab




The System Tab contains network settings and several user selections for customizing the test system configuration. The following settings are available from this screen.

| System Field | Setting | System Field | Setting |
|---|---|---|---|
| **Backend port** | LAN port setting<br>*Do not change* | **Sanitize** | Restores all settings to factory defaults |
| **Frontend port** | LAN port setting<br>*Do not change* | **Restart backend** | Restart backend system. May be required if system crashed |
| **Language** | English<br>*No other languages at this time.* | **Export snapshot** | Saves snapshot of settings to a TSS text file. Available selections are:<br>☐ Tests<br>☐ Devices |

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| System Field | Setting | System Field | Setting |
|---|---|---|---|
| | | | ☐ Libraries<br>☐ System dump<br>Check selections to export. |
| **Dark mode** | On = White text against dark background.<br>Off = Dark text against white background | **Import snapshot** | Import previously exported snapshot of system settings. |
| **Developer mode** | Hides some features like Trace mode. | **Version** | Software version |
| **Optimize traces** | Reduces amount of data captured in trace. | | |

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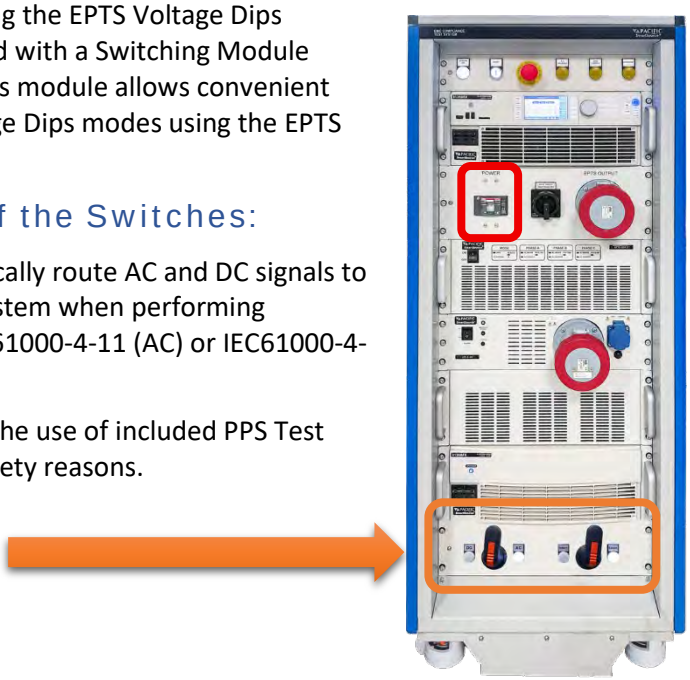
# 7 EPTS AC – DC Mode Switch Module Operation

SmartTS-HFI test systems containing the EPTS Voltage Dips hardware module may be equipped with a Switching Module including two manual switches. This module allows convenient switching between AC or DC Voltage Dips modes using the EPTS hardware.



## 7.1 Purpose and Function of the Switches:

The switches are used to automatically route AC and DC signals to the EPTS Module inside the test system when performing immunity testing according to IEC 61000-4-11 (AC) or IEC61000-4-34 (AC) and IEC 61000-4-29 (DC).

To use this AC/DC switch module, the use of included PPS Test Suite software is mandatory for safety reasons.

## WARNING

**CHANGING SWITCH POSITIONS IS ONLY PERMITTED WHEN THE SMARTTS-HFI or ECTS2 SYSTEM IS SWITCHED OFF! THE POWER OFF SWITCH HAS TO BE IN THE FOLLOWING POSITION**

**PLEASE DO NOT OPERATE THE SWITCHES WHEN THE SYSTEM IS ON, REGARDLESS OF IT BEING IN OPERATION OR NOT.**

**THIS CAN CAUSE DAMAGES NOT COVERED BY WARRANTY!**

**ALWAYS OPERATE THE SWITCHES WITH SYSTEM POWERED OFF!**

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## 7.2 Manual Switches Operation

**LEFT SWITCH – AC or DC Selection**

The default position for the operation of the system is AC mode. This position is mandatory to execute and run all AC Harmonics, Flicker and AC IEC Immunity Test in either Pre or Full Compliance Mode. The DC Position is used to run 61000-4-29 DC tests.

**RIGHT SWITCH: Internal or External Mode**

The default Position is Intern (Internal). Intern means that the local MAINS is connected to the inputs of the EPTS Module to run Power Line Immunity (AC) tests (IEC61000-4-11 and IEC61000-4-34). In Europe, this means that the mains frequency of 50 Hz is used.

The Extern (External) Position means that instead of the local mains (default 230V/50Hz in Europe or 277V/60Hz in US), an external AC Source is used and connected to the inputs of the EPTS Module. This can be the case when a different frequency is needed or voltage is different from the local mains voltage.

In this case, an external AC Source (preferably from PPS) **has** to be connected to the provided additional dedicated AC input terminal in the SmartTS-HFI cabinet. See Image to the right.

*Figure 7-1: External AC Input Terminal*

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## 7.3 Default Switch Positions

The following sections illustrate typical positions for specific tests.

Harmonics & Flicker Test Default Position

---

DEFAULT POSITION to run IEC61000-4-11 and IEC61000-4-34 Full Compliance Test using local 50Hz Mains:

---

DEFAULT POSITION to run IEC61000-4-11 and IEC61000-4-34 in Full Compliance Mode using an external AC Source instead of local 50 Hz Mains (example 60Hz or voltage lower or higher than local mains voltage):

---

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DEFAULT POSITION to run IEC61000-4-29 in Full Compliance Mode (2 channels of the AC/DC Source are routed to the inputs of the EPTS and programmed in DC).

