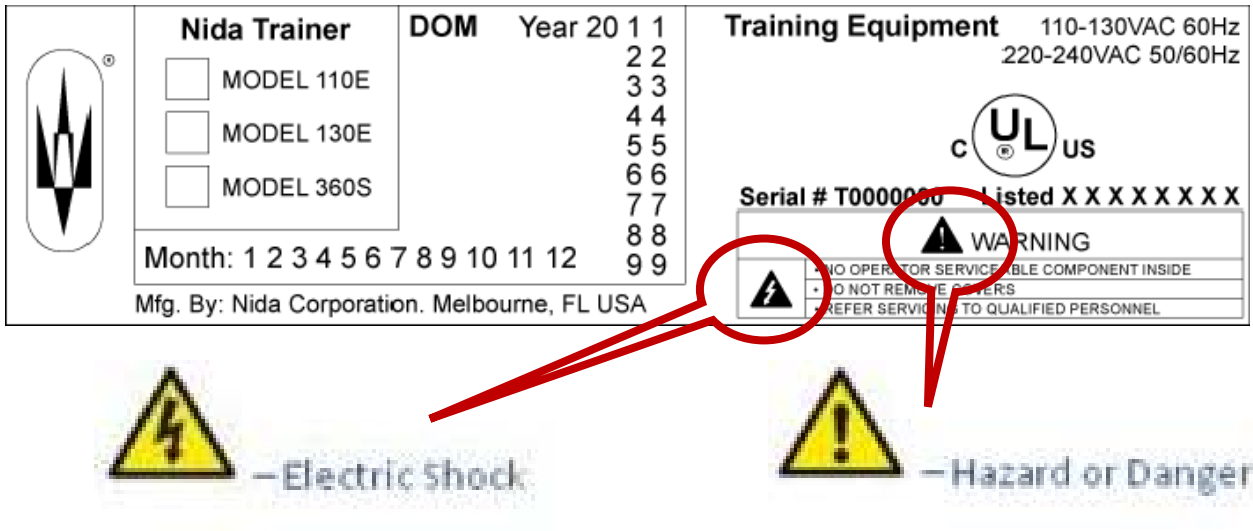
Nida Corporation

Model 130E Trainer

User's Guide

PRELIMINARIES



Only

qualified service personnel

are authorized to work on the

Nida Model 130E Trainer.

The electrical protection in this equipment will be impaired if used in a manner not specified by the manufacturer.

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INTRODUCTION

Congratulations on your selection of the ***Nida Model 130E Trainer***. We are certain that you will be satisfied with your purchase of one of the finest electronics training platforms on the market. Whether you are using a single trainer or are setting up a classroom of trainers, your satisfaction and success is important to us.

Nida Corporation has been in the technical training market for over 40 years and our products are considered top-quality. We are so committed to product quality and reliability that we offer a 5-year warranty on your new trainer. If you are a first-time purchaser of a Nida Corporation product, welcome to the family. We believe you will find that our commitment to your program success is an integral part of our business model. You will become part of the Nida Family of Users. If this is not your first purchase of a Nida product, you already know how important your student success is to our team.

We want to ensure that you and your students get the best results from the trainer and are comfortable with operating it safely. This manual contains all the information you need to safely set up, operate, and maintain your trainer. Please read this user's guide thoroughly before setting up your Nida lab for the first time and refer back to it if you need any information about the trainer.

As you read through the user's guide, be aware of these special types of information:

WARNING

This information is intended to alert you
to important safety information
that will protect you and your students from harm.

CAUTION

This information is intended to help you avoid damaging the trainer, other property, or the environment.

NOTE

This information provides reminders or additional explanation of a topic.

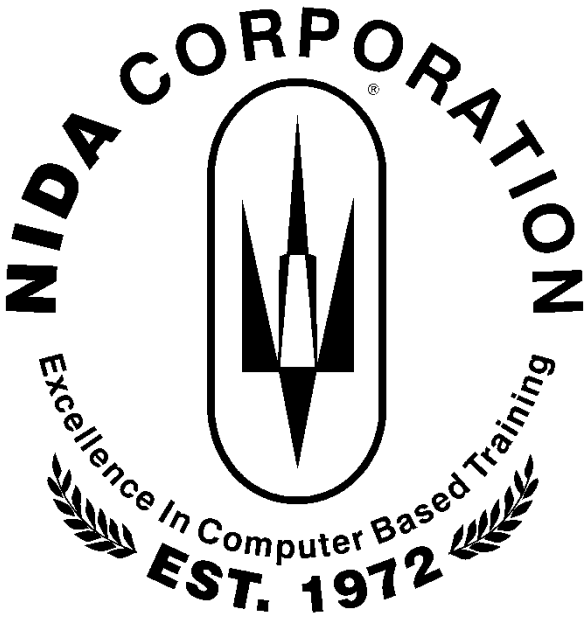
All WARNING and CAUTION information should be passed on to your students prior to their use of the Model 130E Trainer.

We recommend that you also read the Nida Corporation Warranty Sheet that came with your purchase. The warranty information will help you understand its coverage and your responsibilities of ownership.

If you have any questions about the trainer, software, or learning content, be sure to check the help files on your DVD. You can also access information on the Nida web site at www.nida.com under the Support tab or give us a call at 1-800-327-6432.

Whether you are a first time buyer or existing customer, thanks for your purchase and let's get started!

Best Wishes
The Employee-Owners of Nida Corporation



A FEW WORDS ABOUT SAFETY

Your safety and the safety of your students are very important to us. Using the Nida trainer safely is an important responsibility.

To help you make informed decisions about safety, we have provided operating procedures and safety information in this manual and important information on labels located on the reverse side of the trainer. The information alerts you to potential hazards that can easily be avoided by following the guidelines, labels, and/or placards.

Of course, it is not practical or possible to warn you about all the hazards associated with operating or maintaining electronic training equipment. You must always use standard safety practices and good judgment when working with and around electronics equipment.

All Nida Corporation products are designed for use in normal environmental conditions. The environment must have suitable power requirements, lighting, and ventilation to meet the specifications of this trainer. (See the TECHNICAL & CONSUMER INFORMATION section). The trainer should be supported by furniture (desks, tables, or lab benches) designed to accommodate the trainers, test equipment, computers, and support material. Other uses or support can result in injury to the operator or damage to the trainer or other property. Injuries or property damage can be prevented if you follow all the instructions in this manual. The most common hazards are discussed below, along with the best way to protect yourself and others.

