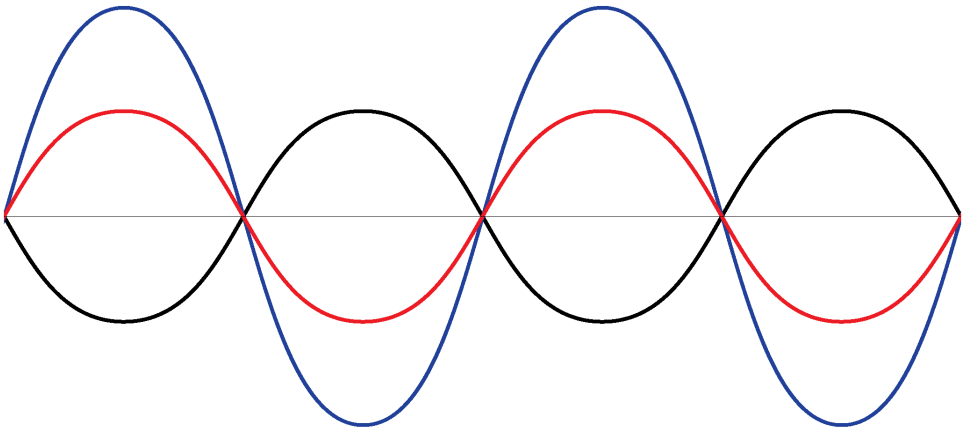
Global Specialties

1400 Series
1403A, 1405A, 1407
100W Triple Output
Switching DC Power Supply

User Manual



Cal Test ELECTRONICS

Notices

Made in China

User Manual Part Number

451-181-001

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Warranty

LIMITED ONE-YEAR WARRANTY

Cal Test Electronics, Inc warrants these products to be free from defective material or workmanship for a period of 1 year from the date of original purchase. Under this warranty, Cal Test Electronics, Inc is limited to repairing this product when returned to the factory, shipping charges prepaid, within the warranty period.

Units returned to Cal Test Electronics, Inc that have been subject to abuse, misuse, damage, or accident, or have been connected, installed, or adjusted contrary to the instructions furnished by Cal Test Electronics, Inc, or that have been repaired by unauthorized persons, will not be covered by this warranty.

Cal Test Electronics, Inc reserves the right to discontinue models, change specifications, price, or design of this device at any time without notice and without incurring any obligation whatsoever.

The purchaser agrees to assume all liabilities for any damages and/or bodily injury which may result from the use or misuse of this device by the purchaser, his employees, or agents.

THIS WARRANTY IS IN LIEU OF ALL OTHER REPRESENTATIONS OR WARRANTIES EXPRESSED OR IMPLIED AND NO AGENT OR REPRESENTATIVE OF CAL TEST ELECTRONICS, INC IS AUTHORIZED TO ASSUME ANY OTHER OBLIGATION IN CONNECTION WITH THE SALE AND PURCHASE OF THIS DEVICE.

Notes

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Compliance Information

EMC

EC Declaration of Conformity - EMC

Compliance was demonstrated to the following specifications listed in the Official Journal of the European Communities: EMC Directive 2014/30/EU.

EN 61000-6-3. Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial, and light-industrial environments.

EN 61000-6-1. Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial, and light-industrial environments.

Safety

EC Declaration of Conformity - Low Voltage

Compliance was demonstrated to the following specification as listed in the Official Journal of the European Communities: Low Voltage Directive: 2014/35/EU.

EN 62368-1:2023 Ed 4.0. Audio/video, information and communication technology equipment - Part 1: Safety requirements.

Environmental

Restriction of Hazardous Substances (RoHS 2)

The product and its accessories conform to the Directive 2011/65/EU (RoHS 2) on the restriction of the use of certain hazardous substances in electrical and electronic equipment, inclusive of any modification and addendum to said Directive.

EN ISO 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

China RoHS 2 refers to the Ministry of Industry and Information Technology Order No. 32, effective July 1, 2015. See “Hazardous Substances Disclosure Table” on page 35.

Product End-of-Life Handling

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

This product is subject to Directive 2012/19/EU of the European Parliament and the Council of the European Union on waste electrical and electronic equipment (WEEE), and in jurisdictions adopting that Directive, is marked as being put on the market after August 13, 2005, and should not be disposed of as unsorted municipal waste. Please utilize your local WEEE collection facilities in the disposition of this product.

Terms & Symbols

The following terms, symbols, and definitions, individually or combination may appear on the product or in this user manual.

Terms

CAUTION A caution statement calls attention to an operating procedure, practice, or condition, which, if not followed correctly, could result in damage to or destruction of parts or the entire product.

MISE EN GARDE Une mise en garde attire l'attention sur une procédure d'exploitation, une pratique ou une condition qui, si elle n'est pas suivie correctement, pourrait entraîner des dommages ou la destruction de pièces ou de l'ensemble du produit.

VORSICHT Ein Warnhinweis macht auf einen Betriebsablauf, eine Vorgehensweise oder einen Betriebszustand aufmerksam, der bei Nichtbeachtung zur Beschädigung oder Zerstörung von Teilen oder des gesamten Produkts führen kann.

WARNING A warning statement calls attention to an operating procedure, practice, or condition, which, if not followed correctly, could result in injury or death to personnel.

AVERTISSEMENT Une déclaration d'avertissement attire l'attention sur une procédure d'exploitation, une pratique ou une condition qui, si elle n'est pas suivie correctement, pourrait entraîner des blessures, voire la mort du personnel.

WARNUNG Ein Warnhinweis macht auf ein Betriebsverfahren, eine Vorgehensweise oder einen Betriebszustand aufmerksam, der bei Nichtbeachtung zu Verletzungen oder zum Tod des Personals führen kann.

NOTE A note statement calls attention to an operating procedure, practice, or condition, which, should be noted before proceeding.

REMARQUE Une note attire l'attention sur une procédure d'exploitation, une pratique ou une condition qui doit être notée avant de continuer.

NOTIZ Eine Hinweiserklärung macht auf einen Betriebsablauf, eine Vorgehensweise oder einen Zustand aufmerksam, der vor dem Fortfahren beachtet werden sollte.

Symbols

CAUTION – Statements or instructions that must be consulted in order to find out the nature of the potential hazard and any actions which must be taken.

WARNING - HIGH VOLTAGE - possibility of electric shock.

Earth (ground) TERMINAL - Refer to the instructions accompanying this symbol in this manual.

The Conformitè Europëenne (CE) mark is the European Union's (EU) mandatory conformity marking for regulating the goods sold within the European Economic Area (EEA).

Safety Information

Safety Notices

This device has been designed and tested in accordance with accepted industry standards and has been supplied in a safe condition. Before applying power, verify that the correct safety precautions are taken (see the following warnings). In addition, note the external markings on the instrument that are described under “Symbols” on page 7.

Throughout this manual and specifically in this section, there are warnings, cautions, and notes that you must follow to ensure safe operation and to maintain the device in a safe condition.

WARNING To avoid personal injury and to prevent fire or damage to the device and the products connected to it, review and comply with the following safety Warning and Cautions.

AVERTISSEMENT Pour éviter toute blessure corporelle et prévenir les risques d’incendie ou de dommages à l’appareil et aux produits qui y sont connectés, veuillez lire et respecter les avertissements et mises en garde de sécurité suivants.

WARNUNG Um Verletzungen sowie Brand- oder Geräteschäden zu vermeiden, lesen Sie bitte die folgenden Sicherheitshinweise und Warnungen sorgfältig durch und halten Sie sich daran.

WARNING Do not use your device in a manner not specified by the manufacturer. Misuse may impair safety protections.

AVERTISSEMENT N’utilisez pas votre appareil d’une manière non spécifiée par le fabricant. Une mauvaise utilisation peut compromettre les protections de sécurité.

WARNUNG Verwenden Sie das Gerät nicht in einer vom Hersteller nicht vorgesehenen Weise. Unsachgemäßer Gebrauch kann die Sicherheitsfunktionen beeinträchtigen.

WARNING Ground the device using a properly connected 3-pin AC source. Never alter or bypass the ground connection. When it is likely that the ground protection is impaired, you must make the device inoperative and secure it against any unintended operation.