**Please note the right switch HAS to be in one active setting Inter or Extern**

## 7.4 Summary of Switch Positions

The table below summarizes the available switch settings:

| Mode | Norm | Left Switch DC-AC | Right Switch Intern-Extern |
|---|---|---|---|
| **AC Dips 50Hz** | IEC61000-4-11 (50Hz) | AC | Intern |
| **AC Dips 50Hz** | IEC61000-4-34 (50Hz) | AC | Intern |
| **DC Dips** | IEC61000-4-29 | DC | Intern |
| **AC Dips 60Hz and or voltage different from Main** | IEC61000-4-11 (60Hz) | AC | Extern |
| | | | |
| **AC Dips 60Hz and or voltage different from Main** | IEC61000-4-34 (60Hz) | AC | Extern |
| **Harmonics** | IEC61000-3-2 | AC | Intern |
| **Flicker** | IEC61000-3-3 | AC | Intern |
| **Harmonics** | IEC61000-3-11 | AC | Intern |
| **Flicker** | IEC61000-3-12 | AC | Intern |

*Table 7-1: Summary of Switch Positions by Test Mode*

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# 8 Library of EPTS System IEC Test Sequences

The following IEC test sequences and revisions are included in the standard EPTS test system library:

## 8.1 Voltage Dips & Interrupts Test Standards - AC

| AC Voltage Dips/Interrupts (IEC 61000-4-11/34...) | Region |
|---|---|
| IEC 61000-4-11 Ed. 3.0 : 2020 (< 16 Arms) | EU / UK |
| IEC 61000-4-11 Ed. 2.1 : 2017 (< 16 Arms) | EU / UK |
| IEC 61000-4-11 Ed. 2.0 : 2004 (< 16 Arms) | EU / UK |
| IEC 61000-4-34 Ed. 1.1 : 2009 (> 16 Arms) | EU / UK |
| KS C 9610-4-11 : 2020 | Korea |

## 8.2 Voltage Variations Test Standards - AC

| AC Voltage Variations (IEC 61000-4-11/34) | Region |
|---|---|
| IEC 61000-4-11 Ed. 3.0 : 2020 (< 16 Arms) | EU / UK |
| IEC 61000-4-11 Ed. 2.1 : 2017 (< 16 Arms) | EU / UK |
| IEC 61000-4-11 Ed. 2.0 : 2004 (< 16 Arms) | EU / UK |
| IEC 61000-4-34 Ed. 1.1 : 2009 (> 16 Arms) | EU / UK |

## 8.3 Voltage Dips & Interrupts Test Standards - DC

| DC Voltage Dips/Interrupts (IEC 61000-4-29...) | Region |
|---|---|
| IEC 61000-4-29 Ed. 1.0 : 2000 | EU / UK |
| KS C 9610-4-29 : 2020 | Korea |

## 8.4 Voltage Variations Test Standards - DC

| DC Voltage Variations (IEC 61000-4-29) | Region |
|---|---|
| IEC 61000-4-29 Ed. 1.0 : 2000 | EU / UK |

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# 9 Software Installation Instructions

## 9.1 Preface

The Test Suite software is required for operate the EPTS hardware and perform all supported IEC Tests. The EPTS-3-XX does not have any front panel controls, only indicators so all operation is done using the Test Suite software. Control of the EPTS hardware is accomplished using USB so a USB cable between the controlling PC and the EPTS-3-XX unit must be connected.

The same Test Suite software also needs to interface to the programmable AC and DC power source used. This is supported through either USB or LAN connection.

Note: Both the EPTS-3-XX switch unit and the AC power source must be connected to the controlling Windows PC to be able to perform IEC 61000-4 immunity tests.

## 9.2 Windows Operating Systems Supported

Required operating system for all EPTS units is Microsoft Windows 11™.

## 9.3 Installing the Test Suite Software

The Test Suite software is distribution as a single executable Windows file named:

**PPS.Test.Suite.x.x.x.exe**

where the “x.x.x” indentifies the software version no. Running the executable will result in a number of pop-up windows. Depending on your Windows version, you may need to allow the install program to make changes to your PC. The User Account Control dialog below will be displayed. The following setup dialogs will appear in the order shown.

Follow the prompts and selections shown in the eight dialog screens below to complete the installation. Note the available selections indicated by the blue arrows. For networks setting selections in dialog number five, consult with your network administrator as needed.

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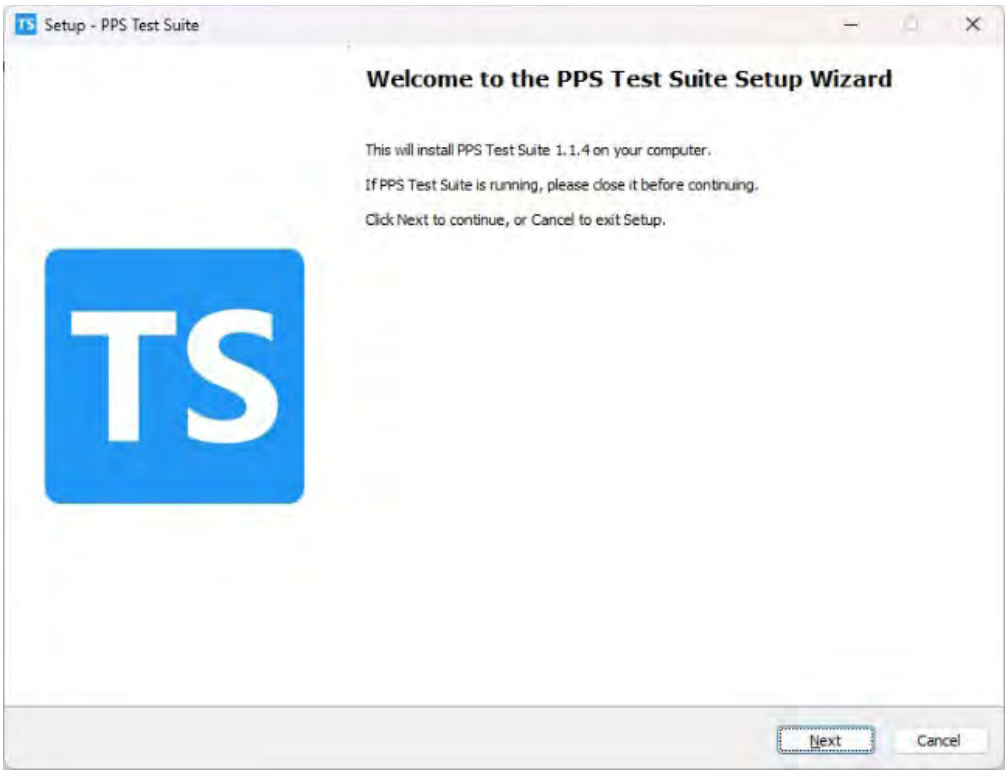


