

TEC (Peltier) Controller PLC-24V10A
Setting Software
"PLC-24V10A Manager.exe"
Operating Manual
(Rev.1.51)
Software Version: 1.5.0.0

Applicable Model List

Model	Hardware Version	Firmware Version	Remarks
PLC-24V10A	2.00 -	1.0.x.x -	See " 10. Restrictions of firmware version 1.1.x.x or earlier "
		1.2.x.x -	
PLC-24V10AL-PT	3.00 -	1.1.x.x -	See " 9. Restrictions on using for PLC-24V10AL (-PT/TH) " See " 10. Restrictions of firmware version 1.1.x.x or earlier "
		1.2.x.x -	
PLC-24V10AL-TH	3.00 -	1.1.x.x -	
		1.2.x.x -	

[IMPORTANT]

This software supports a product listed in the applicable model list.

Support for this software is available on Kurag Electronics.

If you have any questions, please contact Kurag Electronics Peltier Controller Support by E-mail.

Kurag Electronics Peltier Controller Support

E-Mail: kurag.tslab@biz.nifty.jp

* The original developer of this software is T. S. Laboratory Corporation.

June 7, 2023

KURAG ELECTRONICS LLC



**KURAG
ELECTRONICS**

Table of contents

1. General	-----	Page 3
2. Install / Uninstall	-----	Page 3
3. Connection	-----	Page 4
4. Screen	-----	Page 5
5. Start and Exit	-----	Page 8
6. Home Tab	-----	Page 9
7. Presets Tab	-----	Page 10
8. Command Menu	-----	Page 13
9. Restrictions on using for PLC-24V10AL (-PT/TH)	-----	Page 15
10. Restrictions of firmware version 1.1.x.x or earlier	-----	Page 15
Revision History	-----	Page 16

1. General

This software is dedicated software for the Peltier Controller PLC-24V10A and PLC-24V10AL(-PT/-TH).

* Hereafter, it is collectively referred to as "PLC-24V10A".

It can read and write various setting parameter of the PLC-24V10A by connecting a PC to the PLC-24V10A with a serial communication cable.

[IMPORTANT]

This software is designed for development or production purpose. Special technical knowledge about temperature control system required for use. The PLC-24V10A may not work definitely when wrong operation or setting is executed.

2. Install / Uninstall

System requirement

Microsoft Windows 10 (*1)(*2)

Microsoft Windows 11 (*1)(*2)

(*1) When the program can not start, it may be solved with a compatible mode of Windows XP.

(*2) When the program file is placed in "Program Files" or "Program Files (x86)" folder, the program may not start.

In such case please place the program file in the place except the "Program Files" or "Program Files (x86)" folder.

Software framework requirement

Microsoft .NET Framework 4

Install

Copy the program file "PLC-24V10A Manager.exe" to HDD.

(*) Please place the program file in the place except "Program Files" or "Program Files (x86)" folder.

Uninstall

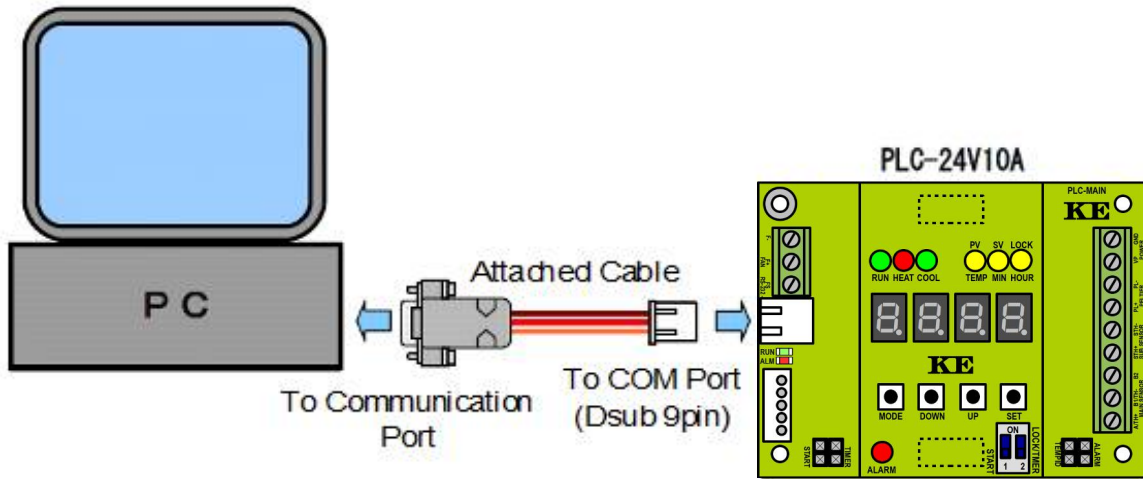
Delete the program file "PLC-24V10A Manager.exe" folder from HDD.

Version up

Overwrite by a new program file after terminating a program.