AVERTISSEMENT Mettez l’appareil à la terre en utilisant une source CA à 3 broches correctement connectée. Ne modifiez jamais ni ne contournez la connexion de mise à la terre. Si la protection de mise à la terre semble compromise, vous devez rendre l’appareil inopérant et le sécuriser contre toute utilisation involontaire.

WARNUNG Erdung des Geräts über eine korrekt angeschlossene 3-polige Wechselstromquelle. Verändern oder umgehen Sie niemals die Erdverbindung. Wenn die Erdungsschutzfunktion beeinträchtigt ist, muss das Gerät außer Betrieb genommen und gegen unbeabsichtigte Benutzung gesichert werden.

WARNING Do not use near water or operate it with wet hands.

AVERTISSEMENT Ne l’utilisez pas à proximité d’eau et ne l’utilisez pas avec les mains mouillées.

WARNUNG Verwenden Sie das Gerät nicht in der Nähe von Wasser und bedienen Sie es nicht mit

nassen Händen.

WARNING For Indoor Use Only. To prevent electric shock, injury, or fire, do not operate in wet, damp, humid, dusty, flammable, or explosive environments.

AVERTISSEMENT Pour usage intérieur uniquement. Pour éviter les risques de choc électrique, de blessure ou d'incendie, n'utilisez pas l'appareil dans des environnements humides, mouillés, poussiéreux, inflammables ou explosifs.

WARNUNG Nur für den Innenbereich. Um Stromschlag, Verletzungen oder Brandgefahr zu vermeiden, betreiben Sie das Gerät nicht in feuchten, nassen, staubigen, brennbaren oder explosionsgefährdeten Umgebungen.

WARNING Do not operate the device with the case open.

AVERTISSEMENT N'utilisez pas l'appareil avec le boîtier ouvert.

WARNUNG Betreiben Sie das Gerät nicht mit geöffnetem Gehäuse.

WARNING Inspect Regularly. Periodically check the device, power cable, and output leads for damage. Do not operate if damage is visible or suspected—contact Cal Test authorized service personnel for inspection.

AVERTISSEMENT Inspectez régulièrement. Vérifiez périodiquement l'appareil, le câble d'alimentation et les câbles de sortie pour détecter tout dommage. N'utilisez pas l'appareil s'il présente des dommages visibles ou suspects — contactez le personnel de service agréé de Cal Test pour une inspection.

WARNUNG Regelmäßige Inspektion. Überprüfen Sie regelmäßig das Gerät, das Netzkabel und die Ausgangsleitungen auf Schäden. Betreiben Sie das Gerät nicht, wenn sichtbare oder vermutete Schäden vorliegen — wenden Sie sich an autorisiertes Servicepersonal von Cal Test zur Überprüfung.

WARNING Do not install substitute parts or modify the device. All servicing must be performed by Cal Test authorized personnel—contact Cal Test Electronics for support.

AVERTISSEMENT N'installez pas de pièces de rechange non autorisées et ne modifiez pas l'appareil. Toute maintenance doit être effectuée par du personnel agréé Cal Test — contactez Cal Test Electronics pour toute assistance.

WARNUNG Installieren Sie keine Ersatzteile und nehmen Sie keine Änderungen am Gerät vor. Alle Wartungsarbeiten müssen von autorisiertem Cal Test-Personal durchgeführt werden — wenden Sie sich für Support an Cal Test Electronics.

WARNING Disconnect power before servicing. Dangerous voltages may remain after power is removed.

AVERTISSEMENT Débranchez l'alimentation avant toute intervention. Des tensions dangereuses peuvent

subsister après la mise hors tension.

WARNUNG Trennen Sie das Gerät vor Wartungsarbeiten vom Stromnetz. Gefährliche Spannungen können auch nach dem Abschalten bestehen bleiben.

WARNING Do not attempt internal service or adjustment. A second person capable of providing first aid must be present. Refer all servicing to qualified personnel only.

AVERTISSEMENT N'effectuez aucun réglage ou service interne. Une seconde personne capable de prodiguer les premiers secours doit être présente. Confiez toute intervention uniquement à du personnel qualifié.

WARNUNG Führen Sie keine internen Wartungen oder Einstellungen durch. Eine zweite Person, die Erste Hilfe leisten kann, muss anwesend sein. Überlassen Sie alle Wartungsarbeiten ausschließlich qualifiziertem Fachpersonal.

WARNING Avoid Exposed Circuits. To avoid injury, remove jewelry such as rings, watches, and other metallic objects. Do not touch exposed connections and components when power is present.

AVERTISSEMENT Évitez les circuits exposés. Pour éviter toute blessure, retirez les bijoux tels que les bagues, montres et autres objets métalliques. Ne touchez pas aux connexions ou composants exposés lorsque l'appareil est sous tension.

WARNUNG Vermeiden Sie offene Stromkreise. Um Verletzungen zu vermeiden, entfernen Sie Schmuck wie Ringe, Uhren und andere metallische Gegenstände. Berühren Sie keine freiliegenden Verbindungen oder Bauteile, wenn das Gerät unter Spannung steht.

WARNING Use Proper Power Source. To ensure the device functions well, use the supplied power cord.

AVERTISSEMENT Utilisez une source d'alimentation appropriée. Pour assurer le bon fonctionnement de l'appareil, utilisez le cordon d'alimentation fourni.

WARNUNG Verwenden Sie eine geeignete Stromquelle. Für einen ordnungsgemäßen Betrieb des Geräts verwenden Sie das mitgelieferte Netzkabel.

WARNING Fuse Replacement. Before replacing the AC fuse (near the AC socket), identify and correct the root cause. Use only fuses with the specified rating.

AVERTISSEMENT Remplacement du fusible. Avant de remplacer le fusible secteur (près de la prise secteur), identifiez et corrigez la cause du problème. Utilisez uniquement des fusibles de la valeur spécifiée.

WARNUNG Sicherung austauschen. Bevor Sie die Netzsicherung (in der Nähe der Netzbuchse) ersetzen, ermitteln und beheben Sie die Ursache des Problems. Verwenden Sie nur Sicherungen mit dem angegebenen Nennwert.

CAUTION Do not operate or place this unit in a humid, dusty, in direct sunlight location or near any heat source.

MISE EN GARDE N'utilisez pas cet appareil et ne le placez pas dans un endroit humide, poussiéreux, en plein soleil ou près d'une source de chaleur.

VORSICHT Betreiben oder platzieren Sie dieses Gerät nicht an einem feuchten, staubigen Ort, in direktem Sonnenlicht oder in der Nähe einer Wärmequelle.

CAUTION Verify Line Voltage. Before connecting to AC mains, check the rear panel voltage rating label. Applying incorrect voltage may damage the device or blow the fuse. Always replace fuses with the specified type and rating for continued protection.

MISE EN GARDE Vérifiez la tension secteur. Avant de raccorder à l'alimentation secteur, vérifiez l'étiquette de tension située à l'arrière de l'appareil. Une tension incorrecte peut endommager l'appareil ou faire sauter le fusible. Remplacez toujours les fusibles par un modèle de type et de calibre spécifiés pour garantir une protection continue.

VORSICHT Netzspannung überprüfen. Vor dem Anschluss an das Stromnetz das Spannungsetikett auf der Rückseite des Geräts prüfen. Falsche Spannung kann das Gerät beschädigen oder die Sicherung auslösen. Verwenden Sie stets Sicherungen des angegebenen Typs und Nennwerts, um den Schutz aufrechtzuerhalten.

CAUTION Do not block any ventilation openings of the unit.

MISE EN GARDE Ne bloquez aucune des ouvertures de ventilation de l'appareil.

VORSICHT Blockieren Sie keine Lüftungsöffnungen des Geräts.

CAUTION This unit must be used within the specified rating. Continuous loading may cause damage to the power supply.

MISE EN GARDE Cet appareil doit être utilisé dans les limites de sa capacité nominale. Une charge continue peut endommager l'alimentation électrique.

VORSICHT Dieses Gerät muss innerhalb der angegebenen Nennwerte betrieben werden. Dauerhafte Belastung kann das Netzteil beschädigen.

CAUTION Observe Electrostatic Discharge (ESD) precautions. Handle internal components using proper antistatic procedures.

