



Nida Corporation

Model 130ST

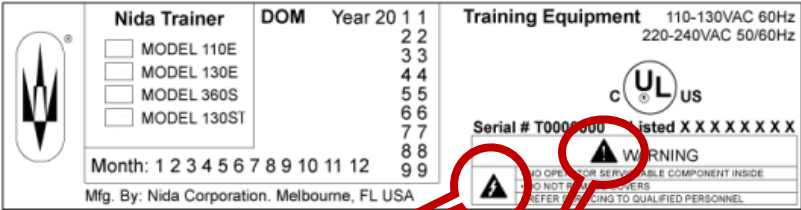
User's Guide



PRELIMINARIES

This technical manual is intended only for use by qualified service personnel, not for general users of the Nida Model 130ST Trainer.

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



In all cases where this symbol is used, the documentation must be consulted.

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INTRODUCTION

Congratulations on your selection of the ***Nida Model 130ST 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 50 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.



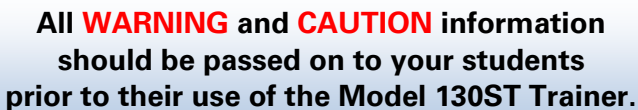
CAUTION

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.



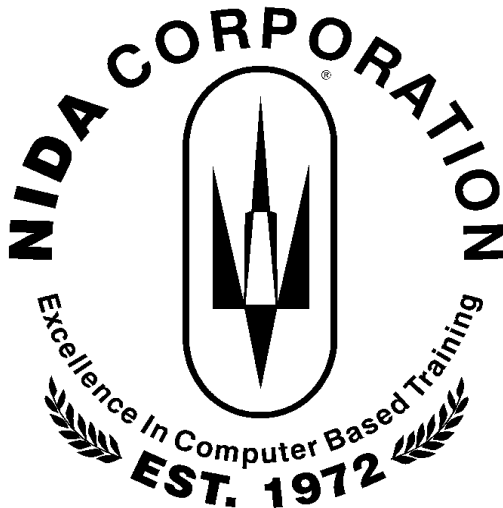
All **WARNING** and **CAUTION** information should be passed on to your students prior to their use of the Model 130ST Trainer.

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 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,
Nida Corporation



SPECIFICATIONS

Specifications for the Model 130ST Trainer are outlined below.

PRIMARY INPUT POWER* 110-130 VAC 60 Hz (0.75 A max), or
220-240 VAC 50/60 Hz (0.5 A max)*

SELECTABLE DC POWER SOURCES

Positive & Negative Voltages:

+3.3, +5, +12, +15, +24 max current, 1 amp, fused at 1.25 amp

-5, -12, -15 max current, 0.35 amp, fused at 0.5 amp

**Primary input power to the trainer is selected by a fuse module located in the AC input assembly on the rear panel.*

AC POWER SOURCE

Low-voltage transformer 12 VAC at 1 amp

DISPLAY 7 in/178mm (measured diagonally) TFT LCD

PRINTED CIRCUIT CARD RECEPTACLES Three sets of receptacles, 30 pins each, for insertion from 1 to 3 PC cards

INPUTS BNC connector selectable to any card position
TFT display provides manual control of all functions

OUTPUT Selectable through BNC connector or audio jack

OPERATING TEMPERATURE

50° to 104° F or 10° to 40° C ambient

DIMENSIONS17.5" (44.4 cm) wide
11.5" (29.2 cm) deep
4 1/2" (11.4 cm) high**CASE**

Aluminum

The Nida Model 130ST Trainer comes provided with the following equipment:

1. Technical Manual, Nida Model 130ST Trainer
2. 130ST Test Program (Built in: Requires Test Card: Sold Separately)
3. AC Power cable, 6'
4. Communications cable, 5'

Optional Accessories:

1. Dust Cover
2. PC130ST Test Card

The following additional equipment is needed for the troubleshooting, calibration, and repair procedures contained in this manual:

1. Multimeter, digital or analog
2. Printed circuit card - Nida series 130 PC130ST-TEST
3. Various small tools (screwdrivers, nutdrivers, etc.)
4. Alligator-to-alligator jumper
5. BNC-to-alligator cable
6. IBM compatible computer (Microprocessor-controlled operation)
7. Communications test plug

SAFETY PRECAUTIONS

Apply the standard “U.S. Government Occupational Safety and Health Act” for those who work with or around electronic/electrical equipment. Modular subassemblies that contain CMOS Integrated Circuits should be considered as an Electrostatic Sensitive Device (ESD). Any person removing these subassemblies or replacing components should be grounded in accordance with MIL-M55565.

