# TSL-MINI Incubator

## Instruction manual

Catalog No. MINI-INCBASIC

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Version 05A
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# Packing List

- CLV-MINI-INCBASIC Incubator x1
- Power Cord x1
- Stainless Steel Shelf x1
- Instruction Manual x1

Signed by:

Date:

**Thistle Scientific is liable for all missing or damaged parts / accessories within 7 days after customer received this instrument package. Please contact Thistle Scientific immediately regarding this issue. If no response within such time period from consignee party, that will be consignee party's whole responsibility.**

## Table of Contents

## Warning

This equipment has been tested and verified to comply with safety limits. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment may generate, use, and radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their expense. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. It is strongly recommended that the user carefully read the following prints before operating any equipment.

1. Read and follow the manual instructions carefully.
2. Do not alter the equipment. Failure to follow these directions could result in personal and/or laboratory hazards, as well as invalidate equipment warranty.
3. Use a properly grounded electrical outlet with correct voltage and current handling capacity.
4. Disconnect from power supply before maintenance and servicing. Refer servicing to qualified personnel.
5. Never use this instrument series without having the safety cover correctly in position.
6. Do not use the unit if there is any sign of damage to the external tank or cover. Replace damaged parts.
7. Do not use in the presence of flammable or combustible material; fire or explosion may result. This device contains components which may ignite such materials.
8. Refer maintenance and servicing to qualified personnel.
9. Ensure that the system is connected to electrical service according to local and national electrical codes. Failure to make a proper connection may create fire or shock hazard.
10. Use appropriate materials and operate correctly to avoid possible hazards of explosion, implosion or release of toxic or flammable gases arising from overheated materials.
11. The unit shall be operated only by qualified personnel.

**Safety Information**

Use high level of precaution against any electrical device. Before connecting the electrical supply, check to see if the supply voltage is within the range stated at the rating label, and see to it that the device be seated firmly. Place the unit in a safe and dry location; it must NOT touch the surrounding. Follow the safety precautions for chemicals / dangerous materials. If needed, please contact qualified service representative or enquiries@thistlescientific.co.uk

**Environmental Conditions**

Ensure the instrument is installed and operated strictly under the following conditions:

1. Indoor use only
2. ≤95% RH
3. 75 kPa – 106 kPa
4. Altitude must not exceed 2000 meters
5. Ambient to 40°C operating temperature
6. Pollution degree: 2
7. Mains supply voltage fluctuations up to ±10% of the normal voltage

**Avoiding Electrical Shock**

Follow the guidelines below to ensure safe operation of the unit.
The MS MINI Incubator has been designed to utilize shielded wires thus minimizing any potential shock hazard to the user. Thistle Scientific recommends against the use of unshielded wires.

To avoid electrical shock:

1. In the event of solution spilling on the instrument, it must be dried out for at least 2 hours and restored to NORMAL CONDITION before each operation.
2. Never connect or disconnect wires loading from the power jacks when the red indicator light of power switch is on.
3. WAIT at least 5 seconds after stopping a run before handling output leads or any connected apparatus.
4. ALWAYS make sure that your hands, work area, and instruments are **clean** and **dry** before making any connections or operating the power supply.
5. ONLY connect the power cord to a properly grounded AC outlet.

**Avoiding Damage to the Instrument**

1. Do not attempt to operate the device if damage is suspected.
2. Protect this unit from physical damage, corrosive agents and extreme temperatures (direct sunlight, etc.).
3. For proper ventilation and safety concerns, keep at least 10 cm of space behind the instrument, and at least 5 cm of space on each side.
4. Use high level of precaution against the damages on the unit.
5. Do not operate the unit out of environmental conditions addressed above.
6. Prior to applying any cleaning or decontamination methods other than manufacturer's recommendation, users should check with the manufacturer's instruction to see if the proposed method will damage the equipment.

**Equipment Operation**

Follow the guidelines below to ensure safe operation of the unit:

1. NEVER access dangerous chemicals or other materials to prevent possible hazard of explosion and damage.
2. Do not operate the unit without lids or covers to prevent possible hazards.
3. A temporary conductivity caused by condensation might occur even though this series is rated Pollution Degree 2 in accordance with IEC 664.

**Symbol**

The symbol used on MS Mini Incubator is explained below.

Indicates an area where a potential shock hazard may exist. Consult the manual to avoid possible personal injury or instrument damage.

Indicates disposal instruction.

**DO NOT** throw this unit into a municipal trash bin when this unit has reached the end of its lifetime. To ensure utmost protection of the global environment and minimize pollution, please recycle this unit.

# Section 1 Introduction

## 1.1 Overview

Thistle Scientific's Mini Incubator is designed for personal use and small laboratories, saving much space. The unit features a broad temperature range to meet a variety of microbiology or hematology applications.

It is compact and economically priced, yet offers unique features not typically found in other incubators. The housing is all corrosion resistant metal, so is the door frame. The glass window of the door offers full visibility to the interior. One stainless steel shelf is included, and can be adjusted to two different levels – additional shelves can be purchased to increase storage capacity. The color touch panel presents vivid and intuitive user interface and the backlit LED ensures enough brightness even in dark environment.

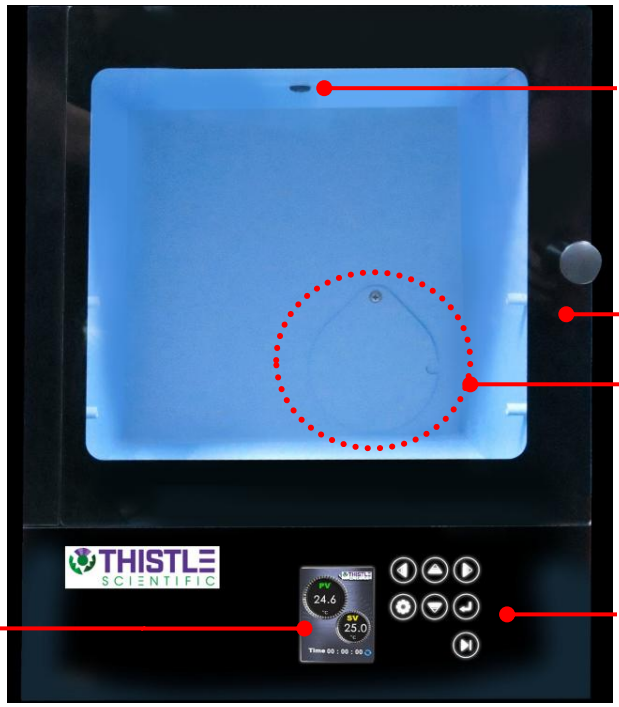
The heating structure incorporated in MS Mini Incubator performs evenly heating and precise temperature control. The microprocessor ensures temperature stability within the chamber. A thermometer port on the top of the unit allows the user to monitor temperatures. In addition, a designed spare port is on the rear of the chamber which allows for an electrical cord to be routed out if needed. Optional Function Control software allows Mini Incubator to perform real-time data recording through a PC.

## 1.2 Feature

- Ideal for microbiology or hematology applications
- Corrosion resistant metal chamber
- Door with large viewing area
- Backlit color touched panel
- One stainless steel shelf is included
- Functional control software available

## 1.3 Components Guide

### Front view




Thermometer Port

Front Door

Spare Port

Touch Keypad

Colored Display

### Rear view


USB 2.0 type-B Port
(to connect with PC)

Main Power Switch

Power Socket &
Fuse Holder

# Section 2 Technical Specification

| | |
|---|---|
| Display | LCD |
| Temperature Range | Ambient +5°C to 70°C |
| Capacity | 17L |
| Exterior Dimension (WxLxH) | 310x306x380 mm |
| Interior Dimension (WxLxH) | 261x255x255 mm |
| Weight | Approx. 12.65 kg |
| Power | 100-240V~, 50/60 Hz, 2A |
| Material | Metal |
| PC Connection | USB |

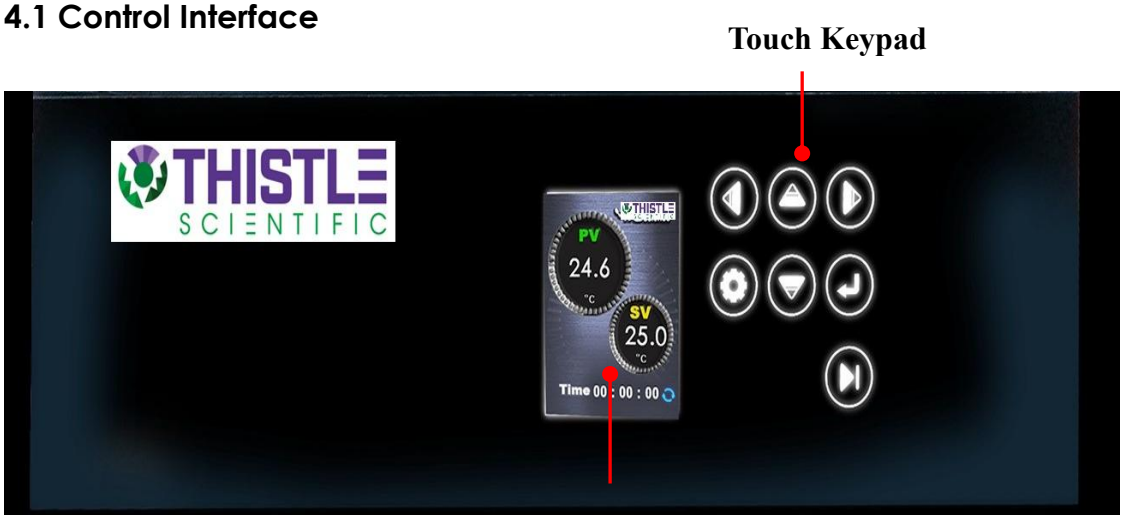
# Section 3 Installation Instructions

The *MS Mini Incubator* is a pre-installed instrument. Place the unit on a sturdy, level, safe and dry place; it is ready for operation.