OPERATOR RESPONSIBILITY

- Know how to disconnect the trainer quickly in case of emergency.
- Understand the use of all trainer controls, inputs, outputs, and connections.
- Be sure that anyone who operates the trainer receives proper instruction.

ELECTRIC SHOCK HAZARDS

- The trainer is current-limited and does not produce sufficient voltages or current to pose an electric shock hazard during proper use.
- Using the trainer in wet conditions could result in a shock hazard.
- Do not connect the trainer to an electrical outlet that has not been tested for the proper voltage output.

WARNING

Do not operate the trainer if it has been
damaged, soaked, or dropped
without first consulting
Nida Corporation technical support.

BEFORE OPERATION

UNPACKING INSTRUCTIONS

a. Observe the notation THIS END UP on the shipping carton.

b. Open the top of the shipping carton and remove the power cord and USB cable.

c. With knees bent, reach down, grasp the bottom of the trainer, and remove it from the box with both hands.

d. Remove the foam packing from each side of the trainer.

NOTE

Retain the shipping carton for repacking or storage of the trainer.

e. Remove the trainer from the plastic bag.

f. Place the trainer on a suitable flat horizontal surface. Ensure that the distance between the flat surface and the trainer bottom is not less than the height of the trainer feet.

CAUTION

Failure to provide adequate bottom clearance will degrade speaker performance and interrupt the natural airflow through the trainer and power supply.

INSPECTION FOR SHIPMENT DAMAGE

a. Check all controls for visible damage.

b. Check PC receptacles to ensure that none of the PC pins are damaged, bent, or broken.

ASSEMBLY INSTRUCTIONS

The Nida Model 130E Trainer comes fully assembled. No assembly instructions are needed.

INSTALLATION INSTRUCTIONS

C A I INSTALLATION

a. Place the trainer on a flat, horizontal surface.

CAUTION

The flat surface must allow unobstructed clearance at a minimum of the height of the trainer feet to ensure proper cooling and speaker operation.

Never remove the feet from the bottom of the trainer.

Ensure the back of the trainer is at least 4 inches from any vertical surface to ensure adequate ventilation and cable management.

b. Connect the line power cord to the AC Connector And Fuse Module located on the back of trainer.

c. Connect the communications cable (if applicable) to the computer. A USB cable is provided for a USB-to-USB interface with the computer.

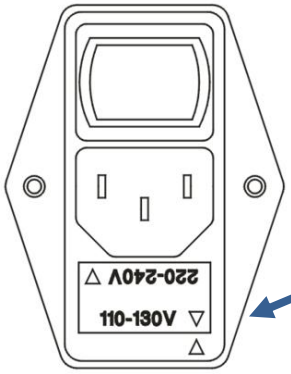
NOTE

If your computer has a serial connection only, contact Nida for a serial cable adapter.

C A I INSTALLATION, continued

d. Ensure that the trainer's MAIN POWER switch is set to the OFF position.

e. Verify that the orientation of the fuse holder matches the local voltage source, 110-130 VAC 60 Hz, or 220-240 VAC 50/60 Hz, as appropriate.



Alignment of arrows indicates voltage setting.

f. Connect the trainer line cord into an approved AC receptacle.

WARNING

Always use the line cord provided with the trainer. Proper grounding of the trainer through the line cord is essential for safe operation.

Do not modify the ground pin or receptacle in any way.

Do not utilize a two-prong power connector adapter. Ensure the trainer, line cord, and receptacle ground are secure and in proper operation.

Failure to properly ground the trainer could result in a shock hazard.

NOTE

See the disconnection instructions in the PREPARATION FOR SHIPPING section of this manual for details on uninstalling the trainer.

C M I INSTALLATION

a. Place the trainer on a flat, horizontal surface.

CAUTION

The flat surface must allow unobstructed clearance at a minimum of the height of the trainer feet to ensure proper cooling and speaker operation.

Never remove the feet from the bottom of the trainer.

Ensure the back of the trainer is at least 4 inches from any vertical surface to ensure adequate ventilation and cable management.

b. Connect the line power cord to the AC Connector and Fuse Module located on the back of the trainer.

c. Connect one RJ11 cable to one of the CMI ports. This cable will be from the CMI amplifier if the trainer is the first in a row of trainers or from another trainer in the network. The CMI amplifier is connected to the serial output of the controlling computer. Connect a second RJ11 cable to one of the CMI ports. This cable goes to the next trainer in the network. If this is the last trainer in the network, no cable or termination device is required in the second CMI port.

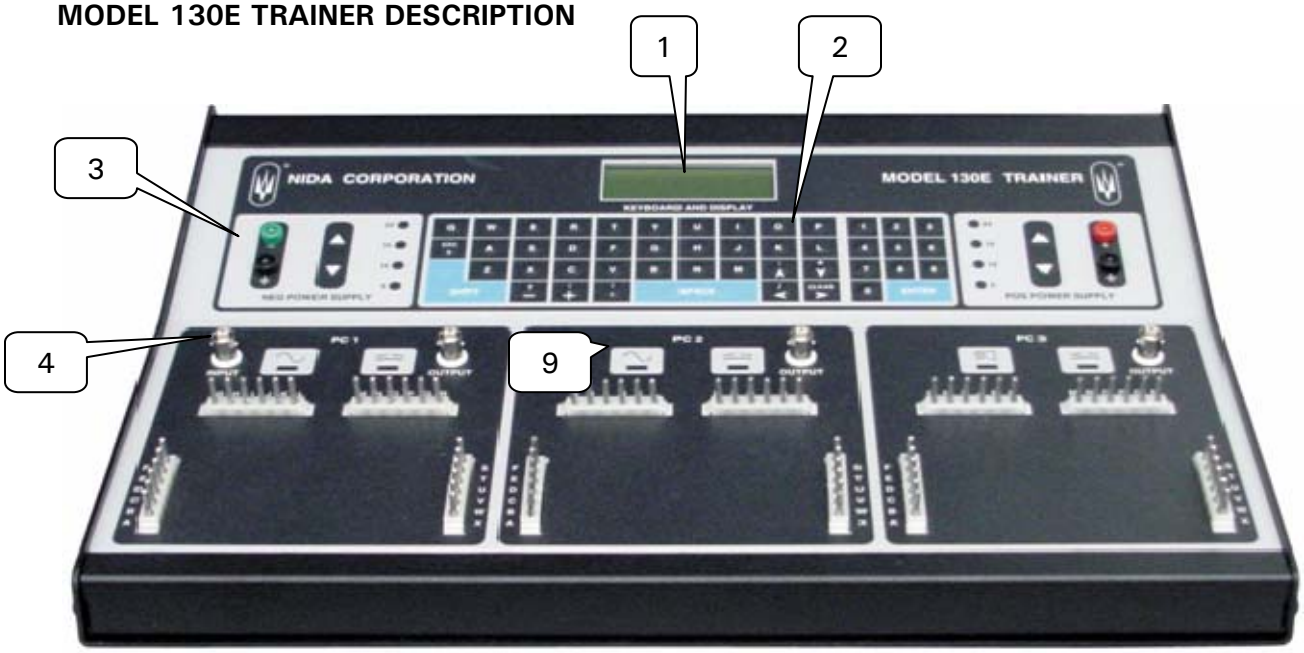
NOTE

The CMI ports are universal and are not designated as an input or output.