During normal operation, the Nida Model 130ST Trainer requires no special or additional precautions. If a fault is observed in trainer operation, the unit should be turned off and maintenance and troubleshooting performed in accordance with the Technical Manual instructions and specified safety notes.

Assembly or disassembly of the trainer must be performed in accordance with the Technical Manual instructions and specified safety notes.

INSTALLATION INSTRUCTIONS

CAI INSTALLATION

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



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.



CAI INSTALLATION (continued)

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

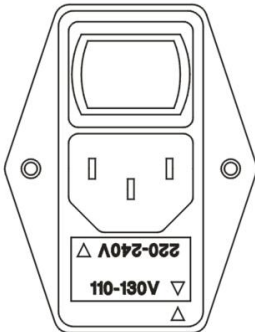
NOTE

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

- 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.

CAI INSTALLATION (continued)

- 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.

CMI INSTALLATION

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



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.



Serial Port

- c. From the CMI amplifier, run an RJ11 cable to the Nida tee adapter. From the tee adapter, run a cable to the first trainer's serial port. Then from the tee adapter, run another cable to the next trainer in line until you reach the final trainer (using tee adapters between each trainer). The CMI amplifier is connected to the serial output of the controlling computer. The last trainer in the network requires no cable or termination device in the open port of the tee adapter.

PREPARATION FOR USE**UNPACKING INSTRUCTIONS**

- a. Observe the notation THIS END UP on the shipping carton.
- b. Open the top of the shipping carton and remove the Technical Manual.
- 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 rubber packing from each side of the trainer.

NOTE

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

- e. Remove the plastic bag from the trainer.

ASSEMBLY INSTRUCTIONS

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

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.

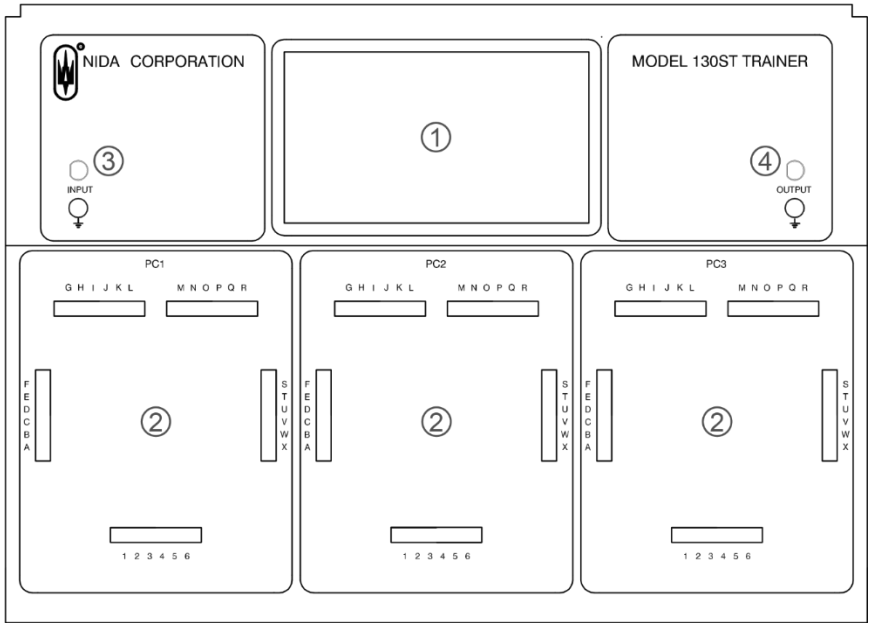
INSTALLATION INSTRUCTIONS

No special installation instructions are required. The trainer does not require special foundations, ventilation, clearances, or plumbing.

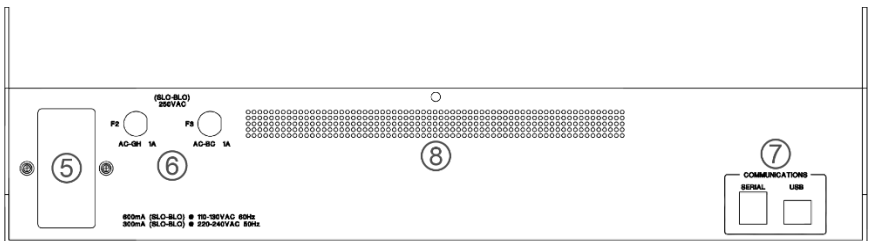
Prior to initial operation, complete the performance verification instructions, in the Maintenance Instructions section, of this manual to ensure that the trainer is functioning correctly.