Note: DO NOT hold the doorknob while lifting up the machine. Please use both hands from the bottom to move the machine.

# Section 4 Operation Instructions

### 4.1 Control Interface




**(1) Touch Keypad:** Parameters such as temp. or timer can be set through touch screen interface. Detailed descirptions are mentioned below.

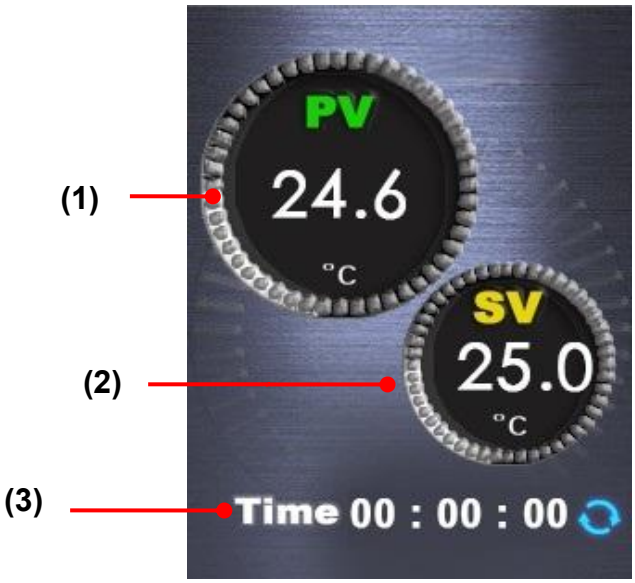
**(2) Color Display**: It shows present value, setting value, and timer.

### 4.1.1 Touch Keypad

| Icon | Description | Function |
|---|---|---|
|  | • Selection Key (Upward) | - Press  to move upward. |
| | • Value-changing Key (Increase) | - Press  to increase the value. Long press the key to speed up changing. |
|  | • Selection Key (Leftward) | - Press  to move leftward. |
|  | • Selection Key (Downward) | - Press  to move downward. |
| | • Value-changing Key (Decrease) | - Press  to decrease the value. Long press the key to speed up changing. |
|  | • Selection Key (Rightward) | - Press  to move rightward. |
|  | • Enter Key | - Press  to enter selected value. |
| | • Confirmation Key | - Press  to confirm the adjusted value. |
|  | • System Setup Key | - Press  to enter system setup page to set temperature offset value and touch keypad sensitivity. Password is needed to enter the page. |
|  | • Start / Stop Key | - Press  to start or stop the operation. |

### 4.1.2 Color Display

The system is equipped with a color display. Parameters such as temperature or timer can be viewed here.




**(1) PV:** Shows the present temperature status in the chamber.

**(2) SV:** Shows the set temperature value user designed.

**(3) Timer:** Use the touch keypad to set up time control. **The timer starts count down when present value reaches the set value.** If time is set as **"00:00:00"** it means **continuous**; icon  at the right will show in blue.

### 4.2 Start the operation

**Step 1** Prepare the samples according to lab protocol. Place the sample into the oven chamber. Make sure the door closes all the way.

**Step 2** To set the temperature or time value, press  to move between the 2 parameter. The selected one will display in blue. Press  , the figure will start flashing, use  to set the value. Press  again to confirm.

***Note 1:*** *If users do not press*  *to confirm for more than 3 seconds, system will automatically confirm.*

**For Timer:**

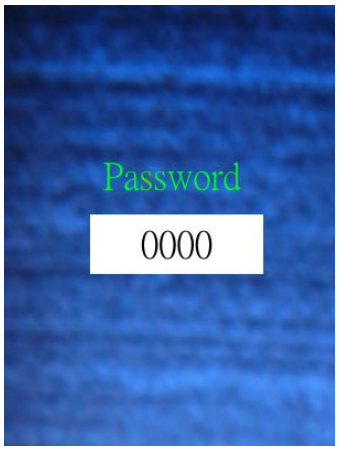
1. Timer is for temperature control only.
2. Timer activates when the target temperature has been reached for the first time. If a value is set for time, it will count down from that value to 0, with alarm sounding for 1 minute.
3. If no value is set for timer (ie. 0), timer will start count up to 9999; in which case the time will not increase anymore, but temperature control will remain.
4. If user reset the target temperature value after timer starts counting, the timer will NOT reset the countdown.

**Step 3** To start temperature control, press the  button. Once temperature control starts, the button will light in red. 

**Tip for maintaining certain humidity during operation:**
To prevent samples from drying out during incubation, user could put a small glass of water at the corner of inner chamber before starting operation.

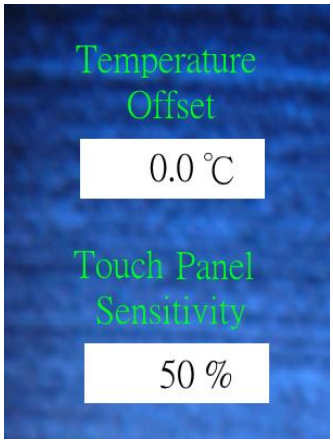
### 4.3 System Setup

**Step 1** Press to enter system setup page. Input the password and press button. (Password: 1111)




**Step 2** Press to move between the 2 columns. The selected one will display in yellow. Press to start changing the value. Press again to confirm. If users do not press to confirm for more than 3 seconds, system will automatically confirm.

***Temperature Offset:*** Ranging from -10.0 to +10.0
***Touch Panel Sensitivity:*** Ranging from 1 to 100. The larger the value is, the more sensitive the touch keypad become.



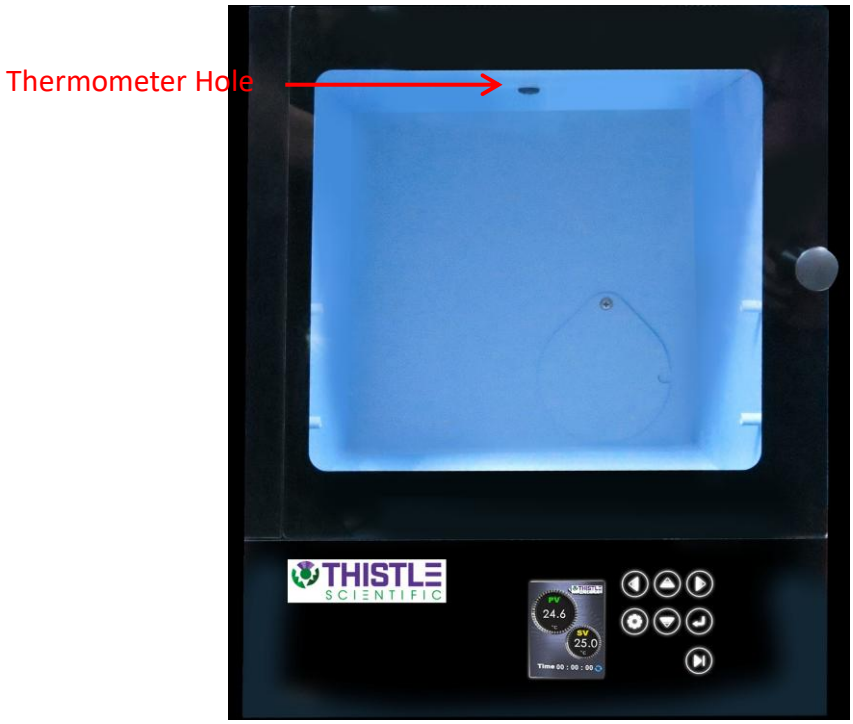

**Step 3** Press to return to home page.

### 4.4 Temperature Calibration

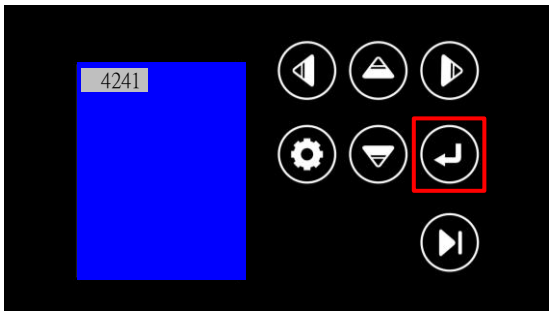
The system allows users to calibrate the temperature parameter to their environment standard. Normally there is no need to perform this action unless there is a temperature discrepancy between the factory environment and your working environment. In such cases, follow the guidelines below to perform user temperature calibration.

**Step 1** Place a certified thermometer through thermometer hole, which is on the top of the oven chamber. Make sure the front door and the behind spare port is closed during the entire calibration process.

*Note: It is suggested to place thermometer in the middle of chamber.*



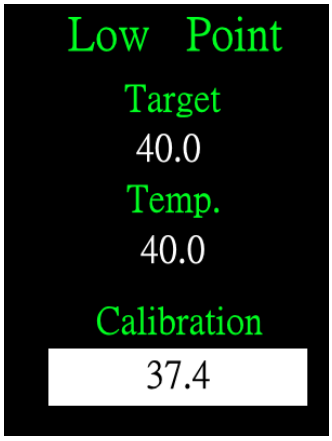

**Step 2** Switch on the main power. When the screen is blue, press ↵. Don't release the button until figure (on the upper left corner) is between 4000 and 5000. Once the figure reaches between 4000 and 5000, release ↵, and the oven is now under Calibration Mode.