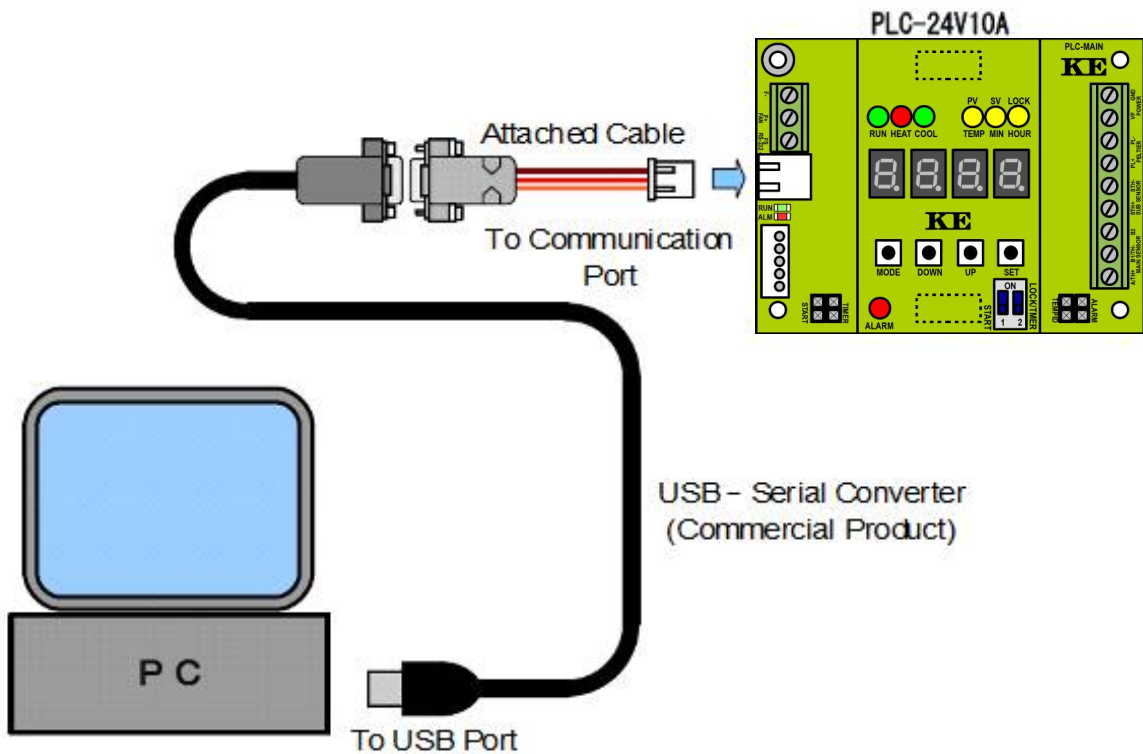
3. Connection

Connect the Peltier Controller PLC-24V10A to a PC with the attached communication cable.



* Please use the Dsub 9 pin female - male straight connection cable to extend the cable.

If your PC does not have the Serial COM Port (RS-232), please use a USB - Serial Converter.



* USB-Serial conversion cable, please prepare the one with RS-232 connector Dsub male 9 pin.

* Please use the Dsub 9 pin female - male straight connection cable to extend the cable.

4. Screen

When starting this software, the following window is displayed.

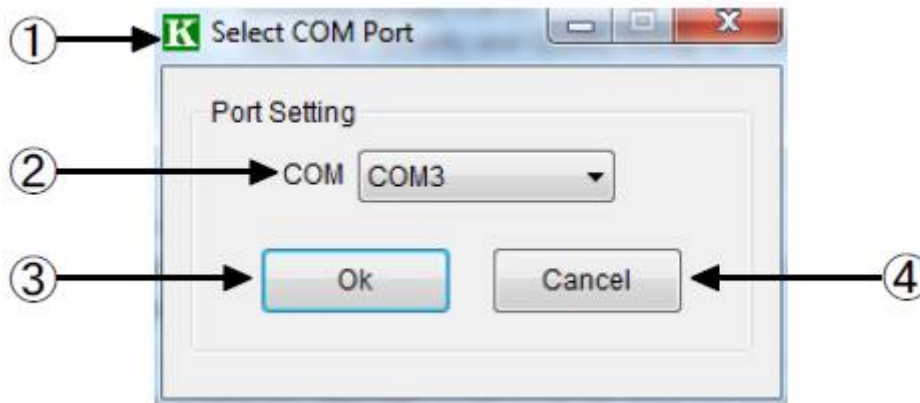


Figure-1 COM Port Selector Window

(1) Title Bar

Clicking the **X** button closes the window and exits this software.

(2) COM Port Name

Select the COM port name to connect.

The currently available COM port list is displayed in the pull-down menu.

(3) Ok Button

Clicking Ok Button connects to the specified COM port and displays the main window (Figure-2).

(4) Cancel Button

Clicking Cancel Button closes this window and exits this software.