OPERATING INSTRUCTIONS

CONTROLS, INDICATORS, AND CONNECTORS



Nida Model 130ST Trainer Control Panel (Keyed)



Trainer Rear Panel

CONTROLS, INDICATORS, AND CONNECTORS (continued)**NOTE**

Trainer controls, indicators, and connectors are followed by their key numbers in parentheses.

KEY	DESCRIPTION	FUNCTION
1	DISPLAY	7-inch Thin Film Transistor (TFT) Liquid Crystal Display. Allows manual control of output voltages, faults, and inputs & outputs. Visual confirmation of trainer data, input or output.
2	PC POSITION CONNECTORS	Receptacles for experiment PC cards. Each receptacle has 30 pins labeled A – X and 1 - 6.
3	INPUT BNC	Connector for external input signal to any PC position. When selected, the BNC signal is applied at pin "E" on the selected PC card position.
4	OUTPUT BNC	Connector for output input signal from any PC position. The output connector receives the signal from pin "T" of the selected PC position.
5	AC POWER CONNECTOR AND FUSE MODULE	Applies power to unit. 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.
6	USER AC POWER FUSES	Two user AC power fuses (F2 and F3) are mounted on the rear panel. These fuses are rated at 1 amp. F2 fuses the user AC for pins B & C and F3 fuses user AC for pins G & H.
7	COMMUNICATION PORTS	Serial and USB communication ports allow connections to a computer and/or additional trainers or equipment.
8	AUDIO	Connects/Disconnects audio from any PC position.

START-UP FOR NORMAL OPERATION

Perform the following start-up steps for normal operation:

- a. Perform daily use inspection, as described in Maintenance Instructions.
- b. Check user AC power fuses F2/F3 (2) and system fuses in trainer fuse module (5). If replacement is necessary, a 750 mA/250 V Slo-Blo fuse is required for 110-130 VAC and a 500 mA/250 V Slo-Blo fuse is required for 220-240 VAC
- c. Connect the AC power cable to the trainer inlet (5).
- d. Place trainer power switch (5) to ON, ensuring the display (1) illuminates and the startup/testing function begins.

A, 1	Common ground
B, C	12 VAC
D, E, F	Inputs (i.e., signals)
G, H	12 VAC
I, J, K, L, M	To fault relays
N	Negative DC voltage -5V, -12V, -15V
O	Positive DC voltage 5V, 12V, 15V, 24V
6	Positive DC low voltage 3.3V, 5V
P, Q, R	To fault relays
S, T, U	Outputs (i.e., signals)
V, W, X	To fault relays
2, 3, 4, 5	Analog signals to computer lessons

PC Connectors and Their Functions

INITIAL CONTROL SETTING

Upon power-up, the Nida 130ST Trainer will be in its initial control setting. That is, system power is applied, but all user functions are deactivated.

NORMAL OPERATION

The trainer is ready for use after the procedures described in paragraphs “Start-Up for Normal Operation” and “Initial Control Setting” have been performed. Specific operation instructions for control settings, card applications, and circuit measurements are contained in each lesson/experiment module of the Nida Series 130 Lab/Text Manuals and Computer Aided Instructions (computer lessons). The Nida 130ST Trainer operates in two modes: Manual Mode and CAI Mode. The current operating mode is displayed on the TFT display. General operation procedures are as follows:

Normal Operation - Manual Mode

Upon power-up, after the trainer has run its diagnostic routine, the trainer will be in the same mode when powered down (manual or CAI modes). No power will be applied to PC card positions, the inputs, outputs, and audio will be disconnected, and no faults will be applied to the PC card positions regardless of the mode.

Should the initial control setting be the CAI mode, and the manual mode is desired:

- a. Toggle the main power switch to the OFF, and then ON.
- b. During the startup/testing routine, press a finger to the progress bar for two (2) seconds.
- c. The trainer will complete the startup/testing routine and switch to the manual mode.
- d. Should the trainer remain in the CAI mode, repeat the above steps.

Manual operation of the trainer allows the student to select any of the functions that the student may wish to use, including the selectable user voltages, applying the input & output BNC and audio jacks, and fault insertion and removal. All manual control is performed by activating menus on the TFT touch display and making selections manually.