**Step 3** Under Calibration Mode, Low Point Calibration is required to perform first. The default low point is 40℃, user only needs to input the heating time. It is suggested to input at least 50 minutes to reach temperature balance. When finish setting, press button to start heating.


*Note: Use button to select Hour/Minute/Second and button to adjust the value.*

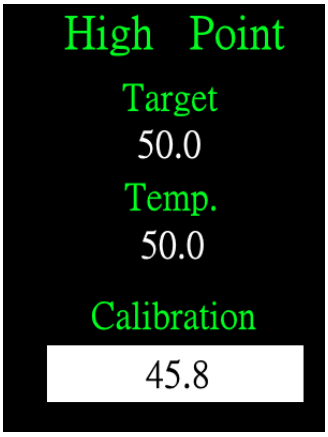
**Step 4** Once present value reaches 40℃, the timer starts count down. When countdown is over, a beep-beep sound will alert. Press button, a blank column will appear. Input the temperature value you have measured, and press button to confirm.




**Step 5** Please proceed to High Point Calibration. The default high point is 50℃, user only needs to input the heating time. It is suggested to input at least 50 minutes to reach temperature balance. When finish setting, press button to start heating.


*Note: Use button to select Hour/Minute/Second and button to adjust the value.*

**Step 6** Once present value reaches 50℃, the timer starts count down. When countdown is over, a beep-beep sound will alert. Press button, a blank column will appear. Input the temperature value you have measured, and press button to confirm.




**Step 7** System will automatically adjust the temperature. Wait until both "Target" and "Temp." show 50℃ and the calibration process is complete. After finishing calibration, turn off the machine.

# Section 5 Function Control Software

NOTE: All rights reserved by Thistle Scientific co., ltd.

### 5.1 Installation Instruction

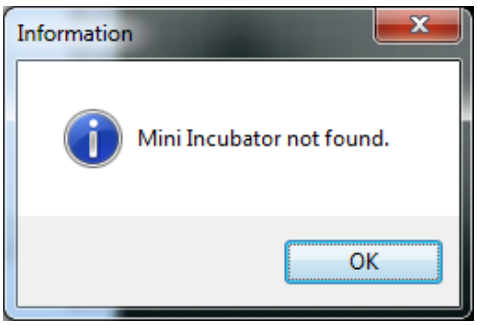
1. Insert the CD into CD ROM and press the setup.exe in the Installer Folder for installation.
2. Follow up the instructions shown on the computer display screen to complete the installation.

### 5.2 Operation Instruction

After the installation completes, user can find a "MS" icon (as the image below) on user's desktop. Double-click the icon to start the remote control operation.

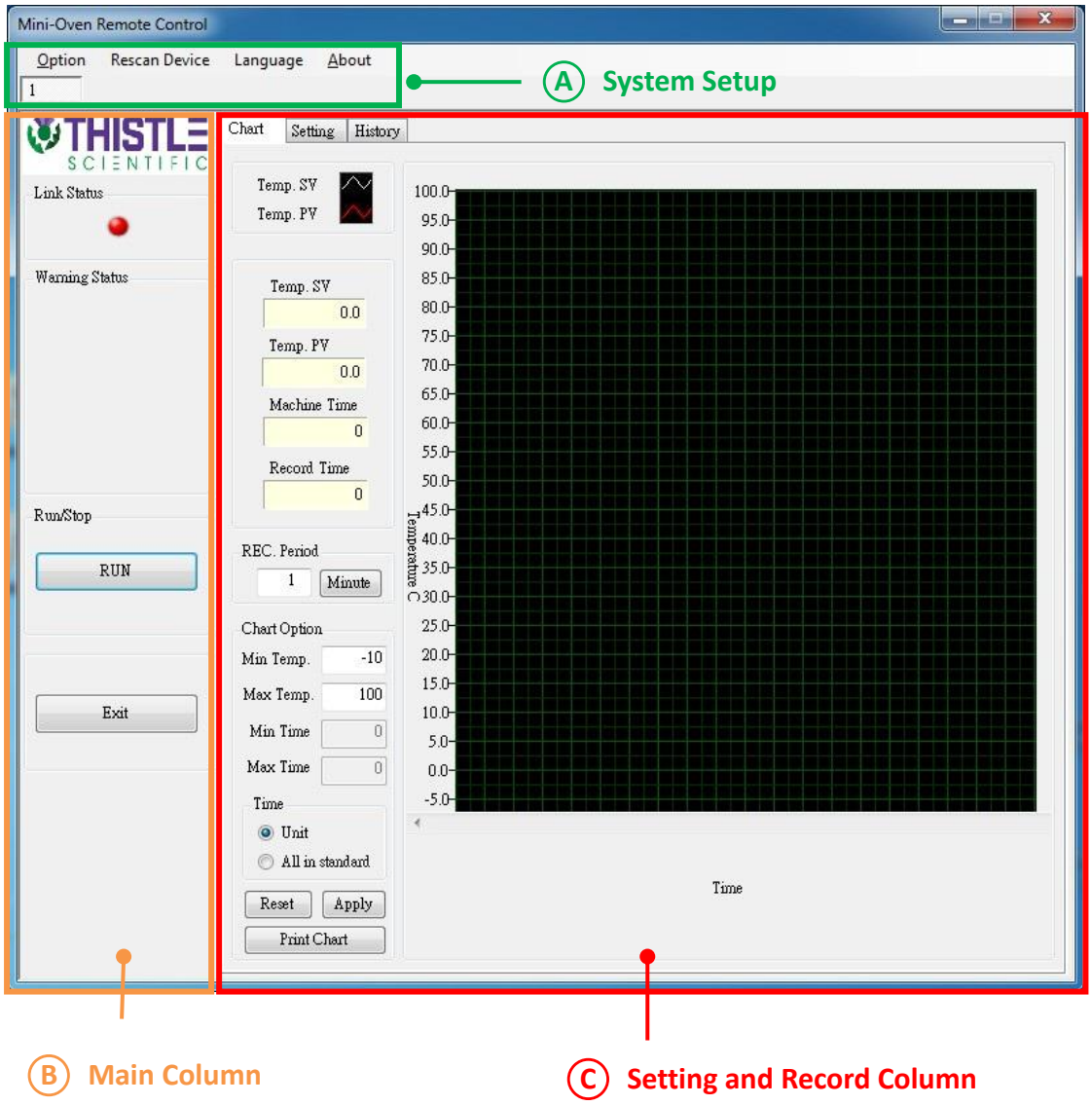

***Notice:***

User will need to use the USB cable to connect the device with user's computer before starting the remote control operation. If the device is not connected or connected wrongly, the software will pop up a warning dialogue as the picture below. The dialogue will disappear once the device is connected. Click "OK" to close the dialogue.

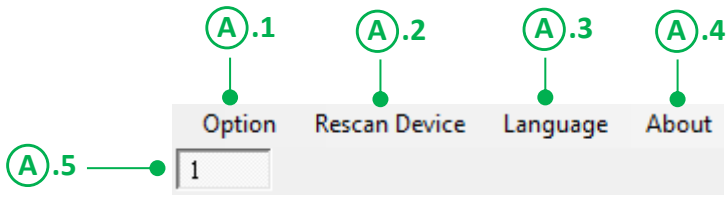



Remote Control Interface Introduction

Start MO-MINI software program and then the below screen will be shown.

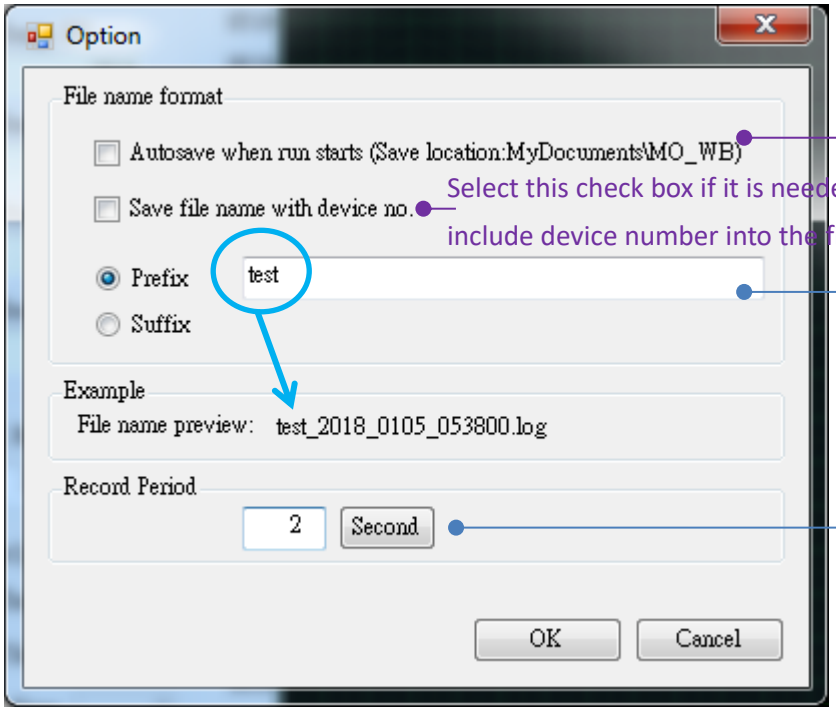


Error **System Setup**




## A.1 Option

| | |
|---|---|
| Option | Set up the file name format and record period. |




It is suggested select this check box to automatically save file every time users start running the machine. If not, system will pop up a file-saving dialogue.

