

# TEC OVEN PELTIER

## Operation Manual

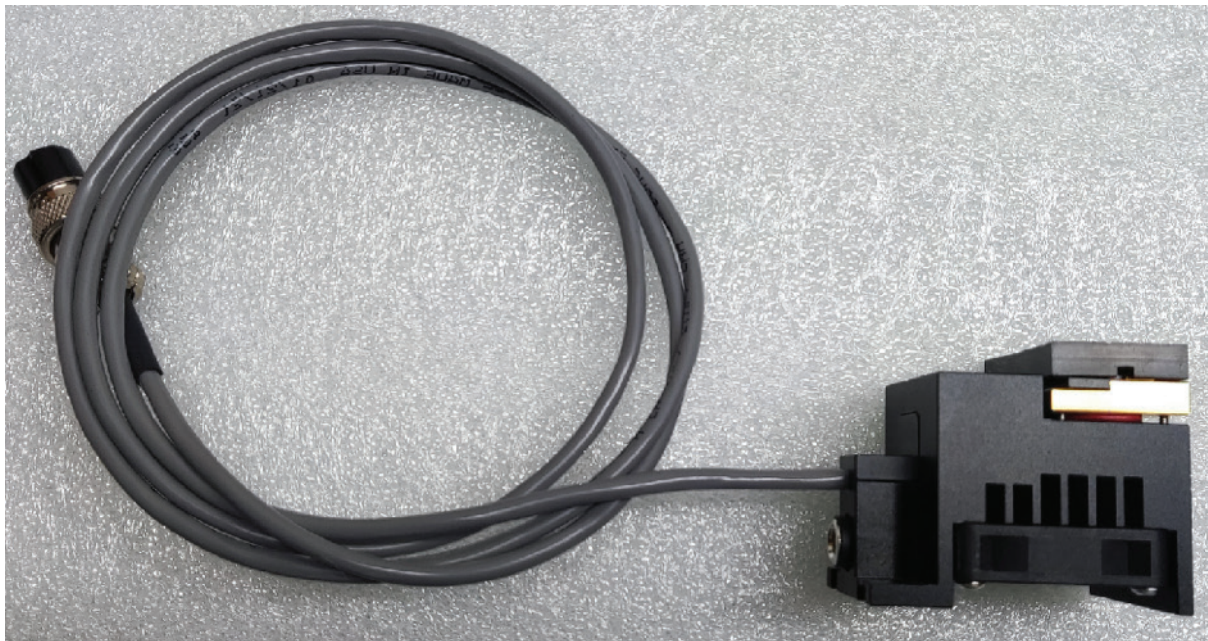


### 1. INTRODUCTION

The Tec Oven Peltier with the thermoelectric Cooler/Heater Module (nonlinear crystal mount) is designed to set and stabilize the temperature of nonlinear crystals in the range of 20°C to 60°C.

