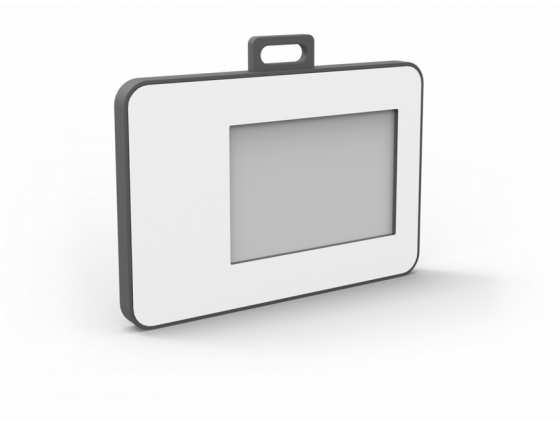
User's Guide

PicoLabel 2.7" Demo Kit
v1.x



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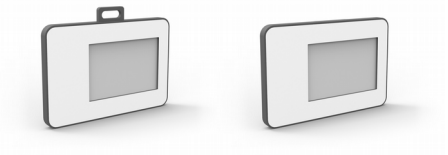
1 What's In the Box

- PicoLabel 2.7″ v1.x (5 pieces)
  - Landscape Lanyard Variant (2 pieces, black and white)
  - Mount Variant (3 pieces – 2 black and 1 white)



Landscape Lanyard Variant

Mount Variant

- NFC Reader (OMNIKEY® 5021 CL)

- *PicoLabel Publisher* software (downloadable online)
- This *User's Guide* printed copy (also downloadable online)
- PicoLabel lanyards (2 pieces)

2 Requirements

- Laptop or PC with USB port
- Windows 7 or later
- OpenGL 2.0 or later

3 NFC Reader Installation

1) Plug in the NFC Reader to your computer's USB port
2) Driver should install automatically

If the driver fails to install automatically, please download the driver from https://www.hidglobal.com/products/readers/omnikey/5021 and install it manually.

4 PicoLabel Publisher for Windows Software for Demo

To enable quick demo we have created the simple application showcasing the main PicoLabel features like displaying ID badge, door signage and an image (e.g. for logistics applications).

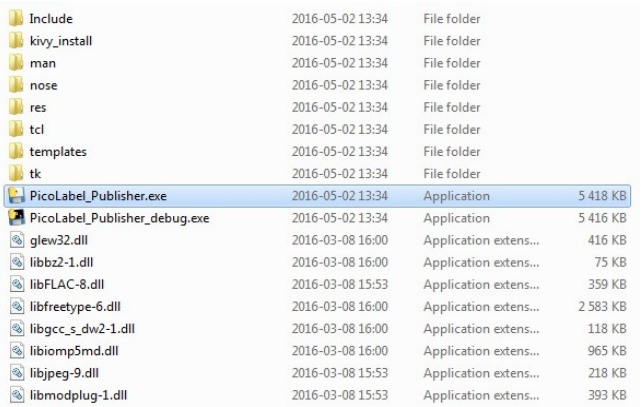
4.1 Download

Download the PicoLabel Publisher for Windows software from https://www.mpicosys.com/products/picolabel/.

4.2 Running the Software

PicoLabel Publisher does not require installation.

1) Unzip the software package
2) Open PicoLabel_Publisher folder
3) Run PicoLabel_Publisher.exe



PicoLabel Publisher files view

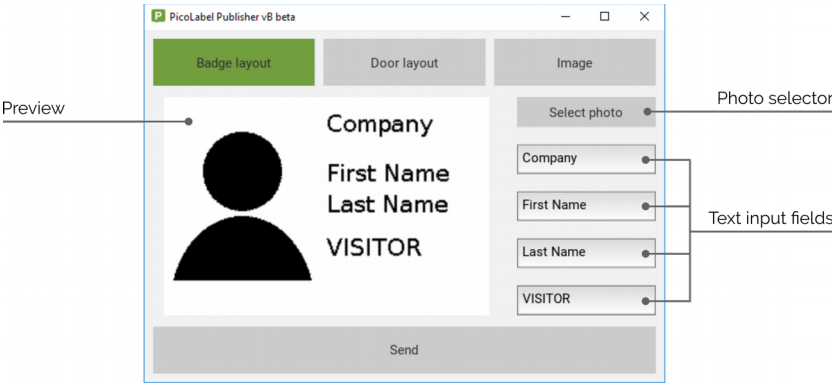
4.3 PicoLabel Publisher Modes

PicoLabel Publisher is a one-window application which allows the user to select from one of the three image modes:

ID Badge Layout

This layout allows to select an image file from the disk, and input the text data, to create an ID badge. The preview panel will update automatically, showing the result expected on the PicoLabel.

Within this layout, the text is sent to the PicoLabel as graphic library commands data and is then rendered on the PicoLabel with the built-in font.

