

# ThoughtStream™ Interface Software: User's guide

*Note: This software is "beta test" software. If you find any bugs, please contact [tstone@pop.nwlink.com](mailto:tstone@pop.nwlink.com) with a description of the problem(s).*

## Introduction

This software is intended to extend the capabilities of the ThoughtStream Personal Biofeedback Training System™. It was developed to run under Windows 95 and should also run under Windows 98 and possibly NT 4.0. Key features of the software include:

- Session data are plotted in graph form;
- Data from up to six sessions may be viewed on the same graph;
- Sensitivity range is increased to 1000% maximum;
- Notes may be added to each session's data graph;
- Three different biofeedback graphical displays are included.

## Installing the software

Locate the ThoughtStream Setup folder on the distribution media<sup>1</sup> and run the Setup program. Follow the instructions which appear on screen.

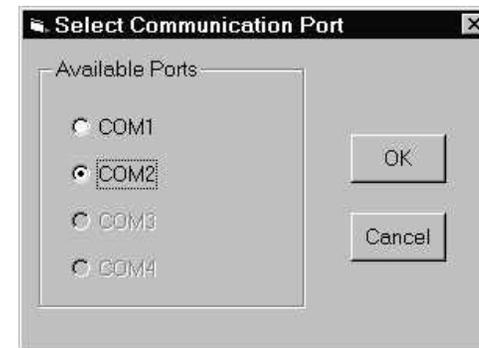
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<sup>1</sup> Generally a CD-ROM. If you have downloaded the software from our website, then you will need to unzip the file before running the SETUP program.

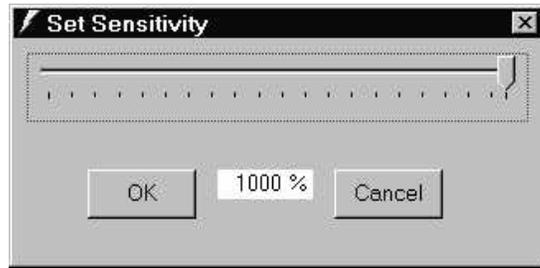
## Running the software

Perform the following steps to prepare for a ThoughtStream session:

- a. Connect ThoughtStream to your PC with the special serial cable included with this software. It comes with a 9-pin serial connector; note which COM port you have plugged it into. Plug the other end into the PC port located on the lower-right side of the system.
- b. Start the ThoughtStream Interface software, and click the Serial Port popdown menu to select a serial port. The following dialog box should appear:



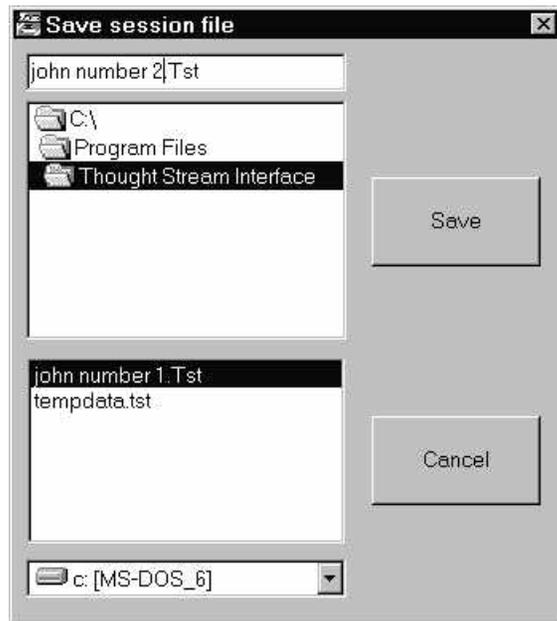
- c. Select the COM port you have connected ThoughtStream to then click OK.
- d. Popdown the Display menu, and select the functions you would like to view (see reference section, below).
- e. Popdown the Session menu and select SET SENSITIVITY. Move the slider which appears to select the initial sensitivity for the session; the available range is from 20% to 1000%.



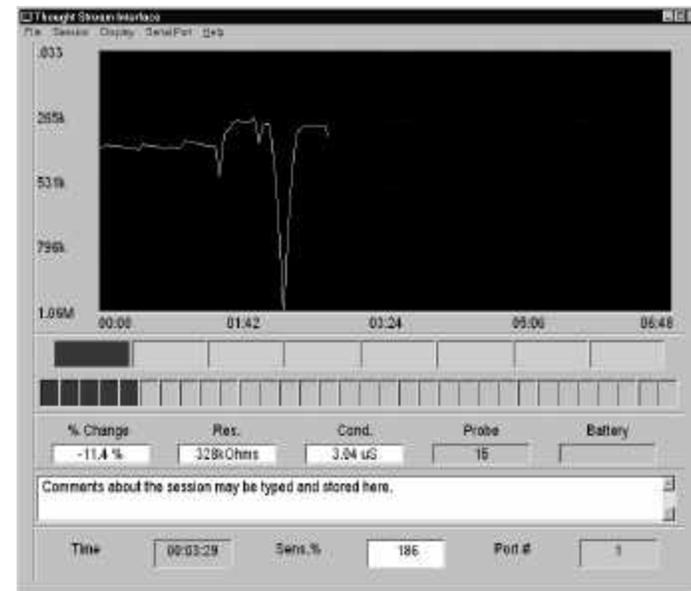
## Customizing the display

The user interface includes a variety of different display modes; you will probably not want to view all of them at once. Those with a check mark next to them will be displayed.

