Thermal R2R

Machine User Manual V1.0



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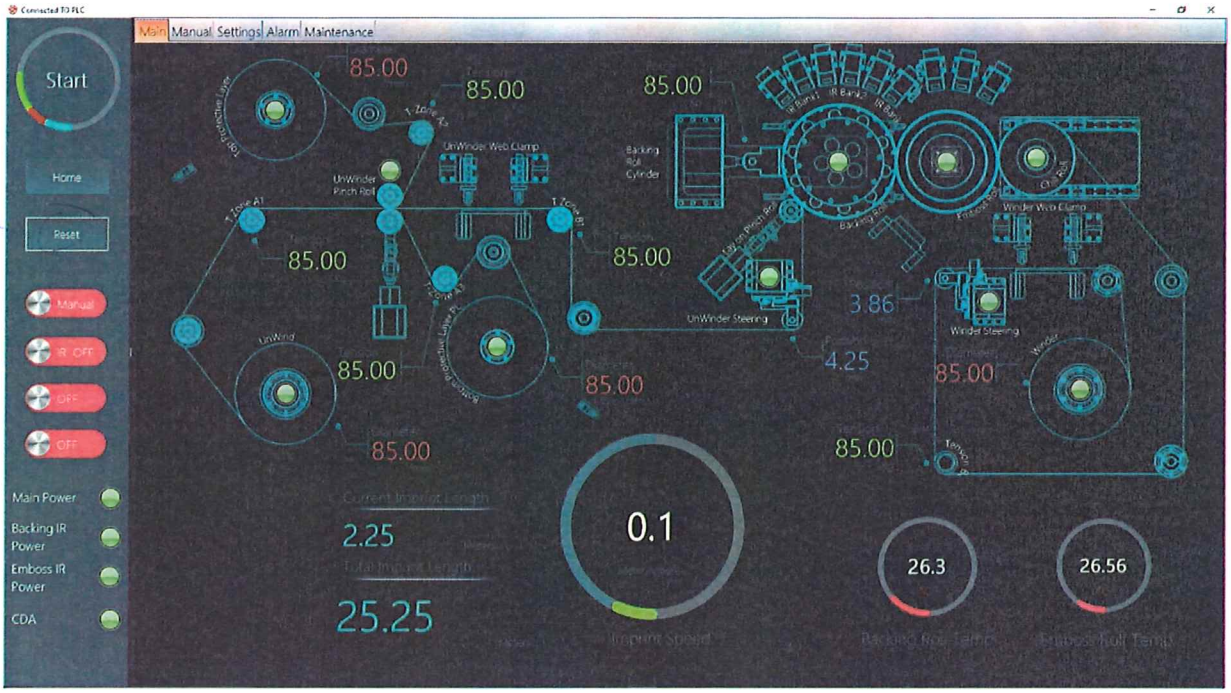
violet. { – ±0.1 mm.
– Stepping activate when machine run.

1. Main *Tab*: Below figure shows the overall machine layout with respective actual values.



alarm.s

Backing mold.

50mm.

- ✓ Red - Diameter Values.
- ✓ Green - Tension Values.
- ✓ Violet - Position Values.

x4

1. "Start" *button*: It will start running the machine automatically according to the user set paramters under the "Settings" *tab* such as imprint speed,zone tension,imprint force,etc.,
2. "Home" *button*: It will home all the servo motors,uncalmp all the web slicers and press both the "Unwinder" and "Lay On pinch" rollers.
3. "Reset" *button*: It will reset the alarm messages and servo motor errors.
4. "Auto /Manual" *toggle*: To start the machine in AutoMode slide this toggle button to "Auto" first then press "Start" button . Slide this button to "Manual" for manual mode opearitons.
5. "IR OFF" *toggle*: It will turn off all the IR lamps even when the machine is running.(User can utilize this function, in case of any emergency).
6. "IR ON" *toggle*: It will turn on all the IR lamps even when the machine is running.
7. "Main Power" *indicator*: "Green" – Main Power ON;"Red" – Main Power OFF.
8. "Backing IR Power" *indicator*: "Green"– Backing IR Power ON;"Red" – Backing IR Power OFF.

make sure film is loose before "home"
"home" after booting up.