Select this check box if it is needed to include device number into the file name.

Appoint desired string of words before/after the file name. You can preview the result at Example below.

The **default value** of how frequent the operation data is recorded. This value will apply on **ALL** machines and **EVERY** operation.

## A.2 Rescan Device

| | |
|---|---|
| Rescan Device | If the device has once disconnected, press "ReScan Device" to help the software find the reconnected device. |

### Ⓐ.3 Language

| | |
|---|---|
| Language | Set up system language. |

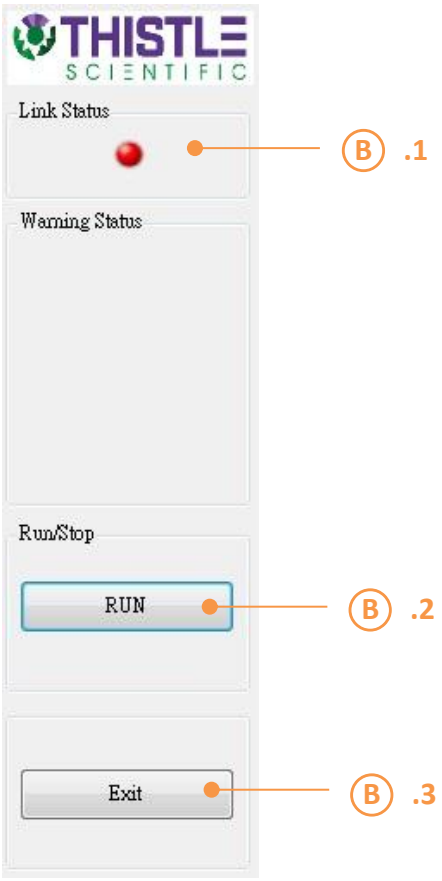

### Ⓐ.4 About

| | |
|---|---|
| About | Display the software version and patent information. |


### Ⓐ.5 Device No.

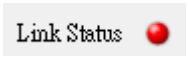
| | |
|---|---|
| 1 | System can control more than one Mini Incubator at the same time; click the blank to switch. |

## Ⓑ Main Column:




### Ⓑ.1 Link Status

Indication whether the Mini Incubator is linked with computer or not.




Disconnected


Connected

### Ⓑ.2 RUN/STOP

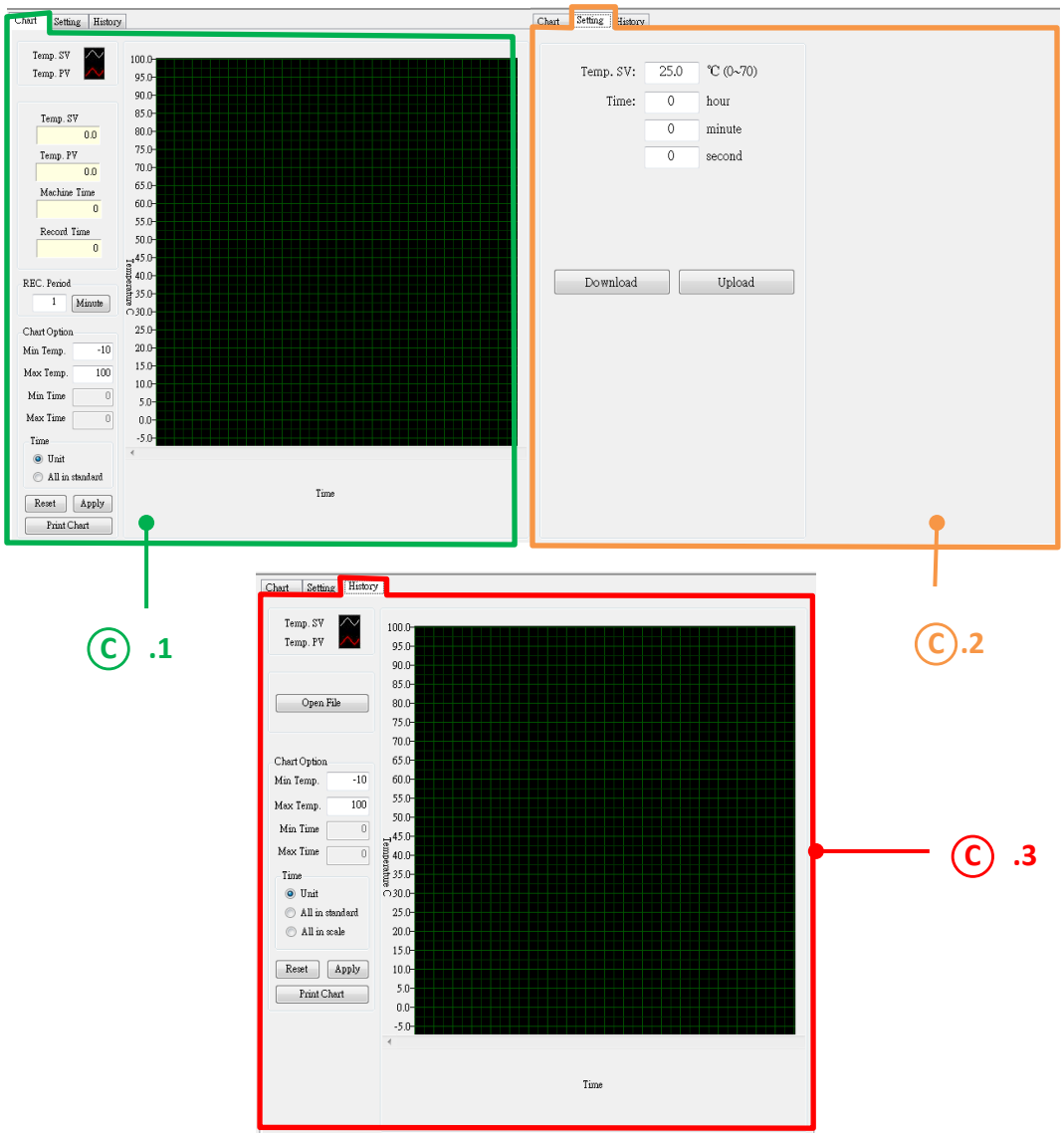
When user finishes all the setting, Click "RUN" to start running the device and press the same button to stop operation.

### Ⓑ.3 Exit

Click to leave the remote control program.

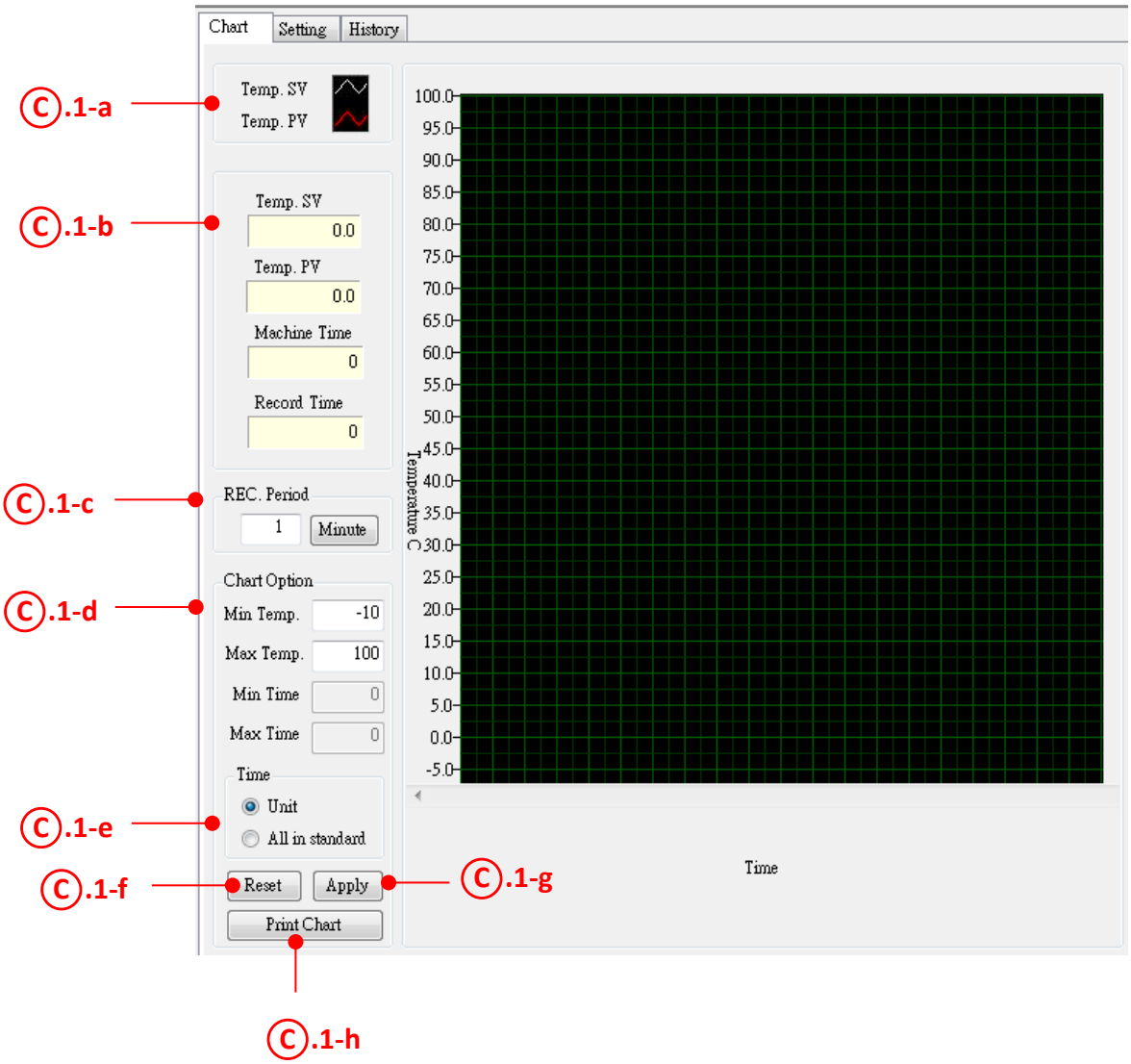
## Ⓒ Setting & Record Column

There are 3 different tabs in this column: ***Chart*** (Ⓒ.1), ***Setting*** (Ⓒ.2), and ***History*** (Ⓒ.3). We'll elaborate the function of each tab respectively in the paragraphs below.