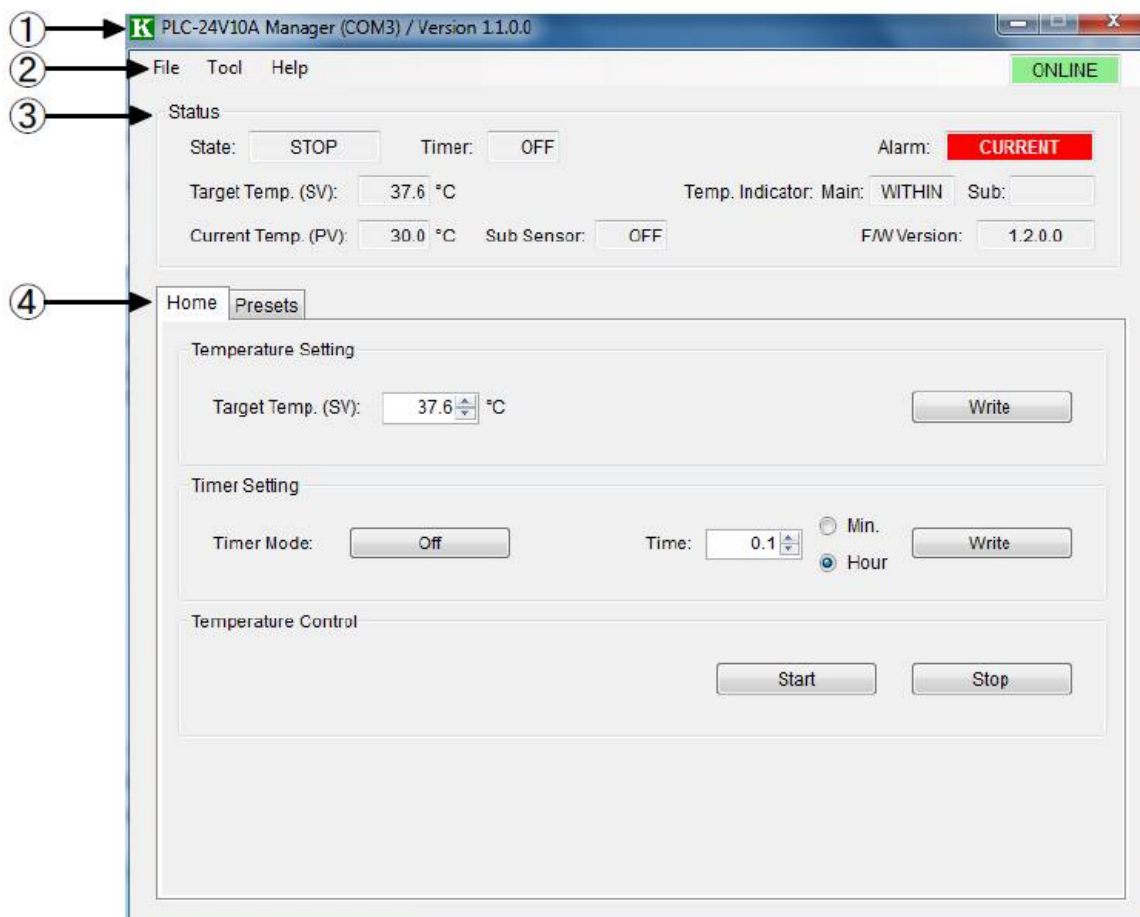


Figure-2 Main Window

(1) Title Bar

The software name, COM port name currently connected and version are displayed. Clicking the **X** button closes the window and exits this software.

(2) Command Menu

Three command menus are provided (See Command Menu for more detail). In right side, the icon which indicates the connection status of the PLC-24V10A with the string of "ONLINE" or "OFFLINE" is displayed.

(3) Status

The Status area is updated every second. Table 1 shows the contents of Status area. The Alarm will occur only when the corresponding setting item in the Presets is set to ON. For the detail of individual alarm, please refer to the manual of the PLC-24V10A.

(4) Tab Menu

The Tab Menu grouped by function. The following tabs are provided:
 Home Tab: It can do the basic settings and temperature control.
 Presets Tab: It can confirm and change the various settings.

Table-1 Status Display

Status Name	Display Contents	Description
State	RUN (XXXX)	Running. (XXXX) explains the regulation mode with the string of "HEAT" or "COOL". The text blinks while the Reverse Protection is running.
	STOP	Stop.
Timer	XXX.X (Min / Hour)	Timer is ON. The remaining time in "Min" or "Hour" is displayed.
	OFF	Timer is OFF.
Target Temp.(SV)	(-)XX.X °C	Target Temperature. (Set Variable)
Current Temp.(PV)	(-)XX.X °C	Main Sensor Temperature. (Process Variable) When the main sensor error is detected (the Alarm status displays "MAIN SENSOR"), "---." is displayed.
Sub Sensor	(-)XX.X °C	If the Sub Sensor is set to ON, the Sub Sensor temperature is displayed. When the sub sensor error is detected (the Alarm status displays "SUB SENSOR"), "---." is displayed.
	OFF	Sub Sensor is OFF.
Alarm	(No indication)	Normal (No alarm occurs)
	MAIN SENSOR	Main sensor alarm is occurring
	FAN	Fan alarm is occurring
	POWER	Drive power voltage alarm is occurring
	CURRENT	Drive current alarm is occurring
	SUB SENSOR	Sub sensor alarm is occurring
Temp. Indicator (Main / Sub)	WITHIN	The temperature is within the Indicator setting temperature range of the Presets.
	UNDER	The temperature is lower than the Indicator lower limit temperature of the Presets.
	OVER	The temperature is higher than the Indicator upper limit temperature of the Presets.
F/W Version	X.X.X.X	Firmware Version of the PLC-24V10A currently connected.