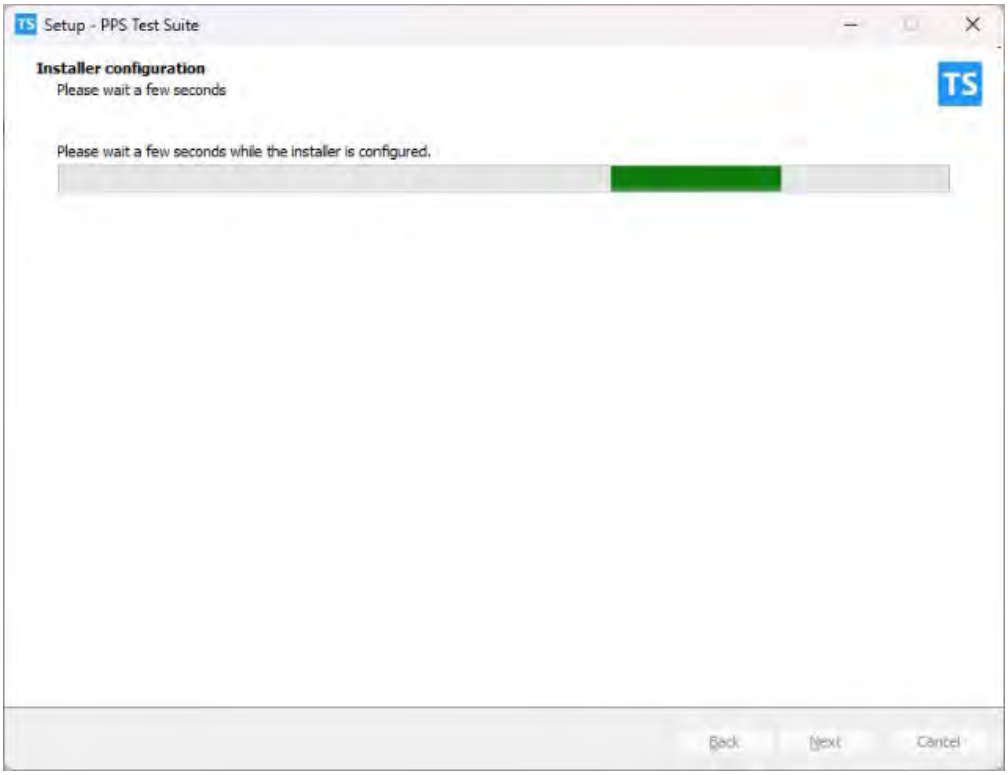


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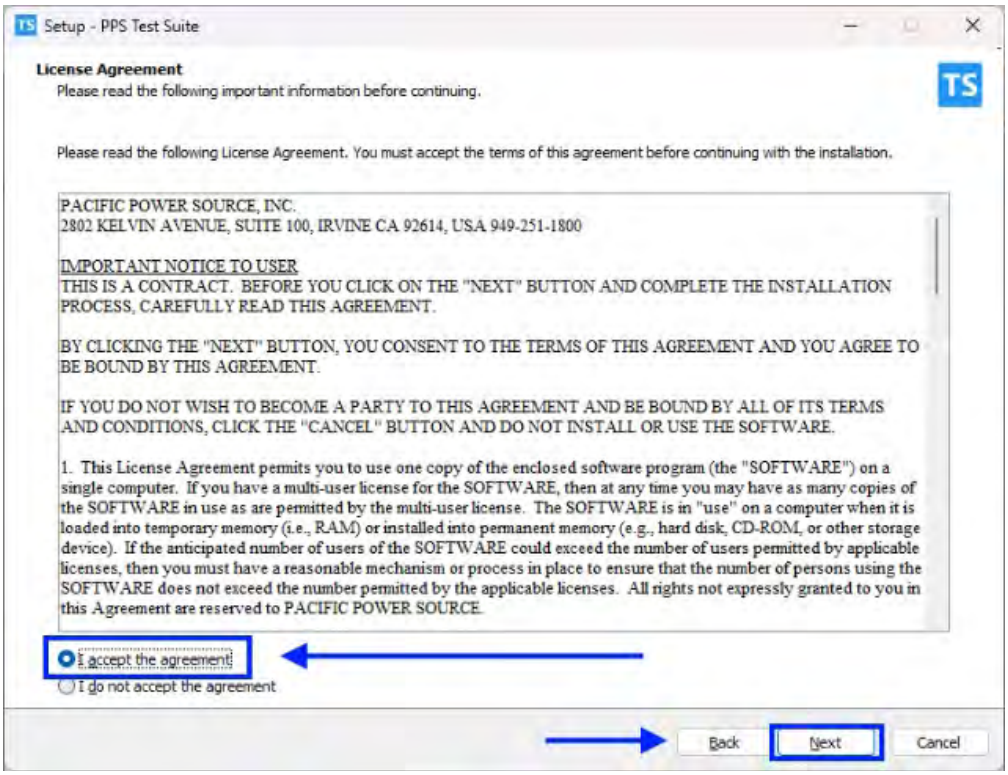