## Ⓒ .1 Chart:

The software will start recording the data as soon as Mini Incubator starts operating (whether start by software control or by button on machine.)



### Ⓒ.1-a

This area helps user distinguish the curves of different parameters in the running chart.


Set Value of Temperature

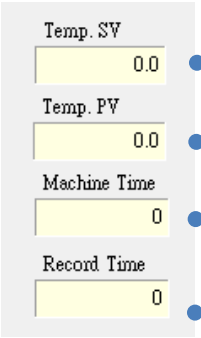
Present Value of Temperature

### Ⓒ.1-b

The program will display user's set values and the current condition in this section. User can compare the values with the curves in chart.

***Note:***

In this column, all the values are unchangeable. If user attempts to adjust the set values, user has to stop the device and enter the setting tab to edit the parameters.

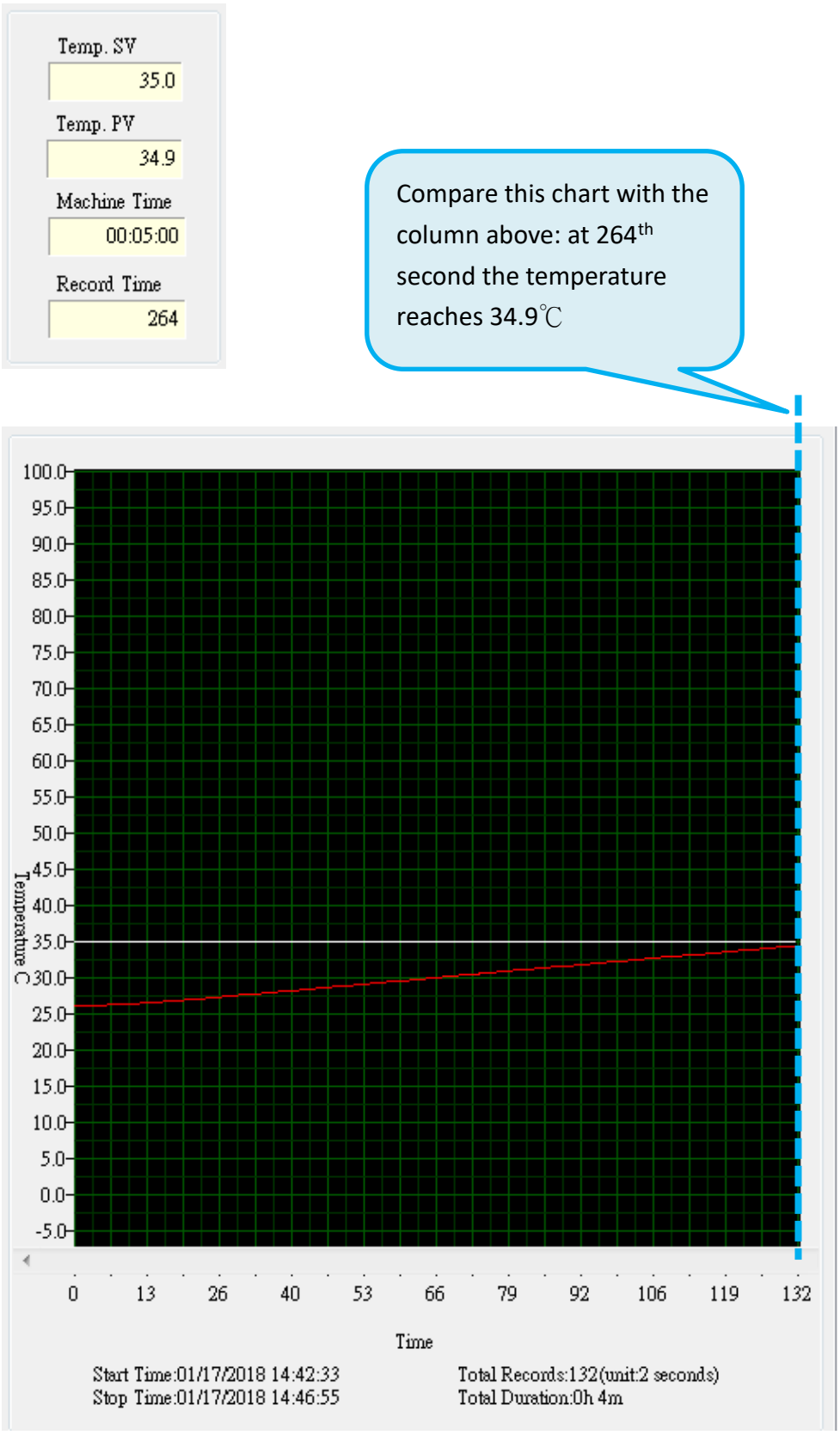



**Temp. SV**: The set temperature value

**Temp. PV**: The real temperature value being measured

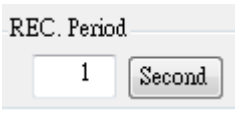
**Machine Time**: The count-down timer which starts count down once present temperature value reaches the set value.

**Record Time:** Total record time


Temp. SV
35.0
Temp. PV
34.9
Machine Time
00:05:00
Record Time
264
Compare this chart with the column above: at 264th second the temperature reaches 34.9℃
100.0
95.0
90.0
85.0
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
Temperature C
0
13
26
40
53
66
79
92
106
119
132
Time
Start Time:01/17/2018 14:42:33
Stop Time:01/17/2018 14:46:55
Total Records:132(unit:2 seconds)
Total Duration:0h 4m

### Ⓒ.1-c

To set up how frequent the operation data is recorded. Press the button; it can be set either in minute or in second.




***Note:***

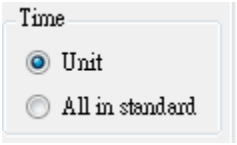
The frequency of data-recording here is only for **current** running. Next time when user starts the program, system will apply the default value in ***Option*** rather than the value here. Please refer to ***A.1 Option*** for setting up default value.

### Ⓒ.1-d

In Chart Option, user is able to edit the scale of chart.

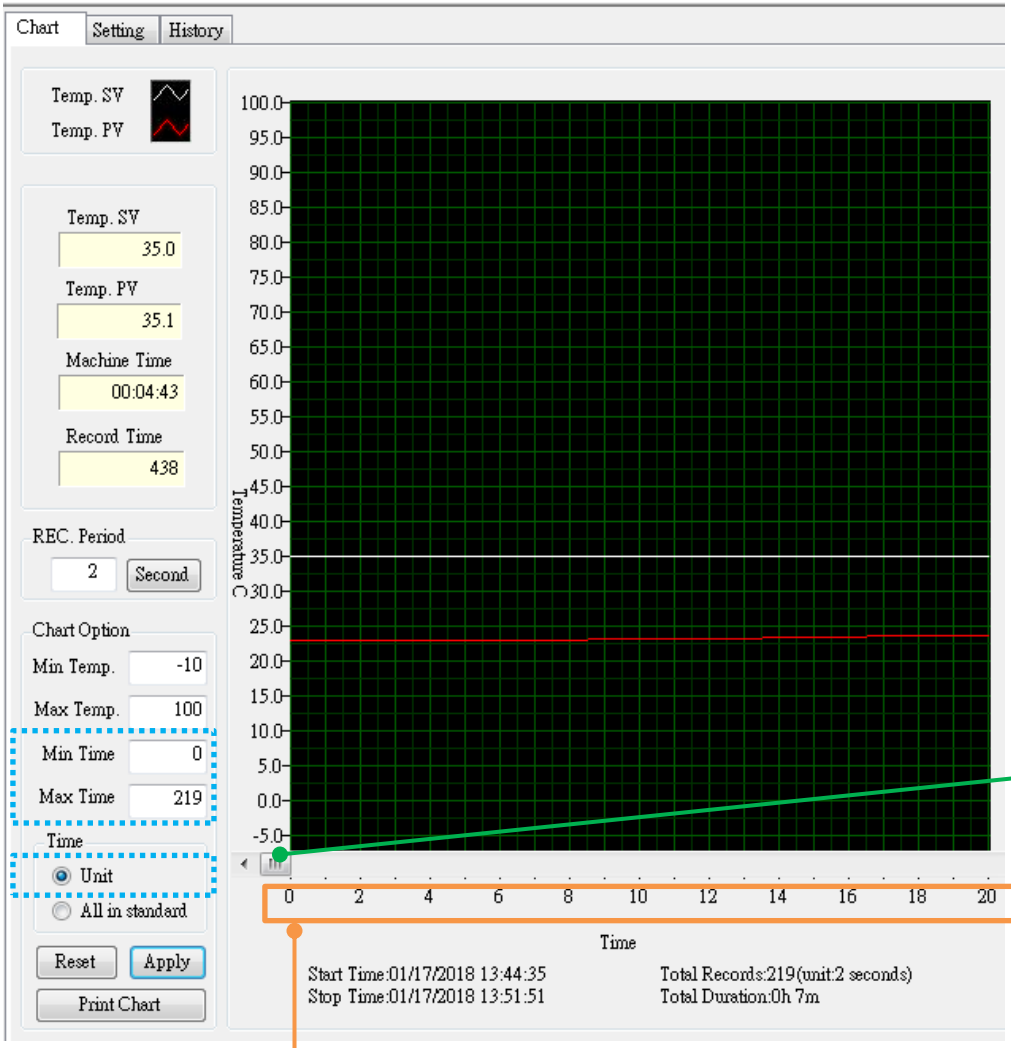

### Ⓒ.1-e

Select either "Unit" or "All in standard" option for the time scale of the chart.