5. Start and Exit

Start:

After launching this software, the COM Port Selector window (Figure-1) is displayed. Select the required COM Port name on the COM Port Selector window and click Ok Button. If the connection is established successfully, the main window (Figure-2) is displayed. The current status and settings value of the PLC-24V10A connected are displayed in the main window.

* The settings value is read from the PLC-24V10A only after connecting at first.

Exit:

Clicking  Button in right side of the Title Bar of the main window (Figure-2) or selecting the "Exit" from the "File" of the Command Menu closes the main window and exits this software.

6. Home Tab

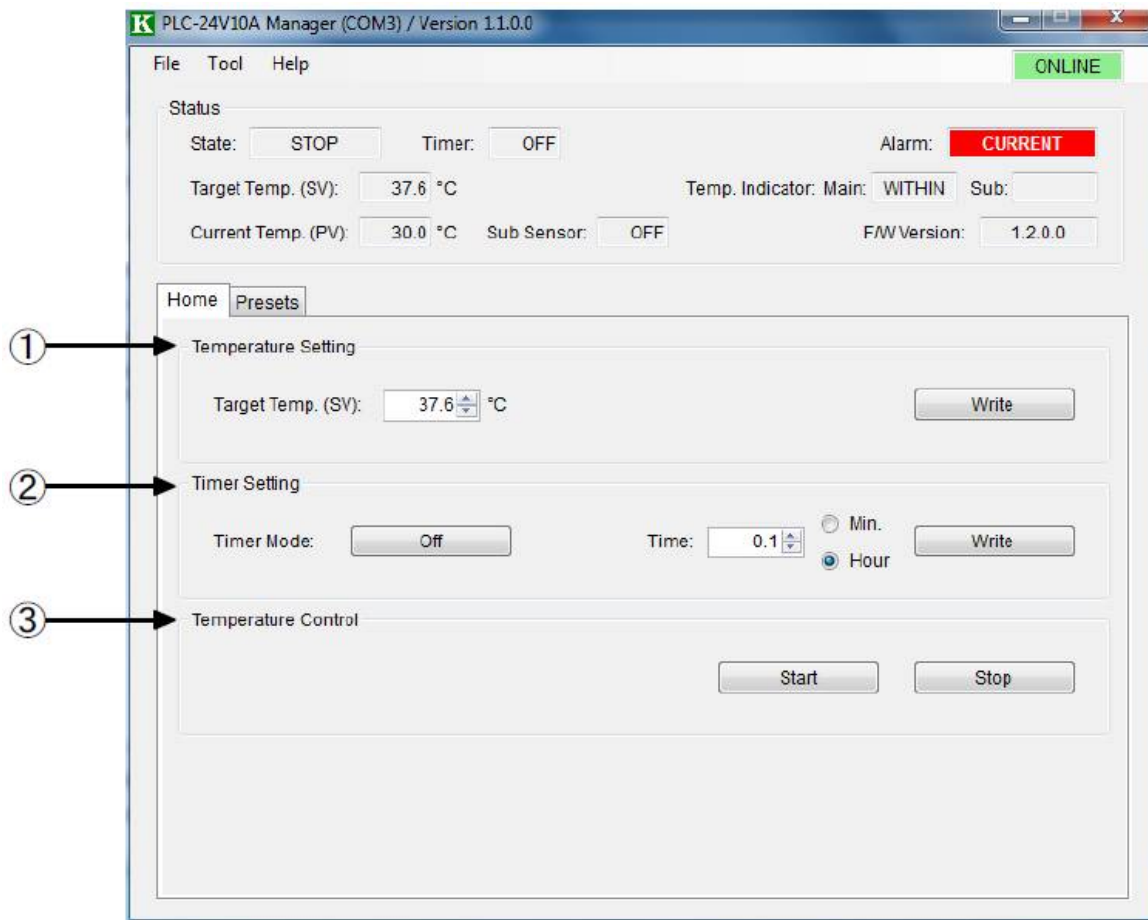


Figure-3 Home Tab

(1) Target Temperature Setting.

It can confirm and change the Target Temperature.

The setting resolution is 0.1 °C.

To change it, input the Target Temperature then click the Write Button.