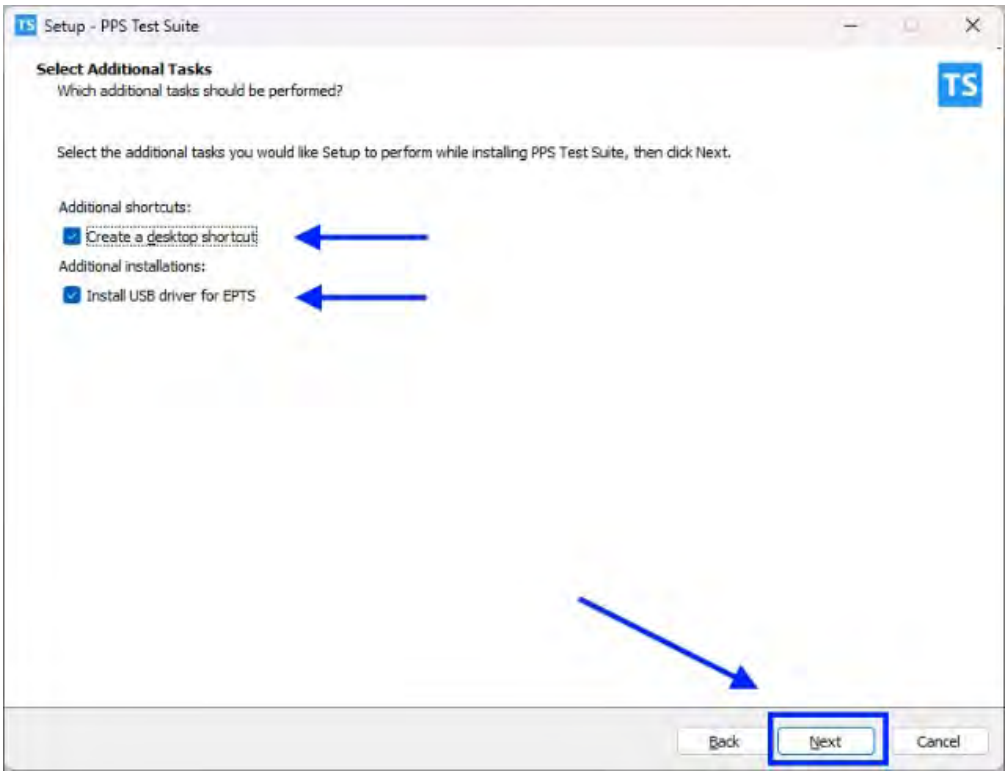


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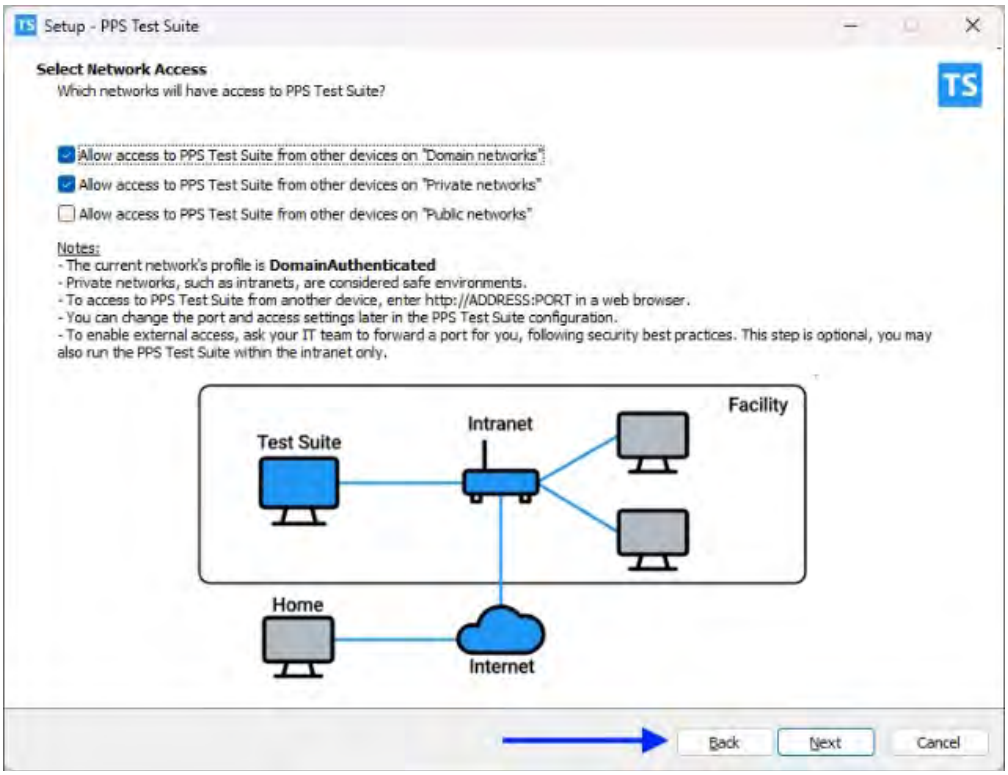