9. "Emboss IR Power" *indicator*: "Green" – Emboss IR Power ON; "Red" – Emboss IR Power OFF.

   - Note: To turn on the "Main Power" press the "ON"(green) *button* located in the front panel. Once the main power on, "Backing IR" and "Emboss IR" power will turn on automatically.

10. "CDA" *indicator*: "Green" – CDA within a user set range; "Red" – CDA not in set range.

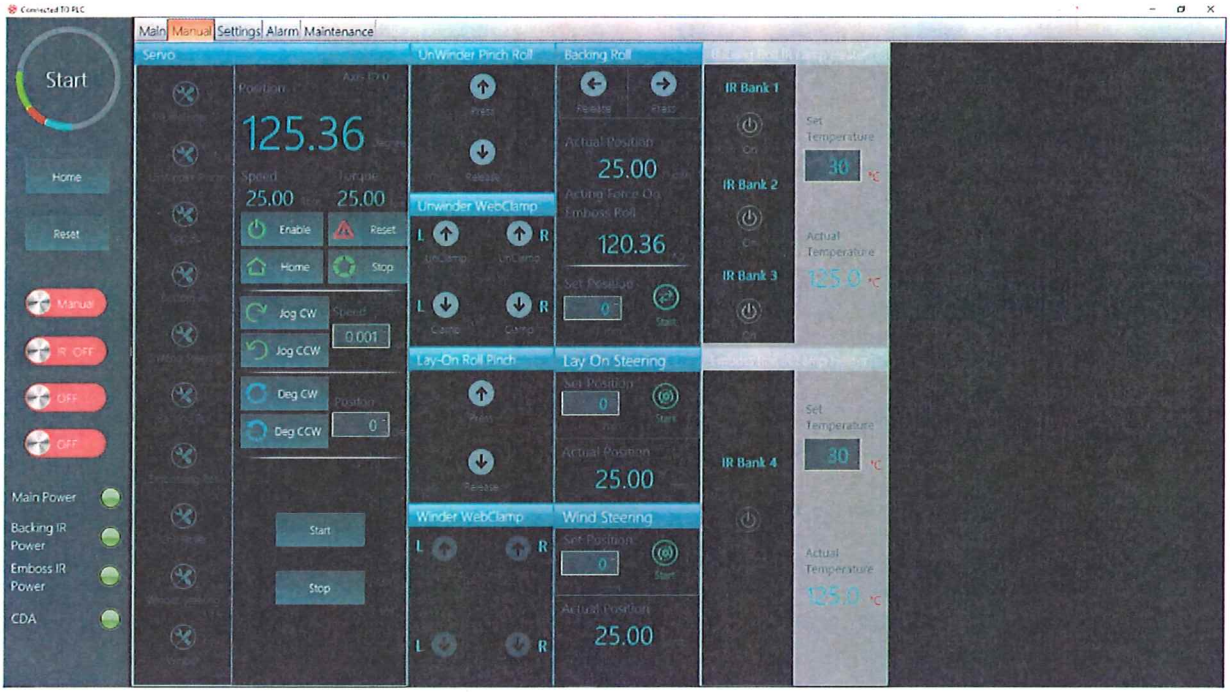
    - Note: User can adjust the pressure range in the CDA pressure switch located on the below panel.

11. "Current Imprint Length" *indicator*: It will show the actual imprinted web length in meters.

12. "Total Imprint Length" *indicator*: It will show the actual, total imprinted web length winded in meters.

    - Note: 1 revolution of Emboss Roller = 1.25 m of web length.

2. Manual *Tab*:



- Servo: Under the servo column,there are 10 different servo *buttons*, as shown above.User can select any one of the servo and then manually operate.