| | |
|---|---|
| Unit | Select "Unit" and press "Apply" to show the part of trend in the range of time scale user set. |
| All in standard | Select "All in standard" and press "Apply" to show the whole operation timespan in 1 sheet of the chart. |

## Image 1 *(Unit)*



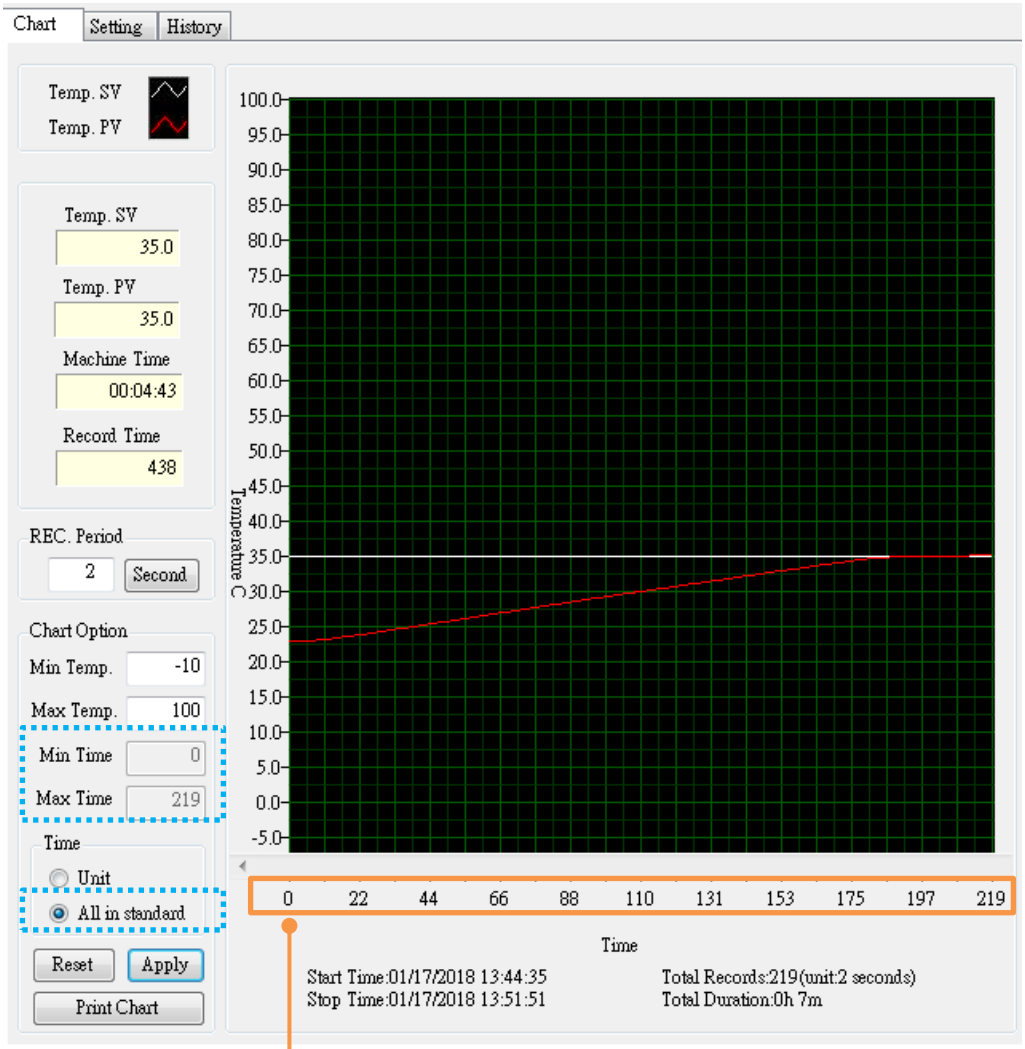

Set desired time range. The max value is total record time.

Use the scroll bar to view the rest of the data.

The time scale is range from the user-defined minimum to maximum value. In this case, it is from 0-219 (unit: 2 sec.).

Note:
If the distance between minimum and maximum time is less than 20 sec/min, no scroll bar will display.

## **Image 2** *(All in Standard)*




The time range cannot be set.

The total recorded data will be concentrated into 1 sheet. In this case, it is the whole 438 seconds operation data.

### Ⓒ.1-f Reset Button 


Press “Reset” to restore to default settings.

### Ⓒ.1-f Apply Button 

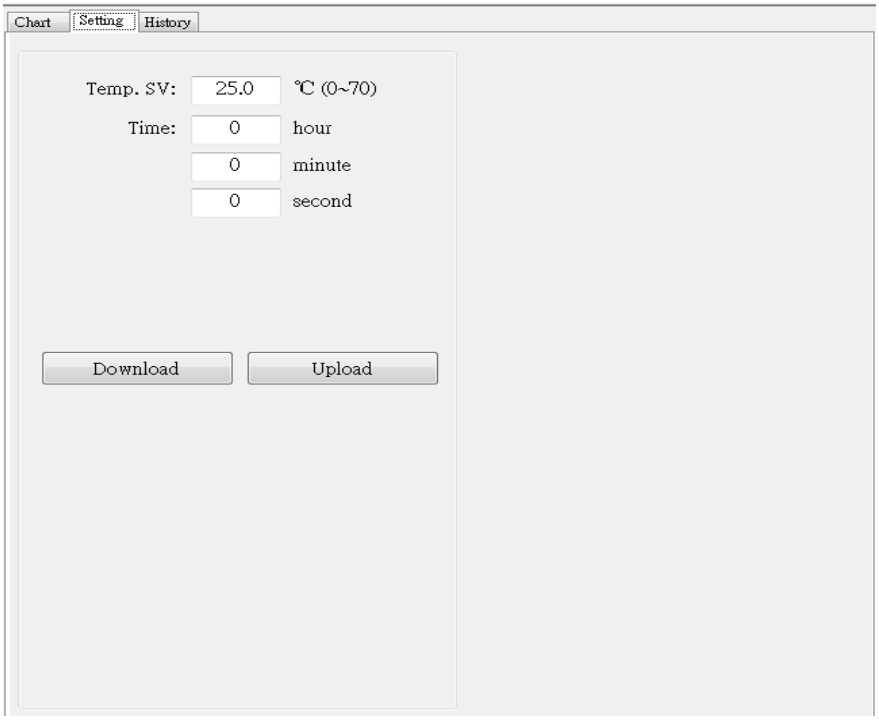

Press “Apply” to confirm the new setting.

### Ⓒ.1-h Print Chart Button 


Press the button to print current-viewed chart.

## Ⓒ.2 Setting:

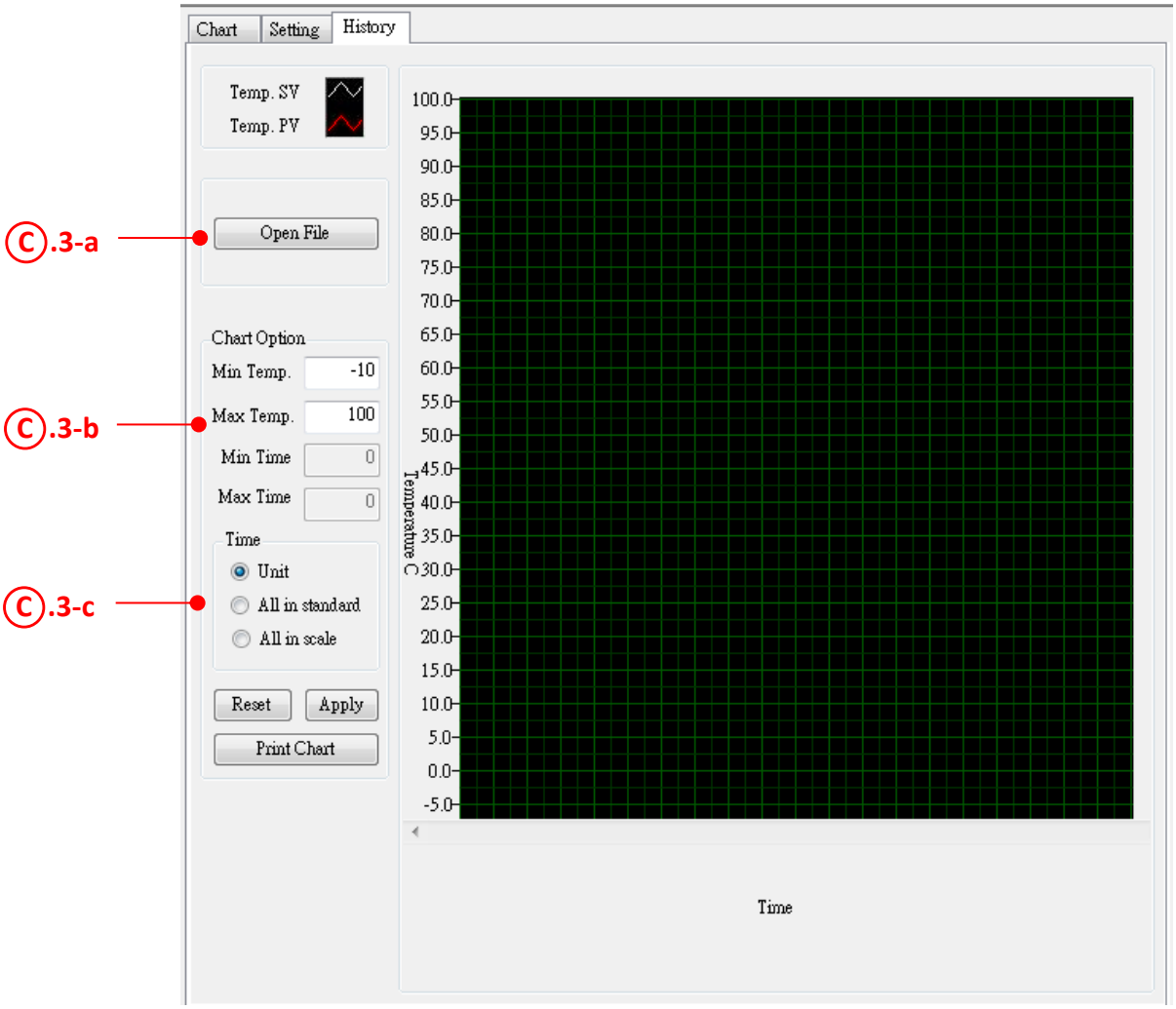
In this tab you can set desired temperature value for desired time.