MISE EN GARDE Respectez les précautions contre les décharges électrostatiques (ESD). Manipulez les composants internes en suivant les procédures antistatiques appropriées.

VORSICHT Beachten Sie die Vorsichtsmaßnahmen gegen elektrostatische Entladung (ESD). Handhaben Sie interne Komponenten unter Einhaltung geeigneter antistatischer Verfahren.

CAUTION Use a input power cable at least 0.75 mm² (18 AWG) and no longer than 2 meters. 13 AWG is recommended.

MISE EN GARDE Utilisez un câble d'alimentation d'au moins 0,75 mm² (18 AWG) et d'une longueur maximale de 2 mètres. Un câble de 13 AWG est recommandé.

VORSICHT Verwenden Sie ein Netzkabel mit mindestens 0,75 mm² (18 AWG) Querschnitt und einer maximalen Länge von 2 Metern. 13 AWG wird empfohlen.

CAUTION The cables are sensitive parts and therefore, you should be careful not to damage them through excessive bending or pulling. Avoid any mechanical shocks to the device to guarantee accurate performance and protection.

MISE EN GARDE La sonde et ses câbles sont des pièces sensibles et vous devez donc faire attention à ne pas les endommager en les pliant ou en les tirant excessivement. Évitez tout choc mécanique sur la sonde pour garantir des performances et une protection précises.

VORSICHT Die Sonde und ihre Kabel sind empfindliche Teile und daher sollten Sie darauf achten, sie nicht durch übermäßiges Biegen oder Ziehen zu beschädigen. Vermeiden Sie mechanische Stöße auf die Sonde, um eine genaue Leistung und Schutz zu gewährleisten.

IEC Measurement Category & Pollution Degree Definitions

Measurement Category (CAT) - classification of testing and measuring circuits according to the types of mains circuits to which they are intended to be connected.

Measurement Category *other than* II, III, or IV: circuits that are not directly connected to the mains supply.

Measurement Category II (CAT II): test and measuring circuits connected directly to utilization points (socket outlets and similar prints) of the low-voltage mains installation.

Measurement Category III (CAT III): test and measuring circuits connected to the distribution part of a building's low-voltage mains installation.

Measurement Category IV (CAT IV): test and measuring circuits connected at the source of the building's low-voltage mains installation.

Mains Isolated: is for measurements performed on circuits not directly connected to a mains supply.

Pollution - addition of foreign matter, solid, liquid, or gaseous (ionized gases) that may produce a reduction of dielectric strength or surface resistivity.

Pollution Degree 2 (P2) - only non-conductive pollution occurs except that occasionally a temporary conductivity caused by condensation is expected.

Introduction

Overview

Cal Test Electronics introduces the Global Specialties 1403A, 1405A, and 1407 100W triple output switching mode DC power supplies designed for accuracy, compactness, and portability. Equipped with rotary encoder knobs for precise voltage and current adjustment with a 4-digit LCD for clear readout. They operate in both constant voltage (CV) and constant current (CC) modes, with automatic crossover based on load conditions. Each model is passively cooled for quiet operation and suited for benchtop or embedded applications.

All three outputs—one variable and two fixed—are fully isolated, allowing flexible configurations for a wide range of test and development scenarios. The main output is adjustable (up to 20V, 36V, or 60V depending on the model), while auxiliary outputs provide fixed 3.3/5VDC and 12VDC. Isolation enables series or parallel connections for generating bipolar, stacked, or higher voltage rails, making these supplies ideal for troubleshooting multi-voltage circuit boards or devices requiring dual supplies. Output polarity is user-configurable across terminals.

The series now supports Windows 11 and includes a USB Type-B interface for remote control and monitoring. Users can operate the power supply through PC control software with graphical interface or via custom automation using standard SCPI command sets. This feature enhances usability in automated test setups or when precise programmable control is needed from a host PC. The LCD panel confirms USB connection status for clear remote operation feedback.

Designed with robust protection features, the power supplies include overvoltage, overcurrent, short-circuit, and overtemperature safeguards. Compliance with CE safety and EMC standards ensures suitability for lab, production, and educational environments. With passive power factor correction and high efficiency (>80%), the 1400 series delivers clean, reliable power in a compact chassis.

Figure 1 Product Image

Key Features

Table 1 Key Features

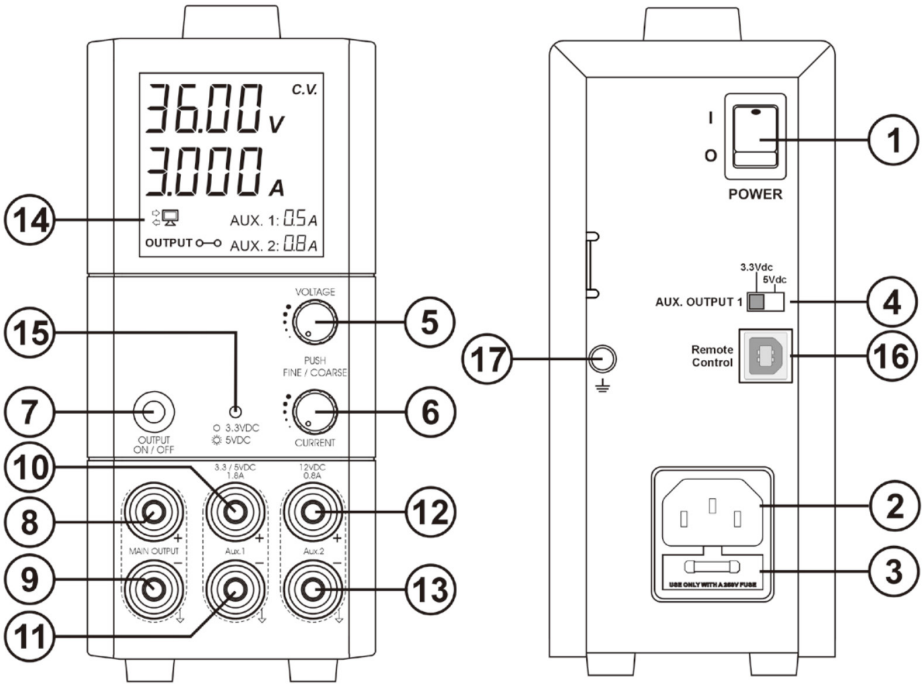
Features	Description
1 Variable & 2 Fixed Isolated Outputs	Features one adjustable main output (up to 20V, 36V, or 60V depending on model) and two fixed outputs (3.3/5VDC and 12VDC), all fully isolated for flexible configurations.
Precision Display & Controls	4-digit display, rotary encoder for fine adjustments, and front-panel Output On/Off button.
PC Control Software for Automated Testing	Downloadable PC control software featuring graphical user interface (GUI). This allows for remote operation, real-time monitoring, automated test sequences, and data logging.
USB Remote Programmability	USB interface with PC support, SCPI command sets, and LabVIEW driver for custom automation.

Supplied Accessories

Table 2 Accessories

Accessory		Model No.	Quantity
Power Cord		-	1
Alligator Clip to Right Angle Sheathed Banana Plugs		-	1

Controls & Indicators



1. **Power Switch**
   Turns the power supply on/off. When powered on, the front display lights up

2. **AC Input Socket with Fuse**

3. **Concealed Fuse Box**
   Pry open the cover to access the fuse.

4. **3.3V/5VDC Selection Switch**
   For Aux Output 1.

5. **Output Voltage Tuning Knob**
   Quick push toggles between coarse and fine tuning.

6. **Output Current Tuning Knob**
   Quick push toggles between coarse and fine tuning.

7. **Output On/Off Push Button**
   • **For Main output:** quick push to toggle ON/OFF
   • **For Main** + **Aux outpu ts:** push and hold 3 seconds to turn all outputs OFF; quick push to turn back ON
   • **Default:** Main output is OFF at startup. To set ON at startup, hold this button while powering on. Repeat to revert.

8. **Main Output Terminal Positive (+)**
   Red color.

9. **Main Output Terminal Negative (–)**
   Black color.

10. **Aux Output 1 Terminal Positive (+)**
    Red color. 3.3VDC or 5VDC selectable.