The Write Button modifies the setting of PLC-24V10A and memorizes the setting value into the PLC-24V10A. The memorized setting value is kept internally, until the next power up, even if the PLC-24V10A is powered off. Therefore re-setting whenever turning on the power is not necessary.

* Target Temperature cannot be specified beyond the range of the Temperature Range of the Presets.

(2) Timer Setting.

It can confirm and change the Timer Setting.

The setting resolution of the Timer is 0.1 Min. or 0.1 Hour.

To change the Timer to the ON or OFF, click the Timer Mode Button. The Timer Mode Button top shows current setting with the string of "On" or "Off".

To change the Timer time, input the Timer time, select the unit from "Min." or "Hour" then click the Write Button.

(3) Temperature Control.

To start the temperature control, click the Start Button.

To stop the temperature control, click the Stop Button.

7. Presets Tab

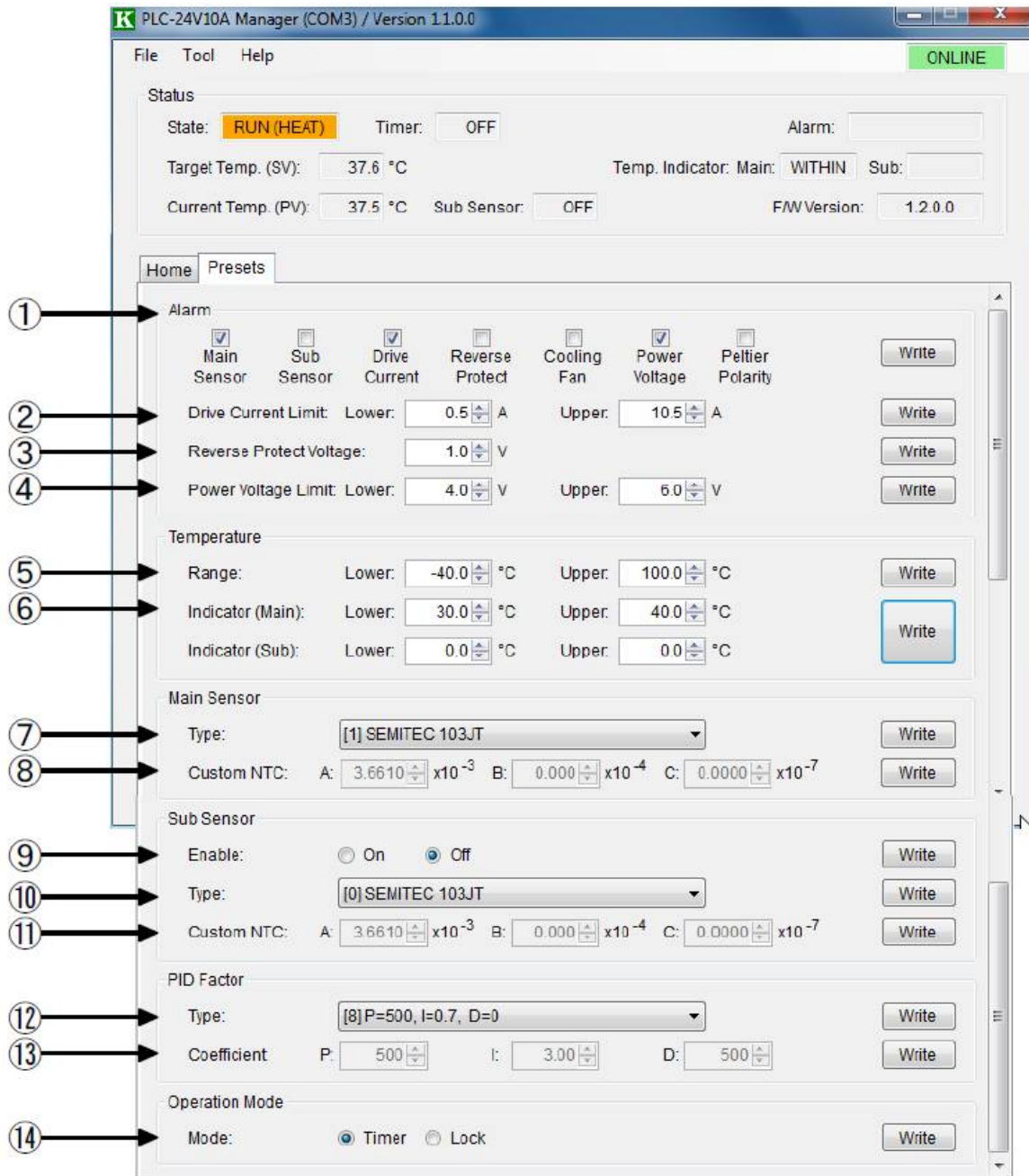


Figure-4 Presets Tab

* The actually displayed area is up to the main window size. The hidden item can be shown by adjusting the scroll bar in right side.

(1) Alarm Enable Setting

It can confirm and change ON/OFF of each Alarm Enable.

To change it, check the Check box of the Alarm then click the Write Button.