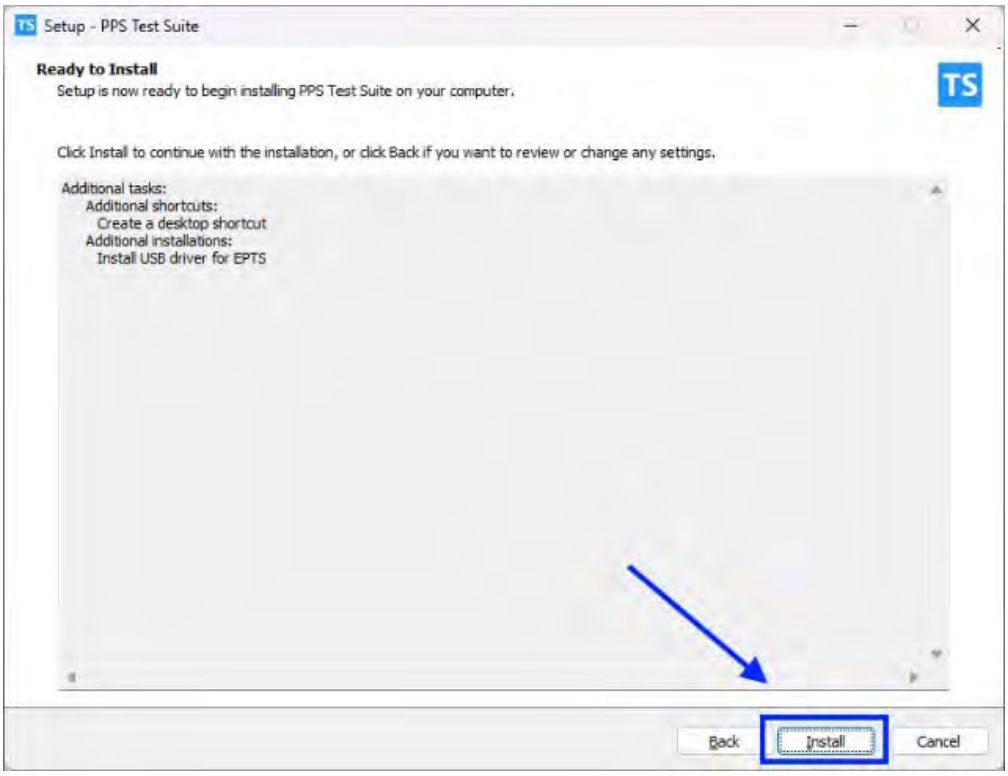


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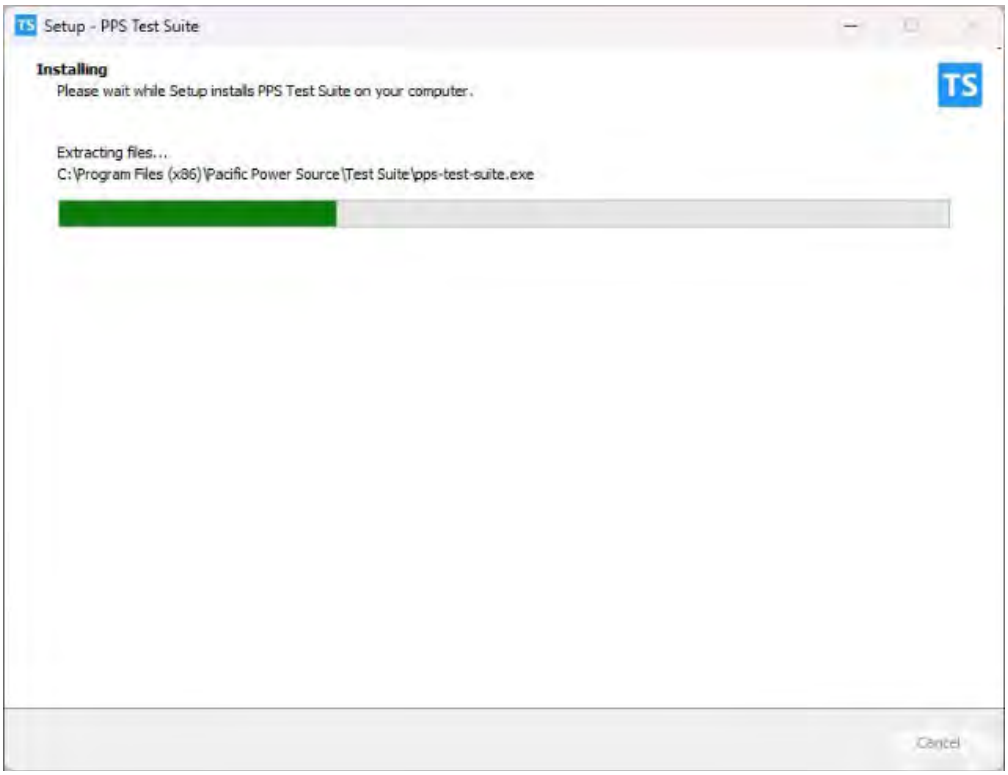

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Once install, the program will lauch and the main Test Suite screen will appear as shown below.

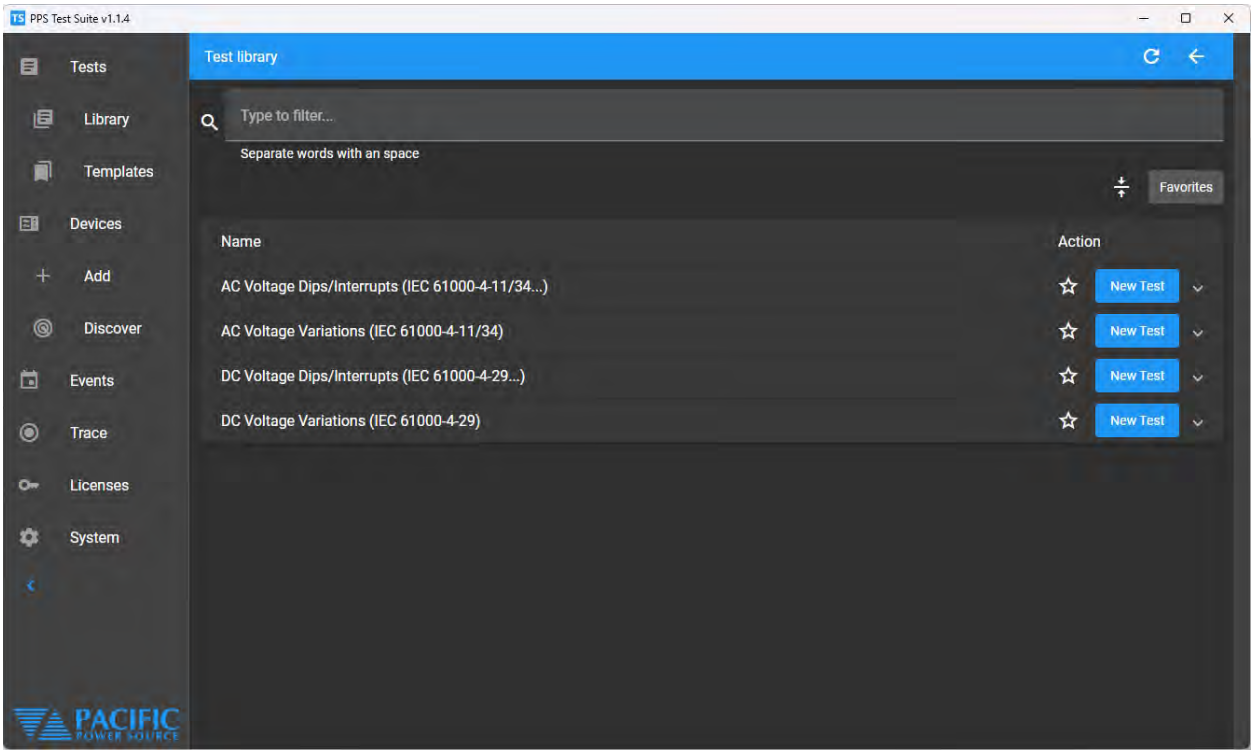


*Figure 9-1: Test Suite Software Main Screen*

## 9.4 Software License

The Test Suite Software represents a significant amount of engineering development to ensure compliance to all relevant IEC 61000-4 test standards. As such, its use is licensed for a specific measurement system only and each copy of the Test Suite software must be registered in order to operate.

The registration code for your instance of the Test Suite and associated test sequence licenses for IEC 61000-x test purchased can be requested by sending an email to Pacific Power's Customer Support department at support@pacificpower.com and include the EPTS or AC & DC Power Source hardware serial number.