11. **Aux Output 1 Terminal Negative (–)**
    Black color. 3.3VDC or 5VDC selectable.

12. **Aux Output 2 Terminal Positive (+)**
    Red color. Fixed 12VDC.

13. **Aux Output 2 Terminal Negative (–)**
    Black color. Fixed 12VDC.

14. **LCD Display Panel Shows**
    - 4-digit voltmeter and ammeter
    - CV (constant voltage) / CC (constant current) mode
    - Output terminal ON/OFF status
    - 2-digit Aux output ammeter
    - USB remote control status

15. **Aux 1 Output Voltage Indicator**
    ON: 5VDC, OFF: 3.3VDC

16. **USB Remote Control**

17. **Ground Terminal**

Operating the Power Supply

Operating Environment

- 10-80% R.H.
- Maximum relative humidity 80% for temperature up to 31°C decreasing linearly to 50% relative humidity at 40°C.
- Altitude up to 2000 m
- Installation category: CAT II
- Pollution degree: 2
- Mains supply voltage fluctuation up to ±10% of the normal voltage

Basic Mode of Operation

This power supply is designed to operate as a constant voltage source or as a constant current source. Automatic crossover between CV and CC modes of operation occurs when the load condition changes as following:

Constant Voltage (CV), Automatic crossover & Constant Current (CC)

The power supply operates in constant voltage (CV) mode as long as the load current remains below the preset current limit. If the load current reaches or exceeds the current limit, the supply automatically switches to constant current (CC) mode—the output voltage decreases, and “CC” is displayed on the LCD. Once the load current falls back below the limit, the supply returns to CV mode.

Setting Output Voltage and Current Limit (CC)

Turn the voltage or current knob to set your desired value. Press the knob briefly to shift the decimal point for faster tuning. Adjust the setting when the desired digit is flashing; if not, press the knob again to move the cursor. Press the current knob once to view the preset current limit.

Aux. output 1 voltage selection

Use switch (4) on the back of the power supply to select between 3.3 VDC and 5 VDC for Aux Output 1. When set to 3.3 VDC, indicator (15) is off; when set to 5 VDC, indicator (15) is on.

Connection and Operation Procedure

1. Check the rating label and plug in to AC mains.
2. Switch on the power supply and the LCD display should be on at the same time.
3. The (CV) icon should be shown on the display.
4. Turn the current volume knob (6) to maximum clockwise if you do not require lower Current limiting value, otherwise do the preset the (CC) limiting procedure.
5. Set your desired output voltage and then turn off the output terminal by push button (7).
6. Connect to your load positive to positive and negative to negative.
7. Turn on the output terminal again and check if display shows (CV).
8. If display shows (CC), either your preset current limiting value is too low or your load requires more voltage and current. You need to reassess the voltage and current requirement of your load and increase the voltage or current accordingly until (CV) appears.

Connecting the 3 outputs

(using 1405A, 0.8-36V, 0.1-3A as an example)

All the three outputs are fully isolated from ground and with each other so that it is possible to make cross connections to power a circuit board or device that requires for example: +3 or +5V, +12 V or -12V and 1-36V as shown in Fig.1.

The variable main output is set for 12V and it is assigned as the +12V source (available maximum current 3A)
Note the variable main output can be set for other voltage (0.8-36V) such as 16V.

The fixed 12V is made as the - 12V source.
The fixed 5V is made as the +5V source.

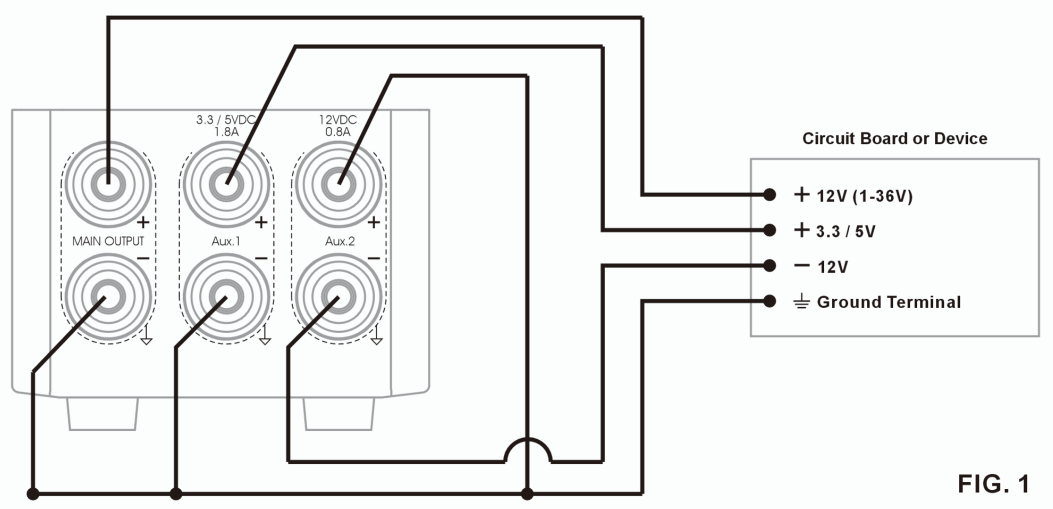


FIG. 1

Connecting outputs in series

(using 1405A, 0.8-36V, 0.1-3A as an example)

You can achieve a fixed 17 V output by connecting the 5 V and 12 V outputs in series.

The 2 outputs (Aux.1) can be connected in series to make a variable 5V to 41V with current 1.8A (Fig. 2)
The 3 outputs can be connected in series to make a variable 17V to 53V with current 0.8A, (Fig. 3)
There are other combination of cross connections for different positive and negative output voltages.

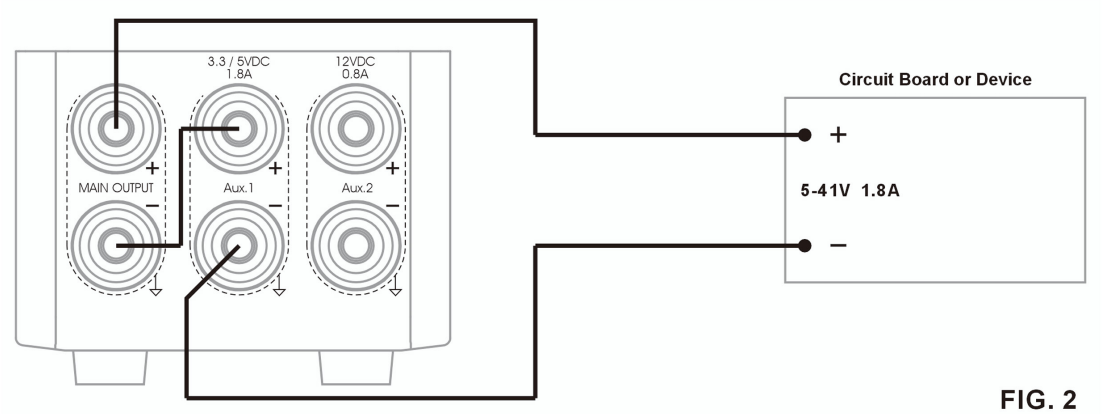


FIG. 2

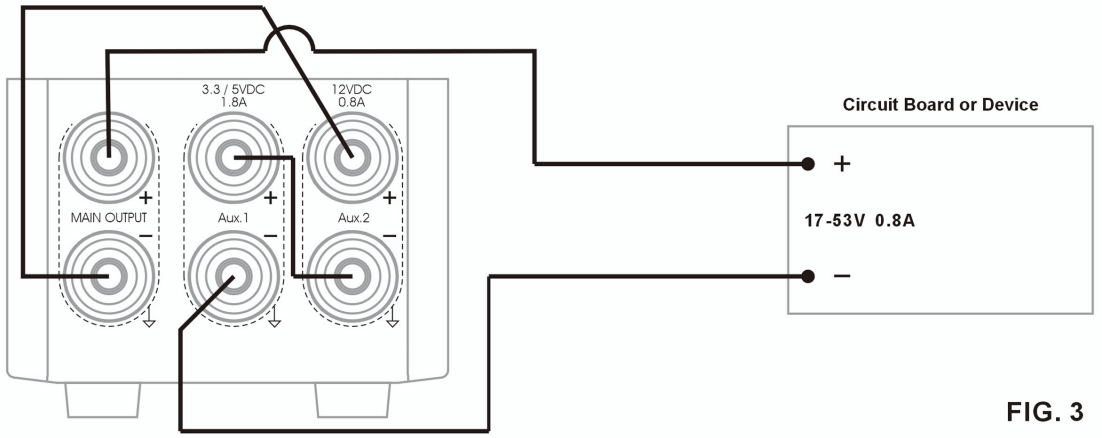


FIG. 3

Specifications & Characteristics

Warm up the device for 20 minutes prior to testing. Specifications are valid after temperature stabilization at 25 °C ± 5 °C. All specifications based on 115 VAC, 60 Hz.

