Tisch Environmental
TE-PRO-CAL
Low-Volume Calibrator

TE-PRO-CAL Operations Manual Table of Contents

1.0 Introduction

1.1 TE-PRO-CAL Overview

The TE-PRO-CAL is an advanced low-volume calibrator that can be used to calibrate low-volume air sampling equipment such as the TE-Wilbur low- volume sampler, the BGI PQ200, Thermo Partisol and other low-volume instruments that operate at 16.67 lpm. The system utilizes a precision-machined venturi to generate a differential pressure proportional to the flow rate that is not affected by temperature variations or humidity. The calibrator is mounted directly to the sampler's inlet downtube for ease of use and quick calibration of field instrumentation. The calibrator is powered by 4 AA batteries. The system is shipped with the calibrator, a NIST traceable calibration certificate, 4 batteries, a filter temperature probe and rugged carrying case. With four generations of experience, leadership, and know-how, the Tisch family would like to welcome you to our company and thank you for choosing Tisch Environmental products.

1.2 Copyrights and Trademarks

1.3 Warranty

Instruments manufactured by Tisch Environmental, Inc. are guaranteed by warranty to be free of defects in materials and workmanship for one year after shipment from Tisch Environmental factories. The liability of Tisch Environmental, Inc. is limited to servicing or replacing any defective part of any instrument returned to the factory by the original purchaser. All service traceable to defects in original material or workmanship is considered warranty service and is performed free of charge. The expense of warranty shipping charges to and from our factory will be borne by Tisch Environmental. Service performed to rectify an instrument malfunction caused by abuse, acts of God or neglect, and service performed after the one-year warranty period will be charged to the customer at the current prices for labor, parts, and transportation. The right is reserved to make changes in construction, design specifications, and prices without prior notice.

1.4 Symbols Used in This Document

The following symbols are used in this document.

General Attention – this symbol is used to make the operator aware of an important directive.

1.5 Recertification

Per USEPA requirements, this instrument should be recertified on an annual basis. Recertification can be performed at our laboratory in Cleves, OH. Simply send the unit to us at:

Tisch Environmental
Attn: Recertification
145 South Miami Ave.
Cleves, OH 45002

Or call us at 1-877-TSP-PM10 or email us at sales@tischenv.com to setup a recertification of your calibrator. Once received, our highly trained technicians will evaluate your unit, perform a multi-stage calibration, and issue a calibration certificate for your calibrator.

Part Numbers for Recertification

TE-PRO-CAL-059 Recertification to NIST primary standards

1.6 Ratings and Specifications

Power	4AA Batteries
Display	2.8” Diagonal 240x320 Color
Operating Temperature	-20ºC to 55ºC
Weight	9lbs. (3.63kg) Complete with case 10lbs 17x14x8” shipping weight and dimensions 2.0 lbs. (0.91kg) hand-held and head unit
Flow System	Range 2 to 20 SLPM with an accuracy of ± 0.75%
Ambient Temperature	Range -40ºC to 55ºC with an accuracy of ± 0.1ºC
Filter Temperature	Range -40ºC to 55ºC with an accuracy of ± 0.1ºC
Barometric Pressure	Range 400 to 800 mmHg with an accuracy of 3 mmHg
Relative Humidty	Range 0-100% +/- 1.5%

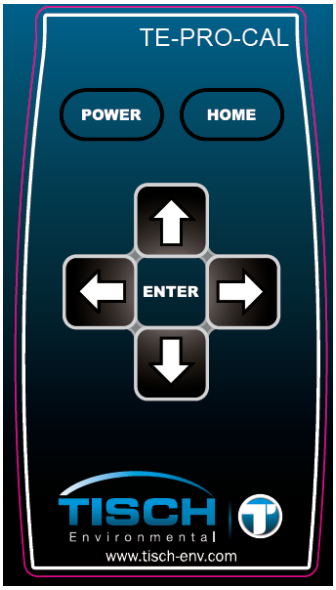
1.7 TE-PRO-CAL Ordering Information

TE-PRO-CAL	TE-FRM-CAL ranged 2-20 SLPM Rugged Carrying Case Hand-held unit Calibration head with connection cable 4AA Batteries included Filter temperature probe NIST traceable calibration certificate
TE-PRO-CAL-059	Recertification of TE-PRO-CAL calibrator

2.0 Menu Navigation

2.1 Button Configuration

The TE-PRO-CAL has (4) arrows for navigating up, down, left and right along with an enter button in the center, a power button and home button.