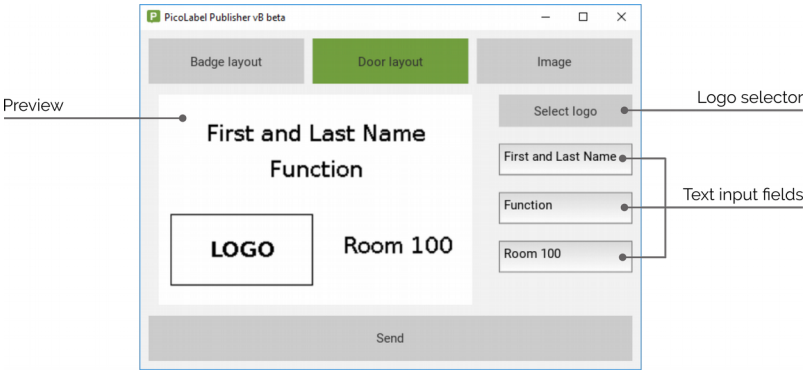


Badge layout view

Door Sign Layout

This layout allows to select an image file from the disk, and input the text data, to create a door signage label. The preview panel will update automatically, showing the result expected on the PicoLabel.

Within this layout, the text is sent to the PicoLabel as graphic library commands data and is then rendered on the PicoLabel with the built-in font.



Door sign layout view

Image Layout

This layout allows to select an image file from the disk. The preview panel will update automatically, showing the result expected on the PicoLabel.

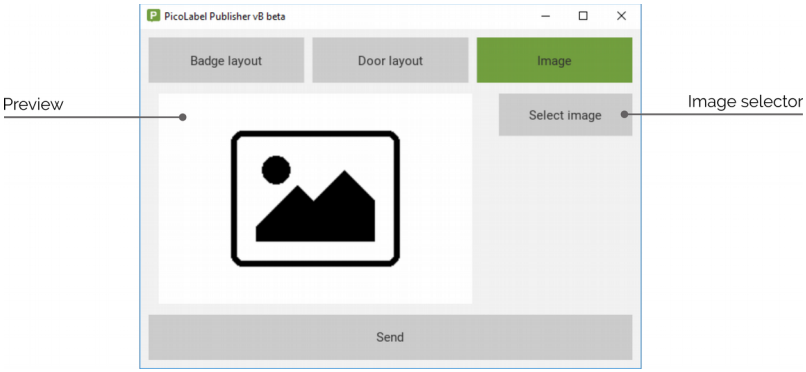


Image layout view

4.4 Image Requirements

ePaper display on PicoLabel is black-and-white. The Publisher software automatically converts the images from colour to monochrome.

Each of the image fields has fixed size. PicoLabel Publisher does not resize the images. If the selected image is bigger than the field size, the image is cropped.

For the best results, it is recommended to prepare the images in a graphic editing software for proper colour (1-bit, monochrome) and resolution:

- Image in ID badge layout: 128 × 176 px
- Logo in door sign layout: 240 × 120 px
- Image in image layout: 264 × 176 px

4.5 Updating PicoLabel ePaper Screen

After filling the data in one of the layouts, place the PicoLabel on the NFC reader, aligning the PicoLabel's left edge with the reader as shown in the image below. PicoLabel can either be placed on top of or underneath the reader.

The N-Mark™ printed on the back of the PicoLabel marks the NFC antenna position to aid the correct alignment.

PicoLabel and reader proper alignment

Click "Send" button to publish the image. The data will be sent to the PicoLabel and displayed on the ePaper screen.

5 Template Modification (Advanced)

With a basic knowledge of JSON format, it is possible to add, delete and modify the image templates used in the PicoLabel Publisher modes. The templates are stored in the *templates* folder; each template is defined by a single JSON file. The JSON files describe the fields used in the template (graphic or text), as well as their sizes and positions.

You can modify the templates according to your preferences. Please restart the application for the changes to take place.

6 PicoLabel Communication Protocol

If you wish to interface PicoLabel with your system, please refer to Communication Protocol Description available at https://www.mpicosys.com/products/picolabel/.

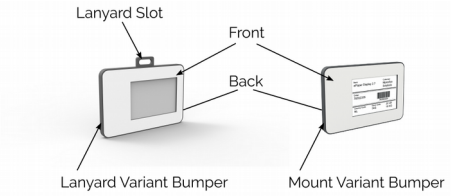
7 Placing Your Card In PicoLabel

PicoLabel housing has room for an external card in the ISO ID-1 (credit card) format. For example you can place your access control card inside.