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# 10 Adjustment Information

## 10.1 Preface

This section covers system adjustments of the EPTS unit. Normally, annual adjustment is recommended.

## 10.2 EPTS Adjustment

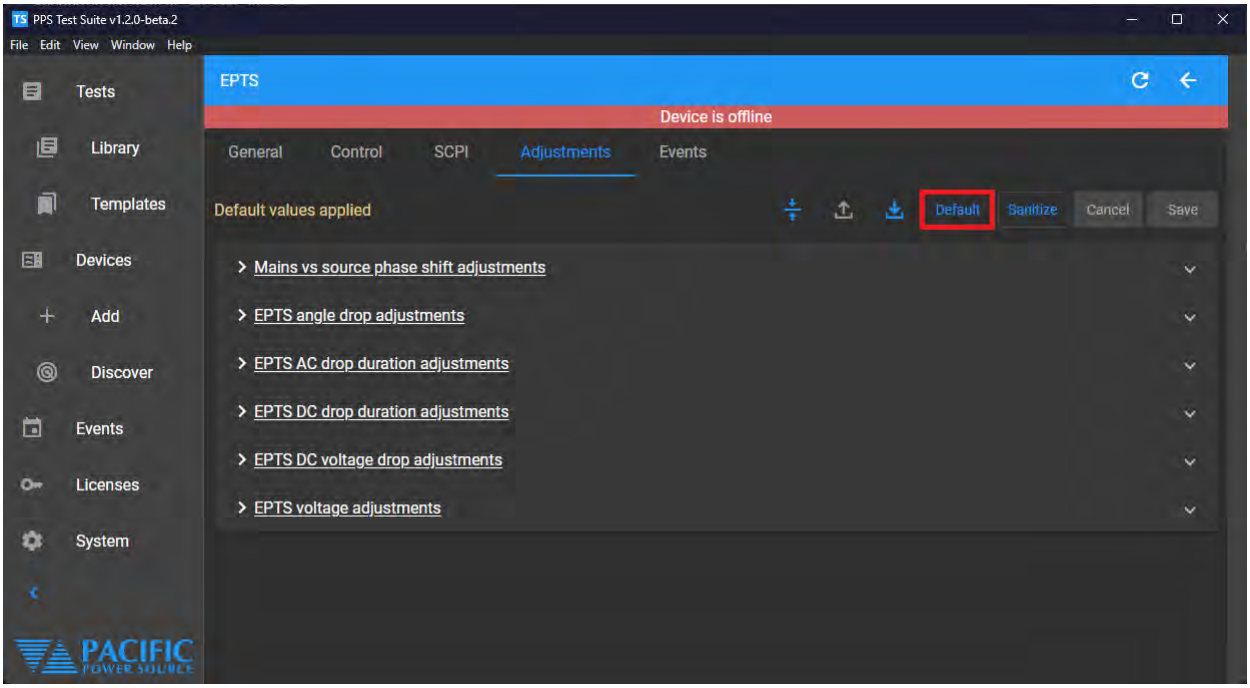
When a new EPTS is discovered and connected to Test Suite, the software automatically searches the PC for a corresponding adjustments file matching the unit's serial number and loads it if available.

If no adjustments file is found, the adjustment fields will remain empty.

### 10.2.1 Default Adjustments

The default adjustment values are set as close as possible to those obtained through manual adjustment.

To apply these values, access the EPTS Device Interface from the Devices menu, navigate to the Adjustments tab, and click the Default button.




This action opens the following pop-up window:

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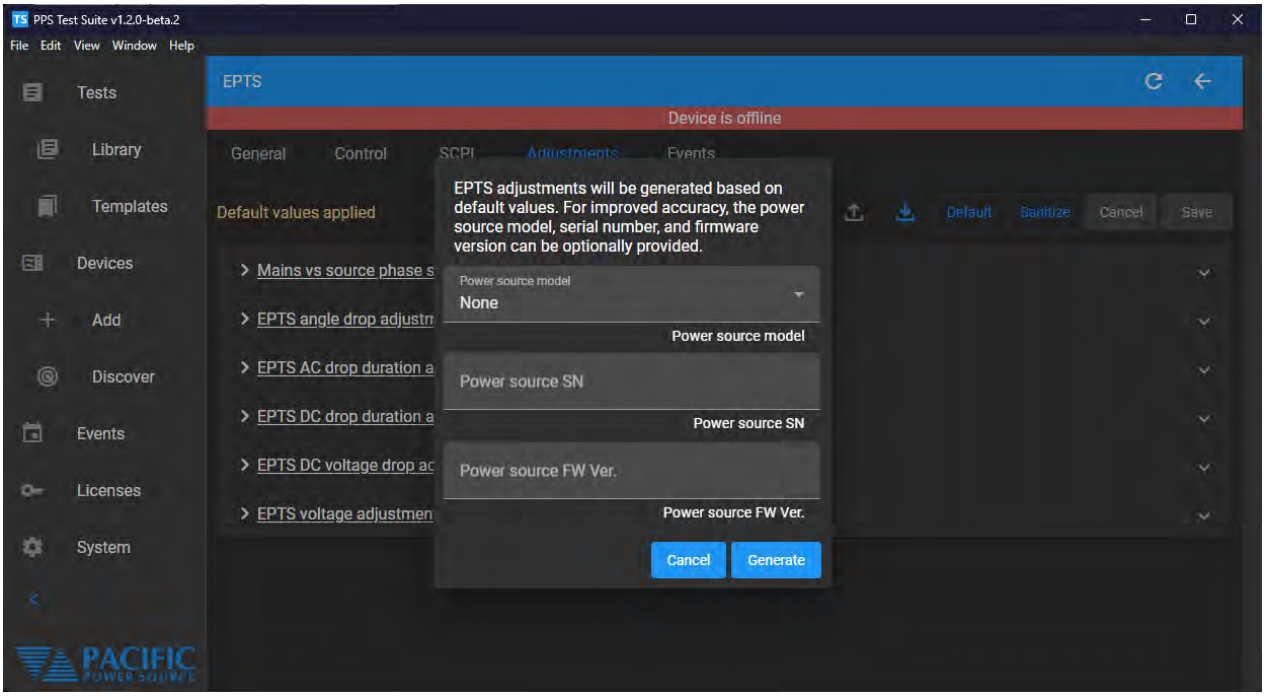
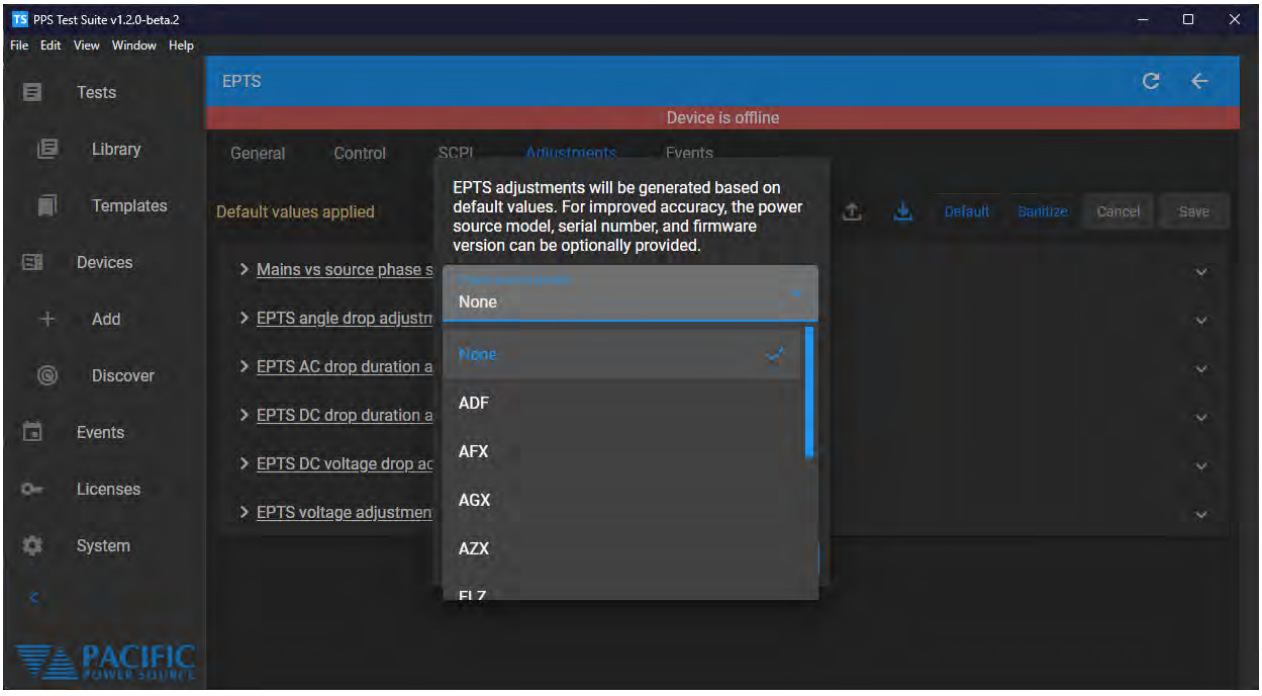



Some adjustment values depend on the power source model. To improve accuracy, select the model for which the adjustments should be performed.




After selecting the model, click Generate. The default adjustment results will then be displayed.

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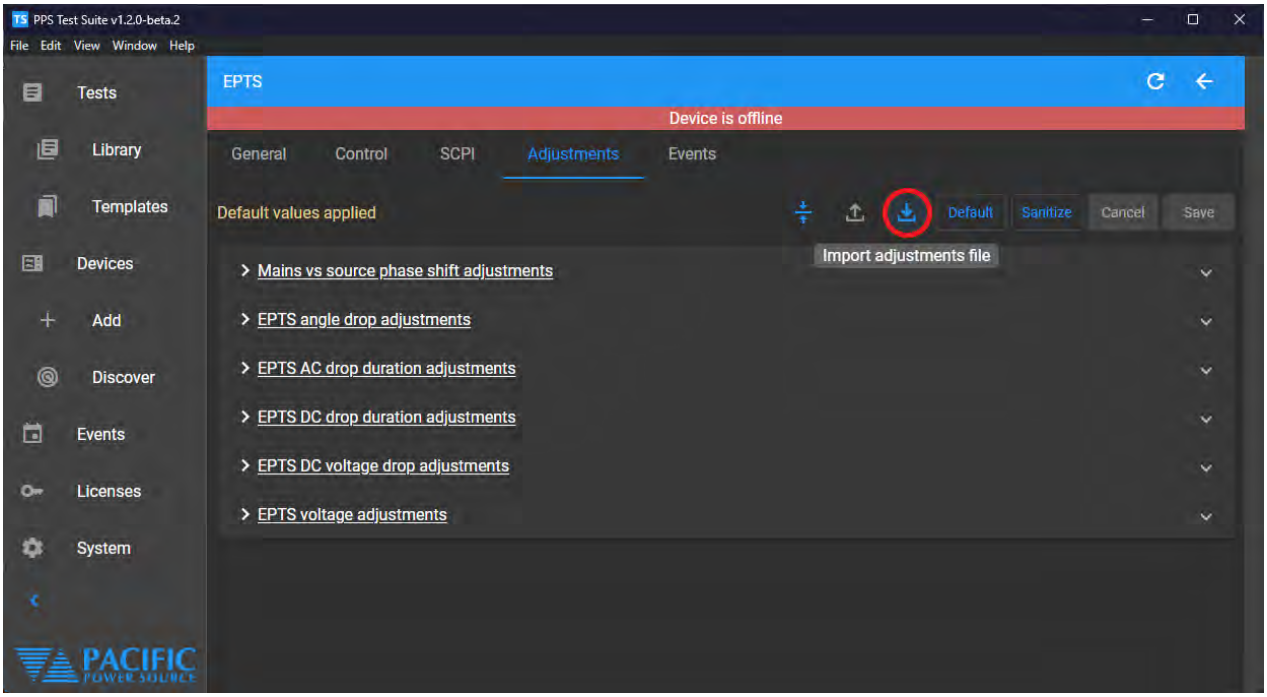
### 10.2.2 Manual Adjustments

To perform a manual adjustment, it is recommended to first generate a default adjustment and then fine-tune the values by iteratively running tests to verify them. You can follow the steps described in the EPTS Device Interface Adjustments tab.