2.2 Powering ON/OFF the Unit / Button Configuration

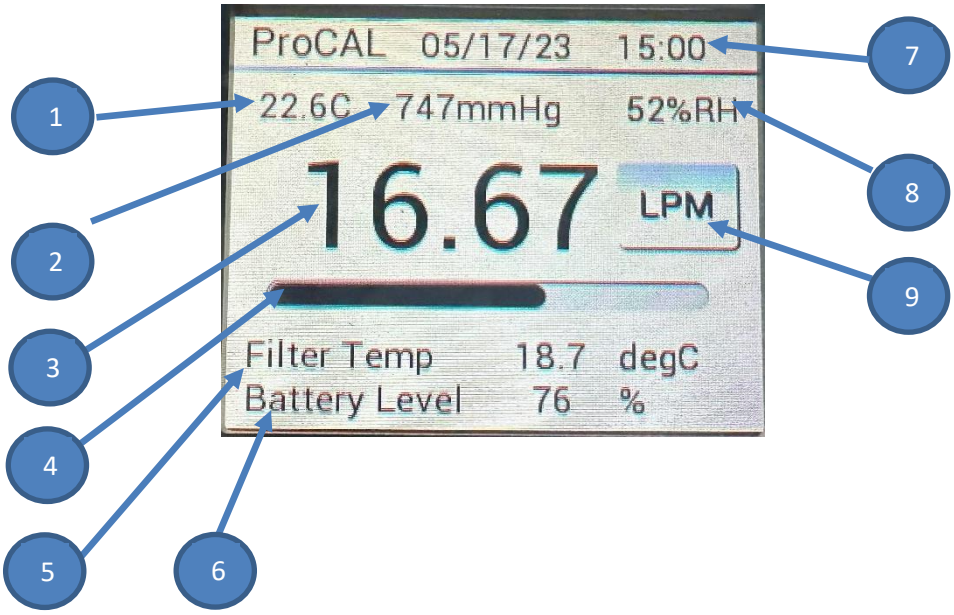
Powering ON the unit
Press the POWER button

Powering OFF the unit
Press and hold the POWER button for longer than 4 seconds

Button Configuration

Left Arrow	Navigates to the left
Right Arrow	Navigates to the right
Up Arrow	Navigates up
Down Arrow	Navigates down
Home	Goes to the previous menu

2.3 Menu Structure



ITEM	DESCRIPTION
1	Ambient Temperature in Degrees Celsius
2	Ambient Barometric Pressure Reading in mmHg
3	Flow Rate in LPM
4	Venturi Pressure bar graph
5	Filter temperature in Degrees Celsius (reads N/A when not connected)
6	Battery level indication
7	Date and Time – configured in settings menu
8	Relative Humidity in %
9	Reading Type: LPM for Liters per Minute, SLPM for Standard Liters per Minute based on 760mmHg and 20°C by pressing the right arrow key in the display screen

Pressing the ENTER button will enter the setup menu.
Pressing the HOME button will go back to the previous screen.
Pressing the RIGHT and LEFT ARROW keys will navigate between items.

SETUP MENU	DESCRIPTION
SYSTEM	Enters the system setup menu.
DATE / TIME	Changes the date and time of the calibrator.

SYSTEM MENU	DESCRIPTION
BACKLIGHT	Changes the backlight setting from 1-25. Increased backlight decreases battery life.
OFF DELAY	Changes the time the unit powers down when not in use.
AVERAGING	Changes the averaging of the flow rate for instruments that have increased pump oscillation.
ZERO FLOW	Zeros the flow rate. Ensure the unit is not connected to a flow source prior to zeroing the flow rate.

LOGGING MENU	DESCRIPTION
LOG ENA	Enables the data log feature.
INTERVAL	Changes the time interval of how often the unit will log readings. It can be set between 5-10 seconds.
TRANSMIT	Transmits log data from the unit to a computer using USB serial port.
ERASE	Erases the log memory.