(2) Drive Current Range Setting

It can confirm and change the Drive Current Range that is used to detect the Drive Current alarm.

To change it, input the Lower Limit and Upper Limit then click the Write Button.

(3) Reverse Protection Voltage Setting

It can confirm and change the voltage of the back electromotive force that invokes the Reverse Protection.

To change it, input the voltage of the back electromotive force then click the Write Button.

About the Reverse Protection, please refer to the manual of the PLC-24V10A.

(4) Power Voltage Range Setting

It can confirm and change the Power Voltage Range that is used to detect the Power Voltage alarm.

To change it, input the Lower Limit and Upper Limit then click the Write Button.

(5) Temperature Range Setting

It can confirm and change the Temperature Range for the Target Temperature.

To change it, input the Lower Limit and Upper Limit then click the Write Button.

* The available range is different according to the main sensor type currently selected.

(6) Indicator Temperature Setting

It can confirm and change the Indicator Temperature that is displayed in the "Temp. Indicator (Main / Sub)" of the Status Display (Table-1).

To change it, input the Lower Limit and Upper Limit then click the Write Button.

To disable the Indicator function, input 0 on both the Lower and Upper Limit.

(7) Main Sensor Type Setting

It can confirm and change the type of the Main Sensor.

To change it, select the type in the pull-down menu then click the Write Button.

* If "[10] NTC Thermistor User Custom" is selected, the following parameters "A", "B" and "C" must also be set.

(8) Main Sensor Custom NTC Setting

It can confirm and change the parameters used when "[10] NTC Thermistor User Custom" is selected in (7).

To change it, input the parameters "A", "B" and "C" then click the Write Button.

* This operation is available only when "[10] NTC Thermistor User Custom" is selected in (7).

(9) Sub Sensor Enable Setting

It can confirm and change ON/OFF of Sub Sensor Enable.

To change it, check the desired Check box then click the Write Button.

(10) Sub Sensor Type Setting

It can confirm and change the type of the Sub Sensor.

To change it, select the type in the pull-down menu then click the Write Button.

* If "[9] NTC Thermistor User Custom" is selected, the following parameters "A", "B" and "C" must also be set.

(11) Sub Sensor Custom NTC Setting

It can confirm and change the parameters used when "[9] NTC Thermistor User Custom" is selected in (10).

To change it, input the parameters "A", "B" and "C" then click the Write Button.

* This operation is available only when "[9] NTC Thermistor User Custom" is selected in (10).

(12) PID Type Setting

It can confirm and change the type of the PID control.

To change it, select the type in the pull-down menu then click the Write Button.

* If "[9] User Custom" is selected, the following coefficients "P", "I" and "D" must also be set.

(13) PID Custom Coefficient Setting

It can confirm and change the coefficients used when "[9] User Custom" is selected in (12).

To change it, input the coefficients "P", "I" and "D" then click the Write Button.

* This operation is available only when "[9] User Custom" is selected in (12).

(14) Operation Mode Setting

It can confirm and change the Operation Mode of the PLC-24V10A.

To change it, check the desired Check box then click the Write Button.

8. Command Menu

Three category menus of "File", "Tool" and "Help" are provided.
 The sub menu name and description under each top menu are shown as follows:

Table-2 Command Menu

Top Menu	Sub Menu	Description
File	Open...	It reads the settings from the specified file and displays on the main window.
	Save...	It saves the settings displayed on the main window into the specified file.
	Exit	It closes the main window and exits this software.
Tool	App -> Device	It writes all settings currently displayed on the main window into the PLC-24V10A.
	Device -> File...	It reads all settings from the PLC-24V10A and saves into the specified file. It shows the information about this software.
Help	About PLC-24V10A Manager	It shows the information about this software.

8-1. Read Settings from File (File / Open...)

Select "Open..." in the "File" of the Command Menu or press "Ctrl + O". Then Figure-5