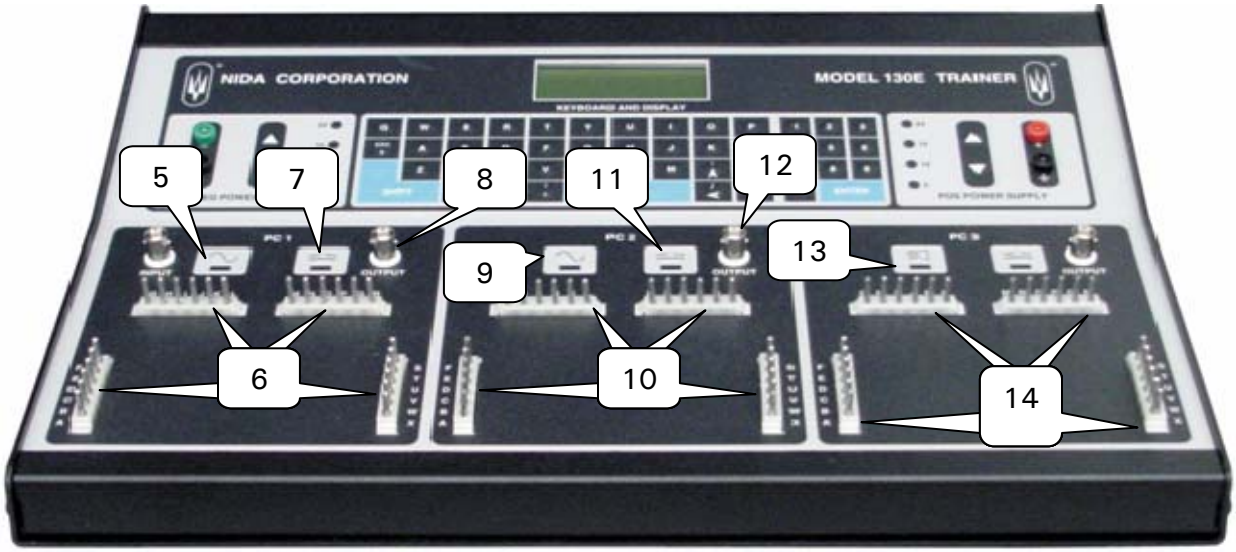
CONTROLS & FEATURES

The Model 130E 3-PositionTrainer is an electronic platform that provides a prewired AC/DC power supply system, an input-output system, and an in-circuit faulting system. Experiment circuits are supported by installing up to three Nida Series 130 pre-wired Experiment PC cards (optional breadboard PC card is also available) onto PC connectors located on the top of the trainer. An RJ11/RS-232 serial interface or USB interface allows operation and control of the trainer from a computer. During computer-controlled operation, the Model 130E is enhanced through the use of external Computer Assisted Instruction (CAI) programs and Computer Managed Instruction (CMI) programs.

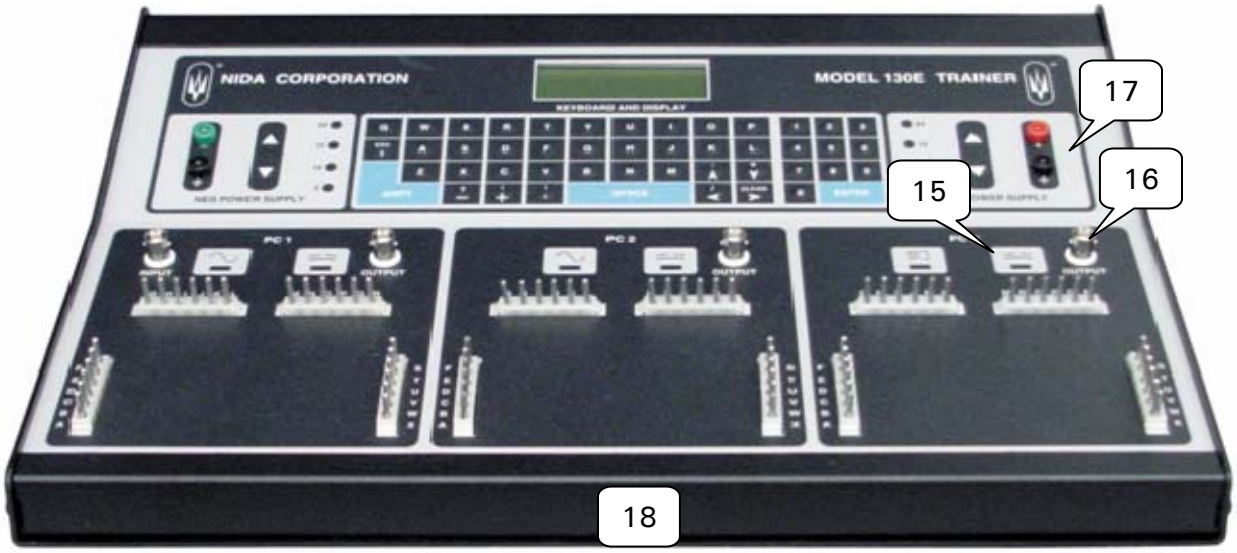
MODEL 130E TRAINER DESCRIPTION



NIDA MODEL 130E TRAINER CONTROL PANEL		
NO.	**COMPONENT**	**DESCRIPTION**
1	DISPLAY	Visual indicator of trainer status, input, or output data.
2	KEYBOARD	Human interface for entering faults, codes, or hexadecimal coded data.
3	NEGATIVE DC POWER SUPPLY SECTION	Sets the output of the negative power supply to preset levels of 0, 5, 15, and 24 DC volts. Displays the DC voltage setting. Provides connection for reading the negative DC voltage level.
4	PC1 INPUT BNC CONNECTION	Provides for the connection of an external input signal to the PC1, Pin E position.