NOTE All entries included in the following tables are characteristics unless otherwise stated.

REMARQUE Toutes les entrées incluses dans les tableaux suivants sont des caractéristiques, sauf indication contraire.

NOTIZ Alle in den folgenden Tabellen enthaltenen Einträge sind Merkmale, sofern nicht anders angegeben.

Table 3 Safety Specifications

Parameter	Condition
IEC/EN 62368-1:2023	Measurement Category II
Approval	CE

Table 4 Electrical Specifications (Not Warranted)

Parameter	1403A	1405A	1407
Input Voltage	110 - 120 VAC, 50 / 60Hz (or on request)		
Full Load Input Current at 115 VAC	1.9 A	2.1 A	1.9 A
Output Voltage Adjustable Range	0.8 - 20 VDC	0.8 – 36 VDC	0.8 - 60 VDC
Output Current Adjustable Range	0.1 - 5 A	0.1 - 3 A	0.1 - 3 A
Voltage Regulation:			
Load from 10% to 90% Variation	≤60 mV	≤50 mV	≤40 mV
Line from 98 to 132 VAC Variation	≤10 mV		
Ripple & Noise (peak to peak)	≤100 mV	≤100 mV	≤120 mV
Current Regulation:			
Load from 10% to 90% Variation	≤30 mA		
Line from 98 to 132 VAC Variation	≤10 mA		
Ripple & Noise (peak to peak)	≤30 mA		
Switching Operation Frequency	50 KHz to 150 KHz		
Aux output 1	Fixed 3.3 /5 VDC. 1.8 A cont. 2 A Max		
Aux output 2	Fixed 12 VDC, 800 mA cont. 1 A Max		
Efficiency (Optimum)	≥80%	≥79%	≥80%
Volt and Amp Control Type	Rotary Encoder		
Voltmeter and Ammeter Display	4 Digit LCD		
Voltmeter Accuracy (Main Output)	5 counts for range V<5 V (±0.1% +5 counts for range V≥5 V)		

Ammeter Accuracy (Main Output)	8 counts for range I≤1 A (±0.2% +6 counts for range I>1 A)
Ammeter Accuracy (Aux. Output 1 & 2)	±0.2 A
LCD Indication	CC, CV, Amp, Volt, Output ON-OFF, Aux output current, USB remote control
Protection	Short Circuit, Overload, Over Temperature, Tracking OVP
Command Set	SCPI
Communication Type	USB (Bundled, Type B)

Table 5 Mechanical Specifications

Parameter	Characteristic
Dimension (L x W x H)	265 mm (L) x 71 mm (W) x 165 mm (H)
Weight	2 Kgs (4.4 Lbs)
Cooling System	Natural Convection

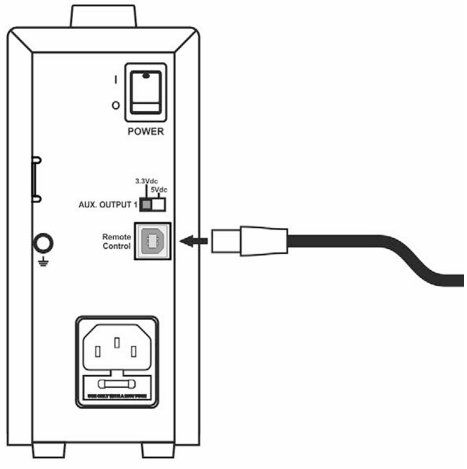
Table 6 Environmental Specifications

Parameter	Characteristic
Operating Temperature	0°C to 40°C
Storage Temperature	-30°C to 70°C
Humidity	≤ 80% RH @ 25°C to 35°C
Altitude	Operating: 2000 m Non-operating: 15000 m
Pollution Degree	P2

Specifications are subject to change without notice. To ensure the most current version of this manual, please download the current version from our website: globalspecialties.com.

PC Connection

Control the device from a Windows PC via USB. Connect using the provided USB cable (see connection diagram). Install the USB driver after connecting the device via USB. See “USB Driver Installation” on page 28.



The LCD display will confirm when the PC is connected with this indicator:

Remote Control options:

1. PC Software. See “PC Control Software Manual” on page 28
2. Custom control using SCPI commands. See “General SCPI Command list” on page 25

SCPI(Standard Commands for Programmable Instruments) defines a standard set of ASCII-based commands for controlling programmable measurement instruments. These commands provide a consistent interface across SCPI-compliant devices.

Command Set

Command & Return Value	Description	Example
Input Command: SOUT<Output>[CR] Return Value: [OK][CR]	Set Output on/off Set Output off: <Output>=0 Set Output on: <Output>=1	Input Command: SOUT0[CR] Return Value: [OK][CR] Meaning: Set Output off
Input Command: GOUT [CR] Return Value: <Output> [CR][OK][CR]	Get Output Status Output off: <Output>=0 Output on: <Output> =1	Input Command: GOUT[CR] Return Value: 0[CR][OK][CR Meaning: Output is off
Input Command: SETD<VOLTAGE><CURRENT>[CR] Return Value: [OK][CR]	SET Voltage and Current <voltage> =0000-3640 <Current> =0000-5100	Input Command: SETD05001000[CR] Return Value: [OK][CR] Meaning: Voltage 5.00V Current 1.000A
Input Command: GETD [CR] Return Value: <Voltage><;><Current><;> <CV/CC Mode><;>[CR][OK][CR]	Get display Volt & display Curr & CV/CC mode <voltage> =0-9999 <Current> =0-9999 <CV mode> =0 CV Mode <CC mode> =0 CC Mode	Input Command: GETD [CR] Return Value: 500;1000;0;[CR][OK][CR] Meaning: The Display value is 5.00V and 1.000A It is CV mode
Input Command: GETS [CR] Return Value: <Voltage><;><Current><;>[CR][OK][CR]	Get Setting Volt & Curr <voltage> =0~3640 <current> =0~5100	Input Command: GETS[CR] Return Value: 500;1000;[CR][OK][CR] Meaning: The Memory setting voltage value is 5.00V and Current is 1.000A
Input Command: VOLT<Voltage>[CR] Return Value: [OK][CR]	Set output voltage	Input Command: VOLT 1000[CR]Return Value: [OK][CR] Meaning: Set voltage value is 10.00V
Input Command: CURR<Current>[CR] Return Value: [OK][CR]	Set output current	Input Command: CURR1000[CR] Return Value: [OK][CR] Meaning: Set Current value is 1.000A
Input Command: GMOD [CR] Return Value: <MODE>[CR][OK][CR]	Get MODE <MODE>=NTP????	Input Command: GMOD[CR] Return Value: NTP8521[CR][OK][CR] Meaning: Mode is NTP8521
Input Command: GVSH [CR] Return Value: <Voltage>[CR][OK][CR]	Get voltage set high limit <voltage>=????	Input Command: GVSH [CR] Return Value: 3700 [CR][OK][CR Meaning: voltage set high limit is 37.00V
Input Command: GVSL [CR] Return Value: <Voltage>[CR][OK][CR]	Get voltage set low limit <voltage>=???	Input Command: GVSL [CR] Return Value: 80 [CR][OK][CR Meaning: Voltage set low limit is 0.80V
Input Command: GISH [CR] Return Value: <Current>[CR][OK][CR]	Get current set high limit <Current>=????	Input Command: GISH [CR] Return Value: 5200 [CR][OK][CR] Meaning: Current set high limit is 5.200A
Input Command: GISL [CR] Return Value: <Current>[CR][OK][CR]	Get current set high limit <Current>=????	Input Command: GISL [CR] Return Value: 100 [CR][OK][CR] Meaning: Current set low limit is 0.100A
Input Command: GMAX [CR] Return Value: <Voltage><;><Current><;>[CR][OK][CR]	Get voltage set high limit & current set high limit <voltage> =???? <current> =????	Input Command: GMAX [CR] Return Value: 3700;3100;[CR][OK][CR] Meaning: Voltage set high limit is 37.00V & Current set high limit is 3.100A
Input Command: GMIN [CR] Return Value: <Voltage><;><Current><;>[CR][OK][CR]	Get voltage set low limit & current set low limit <voltage> =??? <current> =???	Input Command: GMIN [CR] Return Value: 80;100;[CR][OK][CR] Meaning: Voltage set low limit is 0.80V & Current set low limit is 0.100A