### 2. DESCRIPTION

2.1. Thermoelectric Cooler/Heater Module is shown in figure 1

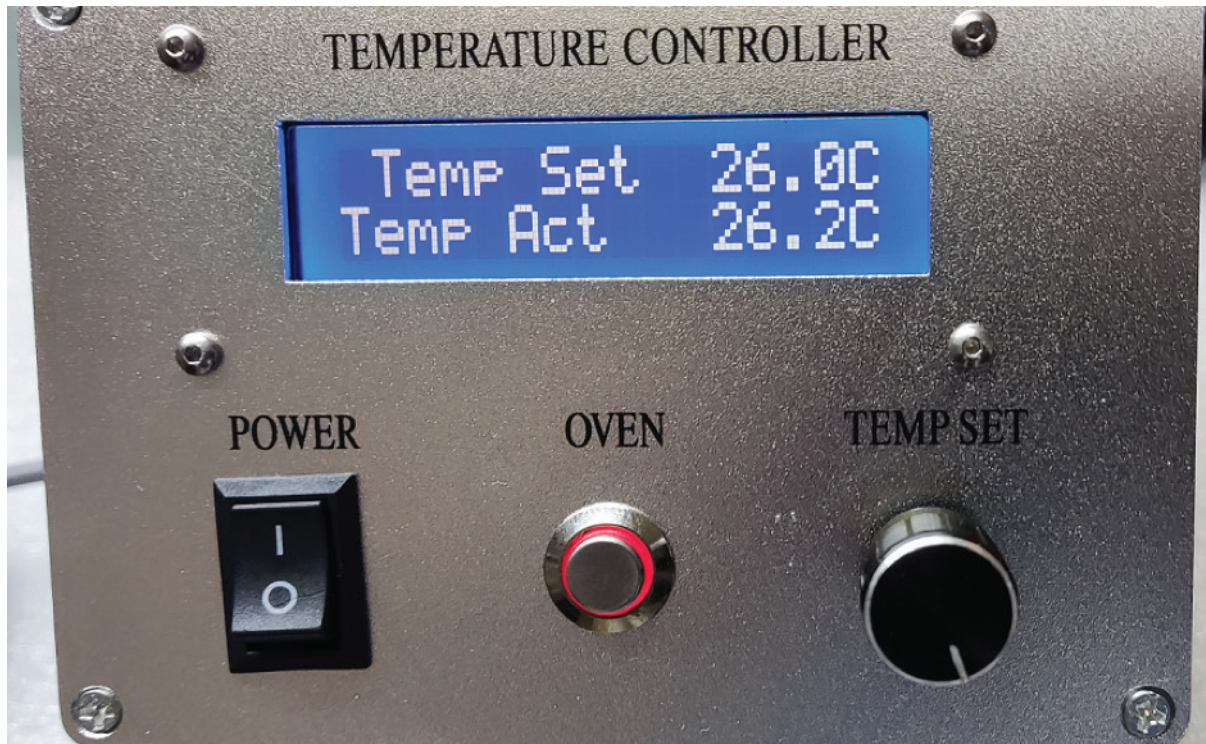


**FIGURE 1. Thermoelectric Cooler/Heater Module**

A Thermoelectric Cooler/Heater Module consists of:

- Tec crystal holder with cover
- Heatsink with 9V to 12V fan
- Tec controller cable
- Fan power connector

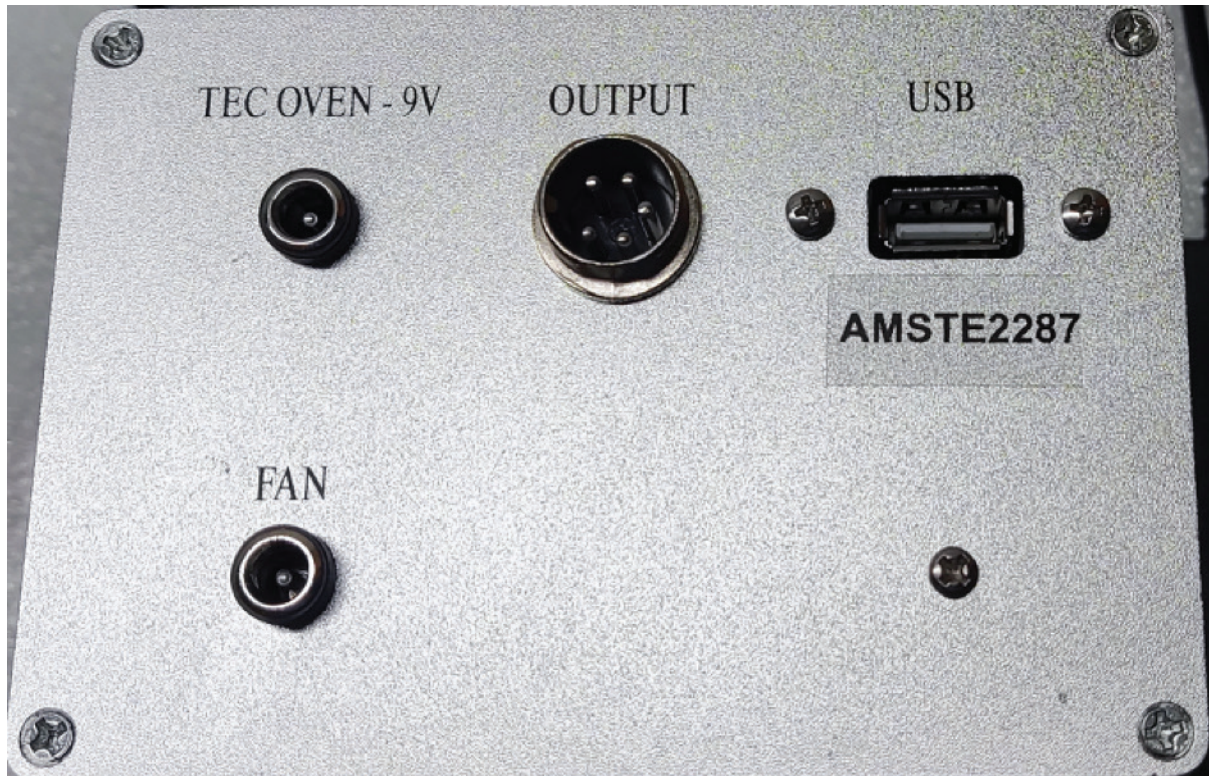
2.2. Tec Oven is shown on figure 2 (front panel) and figure 3 (back panel)