1. "Position" *display*: It will show the current servo motor position in deg.
2. "Speed" *box*: User can set the servo motor speed in Rpm.
3. "Torque" *box*: User can set the servo motor torque in Nm.
4. "Enable" *button*: It will enable the servo motor.
5. "Home" *button*: It will home the servo motor.
6. "Reset" *button*: It will clear the servo motor error.
7. "Stop" *button*: It will stop rotate the servo motor.
8. "Jog CW" *button*: It will jog the servo motor in CW direction.
9. "Jog CCW" *button*: It will jog the servo motor in CCW direction.
10. "Speed" *box*: User can set the servo motor jog speed in Rpm.
11. "Deg CW" *button*: It will rotate the servo motor according to the user set position in CW direction.

12. "Deg CCW" *button*: It will rotate the servo motor according to the user set position in CCW direction.
13. "Speed" *box*: User can set the servo motor positon in deg.
14. "Start" *button*: It will start rotate the servo motor.
15. "Stop" *button*: It will stop the rotation.

❖ Unwind Pinch Roll:

1. "Press" *button*: It will press the web towards the "Pinch" roller.
2. "Release" *button*: It will release the web from the "Pinch" roller.

❖ Unwinder Web Clamp:

1. "L Unclamp" *button*: It will unclamp the left side web slicer from the slice table.
2. "R Unclamp" *button*: It will unclamp the right side web slicer from the slice table.
3. "L Clamp" *button*: It will clamp the left side web slicer from the slice table.
4. "R Clamp" *button*: It will clamp the right side web slicer from the slice table.

❖ Lay On Roll Pinch:

1. "Press" *button*: It will press the web towards the "Backing" roller.
2. "Release" *button*: It will release the web from the "Backing" roller.

❖ Winder Web Clamp:

1. "L Unclamp" *button*: It will unclamp the left side web slicer from the slice table.
2. "R Unclamp" *button*: It will unclamp the right side web slicer from the slice table.
3. "L Clamp" *button*: It will clamp the left side web slicer from the slice table.
4. "R Clamp" *button*: It will clamp the right side web slicer from the slice table.

❖ Backing Roll:

1. "Press" *button*: It will press the web towards the "Emboss" roller.
2. "Release" *button*: It will release the web from the "Emboss" roller.
3. "Position" *display*: It will show the actual "Backing" roller position in mm.
4. "Actual Force" *display*: It will show the actual "Backing" roller force on "Emboss" roller in kg.
5. "Set Position" *box*: User can set the "Backing" roller position in mm.(Default Value: 50mm)

6. "Start" *button*: It will move the "Backing" roller according to the user set position.

❖ LayOn Steering:

1. "Set Position" *box*: User can set the "LayOn Steering" position in mm.
2. "Start" *button*: It will steer the web according to the user set position.
3. "Actual Position" *display*: It will show the actual "LayOn Steering" position in mm.

❖ Wind Steering:

1. "Set Position" *box*: User can set the "Wind Steering" position in mm.
2. "Start" *button*: It will steer the web according to the user set position.
3. "Actual Position" *display*: It will show the actual "Wind Steering" position in mm.

❖ Backing Roll IR Lamp Heater:

1. "IR Bank 1" *button*: It will turn on the IR lamp 1 and 2.
2. "IR Bank 2" *button*: It will turn on the IR lamp 3 and 4.
3. "IR Bank 3" *button*: It will turn on the IR lamp 5 and 9.
4. "Set Temperature" *box*: User can set the "IR Bank 1,2 and 3" temperature in °C.
5. "Actual Temperature" *display*: It will show the actual "IR Bank 1,2 and 3" temperature in °C.

❖ Emboss Roll IR Lamp Heater:

1. "IR Bank 4" *button*: It will turn on the IR lamp 6, 7 and 8.
2. "Set Temperature" *box*: User can set the "IR Bank 4" temperature in °C.
3. "Actual Temperature" *display*: It will show the actual "IR Bank 4" temperature in °C.