General SCPI Command list

Basic SCPI Syntax Rules :

Command syntax	Each SCPI command is defined with an uppercase portion and a lowercase portion. The uppercase portion is mandatory, and the lowercase portion is optional. Example: VOLTage? is the same as VOLT? SCPI commands are not case-sensitive. This means VOLTage?, VOLTAGE?, and voltage? are all interpreted the same during communication.
Square bracket [ ]	- Indicate that the command inside the brackets is optional. Example: VOLTage[:LEVel]? can be written as VOLTage? (the [:LEVel] portion is skipped).
Angle bracket < >	- Indicate a required parameter for the command. Example: VOLTage <value> means the VOLTage command must be followed by a value. Example: VOLTage 5V

Command shortening – Optional keywords can be omitted if unambiguous.
Example: VOLTage[:LEVel][:IMMediate][:AMPLitude]? can be written simply as VOLT?
Note – For power supplies, each command must end with a newline character \n.
Example: VOLT?\n

1. Set and read output Voltage

VOLTage[:LEVel][:IMMediate][:AMPLitude] <value>
Description: Set output voltage (Unit: V or mV)
Return Value: none
Example: “VOLT 1.00V”
means set output voltage to 1.00V

VOLTage[:LEVel][:IMMediate][:AMPLitude]?
Description: Read output voltage setting
Return Value: set value of out voltage in Volt.
Example: “VOLT?”
return “1.00V”
means the output voltage is set to 1.00V

2. Set and read output Current

CURRent[:LEVel][:IMMediate][:AMPLitude] <value>
Description: Set output current limit. (Unit: A or mA)
Return Value: none
Example: “CURR 1.000A”
means set output current limit to 1.000A

CURRent[:LEVel][:IMMediate][:AMPLitude]?
Description: Read output current limit setting
Return Value: set value of out current limit in Amp.
Example: “CURR?”
return 1.000A”
means the output current limit is set to 1.000A

3. Read output voltage range

VOLTage:RANGe?
Description: Read the output voltage range
Return Value: value of output voltage range.
Example: “VOLT:RANG?”
return “0.80V,21.00V”
means the output voltage range is 0.80V-21.00V.

4. Read output current range

CURRent:RANGe?
Description: Read the output current range.
Return Value: value of output current range.
Example: “CURR:RANG?”
return “0.100A,5.200A”
means the output current range is 0.100A-5.200A

5. Read actual output voltage

MEASure[:SCALar]:VOLTage[:DC]?
Description: Read the actual output voltage.
Return Value: actual value of output voltage in Volt.
Example: “MEAS:VOLT?”
return “5.00V”
means the actual output voltage is 5.00V

6. Read actual output current

MEASure[:SCALar]:CURRent[:DC]?
Description: Read the actual output current.
Return Value: actual value of output current in Amp.
Example: “MEAS:CURR?”
return “1.000A”
means the actual output current is 1.000A

7. Read actual output power

MEASure[:SCALar]:POWer[:DC]?
Description: Read the actual output power
Return Value: actual value of output power in Watt
Example: “MEAS:POW?”
return “20.00W”
means the actual output power is 20.00W

8. Set and read output ON/OFF status

OUTPut[:STATe] <bool>
Description: Set output ON/OFF. <bool> = 0|1
Return Value: none
Example: “OUTP 0”
means set output is OFF

OUTPut[:STATe]?
Description: Read output ON/OFF status
Return Value: return 0|1
Example: “OUTP ?”
return “0”
means the output is OFF

9. Read SCPI version and Serial number

SYSTem:VERSion?
Description: Read SCPI version
Return Value: “YYYY.V”, YYYY is year, V is version.
Example: “SYST:VER?”
return “1999.0”
means year 1999, version 0

SYSTem:SN?
Description: Read Serial Number
Return Value: Serial number of power supply
Example: “SYST:SN?”
return “2015091813”

10. Read identity of power supply

***IDN?**
Description: Read identity of power supply
Return Value: “Manufacturer Name, Model, S/N, Software Version”
Example: “*IDN?”
return “Global Specialties, 1405A, XXXXXXXXXX, 1.0”

11. Set power supply to remote mode

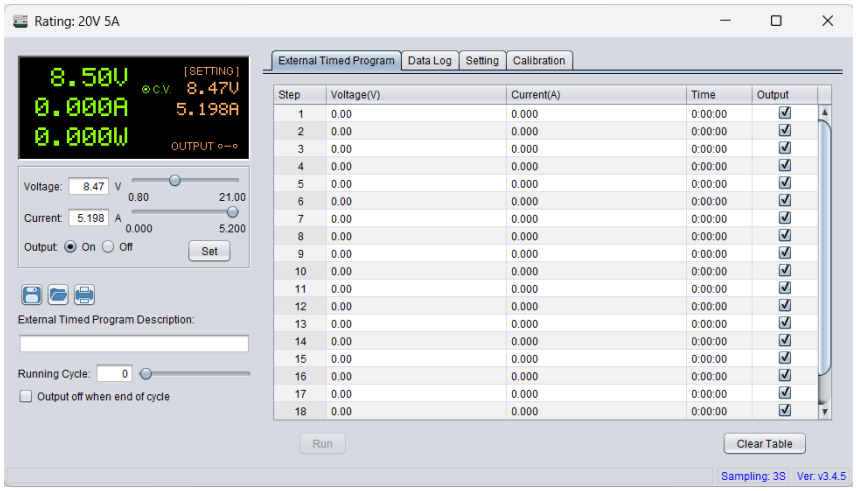
SYSTem:REMote
Description: Set power supply to remote mode. Power supply indicates locked.
Return Value: none
Example: “SYST:REM”
means set power supply to remote mode. The button and knobs are locked.

12. Set power supply to local mode

SYSTem:LOCal
Description: Set power supply to local mode. Power supply indicates unlocked.
Return Value: none
Example: “SYST:LOC”
means set power supply to local mode. The button and knobs are unlocked.

PC Control Software Manual

The device supports PC Software with a user interface for remote control over USB connectivity.



Support Power Supply Models

1403A, 1405A, 1407

Supported Operating Systems

Windows 7, Windows 10, Windows 11

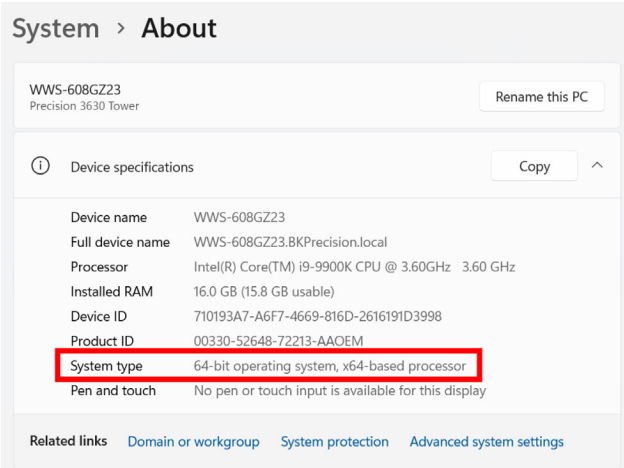
USB Driver Installation

For the device to function, the USB driver must installed before the power supply can be connected to PC through USB connection.

Download the USB driver from www.globalspecialties.com/product/1405A. Extract the WindowsUSBDriver.zip file.

