Content

1. Installation ........................................................................................................... 34
2. Functions ............................................................................................................... 35
3. LCD Panel Description ....................................................................................... 36
4. Key Pad description ............................................................................................ 37
5. Function Mode ..................................................................................................... 38
6. Base Point/Origin(Org) ..................................................................................... 39
7. Direction [Dir] ..................................................................................................... 41
8. Resolution [Dot] .................................................................................................. 42
10. Offset calling ....................................................................................................... 45
11. Scale [Scale] ....................................................................................................... 46
12. Radius setting [Rad] ......................................................................................... 47
13. Gap Tuning [Tune] ............................................................................................. 48
14. Read Head traveling speed setting [Speed] .................................................... 51
15. Battery capacity [Bat] ......................................................................................... 52
17. Parameter default .............................................................................................. 54
18. Dimension .......................................................................................................... 55
19. Appendix ............................................................................................................ 56
20. Version History .................................................................................................. 60
1. Installation

(1) At installation, the position of read-head is important.

☆☆ (2) Gap Tuning: (Waring)
In order to guarantee the accuracy of system, gap tuning procedure must be done after battery changed or reinstallation of read head. [Reference page: P.17]
2. Functions and Specifications

(1) Functions
1. Switching between ABS and REL. See appendix.
2. Units of measurement: mm/inch/deg
3. Base point (Origin) coordinate setting
   (Setting of the coordinate where it stops at the moment.)
4. Counting direction setting (increase/decrease)
5. Resolution setting (decimal point setting)
   mm=(0.005, 0.01, 0.1, 1); inch=(0.0001, 0.001, 0.01, 0.1);
   deg=(0.001, 0.01, 0.1, 1)
6. 5 sets of offset settings. See appendix.
7. Programmable scaling factor.
8. Diameter setting for arc measurement. (The smallest radius is 50mm.)
9. Gap adjustment assistant (For better installation.)
10. Rated velocity setting (Maximum speed)
11. Battery condition display
12. Key lock

(2) Specifications
◎ LCD 8 digits display
◎ Use two 1.5 V AA Type battery (No. 3 battery)
◎ Max. gap between read head and tape 2.0mm
◎ Operation: 4 keys
◎ Temperature for stocking : -5℃ ~ +65℃
◎ Operation temperature: 0℃ ~ +50℃
◎ Battery life circa one year (Assumed speed is set to 1.5 m/sec or below)
3. LCD display panel

**ORG 1234** : 5 sets of ABS counter
-see appendix

: Gap too big

**CNT 1234** : 5 sets of REL counter
-see appendix

: Gap too short

: Degree

: Blinking (Gap not adjusted)

: mm

: OK

: Gap is proper

: inch

: ABS

: ABS mode

: Radius setting

: REL

: REL (INC) mode

: Radius value

: LOW

: Battery low

: Key locked

: minus

: Bad flatness

NO SEN : Read head is away from tape
4. Key operations

◎ Normal mode

◎ The meaning of key at the Normal mode:

- **MENU**
  - Menu

- **ABS/REL**
  - Switching between ABS/REL mode

- **mm/inch radius**
  - Switching between units (mm/inch/degree)

- **ZERO ENTER**
  - Set to zero (only for REL mode)

- **ABS/REL** + **mm/inch radius**
  - Lock and unlock the key

- **MENU RETURN** + **ABS/REL**
  - ABS mode: switching ORG
  - REL mode: switching CNT
5. Function Mode
At normal mode, press MENU to enter function mode.

◎ The meaning of key at the Function mode:

- **MENU RETURN**
  : Return to normal mode/Back one page

- **ABS/REL**
  : Switching between functions
  Org > Dir > Dot > Offset > Scale > Rad > Tune > Speed > Bat > Edit > Org

- **mm/inch radius**
  : Switching between functions
  Org > Edit > Bat > Speed > Tune > Rad > Scale > Offset > Dot > Dir > Org

- **ZERO ENTER**
  : Confirmation key
6. Base point (origin) setting (Org)

**Function:** This is to set the origin coordinate. (It sets the coordinate where it stops at the moment.) User can set the value according to need. It can be zero or non-zero. If it is zero, it is origin. This is only for ABS mode.