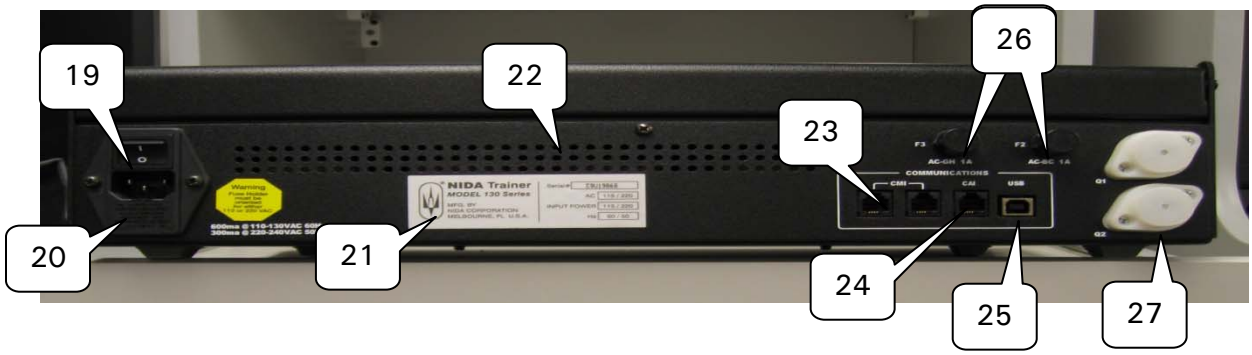


NIDA MODEL 130E TRAINER CONTROL PANEL, continued		
5	PC1 AC POWER BUTTON	Applies 14 VAC nominal voltage to PC1 Pins B, C, G, and H.
6	PC1 CONNECTORS	Provides connections to the experiment card installed in the PC1 position through 24 connector pins labeled A through X.
7	PC1 DC POWER BUTTON	Applies positive and negative DC voltage to PC 1 Pins O and N.
8	PC1 OUTPUT BNC CONNECTION	Allows connection of external equipment to monitor the output at PC1 Pin T.
9	PC2 AC POWER BUTTON	Applies 14 VAC nominal voltage to PC2 Pins B, C, G, and H.
10	PC2 CONNECTORS	Provides connections to the experiment card installed in the PC2 position through 24 connector pins labeled A through X.
11	PC2 DC POWER BUTTON	Applies positive and negative DC voltage to PC 2 Pins O and N.
12	PC2 OUTPUT BNC CONNECTION	Allows connection of external equipment to monitor the output at PC2 Pin T.
13	SPEAKER BUTTON	Connects and disconnects the speaker from PC3 Pin T. The maximum output power of the speaker is limited to 101 dB @ 600 Hz and 96 dB @ 1 kHz at a position of 1 foot from the speaker.
14	PC3 CONNECTORS	Provides connections to the experiment card installed in the PC3 position through 24 connector pins labeled A through X.



NIDA MODEL 130E TRAINER CONTROL PANEL, continued		
15	PC3 DC POWER BUTTON	Applies positive and negative DC voltage to PC 3 Pins O and N.
16	PC3 OUTPUT BNC CONNECTION	Allows connection of external equipment to monitor the output at PC3 Pin T.
17	POSITIVE DC POWER SUPPLY SECTION	Sets the output of the positive power supply to preset levels of 0, 5, 15, and 24 DC volts. Displays the DC voltage setting. Provides connection for reading the positive DC voltage level.
18	CHASSIS	Full metal chassis for durability and reliability. **WARNING** Only qualified technicians are authorized to open the Nida Model 130E Trainer chassis.

MODEL 130E TRAINER DESCRIPTION, continued



NIDA MODEL 130E TRAINER REAR PANEL		
NO.	**COMPONENT**	**DESCRIPTION**
19	TRAINER MAIN POWER ON-OFF SWITCH	Applies power to the trainer. This is the switch referred to when setting the "Initial Control Settings" in the learning content.
20	AC POWER CONNECTOR AND FUSE MODULE CAUTION	Provides line cord connection to the Model 130E Trainer. The input voltage rating is 110-130 VAC 60 Hz, or 220-240 VAC 50/60 Hz. A 600 mA/250 V Slo-Blo fuse is required for 110-130 VAC and a 300 mA/250 V Slo-Blo fuse is required for 220-240 VAC. **Only qualified technicians are authorized to open the AC power fuse modules.**
21	IDENTIFICATION PLATE	Provides model number, serial number, and system specification data.
22	VENTILATION GRID	Provides ventilation for the trainer AC and DC power supplies.
23	CMI COMMUNICATION PORTS	Provides RJ 11 connections for Computer Managed Instruction (CMI).
24	CAI COMMUNICATION PORT	Provides computer serial connection port for Computer Assisted Instruction (CAI) interface.
25	USB COMMUNICATION PORT	Provides computer USB connection port for Computer Assisted Instruction (CAI) interface.
26	USER AC POWER FUSES	Fuses F2 and F3 provide AC overcurrent protection during experiments. The fuses are rated at 1A/250V.
27	POWER TRANSISTORS Q1 and Q2	Power transistors are part of the trainer's experiment board DC power supply. No user intervention is required.
--	POWER SUPPLY LINE CORD	Not shown but included with the trainer is a UL certified power supply line cord. Always use the provided cord or a cord that meets the specifications identified in the Model 130E Trainer TECHNICAL SPECIFICATIONS AND CONSUMER INFORMATION section of this guide.

MODEL 130E PC POSITION PIN FUNCTION DESCRIPTION

Three printed circuit (PC) card positions are available on the face of the Model 130E trainer to support the learning content experiment circuit cards. The positions are labeled PC1, PC2, and PC3. Each of the PC positions provides 24 connector pins for mounting the Model 130 Series experiment PC boards. The connector pins provide the function shown in the PC Connector Pin Functions table.