For 32-bit Windows USB Driver: run “CP210xVCPInstaller_x86.exe”
For 64-bit Windows USB Driver: run “CP210xVCPInstaller_x64.exe”

The bit version of Windows can be found in System Properties.

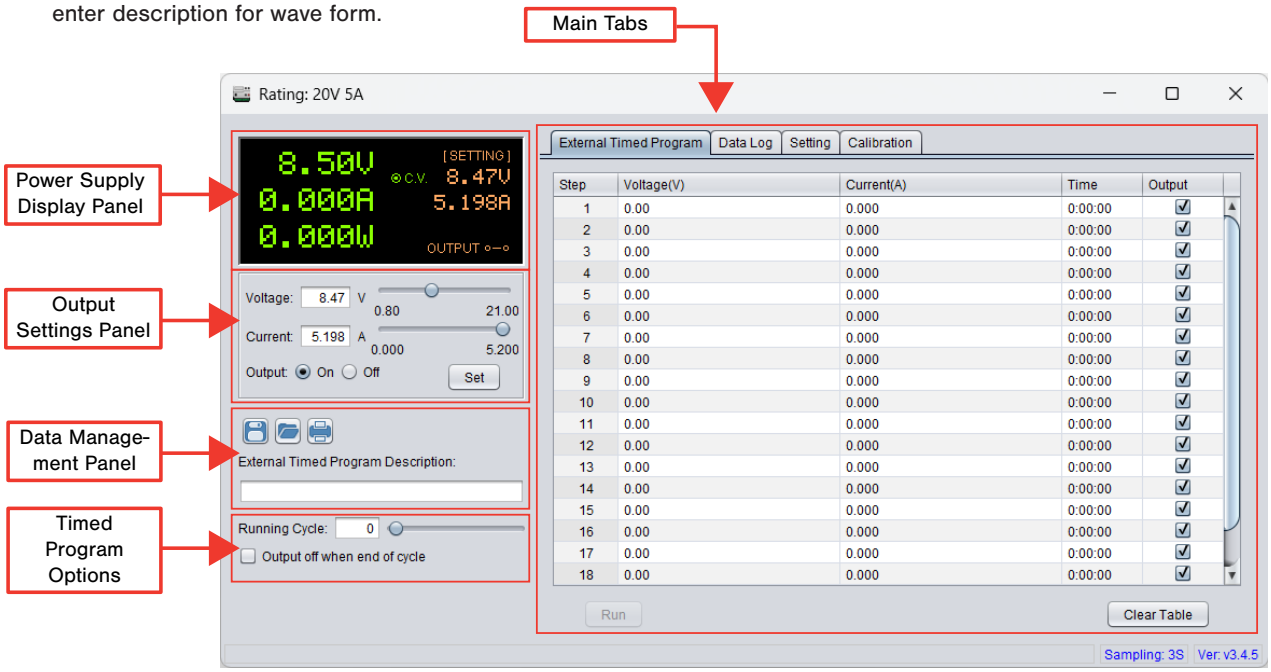


PC Software Setup

Install the USB driver before installing the PC software. Download the PC Software from the product page on our website: www.globalspecialties.com/product/1405A. The same software can be used for all three models. Extract the the zip folder. Open the folder and run the “pscs.bat” file to launch the application.

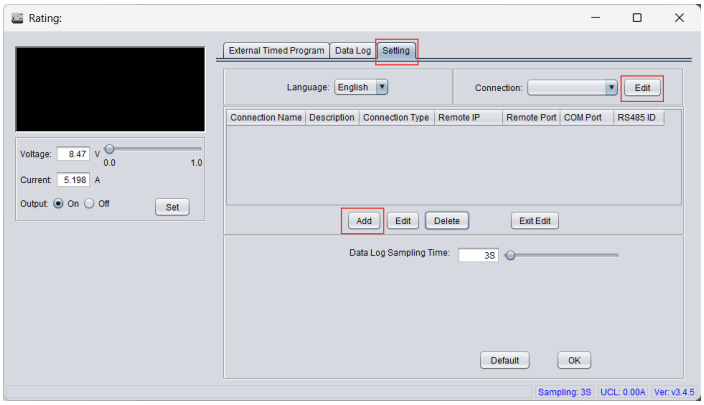
PC Software Overview

1. **Main Tabs** - tabs to setup timed program, display data log, change connection settings, and calibrate the power supply.
2. **Power Supply Display Panel** – use to display real-time information of connected power supply.
3. **Setting Panel** – use to set voltage value, current value and output On/Off.
4. **Data Management Panel** – save, load, export, or print measurement data or program settings. Textbox is used to enter description for wave form.

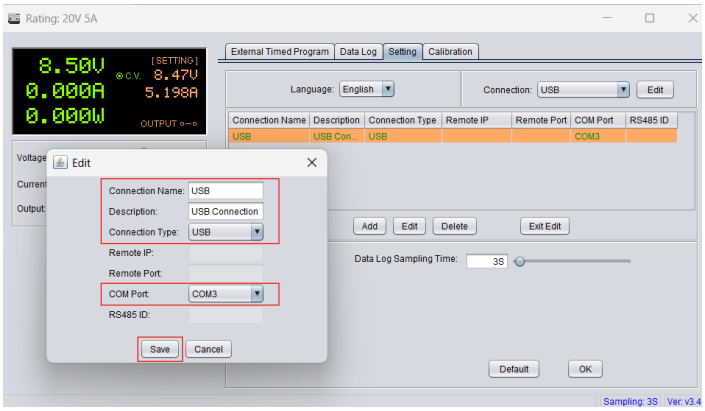


Connect to Power Supply

The **Main Display Panel** will be blank and the **Data Log** tab inactive until you connect the power supply.



1. Click the **Settings** tab.
2. Next to **Connection** dropdown click **Edit**.
3. Click **Add**.
4. Enter the Connection information:

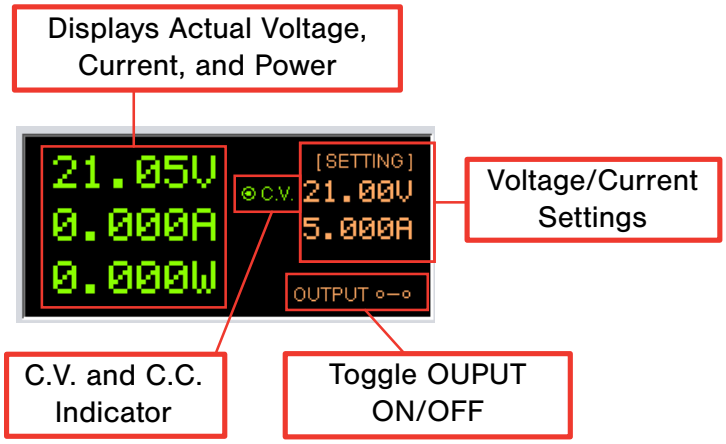


   a. **Connection Name:** USB
   b. **Description:** USB Connection
   c. **Connection Type:** USB
   d. **COM Port:** Select the USB COM port (typically COM3).
5. Click **Save**.

If successful, the power supply is now connected to the computer and the Power Supply Display Panel and Data Log tab activates and shows the current values.

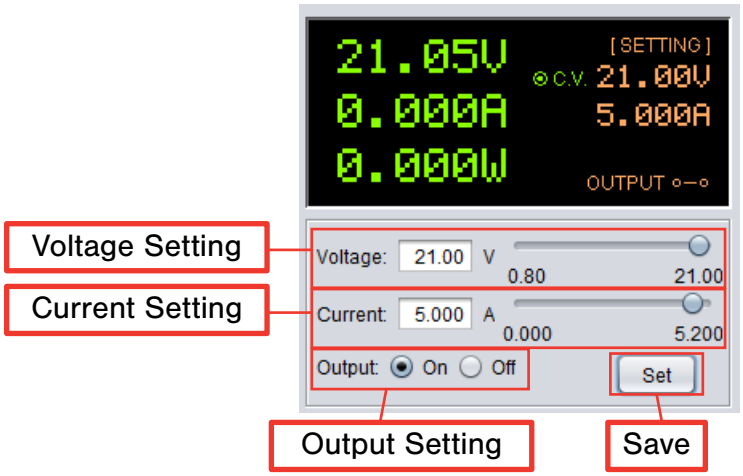
Power Supply Display Panel

Shows the following information: Output Voltage, Output Current, Output Power, Output Status On/Off, C.V./C.C. Mode, and Voltage/Current Settings.