| | |
|---|---|
| ***Temp.SV*** | Set up desired temperature value. |
| ***Time*** | The countdown timer which starts count down once the present temperature value reaches the set value. |
| Download | Press Download button to receive setting data from machine. |
| Upload | Press Upload button to launch above setting data to the machine. |

### Ⓒ.3 History:

History page look very similar to Chart page. In History, you can view historic record data.

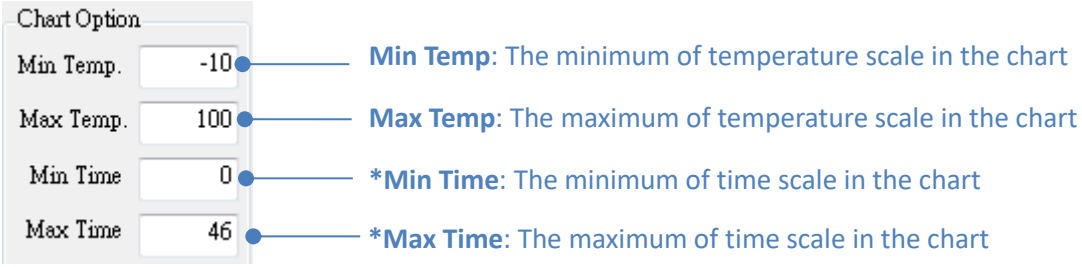


### Ⓒ.3-a Open File Button


Click to open desired historic record data (.log file)

### Ⓒ.3-b Chart Option

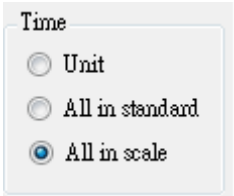
In Chart Option, user can edit the scale of chart.




*The distance between the minimum and maximum time scale should be more than 20 seconds/minutes, otherwise the resolution of the curves will be compromised.

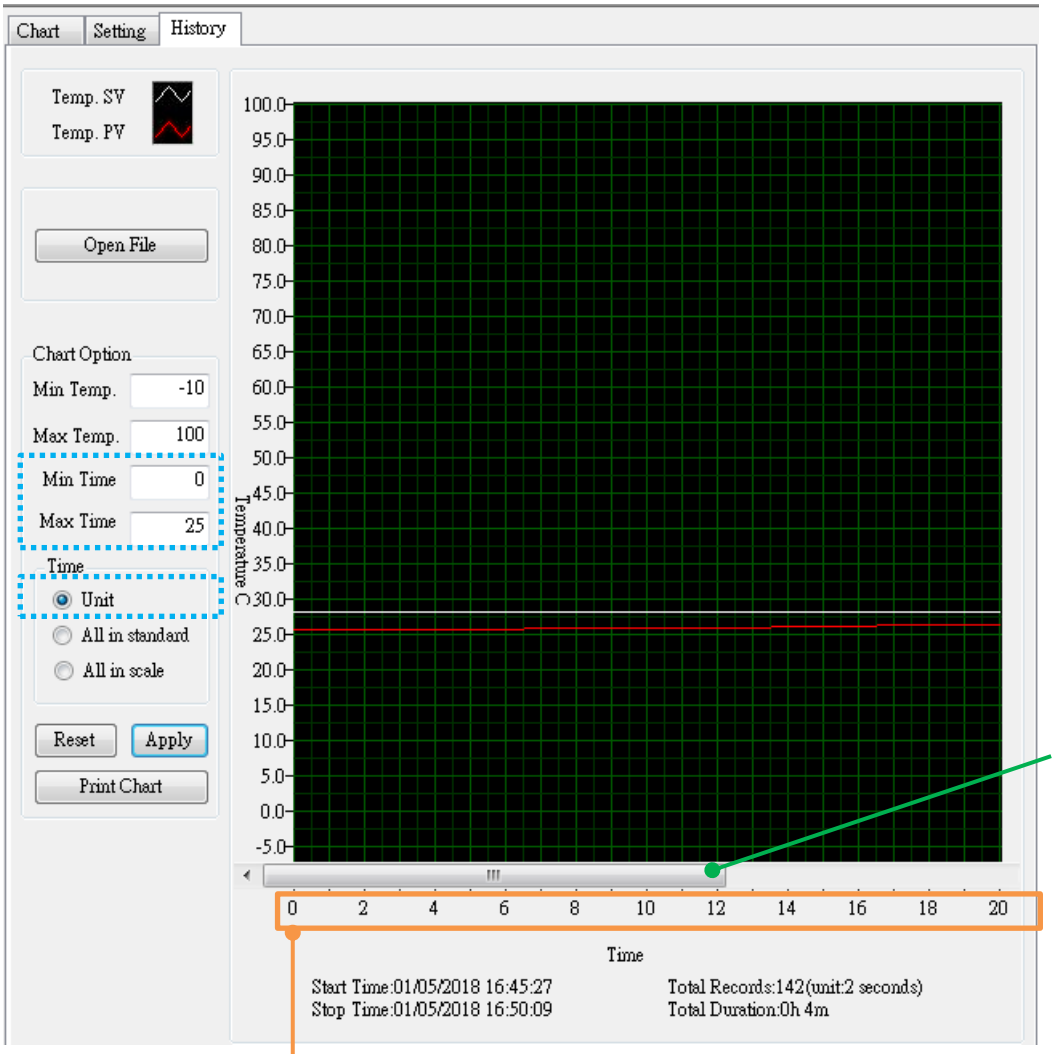
### Ⓒ.3-c Time Scale Option Column

Select one of the option and press "Apply" to view the curves with different time scales.




| | |
|---|---|
| **Unit** | Select "Unit" and press "Apply" to show the part of trend in the time scale user defined. |
| **All in standard** | Select "All in standard" and press "Apply" to show the whole operation data in 1 sheet of the chart. |
| **All in scale** | Select "All in scale" and press "Apply" to show the part of trend in the time scale user defined in 1 sheet. |