**FIGURE 2. Tec Controller (temperature controller) front panel**

- On the front panel are located:
  - Two lines digital **LCD Display** for viewing temperature set point and actual temperature
  - Encoder '**TEMP SET**' for setting temperature set point. The temperature set point is changed by rotation the Encoder '**TEMP SET**' knob wherein:
    - rotating the '**TEMP SET**' knob is changing the set temperature in increments of 1°C
    - pressing and subsequent rotating the '**TEMP SET**' knob is changing the set temperature in increments of 0.1°C
    - repeat pressing of the '**TEMP SET**' knob returns back its initial state.
  - Power switch '**POWER**' for switching on/off the power supply
  - Illuminated pushbutton '**OVEN**' for switching on/off the thermoelectric Cooler/Heater Module





**FIGURE 3. Tec Controller (temperature controller) back panel**

The following items are located on the back panel:

- Connector '**OUTPUT**' for connection of the thermoelectric Cooler/Heater Module
- Connector '**TEC OVEN – 9V**' for connection to the 9VDC ,4A power supply
- Connector '**FAN**' for connection of the fan power
- Connector '**USB**' for connection to the PC

### **3. TEC OVEN (TEMPERATURE CONTROLLER) OPERATION**

#### **3.1. SET UP FOR OPERATIONS**

- Connect thermoelectric Cooler/Heater Module to the '**OUTPUT**' connector with a suitable cable.
- Connect AC/DC adapter 9VDC to the connector '**TEC OVEN – 9V**' with a suitable cable
- Connect '**FAN**' to the oven with a suitable cable

#### **3.2. STANDALONE OPERATION**

- Switch on the '**POWER**' switch. The display will show two lines: **TEMP SET** and **TEMP ACT**
- Set the desired temperature using the '**TEMP SET**' knob (as specified in item 2.2)
- The display will show the set temperature as **TEMP SET**.



- Press the illuminated pushbutton '**OVEN**' for switching on the thermoelectric Cooler/ Heater Module. The red LED in the illuminated pushbutton '**OVEN**' lights up
- Heating stabilization process usually takes 10 min to 15 min depending on the set temperature and environmental conditions

**NOTE:** During operation, a change in the temperature set point also permitted (using 'TEMP SET' knob).

(1\*) AC/DC adapter 9VDC and fan power cable are supplied together with the thermoelectric Cooler/ Heater Module and the Tec (temperature) controller

### 3.3. OPERATION WITH TEC OVEN THERMO INTERFACE SOFTWARE

- Create a folder on the PC with arbitrary name
- Place in the created folder **TEC OVEN INTERFACE** (attached)
- Connect '**USB**' Connector to PC with USB cable
- **If the main grid does not have ground pin advise to use digital isolator.**
- Double click on **TEC OVEN INTERFACE** open user software communication (figure 4)