3.0 Operation

3.1 Connecting the Handheld to the Head Unit

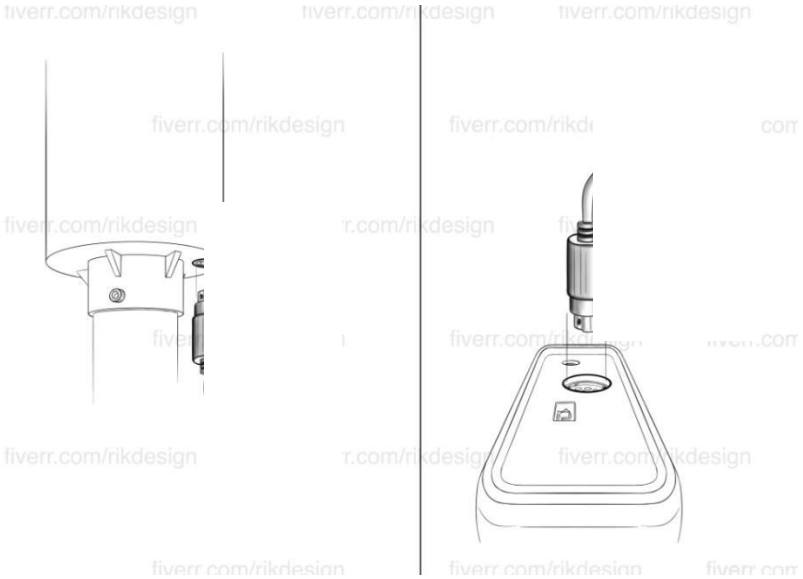
NOTE: The hand-held unit should be powered down before connecting the calibration head unit.

With the hand-held unit powered OFF connect the cable from the calibration head unit into the port of the hand-held

The cable that connects the hand-held to the top head is part number:
TE-PRO-CAL-014

The flat part of the cable faces the outside of the calibrator head.

The flat part of the cable on the handheld faces the back of the handheld.



3.2 Replacing the Batteries

The TE-PRO-CAL requires (4) AA batteries.

To replace the batteries:

Remove the rear battery cover by pushing down and sliding off the cover.
Replace the batteries noting the direction of the batteries by the sticker located in the bottom of the battery compartment.

Insert the (-) side of the battery in to slot first, then push down the (+) side to lock it into place.

Replace the battery cover.

3.3 Logging Feature

The TE-PRO-CAL has a data logging feature that will record data in 5-10 second user-selectable intervals.

NOTE: LOGGING WILL AUTOMATICALLY BE TURNED OFF WHEN….

- Instrument is powered off or instrument auto powers off
- Interval setting is changed
- The erase command is issued

To use the data logger, these steps must be followed in order:

Connect the sensor head unit and temperature probe to the handheld and power ON the calibrator.

Open the menu by pressing ENTER. Then press the RIGHT ARROW key to Logging and press ENTER.

To record data from an empty state, press the RIGHT ARROW key to ERASE and press enter. Press ENTER again to Execute. Press HOME to return to the previous menu.

Set your time INTERVAL by pressing the Arrow keys to INTERVAL and press ENTER. Use the UP/DOWN ARROW keys to set your log interval between 5-10 seconds. This setting will log the current reading every set interval. After you've selected the interval, press ENTER to Confirm.

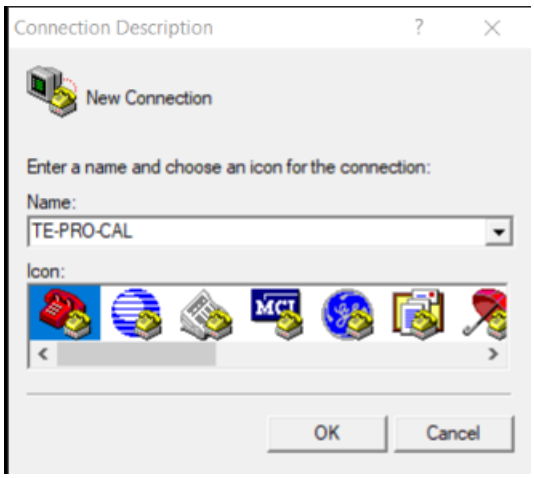
Use the ARROW keys to LOG ENA (Log Enabled). Press the UP ARROW key to ENABLE. Press ENTER to Confirm.

The TE-PRO-CAL will now start logging.

Press the HOME key to go back to the HOME screen.

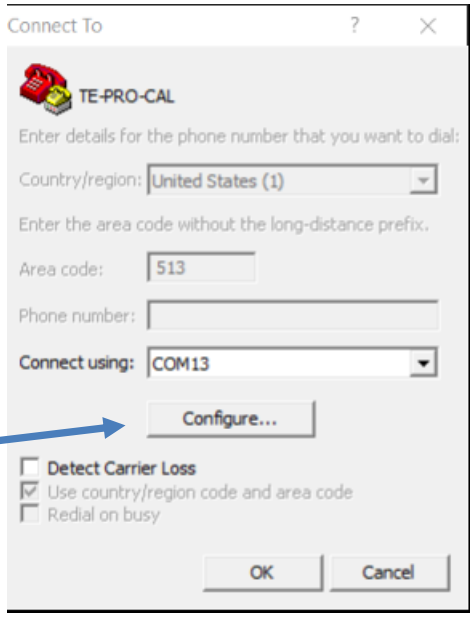
As you use the calibrator, the TE-PRO-CAL will log every set interval.