RECIPE.

max 200°C

3. Settings *Tab*: All the parameters shown in the settings tab will be applied for Auto Run.



❖ Imprint Speed:

1. "Set Imprint Speed" *box*: User can set the imprint speed in m/min.
2. "Actual Speed" *display*: It will show the actual imprint speed in m/min.

❖ LayOn Steering:

1. "Set Position" *box*: User can set the "LayOn Steering" position in mm.(*Default value: 4 mm*).
2. "Actual Position" *display*: It will show the actual "LayOn Steering" position in mm.

❖ Wind Steering:

1. "Set Position" *box*: User can set the "Wind Steering" position in mm.(*Default value: 4 mm*).
2. "Actual Position" *display*: It will show the actual "Wind Steering" position in mm.

❖ Backing Roll Temperature:

1. "Set Temperature" *box*: User can set the "Backing Roller" temperature in °C. → The 5 IR lamps on top of backing rol.
2. "Actual Temperature" *display*: It will show the actual "Backing Roller" temperature in °C.
3. "ON" *toggle*: Before "Auto Start" user must slide "ON" to turn on the "IR Bank 1,2 and 3" lamps in Auto mode.

4. "OFF" *toggle*: After machine stoped, user must slide "OFF".

❖ Emboss Roll Temperature:

1. "Set Temperature" *box*: User can set the "Emboss Roller" temperature in °C.
2. "Actual Temperature" *display*: It will show the actual "Emboss Roller" temperature in °C.
3. "ON" *toggle*: Before "Auto Start" user must slide "ON" to turn on the "IR Bank 4" lamps in Auto mode.
4. "OFF" *toggle*: After machine stoped, user must slide "OFF" this button.

❖ T Zone A1:

1. "Set Tension" *box*: User can set the "T Zone A1" tension in kg.
2. "Actual Tension" *display*: It will show the actual "T Zone A1" tension in kg.

❖ T Zone A2:

1. "Set Tension" *box*: User can set the "T Zone A2" tension in kg.
2. "Actual Tension" *display*: It will show the actual "T Zone A2" tension in kg.

❖ T Zone A3:

1. "Set Tension" *box*: User can set the "T Zone A3" tension in kg.
2. "Actual Tension" *display*: It will show the actual "T Zone A3" tension in kg.

❖ T Zone B1:

1. "Set Tension" *box*: User can set the "T Zone B1" tension in kg.
2. "Actual Tension" *display*: It will show the actual "T Zone B1" tension in kg.

❖ T Zone B2:

1. "Set Tension" *box*: User can set the "T Zone B2" tension in kg.
2. "Actual Tension" *display*: It will show the actual "T Zone B2" tension in kg.

❖ Imprint Force:

1. "Set Force" *box*: User can set the imprint force("Backing roller" force towards the "Emboss roller") in kg.
2. "Actual Force" *display*: It will show the actual imprint force in kg.

❖ Unwind Diameter Sensor:

1. "Calibrate" *button*: It will calibrate the "Unwind Diameter Sensor". (Before calibration, user must insert the empty core into the "Unwinder" and chuck it).
2. "Actual Distance" *display*: It will show the actual "Unwinder"diameter in mm.
3. "Calibration" *indicator* : "Green" color - sensor calibrated; "Red" color - sensor not calibrated.

❖ Wind Diameter Sensor:

1. "Calibrate" *button*: It will calibrate the "Wind Diameter Sensor". (Before calibration, user must insert the empty core into the "Winder" and chuck it).
2. "Actual Distance" *display*: It will show the actual "Winder"diameter in mm.
3. "Calibration" *indicator* : "Green" - sensor calibrated; "Red" - sensor not calibrated.