PC Connector Pin Functions

A	Common ground
B, C	14 VAC (PC1, PC2)
D, E, F	Inputs (i.e., signals)
G, H	14 VAC (PC1, PC2)
I, J, K, L, M	To fault relays
N	Negative DC voltage
O	Positive DC voltage
P, Q	To fault relays
R	Reserved
S, T, U	Outputs (i.e., signals)
V, W, X	To fault relays

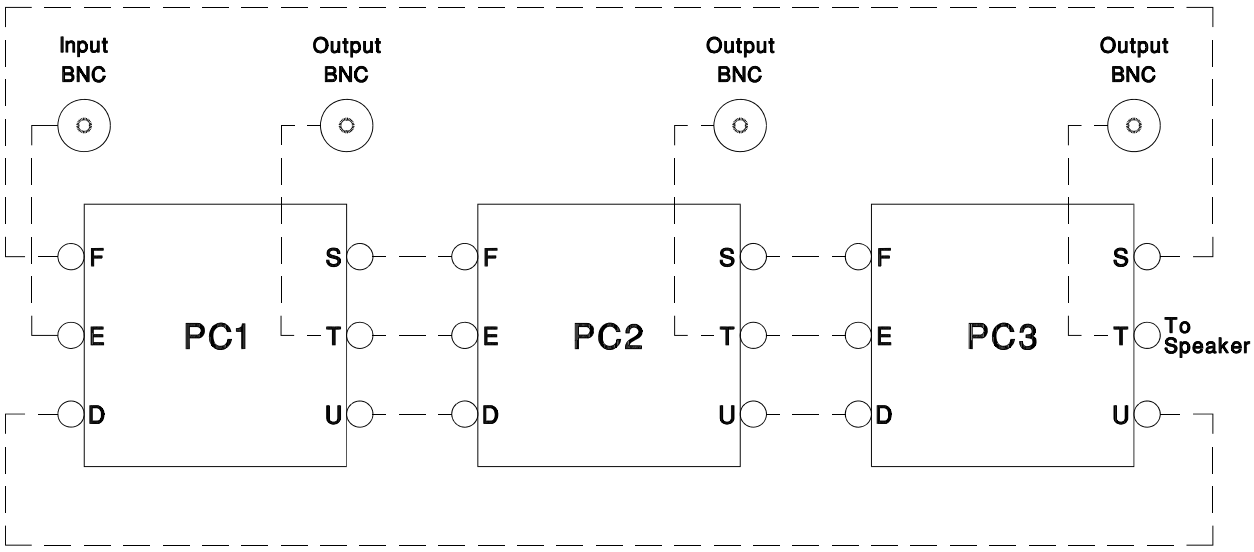
The 130E Trainer is grounded through the ground pin on the line cord.

WARNING

Always use the line cord provided with the trainer. Proper grounding of the trainer through the line cord is essential for safe operation. Do not modify the ground pin or receptacle in any way. Do not utilize a two-prong power connector adapter. Ensure the trainer, line cord, and receptacle ground are secure and in proper operation or a shock hazard could result.

MODEL 130E PC POSITION INTERCONNECTIONS

The three PC positions on the Model 130E Trainer are interconnected to BNC inputs, BNC outputs, and to each other. The internal connections are shown below.



PC Position Internal Connections

OPERATION

START-UP FOR NORMAL OPERATION

Perform the following start-up steps for normal operation:

a. Perform daily use inspection, as described on page 20 of this manual.

b. Press and hold down the SHIFT key; then set the trainer Main Power switch to ON. After the self-test is complete, release the SHIFT key. Ensure that the display illuminates.

INITIAL CONTROL SETTING

Upon power-up, the Nida 130E Trainer will be in its initial control setting. That is, system power is applied, but all user functions are deactivated. The trainer will perform a self-test followed by an audible "chirp". The chirp indicates that the trainer is ready for use.

NORMAL OPERATION

The trainer is ready for use after the initial control setting has been performed. Specific operation instructions for button selections, card applications, and circuit measurements are contained in each lesson/experiment module of the Nida Series 130 Lab/Text Manuals, CAI and CMI. The Nida 130E Trainer operates in one of three modes: (1) Manual Mode, (2) CAI Mode, and (3) CMI mode. General operation procedures are as follows:

NORMAL OPERATION - MANUAL MODE

Upon power-up, after the trainer has run its diagnostic routine, it will be in whatever mode it was in when last powered down. For example; if, during its last use, the trainer was being used for CAI, it will default to CAI mode upon power-up. In this instance, to place the trainer in manual mode, recycle the AC Main Power switch while holding down the SHIFT KEY on the keyboard. After the first of two chirps, release the SHIFT KEY. The trainer will complete its initial control settings and indicate completion with a second chirp.

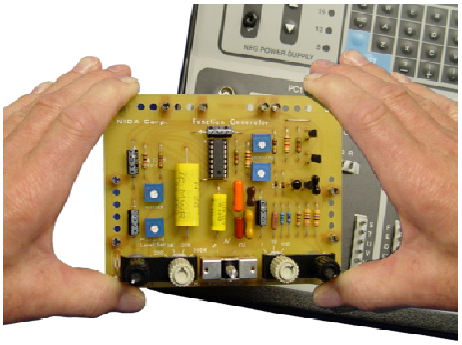
Manual operation of the trainer allows the user to select any of the functions, including the selectable user voltages, the speaker, and fault insertion/removal.

TRAINER FAMILIARIZATION

To familiarize yourself with the Model 130E Trainer, you will need an experiment circuit card. Any card will suffice; however, if you have the DC Card Set, select the PC130-CF card.

INSTALLING A PC CARD ON THE TRAINER IN A PC POSITION

a. Select a PC card and pick it up by the four corners.



INSTALLING A PC CARD ON THE TRAINER IN A PC POSITION, continued

b. With the component side up, align the PC card over the pins in the PC2 position.

c. Gently press the card down on the pins until it stops.

NOTE

The PC-to-board connections are designed to self-clean with each insertion and removal of the card.

REMOVING A PC CARD FROM A TRAINER PC POSITION

a. Grasp the PC card by its four corners.

b. Gently rock the card while pulling up on all four corners simultaneously.

APPLYING POWER TO A PC POSITION

When the Model 130E is used with the lab/text manual or as a stand-alone unit, power to the PC positions must be manually applied. The following steps are used to apply power to the PC positions. You will not need a PC experiment card for this exercise.

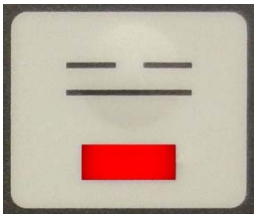
a. Perform a normal start up and ensure the trainer is in the manual mode.

b. For positive DC voltage, select a voltage level (5v, 12v, 15v, 24v) by pressing the UP positive DC power supply button until the indicator for the desired voltage level illuminates.

APPLYING POWER TO A PC POSITION, continued

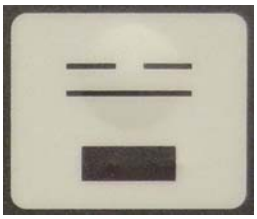
c. For negative DC voltage, select a voltage level (-5v, -12v, -15v, -24v) by pressing the UP negative DC power supply button until the indicator for the desired voltage level illuminates.

d. Select a PC position and press the DC button for that position.