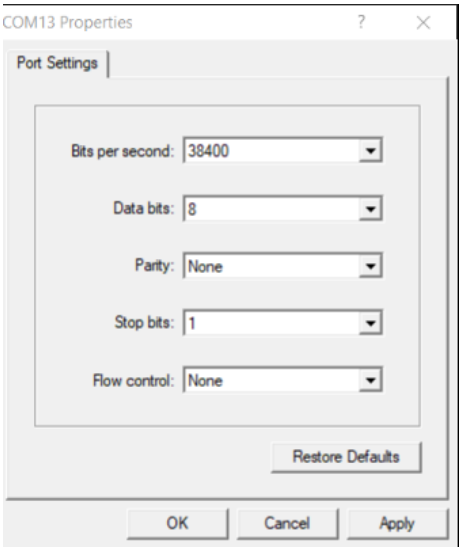
After you have finished logging, connect your handheld to a computer via the USB port. You can use HyperTerminal, PuTTY or any other type of terminal emulation program of your choice to read the data.



Using HyperTerminal for example, after connecting the handheld to your computer via USB, open the HyperTerminal program and enter a name for your connection and press OK.

Select the USB communication port the handheld is on, and press CONFIGURE.



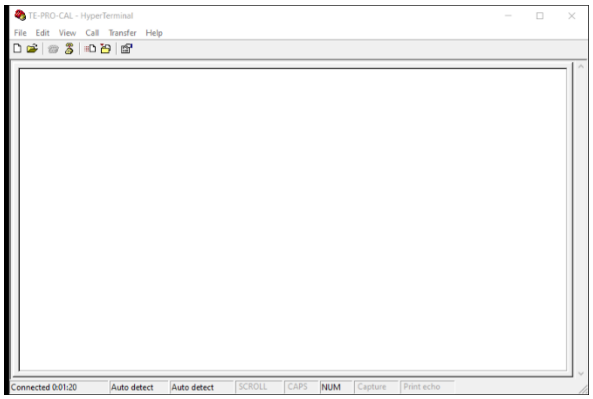


Under the Port Settings:

Bits per second: 38400
Data bits: 8
Parity: None
Stop bits: 1
Flow Control: None

Press APPLY, OK, and OK again to start the connection.

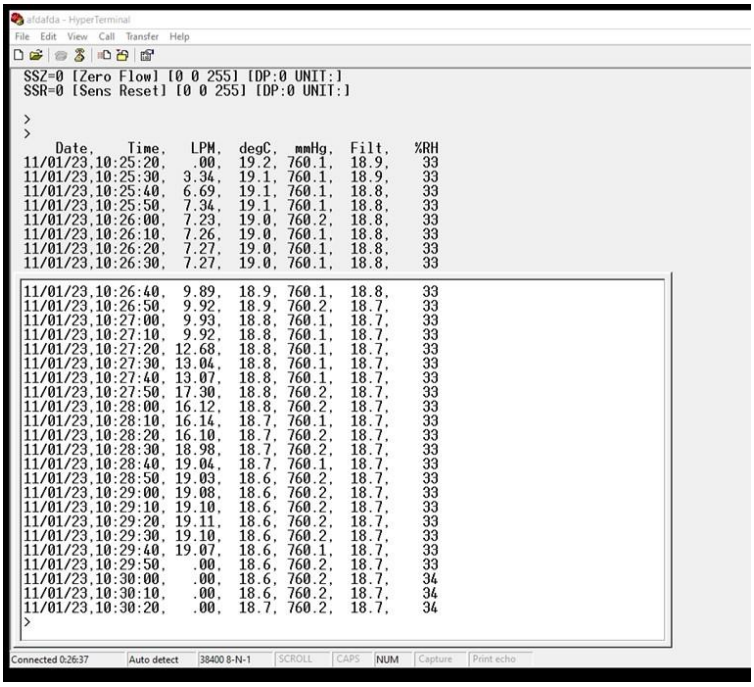
HyperTerminal will start off with a blank screen.



On the handheld, open the menu by pressing ENTER, and scroll to the LOGGING menu.

Scroll to TRANSMIT, and press ENTER. Press ENTER again to EXECUTE. The terminal will transfer all data saved when logging was enabled. While the data is being transferred, the handheld menus will be frozen until the transfer is complete.

This screenshot shows an example of the data presented by Hyperterminal.



Appendix A: Revision History

Revision No.	Date	Description
REV001.0	8-9-23	Manual created
REV001.1	11-1-23	Added logging feature to manual for firmware version 2.33
REV001.2	11-29-23	Modified range of unit from 2-20lpm