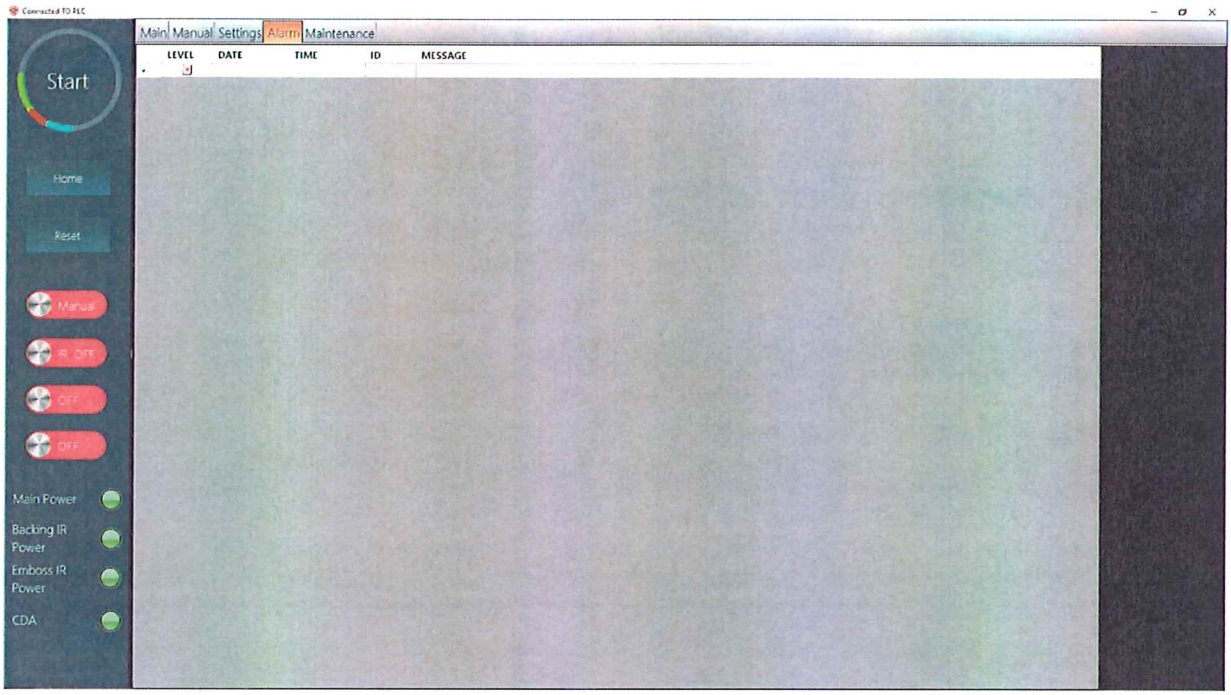
❖ Numeric Pad: It will pop-up,when user press any of the "Set" box.



1. "Min": It will show the minimum value for the respective parameter.
2. "Max": It will show the maximum value for the respective parameter.
3. "Clear" *button* : It will clear the values from display.
4. "Confirm" *button* : It will set the values to the respective paramter.
5. "Close" *button* : It will close the "Numeric Pad".

4. Alarm *Tab*: The alarm messages will be displayed in the table as shown below. Solve the respective alarm and press "Reset" button to clear the "red" icon under "LEVEL" column.

   ✓ **Note:** The Alarm message will never reset or clear, until the alarm (error) was solved physically.



1. "UnWind_Servo_Motor_Error": This alarm occurs when the "Unwinder" servo hanged or jammed.
2. "Pinch_Roller_Servo_Motor_Error": This alarm occurs when the "Pinch" servo hanged or jammed.
3. "TOP_PL_Servo_Motor_Error": This alarm occurs when the "Top PL" servo hanged or jammed.
4. "Bottom_PL_Servo_Motor_Error": This alarm occurs when the "Bottom PL" servo hanged or jammed.
5. "LayOn_Steering_Servo_Motor_Error": This alarm occurs when the "STR-1" servo hanged or jammed.
6. "Backing_Servo_Motor_Error": This alarm occurs when the "Backing" servo hanged or jammed.
7. "Emboss_Servo_Motor_Error": This alarm occurs when the "Emboss" servo hanged or jammed.
8. "Chiller_Servo_Motor_Error": This alarm occurs when the "Chill" servo hanged or jammed.
9. "Wind_Steering_Servo_Motor_Error": This alarm occurs when the "STR-2" servo hanged or jammed.
10. "Wind_Servo_Motor_Error": This alarm occurs when the "Wind" servo hanged or jammed.