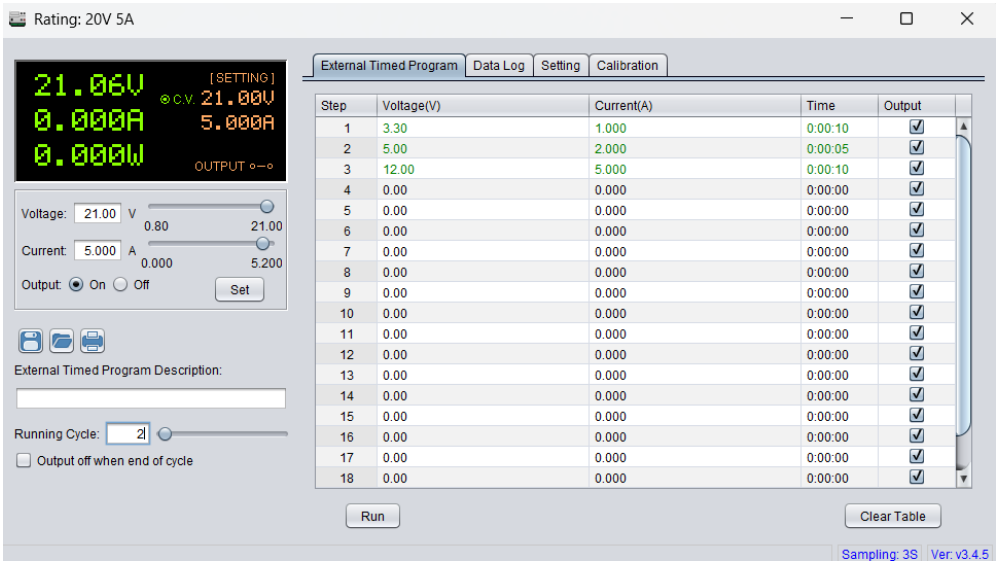
Output Settings Panel

Use the voltage/current sliders or enter values directly in the input fields. After adjusting, click Set to apply the settings.



External Timed Program

The External Timed Program tab supports up to 20 user-defined steps, each with Voltage, Current, Run Time, and Output ON/OFF. The PC fully controls timing and step transitions. You can also enter a description, which is saved with the program in a CSV file.



How to Set Up:

- Double-click a cell to edit.
- Adjust values with the slider or by typing. Voltage and Current use sliders only; use arrow keys for fine adjustments.
- Set run time (0-9h:59m:59s). A time 0 skips the step. Change the value by typing then press **ENTER** to set the value or double click the seconds, minutes, or hours parameters and then use the arrows.
- Choose cycles (0-999). Entering 0 runs continously.
- Click **Run** to begin,
- Click **Stop** to halt the program.
- Click **Clear Table** to reset settings back to default.

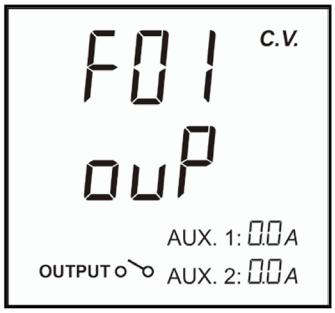
Calibration

1. Open the **Calibration** tab.
2. Click **Enter Password** and enter the password (**password** by default).
3. Click **Start Calibration**.
4. The system will show a voltage setting.v
5. Measure the actual output with a multimeter.
6. Enter the measured value.
7. After voltage, the system will show a current setting.
8. Measure the output current with a multimeter.
9. Enter the measured value.
10. Calibration is complete after both steps.

Fault Codes

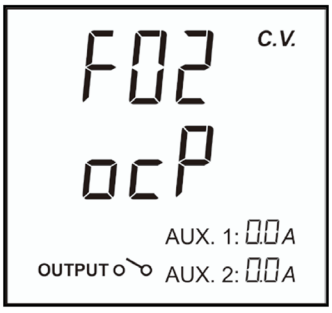
Fault Code F01: Tracking Overvoltage Protection

Protects the load in case of output voltage control failure. Limits output to 110% of the set voltage (minimum 1.7V). When triggered, output is disabled and the ouP warning displays.



Fault Code F02: Overcurrent Safeguard

Backup protection if constant current (CC) mode fails. Prevents damage to the DUT or load. If ocP warning appears, immediately power off the unit.



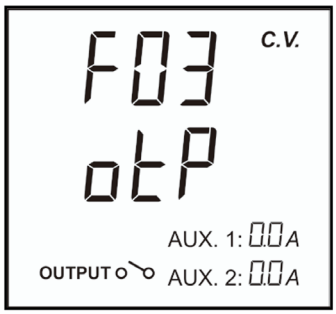
To reset:

1. Power off the unit.
2. Remove the load.
3. Power on and recheck operation.

If the warning persists, contact technical support.

Fault Code F03: Overtemperature Protection

Triggered by excessive internal temperature. Check load conditions, output settings, and ensure proper ventilation with adequate clearance. Allow 30 minutes for cooldown before restarting.
If the condition persists, contact technical support.



Cleaning

Clean only the exterior device and cables. Use a soft cotton cloth light moistened with a mild solution of detergent and water. Do not allow any portion of the device to be submerged at any time.

WARNING Dry the device thoroughly before attempting to make voltage measurements.

AVERTISSEMENT Séchez soigneusement l'appareil avant de tenter d'effectuer des mesures de tension..

WARNUNG Trocknen Sie das Gerät gründlich ab, bevor Sie versuchen, Spannungsmessungen durchzuführen.

CAUTION Do not subject the device to solvents or solvent fumes as these can cause deterioration of the device and cables.

MISE EN GARDE Ne soumettez pas la sonde à des solvants ou à des vapeurs de solvants car ceux-ci peuvent entraîner une détérioration du corps de la sonde et des câbles.

VORSICHT Setzen Sie die Sonde keinen Lösungsmitteln oder Lösungsmitteldämpfen aus, da diese zu einer Beschädigung des Sondengehäuses und der Kabel führen können.

China RoHS 2

Hazardous Substances Disclosure Table

China RoHS 2 refers to the Ministry of Industry and Information Technology Order No. 32, effective July 1, 2015, titled Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products. To comply with China RoHS 2, we determined this product's Environmental Protection Use Period (EPUP) to be 25 years in accordance with the Marking for the Restricted Use of Hazardous Substances in Electronic and Electrical Products, SJT 11364.

中國 RoHS 2 指工業和信息化部令第 32 號，自 2015 年 7 月 1 日起生效，題為《電氣電子產品有害物質限制使用管理辦法》。為符合中國 RoHS 2，我們根據電子電氣產品有害物質限制使用標誌 SJT 11364 將本產品的環保使用期限 (EPUP) 確定為 25 年。

Part Name 零件名稱	Hazardous Substance 有害物質					
	Lead (Pb) 鉛	Mercury (Hg) 汞	Cadmium (Cd) 鎘	Hexavalent Chromium (Cr (VI)) 六價鉻	Polybrominated biphenyls (PBB) 多溴聯苯	Polybrominated diphenyl ethers (PBDE) 多溴二苯醚
Printed Circuit Board Assemblies 印刷電路板組件	X	O	O	O	O	O
Electrical Components 電氣元件	X	O	O	O	O	O
Metal Components 金屬部件	X	O	O	O	O	O
Plastic Components 塑料部件	O	O	O	O	O	O

This table is made per guidance of SJ/T 11364.
該表是根據 SJ/T 11364 的指南製作的。

O: Indicates that this hazardous substance contained in all of the homogeneous materials for the part is below the limit requirement in GB/T 26572.

O: 表示該有害物質在該部件的所有均質材料中的含量低於 GB/T 26572 中的限量要求。

X: Indicates that this hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in GB/T 26572.

X: 表示該有害物質在用於該部件的至少一種均質材料中的含量高於 GB/T 26572 中的限量要求。

Electronic Format Only

Manual Part Number: 451-181-001

Revision: A

Cal Test
ELECTRONICS