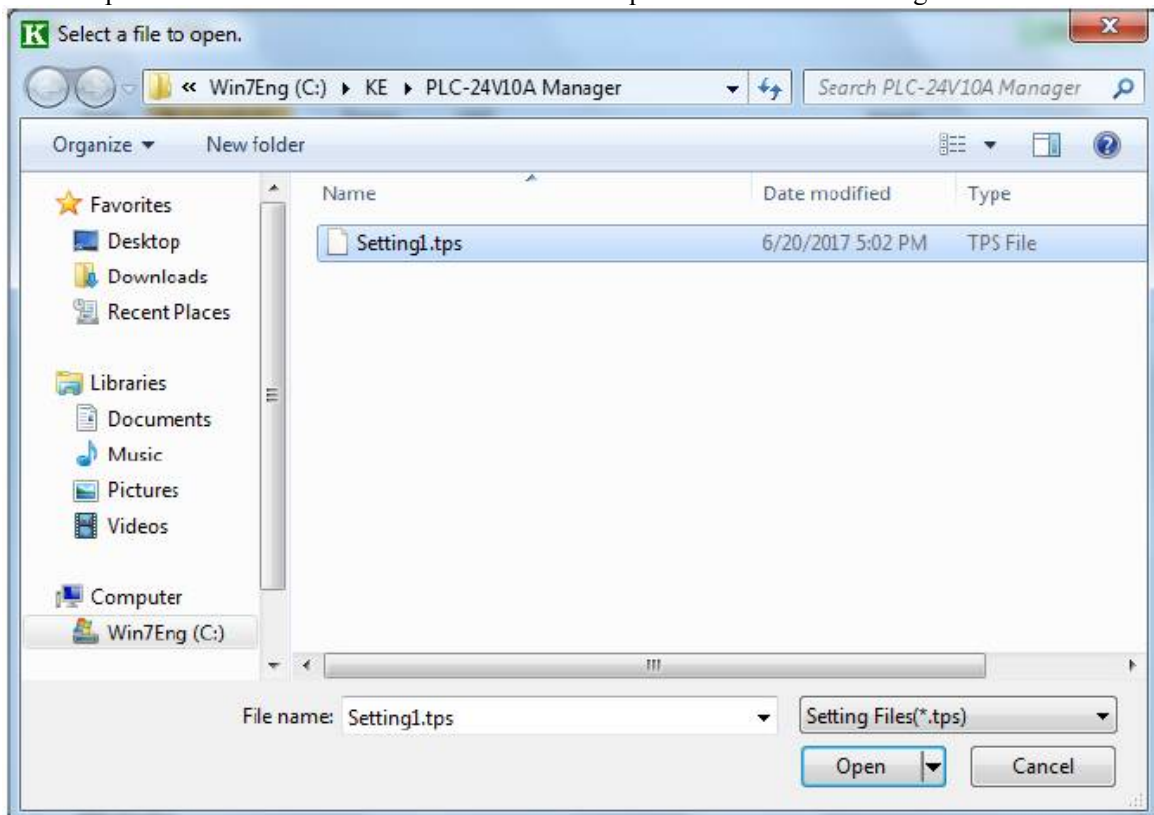


Figure-5 Read Settings from File

Select a settings file (the file extension is "tps") and click Open Button. Then the settings is read from the specified file and displayed on the main window.

8-2. Save Settings into File (File / Save...)

Select "Save..." in the "File" of the Command Menu or press "Ctrl + S". Then Figure-6 is displayed.

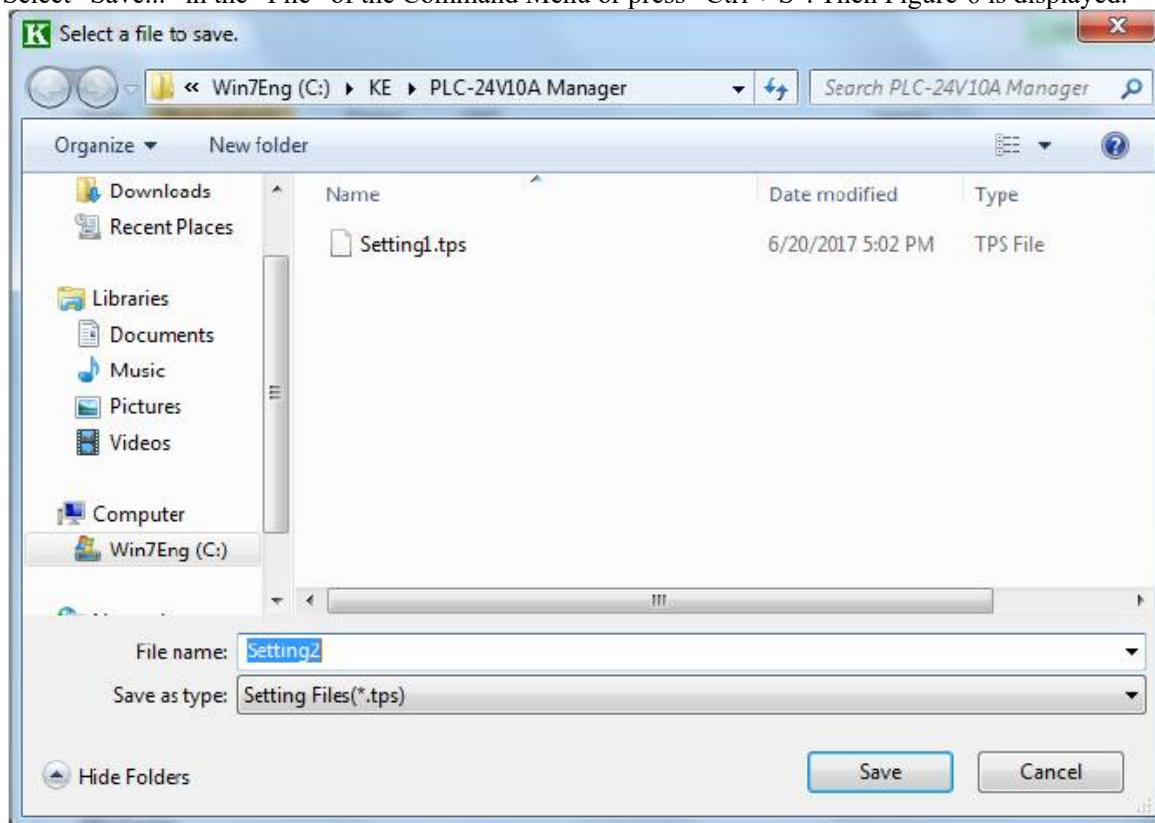


Figure-6 Save Settings into File

Input name of the settings file for saving on the File name area and click Save Button. Then the settings on the main window are saved into the specified file.