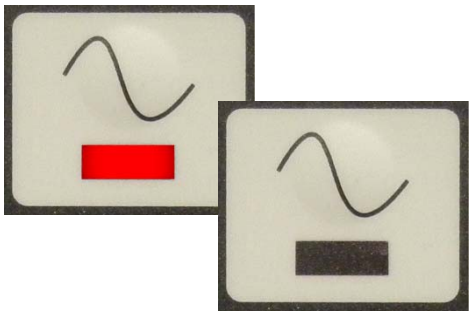


e. You can verify proper DC voltage application by using a multimeter to check for voltage between pin A (ground) and pins N (negative DC) and pin O (positive DC) at the PC position selected.

f. Press the PC position DC button again to remove DC power from the PC position. Verify that pins N and O are reading zero volts (±5%).



g. For AC power, simply press the AC button for PC1 or PC2. Verify AC voltage across pins B and C for the appropriate PC position. AC voltage should be 14 VAC.



NOTE

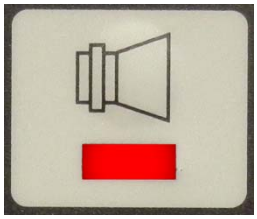
The PC3 position does not have an AC power input.

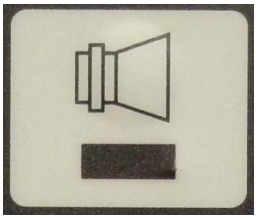
SPEAKER OPERATION

The Model 130E trainer has two built-in speakers. One speaker provides audio indications of functions and warnings. The trainer chirps following initial control settings and provides a pulsing chirp in the event that a power condition does not meet experiment specifications. Sound from this speaker exits the trainer through holes located on the bottom of trainer and is limited to 48 dB maximum. There are no user controls of this speaker.

The second speaker is used for presenting audio outputs during experiments. The sound from this speaker emanates from slots in the left side of the trainer. The speaker output, measured at 1 foot (0.33 meters), is 101 dB @ 600 Hz and 96 dB @ 1 kHz.

Most experiments will direct you to activate the speaker when needed. To activate the speaker, press the Speaker button at the PC3 position.





To turn the speaker off, press the speaker button at the PC3 position again.

NORMAL SHUTDOWN

Perform the following steps to shut down the Nida Model 130E Trainer:

a. Press the SHIFT/CLEAR keys. This disconnects all power to the PC cards and clears all faults.

b. Set the trainer Main Power switch to OFF. The display light should extinguish.

c. Remove experiment cards and test equipment from the PC positions.

d. Unplug the power cord from the AC power source (as required).

EMERGENCY SHUTDOWN

If any function of the trainer is suspected of incorrect operation, shut down and unplug the trainer immediately. No further emergency operation procedures are needed.

WARNING

Ensure that a qualified technician authorized to work on Nida trainers completes a performance verification check, as described in the Model 130E 3-Position Trainer technical manual prior to subsequent use.

SPECIAL OPERATIONS

FAULTING OPERATIONS

Faults can be either inserted or removed manually, by a computer system (CMI), or by CAI Lessons. The CAI and CMI faults are inserted automatically through the computer software or lesson experiment; therefore, only the manual mode of operation is discussed.

Setting Faults

Faults are set by using the keypad and the code F for fault.

a. Press the "F" key on the keypad.

b. Enter the one-digit PC position (press 1 for PC1, 2 for PC2, or 3 for PC3) on the keypad.

c. Enter the two-digit fault number code (00 to -15) on the keypad.

NOTE

Single digit faults must be proceeded by a 0.

d. Press the ENTER key.

Example: Entering F302 sets fault 02 into the PC3 position.

Erasing Faults

Faults are erased (cleared) by using the keypad and the code E for erase.

a. Press the "E" key on the keyboard.

b. Enter the one digit PC position (press 1 for PC1, 2 for PC2, or 3 for PC3) on the keypad.

c. Enter the two digit fault number code (00 to 15) on the keypad.

d. Press the ENTER key.

Example: Entering E302 erases fault 02 from the PC3 position.

FAULTING OPERATIONS, continued

Clearing All Faults in a PC Position

All faults that have been previously entered are removed using the keypad and the code C for clear.

a. Press the "C" key on the keypad.

b. Enter "100" for PC1 on the keypad -or- "200" for PC2 -or- "300" for PC3.

c. Press the ENTER key.

Example: Entering C100 clears all faults in the PC1 position, while C200 clears all faults in PC2. To clear ALL faults in ALL PC positions, use C000; or just press SHIFT/CLEAR.

COMPUTER CONTROLLED OPERATION

The Nida Model 130E can be connected to a computer for running CAI Lessons or to a computer network for running CMI Lessons.

ADDRESSING THE TRAINER

This procedure assigns an address to the trainer. An address is necessary when more than one trainer is connected to a controlling computer. There are two methods for addressing a trainer:

1. Manually, via the trainer keyboard.
2. Electronically, via the controlling computer software.

Manual Addressing

Perform a normal start up in the manual mode. Addressing is accomplished by typing "address" in the trainer keyboard followed by pressing the ENTER key. The trainer display will respond with:

Address: XXX: _

The "XXX" indicates the trainer's present address. At the cursor, type in any decimal number between 1 and 250 and press ENTER. If "address" is typed again, the trainer's new address will be displayed.

Computer Addressing

Addressing a trainer through a computer is accomplished using either the CBT (Computer Based Training) software, or through the 130E Test Program that comes with the trainer.

MAINTAINING YOUR TRAINER

CLEANING

For best performance, the Model 130E Trainer should be cleaned periodically to remove dust, dirt, and grease.

a. Ensure the trainer power is off.

b. Remove dust from the trainer with a soft brush.

c. Remove heavier dirt by wiping down the trainer with a mild cleaning agent applied to a soft cloth.

CAUTION

Do not spray cleaning agent directly on the Model 130E Trainer.

INSPECTION

The trainer requires no schedule of periodic inspections. Daily use inspections, however, should be carried out by performing the following steps:

a. Check the general condition of the trainer for bent or broken pins or switches.

b. Check that the display indicates zero VDC. If not, alignment procedures must be performed by a qualified technician in accordance with the Model 130E 3-Position Trainer technical manual.

c. Check the power cord for damage such as cut wires, dents, nicks, and bent, loose, or broken prongs.