Step 1. If not in ABS mode, press \( \text{ABS/REL} \) to switch into ABS mode.

Step 2. Press \( \text{MENU RETURN} \) once, then press \( \text{ABS/REL} \) or \( \text{mm/inch radius} \) until it shows Org.

Step 3. Press \( \text{ZERO ENTER} \) to enter setting.
Step 4. Press to set the sign. Then press to switch to next digit. The digit will flicker. Press to change the value. After change is done, press to confirm. The display will show the newly set value. Press to confirm.

Note: The setting range is -360° ~ +360° at the angle mode.
Note: If parameter is over the setting range, it will shows an “Error”.
7. Counting direction (Dir)

Function: It is possible to set the direction for incremental signal.

Step 1. Press \textbf{MENU} \textbf{RETURN}, than press \textbf{ABS/REL} or \textbf{mm/inch radius} \textbf{ENTER} to enter setting.

Step 2. Press \textbf{ZERO \ ENTER} to enter setting, than Press \textbf{ABS/REL} \textbf{mm/inch radius} or \textbf{ENTER} to choose counting direction \{positive or negative\}, than press \textbf{ZERO \ ENTER}.
8. Resolution setting (Dot)

Function: It is possible to set the resolution according to user’s requirement.
1. For mm, possible choices are 0.005, 0.01, 0.1, 1 mm.
2. For inch, possible choices are 0.0001, 0.001, 0.01, 0.1 inch.
3. For degree, possible choices are 0.001, 0.01, 0.1, 1 degree.

Step 1. Press \( \text{mm/inch} \) to choose the unit needed.

Step 2. Press \( \text{MENU} \) once, and press \( \text{ABS/REL} \) or

Step 3. Press \( \text{ZERO} \) to enter setting. Press \( \text{mm/inch} \) to choose the resolution needed.

Finally, press \( \text{ZERO} \) to confirm.
9. Offset setting (offset)

**Function:** It is possible to set different offsets. But it is only for ABS mode. (PMLD has 5 sets of independent offsets. Offset provides user to switch between different translational coordinates. When using offset, the PMLD adds the according offset value and shows it. So user does not need calculator)

Step 1. Press \( \text{ABS/REL} \) to choose ABS mode.

Step 2. Press \( \text{MENU RETURN} \) once, then press \( \text{ABS/REL} \) or \( \text{mm/inch radius} \) until it shows Offset.

Step 3. Press \( \text{ABS/REL} \) or \( \text{mm/inch radius} \) to select which offset to set. After selection, press \( \text{ZERO ENTER} \)
Step 4. Press \( \text{ABS/REL} \) to set the sign. Then press \( \text{mm/inch radius} \) to switch to next digit. The digit will flicker. Press \( \text{ABS/REL} \) to change the value, and press \( \text{ZERO ENTER} \) to confirm.

Note: The setting range is \(-360° \sim +360°\) at the angle mode.
10. Offset calling

**Function:** After offset value have been set up, user could call the setting value. This function is only for ABS mode.

Step 1. Press \( \text{ABS/REL} \) to switch into ABS mode.

Then keep pressing on \( \text{MENU} \) and then press \( \text{ABS/REL} \) to choose which ORG value to call.

Step 2. After chosen, release \( \text{MENU} \) and \( \text{ABS/REL} \) at the same time, panel will show ORG.

Step 3. Press \( \text{ZERO ENTER} \) will show the preset value, then Press \( \text{ZERO ENTER} \) again, finish calling process.
11. Scale (Scale)

Function: It is possible to set to a different scale for coordinate display.

Step 1. Press \( \text{MENU} \) once, and press \( \text{ABS/REL} \) or \( \text{mm/inch} \) until it shows Scale. then press \( \text{ZERO} \) to enter setting.

Step 2. Press \( \text{ABS/REL} \) to change the flashing digit. Press \( \text{mm/inch} \) to change to next digit. Press \( \text{ABS/REL} \) to change the value. Finally press \( \text{ZERO} \) to confirm.