If the specified file already exists, the confirmation message for overwrite is displayed.

8-3. Exit (File / Exit)

Select "Exit" in the "File" of the Command Menu. Then the main window closes and this software exits. The **X** Button on the Title Bar can also exit this software.

8-4. Write All Settings to PLC-24V10A (Tool / App -> Device)

Select "App -> Device" in the "Tool" of the Command Menu. Then all settings on the main window are sent to the PLC-24V10A. All settings sent to the PLC-24V10A are overwritten and memorized immediately.

8-5. Save All Settings from PLC-24V10A (Tool / Device -> File...)

Select "Device -> File..." in the "Tool" of the Command Menu. Then Figure 6 is displayed.
Input name of the settings file for saving on the File name area and click Save Button. Then all settings is read from the PLC-24V10A and saved into the specified file.
If the specified file already exists, the confirmation message for overwrite is displayed.

* The settings that is read in a lump are not updated to the main window. If you want to load these settings to the main window, read the saved settings file according to Read Settings from File (File / Open...).

8-6. Information about this Software (Help / About PLC-24V10A Manager)

Select "About PLC-24V10A Manager" in the "Help" of the Command Menu. Then the popup window that contains the information about this software is displayed.
Click Ok or X Button. Then the pop up window closes.

9. Restrictions on using for PLC-24V10AL (-PT / TH)

9-1. In the case of PLC-24V10AL-PT

The temperature sensor that can be selected with "(7) Main sensor type setting" on the Presets tab is "[0] Pt 100" only.
Selecting NTC thermistor ([1] - [10]) will not work properly.

The maximum temperature range that can be set with "(5) Target temperature range setting"
The lower limit is -40°C to the upper limit 100°C.
Even if you set the range beyond the lower limit of -40°C to the upper limit of 100°C, please note that correct temperature can not be measured.

9-2. In the case of PLC-24V10AL-TH

In the "Preset" tab "(7) Main Sensor Type Setting", the temperature sensor that can be selected is NTC thermistor ([1] - [10]).
Selecting "[0] Pt 100" will not work properly.

10. Restrictions of firmware version 1.1.x.x or earlier

If the firmware version is 1.1.x.x or earlier, the lower limit of Peltier drive power supply voltage range setting is valid at 2.7 V or more.
When power supply voltage for Peltier drive is less than 2.7 V in dual power supply operation, please use power supply voltage alarm function to OFF setting.
(Uncheck Alarm setting "Power Voltage")

If the firmware version is 1.2.x.x or later, the lower limit of the Peltier drive power supply voltage range setting can be set from 0.1 V.
Power supply voltage alarm function can also be used when the power supply voltage for Peltier drive is less than 2.7 V in dual power supply operation.
(For single power supply operation, set it to 2.7 V or higher)

Revision History

Rev.	Date	Description	Author
1.00	03/07/2016	Initial release	SAK
1.10	04/17/2017	Company name change accompanying by business transfer T. S. Laboratory Corporation -> Kurag Electronics LLC Change the support window from T. S. Laboratory to Kurag Electronics Word-processor software change: MS-Word → OpenOffice Writer	Y.O
1.20	06/20/2017	Update software version : 1.1.0.0 Change screen capture image (Logo and icon change: TSL to KE) Add " 10. Restrictions of firmware version 1.1.x.x or earlier "	Y.O
1.30	09/29/2018	Update software version : 1.2.0.0 Upper limit of target temperature: 150°C->200°C	Y.O
1.40	09/29/2018	Update software version : 1.3.0.0 Fixed event lower limit temperature reading bug Expansion of target temperature setting range for NTC thermistors	Y.O
1.50	07/09/2020	Update software version : 1.5.0.0 System requirement: Remove Win8 or earlier, Add Win10 Add description of "Vendor tab"	Y.O
1.51	06/07/2023	Software version : 1.5.0.0 System requirement: Add Win11	Y.O

**TEC (Peltier) Controller PLC-24V10A
Setting Software
"PLC-24V10A Manager.exe"
Operating Manual
(Rev.1.51)**

June 7, 2023

Developer: T.S. Laboratory Corporation URL <http://tslab.com/>
Manufacturer: Kurag Electronics LLC URL <http://kurag.o.oo7.jp/kurag-el/>