WARNING

Never use a power cord that is damaged or missing the ground pin.
Proper grounding of the trainer through the line cord is essential for safe operation.
Do not modify the ground pin or receptacle in any way.
Do not utilize a two-prong power connector adapter.
Ensure the trainer, line cord, and receptacle ground are secure and in proper operation or a shock hazard could result.

PERFORMANCE VERIFICATION

To ensure the proper performance of your Model 130E Trainer, periodic performance verifications are recommended. Performance verification is also recommended if the Model 130E Trainer is suspected of inconsistencies or of being in error. The following performance verification procedures are provided for checkout of the 130E trainer power supplies and fault insertion capabilities.

WARNING

If the performance verification detects any out-of-tolerance voltage measurement, do not use the trainer until a qualified technician has recalibrated the trainer in accordance with the Model 130 3-Position Trainer technical manual.

The Performance Verification does not require the use of a computer. The verification may be performed on any Nida Model 130E Trainer. The following test equipment and components are required:

- Multimeter, digital or analog
- Nida Series 130 PC Card PC130-CF (Optional: voltage measurements can be made directly on PC connector pins.)

Primary Power Checkout

a. Check that the rear panel fuses F2 and F3 are good and that the rating matches the rating listed on the fuse holder. Also check that the 110/220 fuse module is in the correct position.

b. Set the POSITIVE and NEGATIVE SUPPLY controls to OFF.

c. Attach a power cord to the AC connector.

d. Press the trainer MAIN POWER switch to ON.

NOTE

The trainer performs a self-diagnostics automatically when the trainer MAIN POWER switch is changed from OFF to ON.

e. Check that the trainer display illuminates.

PERFORMANCE VERIFICATION, continued

DC Voltage Power Supply Familiarization

a. Attach the multimeter to the Positive Power Supply Connectors; observe correct polarity.

b. Select all four POSITIVE SUPPLY settings while observing the multimeter and voltage display.

The positive power supply is capable of producing preset voltages at 0, 5, 12, 15, and 24 volts. The voltage reading on the multimeter should agree with the reading on the display to within ±5%.

c. Attach the multimeter to the Negative Power Supply Connectors; observe correct polarity.

d. Select all four NEGATIVE SUPPLY settings while observing the multimeter and voltage display.

The negative power supply is capable of producing preset voltages at 0, 5, 12, 15, and 24 volts. The voltage reading on the multimeter should agree with the reading on the display to within ±5%.

e. Return both the POSITIVE and NEGATIVE SUPPLY controls to the off position.

f. Check the voltage display for a 0 volt reading.

g. Check for a 0 volt, ±0.2 VDC, reading using the multimeter at the + and – Power Supply Connectors

h. Disconnect the multimeter.

PERFORMANCE VERIFICATION, continued

Current Limit Checkout

a. Set up the multimeter to measure current greater than 1.5 amps.

b. Attach the multimeter probes to the TIP CONNECTORS of the positive DC power supply connectors. Observe proper polarity.

c. Set the POSITIVE DC POWER SUPPLY control to +12 VDC.

d. Measure the current draw on the multimeter. Current should be limited to 1 amp ±10%. Note: trainer display will measure 0 volts.

e. Return the POSITIVE DC POWER SUPPLY control to OFF and detach multimeter probes from the positive DC power supply +TIP CONNECTORS.

f. Attach the multimeter probes to the TIP CONNECTORS of the negative DC power supply connectors. Observe proper polarity.

g. Set the NEGATIVE DC POWER SUPPLY control to −12 VDC.

h. Measure the current draw on the multimeter. Current should be limited to 1 amp ±10%. Note: trainer voltmeter will measure 0 volts.

i. Return the NEGATIVE DC POWER SUPPLY control to OFF and disconnect multimeter probes from the −TIP CONNECTORS.

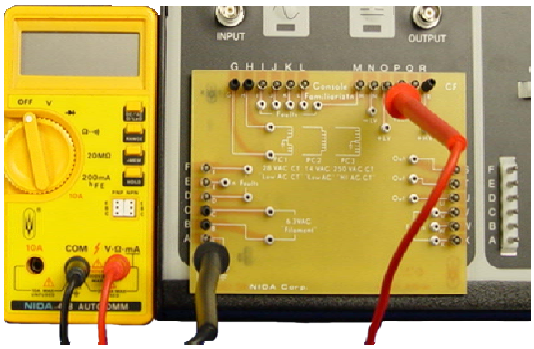
TRAINER FAMILIARIZATION

PC CARD AND CONNECTOR PANEL FAMILIARIZATION

a. Install PC130-CF on the trainer in the PC1 position (or make all voltage measurements on the pins in the PC1 position).

b. Set the POSITIVE and NEGATIVE SUPPLY controls to 5 volts.

c. Measure the DC voltage on PC130-CF TPs: first on +V (pin O) as shown and then on –V (pin N). Voltage measurements should be 0 VDC on both pins.



d. Press the DC POWER button. Ensure that red indicator lamp illuminates.

e. Measure the DC voltage on PC130-CF TPs +V (pin O) and -V (pin N). Voltage measurements should be 5 VDC on both pins.

DC power is not applied to the PC position until the DC POWER button is ON.

f. Press the AC POWER button. Ensure that red indicator lamp illuminates.

g. Measure the AC voltage across PC130-CF TPs B and C (pins B and C). Voltage measurement should be 14 VAC nominal.

h. Measure the AC voltage across PC130-CF TPs G and H (pins G and H). Voltage measurement should be 14 VAC nominal.

i. Press the SHIFT/CLEAR switches. Ensure that the DC POWER and AC POWER button red indicator lamps extinguish.

j. Measure the DC voltage on PC130-CF TPs O and N (pins O and N). Voltage measurement should be 0 VDC.

k. Measure the AC voltage on PC130-CF TPs B and C, and G and H (pins B, C, G, and H). Voltage measurements should be less than 3 VAC for TPs B and C, and for TPs G and H. (Measurements may vary, depending on characteristics of test equipment used.)

l. Remove PC130-CF from the PC1 position and install in the PC2 position (or make all voltage measurements on the PC2 position pins).

m. Repeat Steps b through k for the PC2 position.

PC CARD AND CONNECTOR PANEL FAMILIARIZATION, continued

n. Remove PC130-CF from the PC2 position and install in the PC3 position (or make all voltage measurements on the PC3 position pins).

o. Repeat Steps b through k for the PC3 position. Do not perform Steps g and h: there is no AC POWER button in the PC3 position.

p. Press the SPEAKER button. Ensure that red indicator lamp illuminates. Press the button again, red indicator will go off.

q. Remove PC130-CF from the PC3 position.

r. Place the POSITIVE and NEGATIVE SUPPLY controls to OFF.