Range: 0.01~1000.00 (Not including 0)
12. Radius setting (Rad)

Function: When the magnetic tape is mounted on a round surface, setting the radius value makes it possible to show the correct angle.

Step 1. Press \textbf{MENU} once, and press \textbf{ABS/REL} or \textbf{mm/inch radius} until it shows Rad. Then press \textbf{ZERO ENTER} to set.

Step 2. The symbol $r$ means radius. Press \textbf{ABS/REL} to change the value, and press \textbf{mm/inch radius} change to next number. The number will be flash. Then press \textbf{ABS/REL} to change the value. The unit is only in mm. When finished setting the parameter, press the \textbf{ZERO ENTER} key.

Value: 50–5000 mm.
13. Gap Tuning (Tune)

Function: Assists the user to check installation distance between read head and magnetic tape is suitable or not, and correct the sensing signal to improve the system accuracy. After system or read head reinstallation, it is best to do this process again.

Step 1. Press \( \text{MENU} \) and \( \text{RETURN} \), and next press \( \text{ABS/REL} \) or \( \text{mm/inch radius} \) to select tune. Press to setting the value.

Step 2. The panel display “Tune-” means that it is under detect. Move the read head slowly. The shift should be over 30mm in 10 second.

Step 3. The panel display “Tune --” means that it is almost done. The display goes back to normal mode when detect finished and will show the symbol of too large gap, too small gap or suitable gap. The message knows the gap between read head and magnetic tape.

※ This action must be complete in 30 seconds, if 30 seconds passes without completing the system tune, system will jump back to normal mode to reduce the power consumption. This time panel will show \( \text{icon} \), means gap adjustment have not been completed yet.

Note: After completing the gap adjustment movement, you must establish the reference point again.
Tuning Result:

(a) Moderate gap: OK

If the detection result demonstrates "OK" symbol, indicated reads and the magnetic tape spacing is moderate.

(b) Too small gap: 

If the detection result demonstrates "" symbol, which indicates gap between read head and magnetic tape is too small after adjustment. You must repeat Tune process again.

(c) Too large gap: 

If the detection result demonstrates "" symbol, which indicates gap between read head and magnetic tape is too large after adjustment. You must repeat Tune process again.
(d) Too high surface roughness: \( \downarrow \uparrow \)

If the detection result demonstrates “\( \downarrow \uparrow \)" symbol, which indicates the mounting surface of magnetic stripe is too rough. You must repeat Tune process again after improving the flatness.

Trouble shooting:

(a) Turning Trouble

If the panel shows “Tune- or Tune--" for a long time, the gap may be too high or the signal of the read head is unstable. Please press \( \text{ZERO ENTER} \) to finish the detecting process.

This time the panel shows "\( \square \)" symbol, indicates the gap adjustment is not yet complete. After reducing reads gap, repeat the tune process again, if it still has not been improved, please check the signal of read head works well.

※ After completing the tune process, display could remember related parameters automatically. In this period, if battery has been changed, “\( \square \)" symbol will show on panel. Although it is not affect the system accuracy, it still suggests to do tune process again.
14. Read Head traveling speed setting (Speed)

**Function:** According to the read head traveling speed requirement, choose the speed limit.

Step 1. Press **MENU** once, and then press either **mm/inch radius** to select the picture "Speed" then press **ZERO ENTER** to enter menu.

Step 2. Press the **ABS/REL** or **mm/inch radius** key. You can select the speed limit for read head moving speed. 1.0m/sec, 1.5m/sec, 2.0m/sec, 2.5m/sec, 3.0m/sec. Press **ZERO ENTER** after setting.

※ The traveling speed upper limit sets bigger, the power consumption becomes larger, thus lowering the battery service life. Lowering the speeds extends the battery service life.
15. Battery capacity (Bat)

Function: Battery current capacity detection

Step 1. Press \text{MENU} once, and then press \text{ABS/REL} or \text{mm/inch radius} until it shows bat. Press \text{ZERO ENTER} to enter the function.

Step 2. The picture will display the value of battery. Press \text{MENU RETURN} key to go back to normal mode.