Nida Series 130 PC Card Fault Operation

Faults can either be inserted or removed manually, by a computer system (CMI), or by CAI Lessons. The manual mode of operation is discussed.

Setting Faults

Faults are set by using the TFT touch screen.

- a. Select the fault menu.
- b. Select the PC position (press PC1, PC2, or PC3).
- c. Select the fault number code 00 through 16. A referenced fault number will include the PC location as the first number, followed by the two-digit card fault number, i.e. F109, F211, F300, etc.)

Erasing Faults

Faults are erased by using the TFT touch screen.

- a. Select the fault menu.
- b. Select the faulted PC location.
- c. Active faults will have a bold outline around the card fault number. Select the fault to erase.

Clearing All Faults

All faults are erased by using the TFT touch screen.

- a. Select the fault menu.
- b. Select the faulted PC location
- c. The Clear selection button will erase all faults for the PC location.
- d. The Clear All selection button will erase all faults regardless of PC location.

Computer Controlled Operation

The Nida Model 130ST can be connected to a computer for running CAI Lessons.

Connection for Computer Aided Instruction (CAI) Lessons

An RJ11 or USB cable is used to connect the Nida Model 130ST to computer that runs CAI Lessons. Once connected, the computer, via CAI Lesson programs, directs student operation of the trainer, sets the proper voltages, inserts and clears faults, and monitors trainer operation. Connect the Nida Model 130ST Trainer to a computer as follows:

- a. Ensure both the trainer and computer are off.
- b. Attach the RJ11 connector to the communications receptacle marked "Serial" on the rear panel of the trainer -or- attach the USB cable to the receptacle marked "USB".
- c. If using the serial port, attach the 9- or 25-pin connector to the COM 1 serial port of the computer. If using the USB port, connect a USB cable between the trainer and the computer.
- d. Verify correct operation by performing the Performance Verification check, in Maintenance Instructions, for the computer mode of operation.

Wired connection for Computer Monitored Instruction (CMI) Lessons

The Nida Model 130ST Trainer is capable of being networked. Networking allows instructor control and monitoring of several trainers on an individual or group basis and the running of CMI Lessons. Also, messages can be sent from the instructor to one or more students, and messages can be sent from a student to the instructor. The connection of the Nida Model 130ST Trainer to a computer network is accomplished by using the serial connector. If the 130ST trainer is used in a network configuration, ensure that each trainer has been addressed, from 01 to 32 in hexadecimal. (Refer to Addressing the Trainer.) Detailed connection and operation procedures are supplied by Nida Corporation on installation of a networking system.

Wireless connection for CMI Lessons

The Nida Model 130ST trainer is capable of wireless connections to a Wi-Fi network using 802.11 b/g/or n protocols for group connections.

Networking allows instructor control and monitoring of several trainers on an individual or group basis and the running of CMI Lessons.

The setup of the Wi-Fi connection to the network is part of the initial installation performed when the trainer was installed. The Wi-Fi address can be viewed in the manual mode by selecting the Setup icon.

The Nida 130ST trainer is also capable of Bluetooth connection to a single PC, tablet, or smart phone.

EMERGENCY OPERATION

If any function of the trainer is suspected of incorrect operation, shut down the unit and do a performance verification check, in Maintenance Instructions. No further emergency operation procedures are needed for the trainer.

SHUTDOWN

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

- a. Press the trainer POWER switch (5) to off. The display should extinguish.
- b. Remove experiment cards and test equipment for the PC positions.
- c. Unplug the power cord from the AC power source.

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.

Computer Addressing

Addressing a trainer through a computer is accomplished using either the CMI software or through the 130ST Test Program that comes with the trainer.

MAINTENANCE INSTRUCTIONS**CLEANING AND LUBRICATION**

Instructions for periodic cleaning of the Nida Mol 130ST Trainer are listed below. No instruction for lubrication is included, since periodic lubrication of the trainer is not necessary.

- a. Remove dust from the trainer with a soft brush.
- b. Remove heavier dirt by wiping down the trainer with a mild cleaning agent applied to a soft cloth.



DO NOT SPRAY CLEANING AGENT DIRECTLY ON THE NIDA MODEL 130ST TRAINER.

STORAGE

The Nida Model 130ST Trainer should be repacked in its shipping carton before being placed in storage for any extended length of time. (See Section 5, Preparation for Reshipment). The packaged trainer should then be stored indoors, at a room temperature of 10°C to 40°C or 50°F to 104°F (ambient).

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, exist.