## **Image 1** *(Unit)*



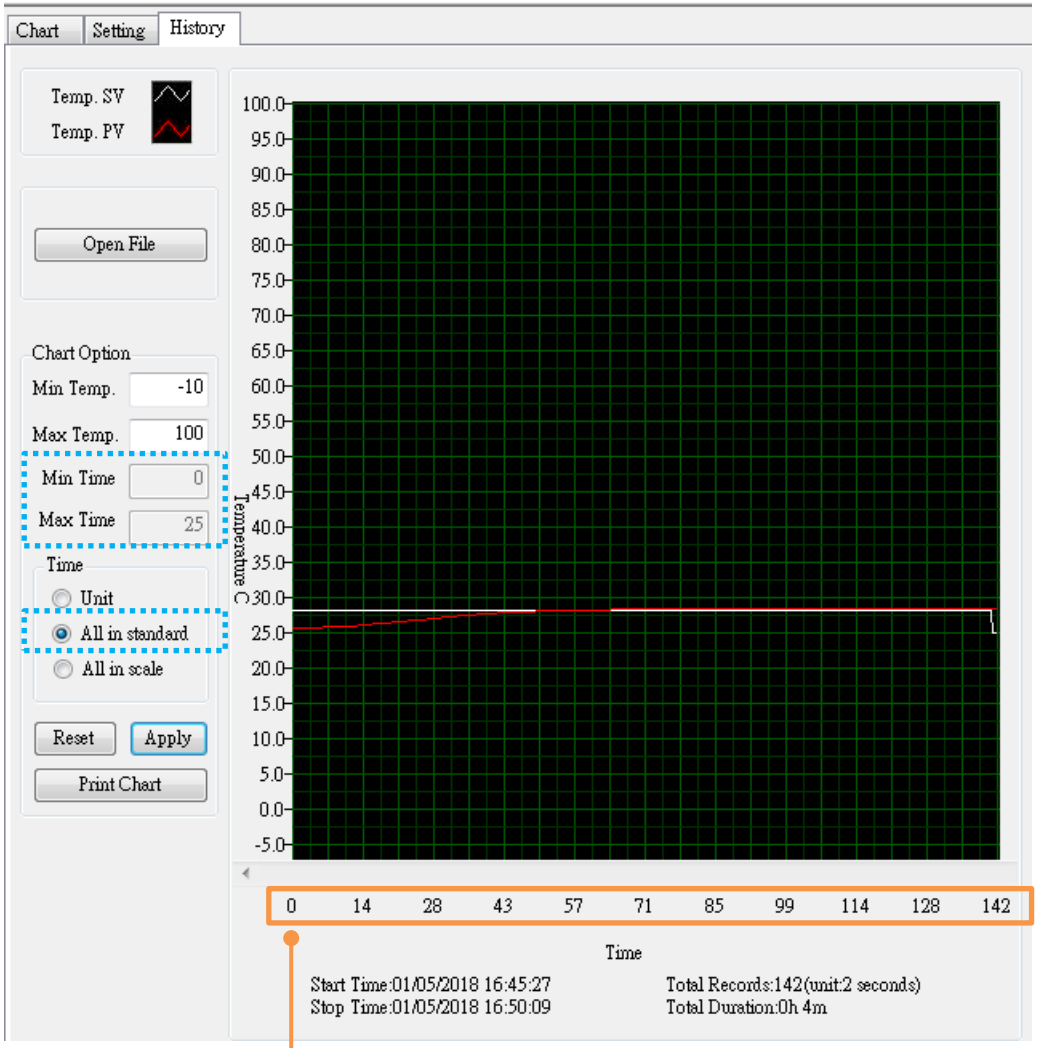

Set desired time range. The max value is total record time.

Use the scroll bar to view the rest of the data.

The time scale is range from the user-defined minimum to maximum value. In this case, it is from 0 to 25.

Note:
If the distance between minimum and maximum time is less than 20 sec/min, no scroll bar will display.

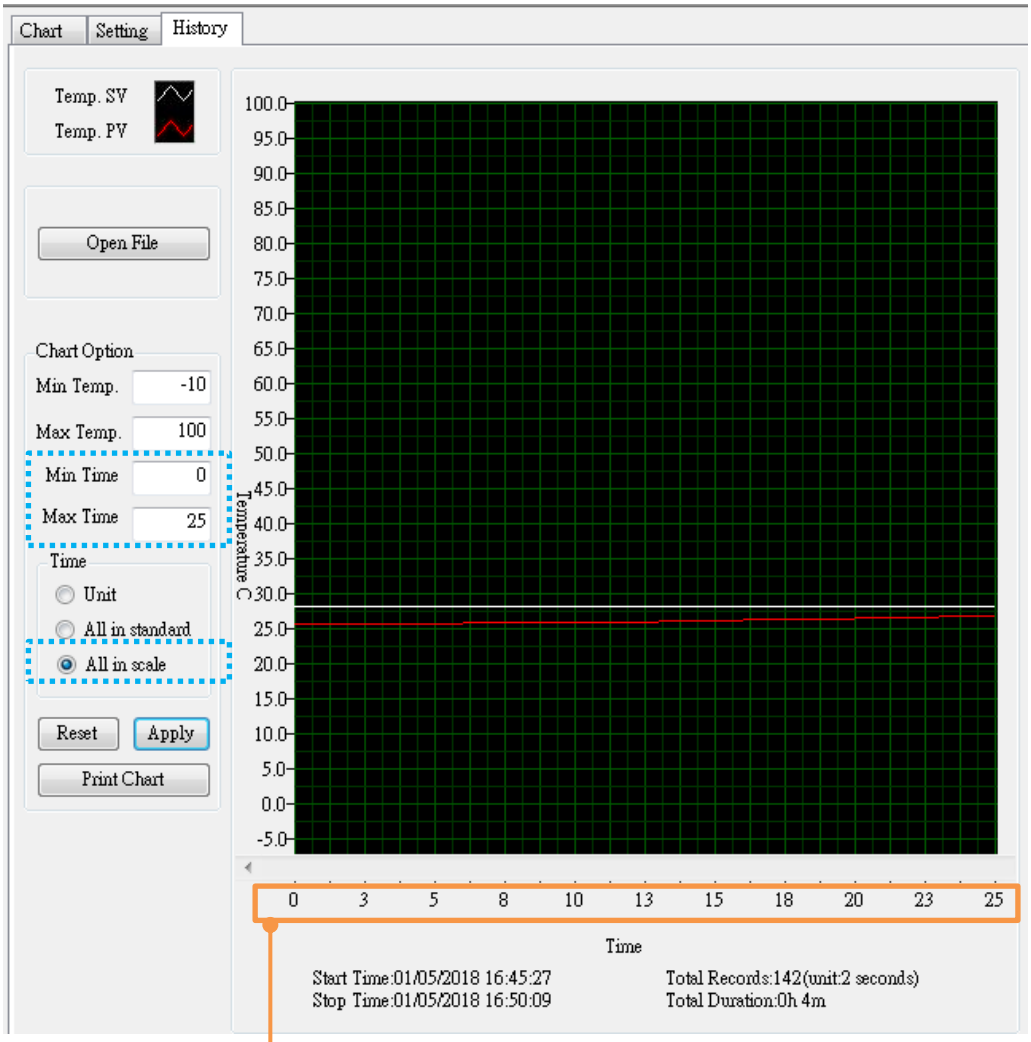
## **Image 2** *(All in standard)*




The time range cannot be set.

The total recorded data will be concentrated into 1 sheet. In this case, it is the whole 142 seconds operation data.

**Image 3** *(All in scale)*




Set desired time range concentrated in 1 sheet

The time scale is range from the user-defined minimum to maximum value, and data in the range will display in 1 sheet. In this case, it is from 0 to 25.

# Section 6 Trouble shooting and Maintenance

## 6.1 Trouble Shooting

| Problem | Possible Causes and Solution |
|---|---|
| 1. The system does not heat up | a. Door is not tightly closed.<br>b. Temperature control is not activated. |
| 2. The system cannot be powered up | Broken fuse. Replace the fuse by following the procedure on the next page |
| 3. Temperature discrepancy between the display and thermometer | There might be some temperature discrepancy between factory setting and your environment. Adjust the temperature to your environment standard by following the **Section 4.4 Temperature Calibration.** |

## 6.2 Warning Illustration

| Alert Information | Description | Performance | Solution |
|---|---|---|---|
|  | The unit finishes temperature control. (Timer finishes count down.) | Warning pops up and beep-beep sound alerts. | Press ↵ or ▶I to go back to home page. |
|  | During operation, the heating device function abnormally hence cause great deviation between set temperature and measured temperature.<br>**E0001:** indicates PV is 5℃ above SV.<br>**E0002:** (PV has reached SV) indicates PV has been 1℃ lower than SV for more than 40 minutes.<br>**E0003:** indicates PV is over 85℃.<br>**E0004:** (PV has not reached SV) indicates PV has been 1℃ lower than SV for more than 40 minutes. | Warning sign pops up with code and beep-beep sound alerts. System stops heating. | Press ↵ or ▶I to go back to home page. |

| | | | |
|---|---|---|---|
| | | | |

*__PV:__ Present Value __SV:__ Setting Value

### Replacing the Fuse

For additional fuses, contact Thistle Scientific.

To replace the fuse:

1. Turn off the main power switch at the rear of image system and detach the power cord from the rear of image system.

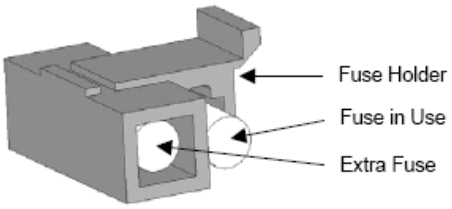
2. Open the fuse compartment located inside the Power Entry Module by inserting a small flathead screwdriver into the slot below the ON/OFF switch. Turn the screwdriver to gently pry open the fuse compartment.

   **Note:** the fuse compartment will not open with the power cord in place.

3. Pull the fuse holder out of the compartment and inspect the fuse. If the fuse is burned or there is a break in the fuse element, replace the fuse with an identical type of fuse (**2A/250V~**) as provided in the fuse holder (see figure below)

4. Place the fuse holder back into the compart

5. Snap the cover close.



## 6.3 Cleaning and Maintenance

The oven interior can be cleaned with a mild detergent or water. To clean the oven, please make sure the power cord is disconnected.

**The system should NEVER come into contact with the following reagents, which could cause irreversible damage:**
Acetone, Phenol, Chloroform, Carbon Tetrachloride, Ethanol, Methanol, Isopropyl alcohol, Alkalis

# Section 7 Ordering Information

| Cat. No. | Description |
|---|---|
| MINI-INCBASIC | Thistle Scientific Mini Incubator with one stainless steel shelf |

**Accessories**

| | |
|---|---|
| INCBASIC-SHELF | Stainless Steel shelf for MINI-INCBASIC. 250 x 240mm |
| INCBASIC-SW | Functional control software for MINI-INCBASIC, including USB cable |

# Section 8 Warranty

Thistle Scientific warrants apparatus of its manufacture against defects in materials and workmanship, under normal service, for ***one year from the shipping date to purchaser***. This warranty excludes damages resulting from shipping, misuse, carelessness, or neglect. Consumable parts are not covered by our warranty. Thistle Scientific's liability under the warranty is limited to the receipt of reasonable proof by the customer that the defect is embraced within the terms of the warranty. All claims made under this warranty must be presented to Thistle Scientific within one year following the date of delivery of the product to the customer.

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Or support@thistlescientific.co.uk