※ If the value of the battery is under 2, the display will show "LOW" symbol. Please change the battery.
16. Software Version (Edit)

Function: The software version of system

Step 1. Press \( \text{MENU} \) once, and press \( \text{ABS/REL} \) or \( \text{mm/inch radius} \) until it shows edit. Press \( \text{ZERO} \) ENTER to enter the function.

Step 2. The panel will show current software version. Press \( \text{MENU} \) RETURN once, and go back to normal mode.
## 17. System default parameter

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dot</td>
<td>Resolution</td>
<td>(1) 0.005mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2) 0.0001inch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3) 0.001</td>
</tr>
<tr>
<td>Dir</td>
<td>Direction</td>
<td>Pos</td>
</tr>
<tr>
<td>Org</td>
<td>Origin</td>
<td>0</td>
</tr>
<tr>
<td>Offset</td>
<td>Origin offset</td>
<td>0</td>
</tr>
<tr>
<td>Scale</td>
<td>Scale</td>
<td>1.00</td>
</tr>
<tr>
<td>Rad</td>
<td>Radius</td>
<td>50mm</td>
</tr>
<tr>
<td>Speed</td>
<td>Speed limit</td>
<td>1.5m/sec</td>
</tr>
</tbody>
</table>
18. Dimension:

[Diagram showing dimensions and tolerances]
19. Appendix

(1) Panel display and function antithesis:

<table>
<thead>
<tr>
<th>Name</th>
<th>LCD Display</th>
<th>Name</th>
<th>LCD Display</th>
<th>Name</th>
<th>LCD Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>b</td>
</tr>
<tr>
<td>C</td>
<td>C</td>
<td>D</td>
<td>d</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>F</td>
<td>F</td>
<td>G</td>
<td>g</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>Name</td>
<td>LCD Display</td>
<td>Name</td>
<td>LCD Display</td>
<td>Name</td>
<td>LCD Display</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>------</td>
<td>-------------</td>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>I</td>
<td>💼</td>
<td>J</td>
<td>👁️</td>
<td>K</td>
<td>🌀</td>
</tr>
<tr>
<td>L</td>
<td>🏳️</td>
<td>M</td>
<td>🌏</td>
<td>N</td>
<td>🌓</td>
</tr>
<tr>
<td>O</td>
<td>🕐</td>
<td>P</td>
<td>🎨</td>
<td>Q</td>
<td>📹</td>
</tr>
<tr>
<td>R</td>
<td>🛠️</td>
<td>S</td>
<td>🌞</td>
<td>T</td>
<td>🏔</td>
</tr>
<tr>
<td>U</td>
<td>📖</td>
<td>V</td>
<td>🍾</td>
<td>W</td>
<td>🌛</td>
</tr>
<tr>
<td>X</td>
<td>🦿</td>
<td>Y</td>
<td>🎤</td>
<td>Z</td>
<td>🎨</td>
</tr>
</tbody>
</table>
(2) Technical description:

(a) Absolution mode:

The same origin, you can not change the origin position.

(b) Relation mode:

You can change any origin by your demand.

(c) ORG (ORG0, ORG1, ORG2, ORG3, ORG4) description:

In the woodworking machine application, it does not cuts the same length by user discretion. (Example: 1 meter and 2 meters, following under description)
The user only changes the setting of the origin. (You need 1 meter that sets ORG0 for 1 meter origin, and for 2 meters, set ORG1 for 2 meter origin.) This function can increase the efficiency in measurement above 2 sizes.

(d) CNT (CNT0, CNT1, CNT2, CNT3, CNT4) description:

In the woodworking machine application, it cuts not the same length on same wood. (Example: 30 centimeters and 40 centimeters, following under description)

The user only changes the CNT setting. User can direct the read out the position and cuts the wood. They don’t need to set the parameter once again.

(e) Origin compensation:

You cannot change the position of origin in absolute mode. If you need to change the position of origin, you must use the origin compensation to offset the position of origin.
## 20. Version history

<table>
<thead>
<tr>
<th>version</th>
<th>Description of change</th>
<th>By</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1.1</td>
<td>Correct the dimension picture description (P.25) and content wrong (P.10)</td>
<td>CWLin</td>
<td>30.Dec.2010</td>
</tr>
</tbody>
</table>