- f. Fit the sensor snugly into the palm, then select START from the SESSION popdown menu.
- g. When the session is over, select SAVE from the FILE popdown menu. Type in the session name (and directory path, if desired) and click on the Save button; in the example below, the session saved is john number 2.tst



- h. That's all there is to running a session. Software details and reference follows in the next session.



<Picture graph

<Color bar graph

<Bar graph

<Internal status

<Session

comments

<Display time etc.

## Display: Picture Graph

The Picture Graph is the core of the program. During a session a graph is drawn of skin resistance in ohms (vertical axis) vs. elapsed time. The full scale range is established by the sensitivity setting you have selected. If a reading occurs outside the range of the screen, then the vertical scale will automatically adjust itself to display the entire graph. Likewise, if the session lasts longer than the displayed time, the displayed time scale will be compressed.

### Display: Color Bar Graph

This is a multicolored bar graph which changes from solid red through a series of colors to magenta as the measured probe resistance increased through its sensitivity range. The spectrum of colors includes red, orange, yellow, green, cyan, blue and magenta. If the measured skin resistance falls below the starting value then the displayed colors are pastel.

### Display: Bar Graph

Enables a two color bar graph with 32 steps. As the skin resistance increases from the starting value the number of green boxes increases until all 32 are filled when the resistance has reached the level determined by the sensitivity setting. If the probe resistance decreases from its initial value the bar graph color is displayed in red. Note that this display may be used to train the GSR in both directions.

### Display: Internal Status

**% change** displays the current percent change in resistance.  
**Res** displays the current probe resistance  
**Cond.** Displays the probe conductivity (resistance) in Siemens (Siemens = 1/Ohms). Also called Mhos.  
**Probe** displays the current 12 bit ADC value coming from the ThoughtStream. If a probe reading is acceptable, the background color will be pastel green. If a probe error condition occurs (short circuit or open—no skin contact) the background color will change to pink. Note: The ThoughtStream will automatically shut itself off if a probe error lasts for ten seconds.

### Display: Session comments

Select this when you wish to include comments about a particular session within the session record.

Display: Display time, etc.

**Time** shows the elapsed time of the current session.

**Sens. %** is the current sensitivity setting.

**Port #** shows which COM port is being used by the interface program. Clicking on the port number **when a session is not running** allows the user to change the port number.

Before the Com window is displayed the program looks at Com's #1-4 to verify which are already in use. The port is set up automatically when it is opened so that the user does not have to set the baud rate, etc.

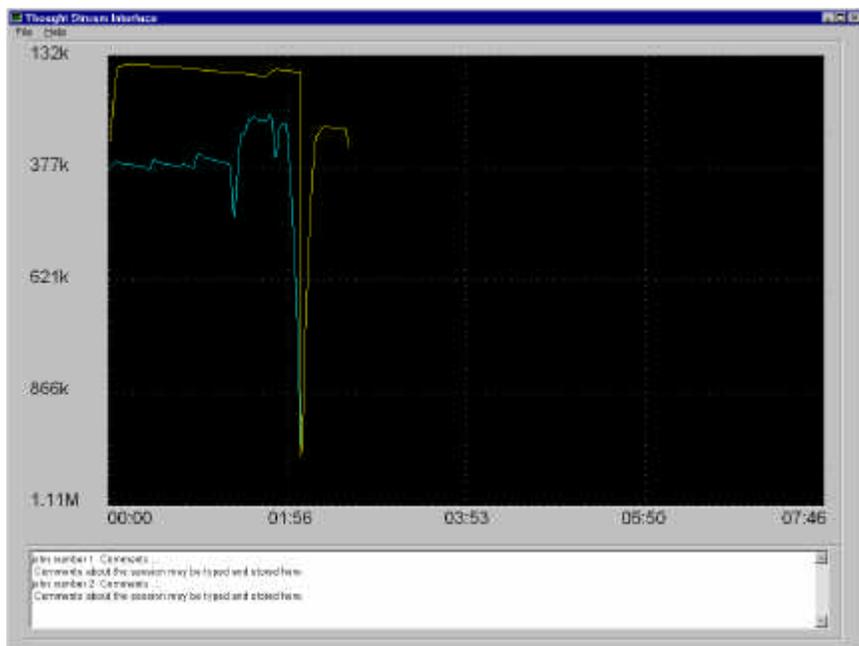
### Displaying multiple sessions

It is possible to recall and plot the data from up to six sessions for comparison purposes. To do this:

- a. Select DISPLAYED SAVED SESSION from the File popdown menu. This brings up the following window:



- b. Select the first session you wish to display by clicking on a session name in the list on the lower left side of the display, then clicking the ADD button. The session will be displayed in the color shown (e.g., “John number 1” will be plotted in pale blue, etc.)
- c. Continue selecting sessions until you are ready to plot them. Then, click the DISPLAY button. This will bring up the following window:



Any comments recorded in the individual records will be displayed together with the session data.

### Tips and reminders

--Wear the sensor band for at least one minute (longer on cold days or if you have unusually dry hands) before starting a session to allow the metal to form a good contact with the skin.

--Clean the sensor metal periodically with rubbing alcohol to remove oils and residues which might interfere with accurate readings.