✓ The following messages share the same comment:

11. "Unwind_LeftSide_Web_Unclamp_Cylinder_Time_Out_Error":
12. "Unwind_LeftSide_Web_Clamp_Cylinder_Time_Out_Error":

13. "Unwind_RightSide_Web_Unclamp_Cylinder_Time_Out_Error":
14. "Unwind_RightSide_Web_Clamp_Cylinder_Time_Out_Error":
15. "Pinch_Roller_Press_Cylinder_Time_Out_Error":
16. "Pinch_Roller_Release_Cylinder_Time_Out_Error":
17. "Wind_LeftSide_Web_Unclamp_Cylinder_Time_Out_Error":
18. "Wind_LeftSide_Web_Clamp_Cylinder_Time_Out_Error":
19. "Wind_RightSide_Web_Unclamp_Cylinder_Time_Out_Error":
20. "Wind_RightSide_Web_Clamp_Cylinder_Time_Out_Error":
21. "LayOn_Roller_Press_Cylinder_Time_Out_Error":
22. "LayOn_Roller_Release_Cylinder_Time_Out_Error":

    - These alarms occur when the specific limit sensor is not activated within certain time limit; the user has to look into why this sensor is not activated. This can be due to, for instance, sensor malfunction, cylinder jammed, broken wire or no air supply etc.

✓ The following messages share the same comment:

23. "Unwind_Servo_Motor_NOT_Enabled_For_AutoRun":
24. "Pinch_Servo_Motor_NOT_Enabled_For_AutoRun":
25. "Top_PL_Servo_Motor_NOT_Enabled_For_AutoRun":
26. "Bottom_PL_Servo_Motor_NOT_Enabled_For_AutoRun":
27. "LayOn_Steering_Servo_Motor_NOT_Enabled_For_AutoRun":
28. "Backing_Servo_Motor_NOT_Enabled_For_AutoRun":
29. "Emboss_Servo_Motor_NOT_Enabled_For_AutoRun":
30. "Chiller_Servo_Motor_NOT_Enabled_For_AutoRun":
31. "Wind_Steering_Servo_Motor_NOT_Enabled_For_AutoRun":
32. "Wind_Servo_Motor_NOT_Enabled_For_AutoRun":

    - These alarms occur when the user press the "Start" *button* for auto run, during any one of the above servo motor was not enabled; user has to clear this alarm and enable the servo and start the proceedings.

5. Initial Operating Procedure (Quick Reference): After machine Power On,

1. Press "Home" *button* to home all the servos and unclamp both the web slicers.
2. Release both "Unwinder" and "LayOn" pinch roll.
3. Insert new web core in the "Unwinder" roller.
4. Insert empty core in the "Winder" roller and pump the air to chuck the core.
5. Pull the web from the "Unwinder" and peel protective layers on both sides after "Unwinder Pinch" roll, arrange the web and protective layers according to the web path shown in the machine layout figure under "Main" *tab.*
6. Affix the web on the empty core in "Winder" roller and pump the air in "Unwinder" roller to chuck the new web core.
7. Calibrate the "Unwinder Diameter" and "Winder Diameter" sensors if it is not calibrated.
8. Set the "Backing Roll" position as "**50mm**" and manually move the "Backing" roll.
9. Ensure both "Backing" roll and "Emboss" roll was engaged properly.
10. Press both "Unwinder" and "Lay On" pinch rollers.
11. Check and Set all the parameters under "Settings" *tab* according to the user requirements.
12. Slide "ON" *button* in both "Backing Roll" and "Emboss Roll" temperature.
13. Activate the "Auto" mode.
14. Press "Start" *button*, to run the machine automatically.