PC POSITION FAULT INSERTION FAMILIARIZATION

a. Ensure power is applied to the 130E Trainer.

b. Ensure the POSITIVE and NEGATIVE SUPPLY controls are set to OFF.

c. Press the SHIFT/CLEAR keys.

d. Install PC130-CF on the trainer in the PC1 position (or make all continuity checks on the PC1 connector pins directly).

e. Using the PC Position Faults table on the facing page, measure the continuity between the indicated pins before and after each fault insertion, and after the fault has been removed.

f. Remove PC130-CF from the PC1 position and install it in the PC2 position, or make all continuity checks on the PC2 connector pins directly.

g. Using the Position Faults table, measure the continuity between the indicated pins before and after each fault insertion, and after the fault has been removed.

h. Remove PC130-CF from the PC2 position and install it in the PC3 position, or make all continuity checks on the PC3 connector pins directly.

i. Using the PC Position Faults table, measure the continuity between the indicated pins before and after each fault insertion, and after the fault has been removed.

PC POSITION FAULT INSERTION FAMILIARIZATION, continued

j. Remove the PC130-CF card and press the SHIFT/CLEAR keys. Return the Trainer to normal service.

NOTE

The "X" in the fault code indicates PC position. For example, F100 indicates setting fault 00 into PC1 and F200 indicates setting fault 00 into PC2. Also, E100 indicates clearing fault 00 from PC1 and E200 indicates clearing fault 00 from PC2.

PC POSITION FAULTS			
TO INSERT FAULT	RESISTANCE MEASUREMENTS		TO REMOVE FAULT
	BEFORE INSERT/AFTER REMOVE	AFTER INSERT	
FX00	Pin L to M - 0 ohms Pin L to A - Infinity Pin M to A - Infinity	Pin L to M - 0 ohms Pin L to A - 0 ohms Pin M to A - 0 ohms	EX00
FX01	Pin X to A - Infinity	Pin X to A - 0 ohms	EX01
FX02	Pin W to A - 0 ohms Pin U to A - Infinity	Pin W to A - Infinity Pin U to A - Infinity	EX02
FX03	Pin W to A - 0 ohms Pin U to A - Infinity	Pin W to A - 0 ohms Pin U to A - 0 ohms	EX03
FX04	Pin P to Q - Infinity	Pin P to Q - 0 ohms	EX04
FX05	Pin X to V - 0 ohms	Pin X to V - Infinity	EX05
FX06	Pin X to V - 0 ohms Pin V to M - Infinity	Pin X to V - 0 ohms Pin V to M - 0 ohms	EX06
FX07	Pin L to M - 0 ohms	Pin L to M - Infinity	EX07
FX08	Pin D to A - Infinity	Pin D to A - 0 ohms	EX08
FX09	Pin K to I - 0 ohms Pin K to A - Infinity Pin I to A - Infinity	Pin K to I - 0 ohms Pin K to A - 0 ohms Pin I to A - 0 ohms	EX09
FX10	Pin J to I - 0 ohms	Pin J to I - Infinity	EX10
FX11	Pin D to I - Infinity	Pin D to I - 0 ohms	EX11
FX12	Pin J to I - 0 ohms Pin I to V - Infinity	Pin J to I - 0 ohms Pin I to V - 0 ohms	EX12
FX13	Pin K to I - 0 ohms	Pin K to I - Infinity	EX13
FX15	Pin L to 0 - Infinity	Pin L to 0 - 1 kΩ	EX15

PREPARATION FOR RESHIPMENT

DISCONNECTION INSTRUCTIONS

a. Position the trainer to allow access to the rear of the trainer.

b. Remove the power cord from the power receptacle.

c. Remove the communications cable from the back of the trainer.

d. Remove the power cord from the back of the trainer.

REPACKING INSTRUCTIONS

a. Place the trainer in the plastic bag.

b. Place the foam packing on each side of the trainer.

c. Pick up the trainer from the bottom, with both hands, and carefully place it into the shipping carton.

d. Place the Technical Manual and other accessories provided on top of the trainer in the shipping carton.

e. Seal the top of the carton. Ensure the notation **THIS SIDE UP** is readable and visible.

STORAGE

The Nida Model 130E Trainer should be repacked in its shipping carton before being placed in storage for any extended length of time. (See Preparation for Reshipment.) The packaged trainer should then be stored indoors, at a room temperature of 10° to 40° C or 50° to 104° F (ambient).

For daily storage after use, cover the trainer with the dust cover and store in a dry place where no chance of physical damage, such as being bumped or jostled, exists.

TECHNICAL AND CONSUMER INFORMATION

TECHNICAL SPECIFICATIONS

The following technical specifications apply to your Model 130E Trainer.

- Primary Power: 110-130 VAC 60 Hz (0.6 A max), or
  220-240 VAC 50/60 Hz (0.3 A max)
- Detachable Power Supply Cord (115 VAC applications):
  - Approvals: UL E84516 or equivalent
  - Standards: IEC 60320
  - Flame Rating: FT2
  - Power Rating: 10A/125V
- DC Power Sources:
  - 0 to -24 VDC with selectable voltages and current up to 1 A
  - 0 to +24 VDC with selectable voltages and current up to 1 A
  - Total DC power across both power supplies not to exceed 39 VDC
- AC Power Sources:
  - Dual 12 VAC at 1 A maximum
- Communications Link: USB or Serial (9600 baud rate with stop bit and parity check)
- Display: 20X4 backlit liquid crystal display (LCD)
- Operating temperature: 5°C to 40°C ambient
- Dimensions:
  - Width – 44.20 cm
  - Height – 11.48 cm
  - Depth – 29.21 cm
- Weight: 5.02 kg (11 lbs)
- Construction: Sheet metal covered by flat panel matte finish
- Experiment Speaker Output at 1 foot (0.33 meters):
  - 101 dB @ 600 Hz
  - 96 dB @ 1 kHz
- Internal Function Speaker Output: 48 dB at 1 foot

CONSUMER INFORMATION

Normal environmental conditions apply to equipment designed to be safe at a minimum under the following conditions.

- Indoor use
- Altitude up to 2000 m (6,600 feet)
- Ambient temperatures between 5° C to 40°C
- Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C
- Main supply voltage fluctuations up to ±10% of the nominal voltage
- Transient over-voltages typically present on the main power supply
- Applicable rated pollution degree