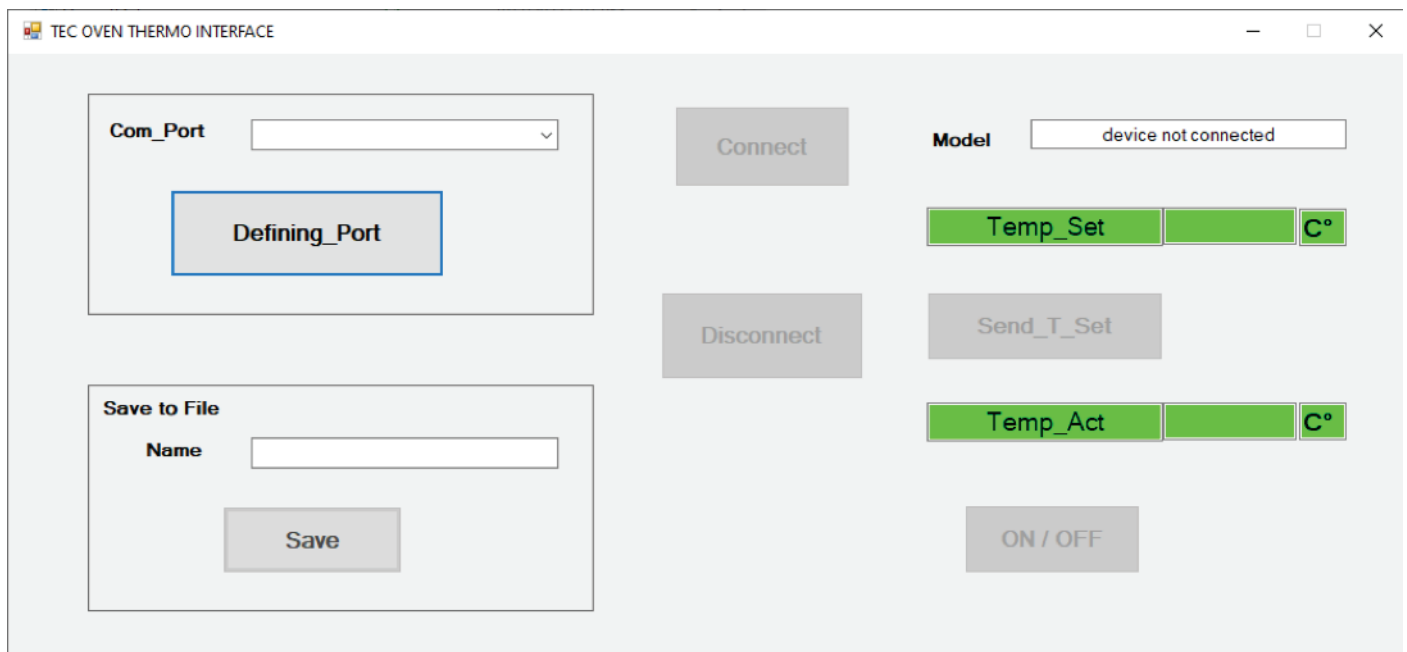


FIGURE 4. User Interface Software

- For defining **Com\_Port** press '**Defining Port**' button, at the same time the number of the connected port appears in the '**Com\_Port**' window
- If you have a lot of USB devices, please select the port corresponding to our device. This port can be checked at the Windows device manager.

For Windows 7 installation need add STM32 com port driver: **en.stsw-stm32102**

Moreover, if the message '**Missing Port**' appears with Windows 10 installation also need add STM32 com port driver: **en.stsw-stm32102**

- Pressing the 'Connect' button interface connects to the Tec controller and activates the interface (figure 5). At this moment, all control knobs of the Tec controller are disabled (except for the '**POWER**' switch), and the current state of the Tec controller are reflected on the interface.