### 10.2.3 Import Adjustments

The EPTS hardware is factory-adjusted and may also be periodically adjusted by a third-party laboratory. The resulting adjustment file is provided for use with the system. Import this file by clicking the icon and selecting the appropriate file from the file explorer. Supported file formats are XML and JSON.

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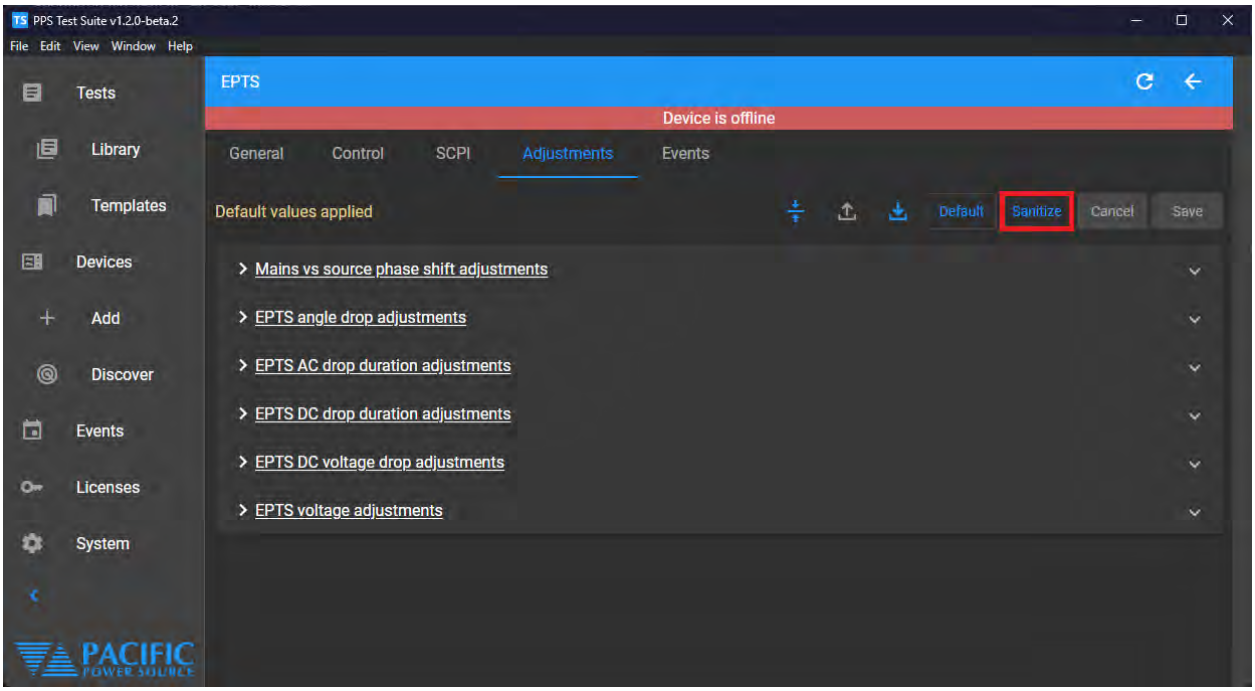
### 10.2.4 Sanitize Adjustments

In the absence of adjustment data, the system automatically identifies the appropriate system type and applies adjustments closely approximating a manual adjustment.

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# 11 Service & Maintenance

## 11.1 Authorized Service Centers

There are NO end-user serviceable parts in this product. In case of a problem or malfunction, DO NOT ATTEMPT TO REPAIR! Instead, contact one of Pacific Power Source's authorized service centers or your local Pacific Power Source distributor. For a list of authorized service centers, refer to section 1, "Contact Information".

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# 12 Declaration of Conformity

The Manufacturer hereby declares that the products:

**Product Name:** EPTS Electronic Power Transfer Switch, All Models in Series

Conforms to the following standards or other normative documents:

**RoHS (DIRECTIVE 2011/65/EU)**

| | |
|---|---|
| Standard applied | EN 50581:2012 |

**SAFETY (DIRECTIVE 2014/35/EC):**

| | |
|---|---|
| Standard applied | EN 61010–1: 2010; ED3/A1:2019 |

**EMC (DIRECTIVE 2014/30/EU):**

| | |
|---|---|
| Standard applied | EN 61326-1: 2013 |

**Reference Standards:**

**ELECTROMAGNETIC IMMUNITY**:

| | | |
|---|---|---|
| RF Electromagnetic Field | IEC 61000-4-3:2020<br>1 kHz sinewave (80% AM) | 80 – 1000 MHz, 3 V/m<br>1.4 – 2 GHz, 3 V/m<br>2.0 – 2.7 GHz, 1 V/m |
| Conducted RF Immunity | IEC 61000-4-6:2013<br>1 kHz sinewave (80% AM) | 0.15-80 MHz, 3 V emf |
| Electrostatic Discharge | IEC 61000-4-2:2008 | ± 4 kV contact discharge<br>± 4 kV air discharge |
| Electrical Fast Transient/Burst | IEC 61000-4-4:2012 | AC or DC power ports, ± 1.0 kV<br>Signal and I/O ports, ± 0.5 kV |
| Surge | IEC 61000-4-5:2014+A1:2017 | Input AC: 0.5kV L-L, 1.0kV L to Earth<br>Input DC: 0.5kV Line to Earth<br>Signal & Telecom: 1.0kV to Earth |
| Voltage Dips and Interruptions | IEC 61000-4-11:2020 | Dips > 95% @ 0.5 Periods, Criterion B<br>30% @ 25 Periods, Criterion C<br>Inter. > 95% @250 Periods, Criterion C |
| Conducted Disturbance at Mains | CISPR 11:2015+A1:2016+A2:2019 | 10-25MHz, < 60dBµV |
| Radiated Disturbance below 1GHz | CISPR 11:2015+A1:2016+A2:2019 | 30-200MHz, < 50 dBµV/m<br>201-1GHz, < 57 dBµV/m |

**Supplemental Information:**

**When and Where Issued**
Oct 14, 2025
Irvine, California, USA

**Authorized Signatory**

Mitchel Orr,
Quality Manager, acting
Pacific Power Source

**Mark of Compliance**

CE

**Responsible Person**
Joe Abranko,
Pacific Power Source, Inc.
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