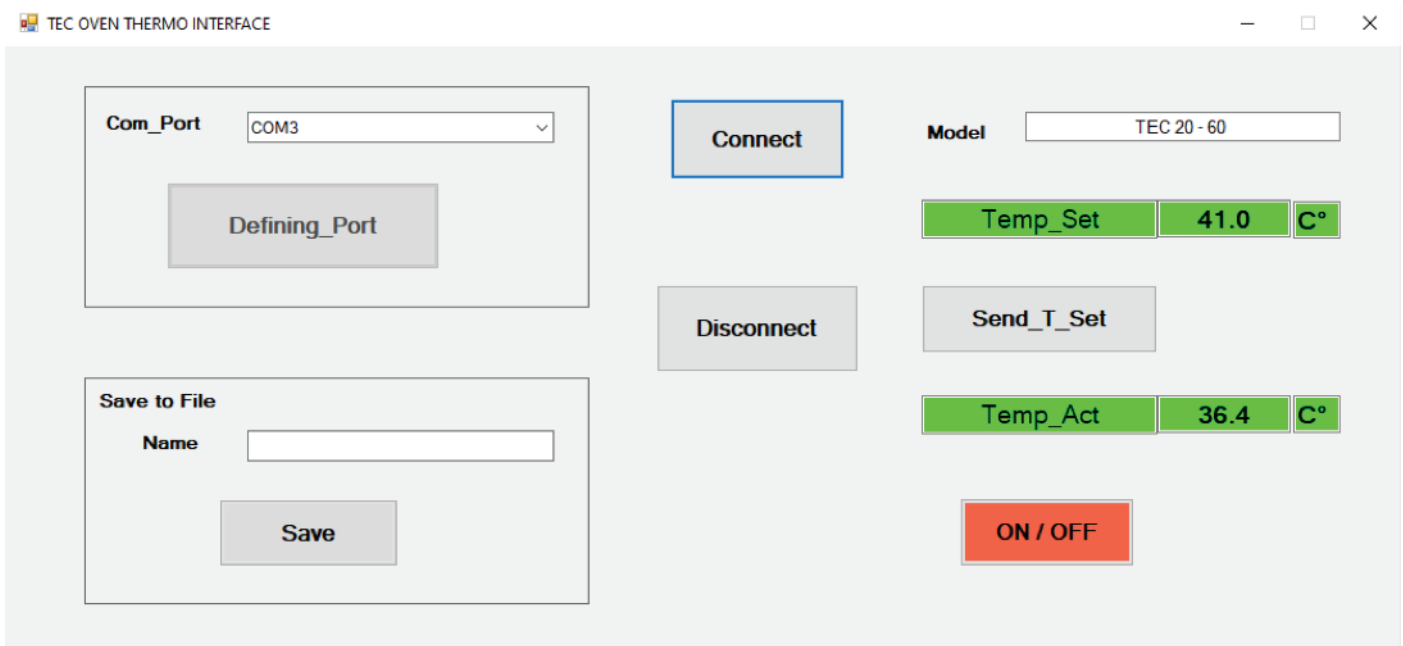


FIGURE 5. User Interface Software

- '**Temp\_Set**' button: at temperature window place a mouse pointer then you should print desire temperature at format: xx.x (for instance: **35.5,60.0**).
- If the desire temperature format is incorrectly set, the message '**Format error. required 20.0 – 70.0**' appears. (figure 6)
- '**Send\_T\_Set**' button: send set temperature data to Tec controller

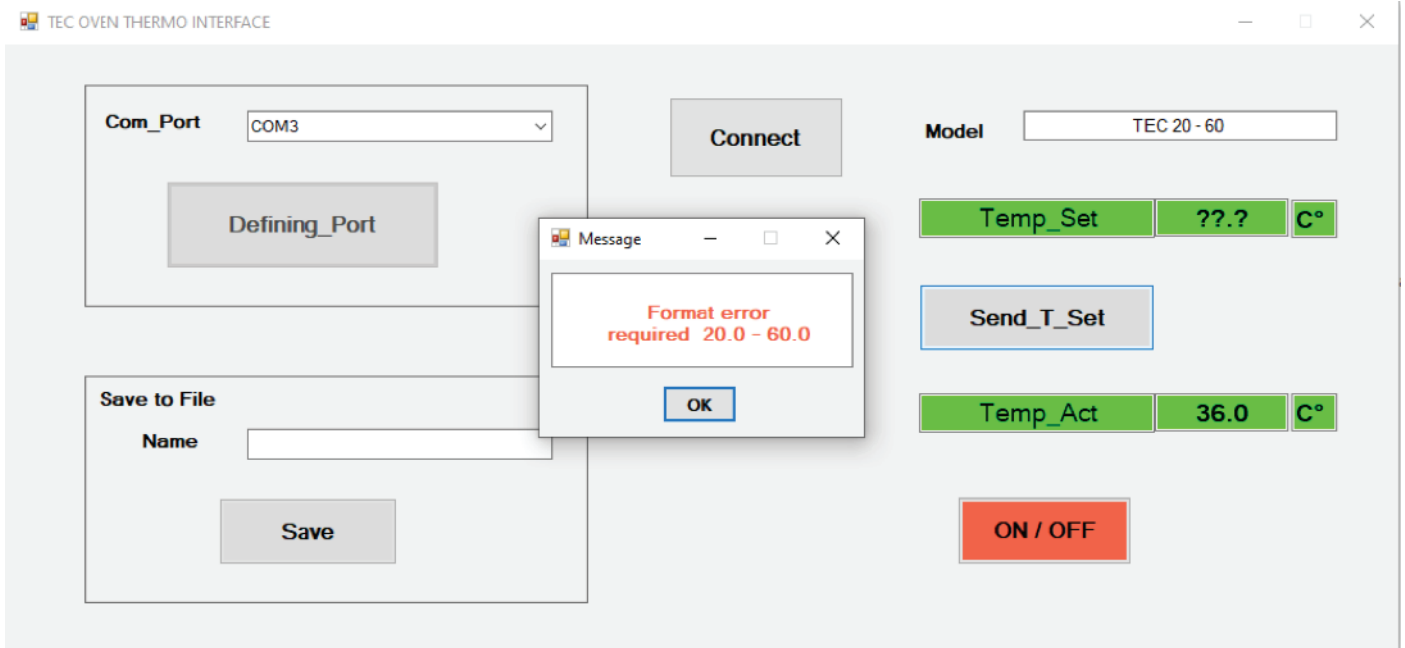


FIGURE 6. User Interface Software

**NOTE:** During operation, a change in the temperature set point also permitted (using 'Temp\_Set', 'Send\_T\_Set' buttons)

- 'ON/OFF' button: switching on/off Tec controller

#### All controls are transferred to PC

- 'Save to File': to save current data of the temperature print in the widow 'Name' name of the file and click 'Save' button (figure 7). It will start temperature file save process with time sampling rate 1.5 sec per point as **Name.txt** file. This file can be use at EXCEL or other programs.
- To stop this file writing press again the 'Save' button. File will be saved in the folder, created in accordance item.3.3. and containing **TEC OVEN INTERFACE**, as **Name.txt**

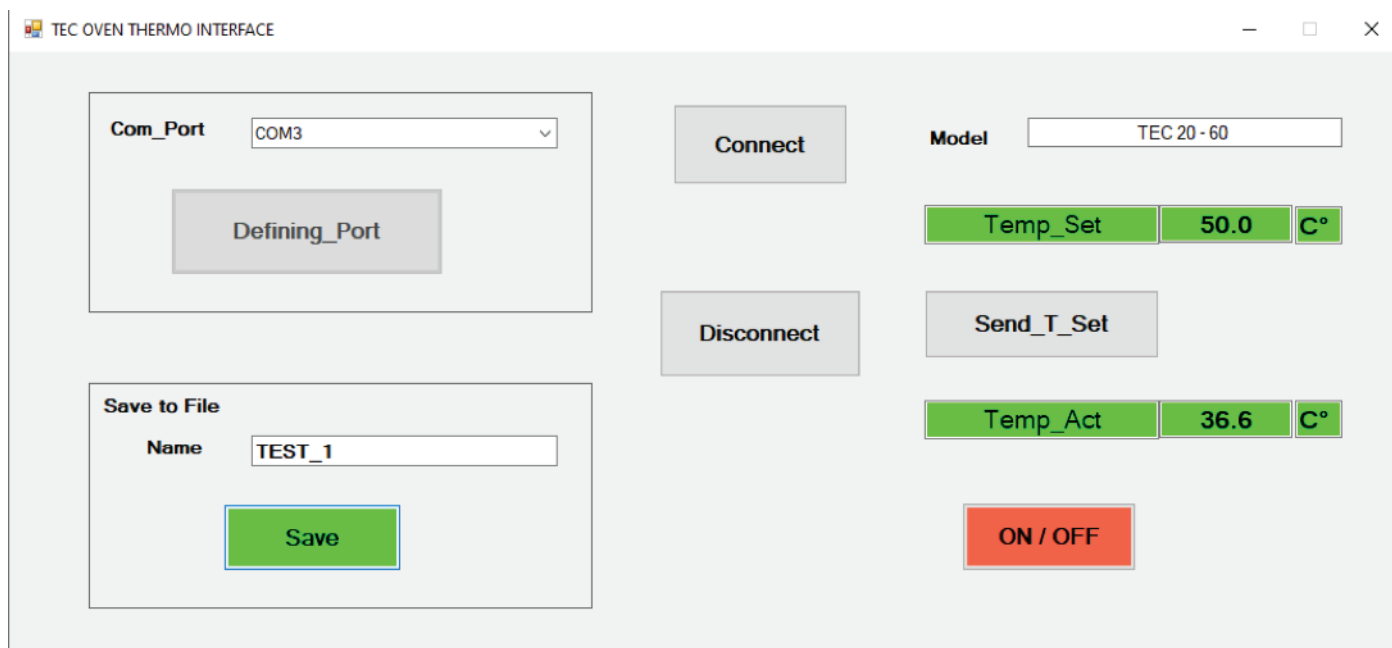


FIGURE 7. User Interface Software

- **'Disconnect'**: the button is used to switch to **STANDALONE** mode (if there is no need to use the **TEC OVEN INTERFACE** further), wherein a **'connection lost'** message appears. (figure 8)
- You must press OK button in this message, while the message **'Missing port'** appears in the **Com\_Port** window, and the **Model, Temp\_Set, Temp\_Act** windows are cleared. (See figure 4)
- The **'connection lost'** message may also appearing the event of an accidental loss of communication between the **TEC OVEN INTERFACE** and the TEC CONTROLLER
- The **'connection lost'** message may also appear after the PC wakes up from sleep mode
- In these two cases, you need also to do the above steps

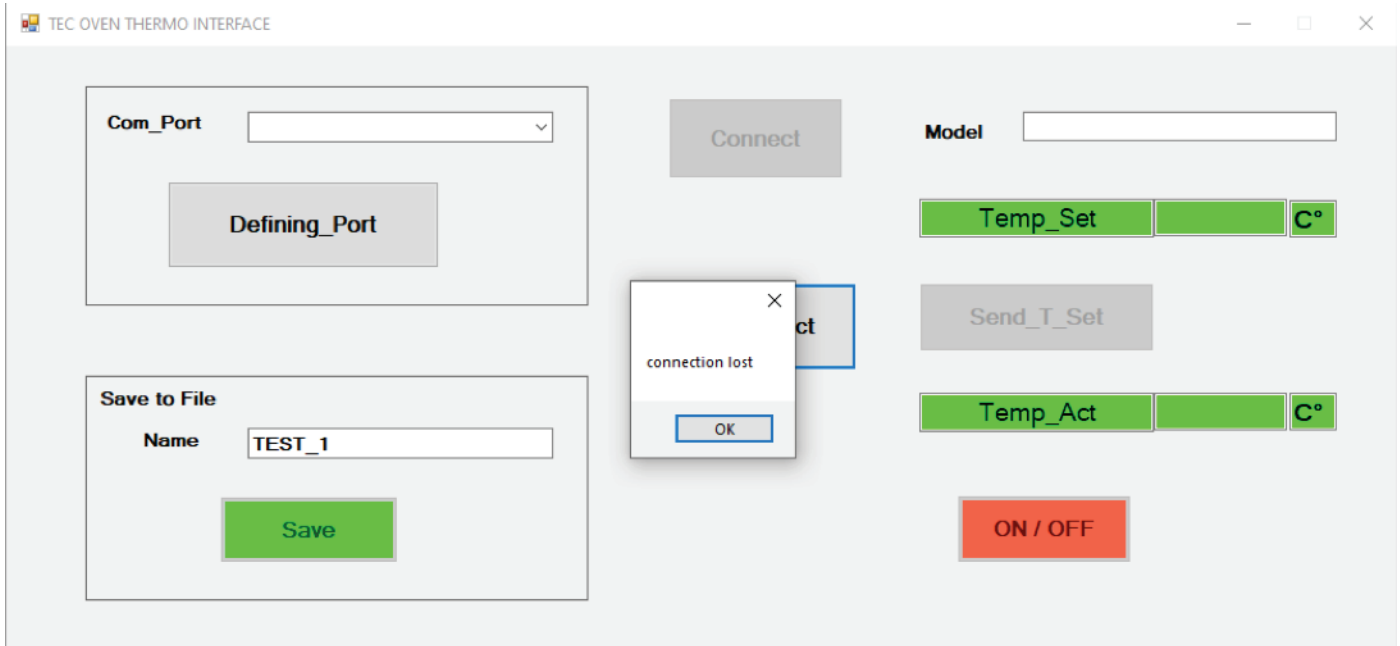


FIGURE 8. User Interface Software

**All controls are transferred to STANDALONE** (see item 3.2.)

To restore the **TEC OVEN INTERFACE** work you need to do following:

- Press '**DefiningPort**' button ,at the same time the number of the connected port appears in the '**Com\_Port**' window .
- Pressing the '**Connect**' button **TEC OVEN INTERFACE** connects to the Tec Controller and activates the **INTERFACE**.

**All controls are back to the TEC OVEN INTERFACE.**





## SAFETY INSTRUCTIONS

Please pay special attentions to following statements for your own safety.

- The unit can generate temperatures that can lead to serious injuries when they come into contact with the skin. It takes a while to cool down after the unit and its devices have been used.
- The unit has to be placed in an upright position.
- The unit and its accessories must not come into contact with water or chemicals.
- The main power switch must always be accessible
- Do not cover the ventilation openings at any time.
- Do not insert any parts into the ventilation inlet or outlet.
- Do not exceed minimum or maximum ambient temperature and humidity conditions during operation or storage of the unit
- The unit must not be used if the unit itself or the power cable shows visible signs of damage.
- The unit is for indoor use only
- You can suffer an electric shock and injuries, if the Unit is not connected properly or if you do not disconnect the unit from the wall power outlet before opening the housing.
- Never connect or remove the power plug with wet hands.
- Original power cable provided by RAICOL has to be used to guarantee safe and proper operation.
- Make sure that the electrical specification meets your local situation.
- Disconnect power before cleaning the equipment. Do not use liquid or aerosol cleaners but only a damp lint-free cloth.
- The unit do not require any maintenance

## WARRANTY

Products manufactured by Raicol Crystals are guaranteed to the original purchaser for a period of one (1) year. Under this warranty, the liability of Raicol Crystals is limited to servicing, adjusting and replacing any defective parts that are of Raicol Crystals manufacture. Raicol Crystals is not liable to the customer for consequential or other damages, labour losses or expenses in connection with or by reason of the use or inability to use the products manufactured by Raicol Crystals.

Raicol Crystals cannot assume responsibility for repairs or changes not authorized by Raicol Crystals or damage resulting from abnormal or misuse or lack of proper maintenance.

## TECHNICAL SUPPORT

We are happy to support you with advice, please email our customer support: [office@raicol-crystals.com](mailto:office@raicol-crystals.com)