7.1 Components

PicoLabel components are listed below:

- Housing Front
- Housing Back
- Bumper
- Lanyard Slot (optional)
- PicoLabel 2.7" board with ePaper display
- White placeholder card

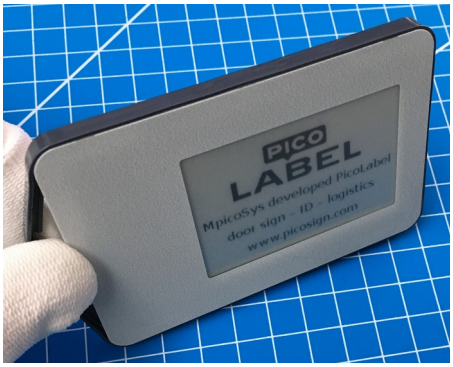


7.2 Instructions

Follow the instructions below to insert your card in the PicoLabel housing. Disassembly should be performed in a clean and ESD-safe environment on a soft surface. It is mandatory to use ESD-safe gloves, especially in regard to handling electronics and ePaper display.

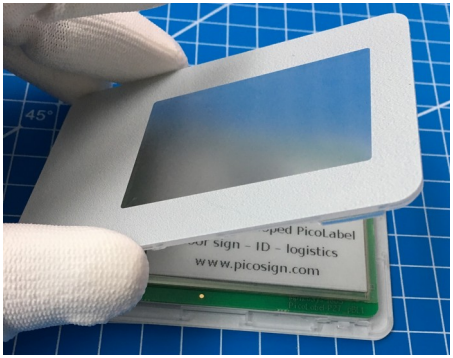
1) Removing Bumper

Remove the bumper from around the housing.



2) Opening Housing

Use plastic pliers to gently detach the Housing Front and Back parts.

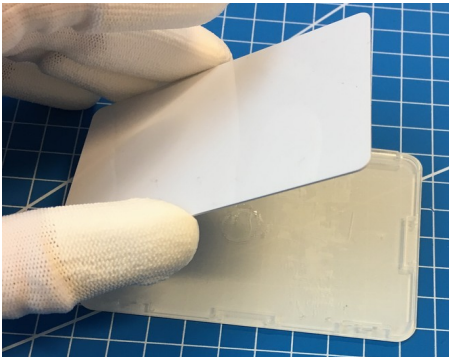


3) Detaching PicoLabel

Remove PicoLabel from the Housing.

4) Inserting Card

Replace the placeholder card with your ID-1 card.

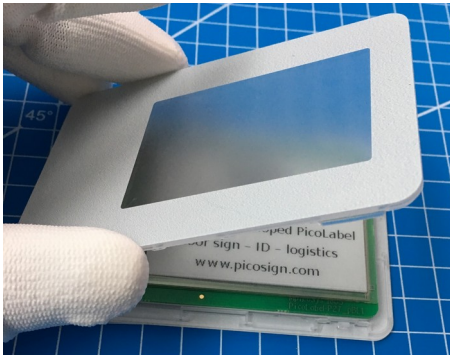


5) Placing PicoLabel

Slide the side of the PicoLabel board to the side of an internal wall of the Housing Back. PicoLabel should stick to adhesive dot and be centred.

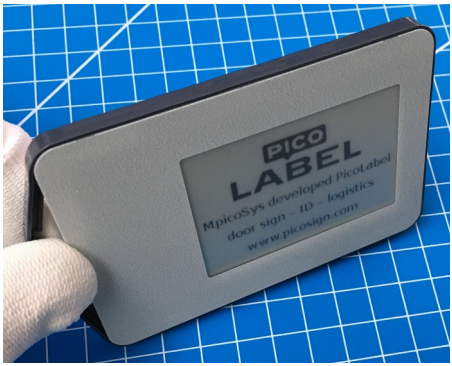
6) Placing Front Housing

Place the Housing Front with transparent window on the ePaper display side. Close the housing carefully by gently pushing the Housing Front into the Housing Back. You should hear a clicking sound.



7) Mounting Bumper

Wrap the Bumper around the PicoLabel housing.



8 PicoLabel Specification

Display size	2.7 inches
Display resolution	264 x 176 pixels
Display density	117 dpi
Display color depth	1 bit (black and white)
Display contrast ratio	Min 7:1
Display active area size	57.3 x 38.2 mm (~2.26 x 1.5 in)
Dimensions (width x height x thickness) excluding lanyard slot	97 x 65.4 x 6 mm (~3.82 x 2.57 x 0.24 in)
Weight	45 g (1.6 oz)
Materials	Polycarbonate (PC), thermo-plastic elastomer (TPE-U)
Water and dust resistance	IP56
Coating technology	UV printing
Image upload time (uncompressed)	2.8 s
Display refresh time	2.5 s
Operating temperature range	17.5 ÷ 22.5 ^{o}C (63.5 ÷ 72.5 ^{o}F)
Power supply source	NFC
Batteries	None
Connectors	None
Communication standard	ISO 14443A-2 (NFC Forum Type-2 Tag)
Communication frequency	13.56 MHz
Security	None
Image write cycles	200,000

9 Ordering Information

Interested in PicoLabel and its functionality? Contact sales@mpicosys.com to order additional PicoLabels.

10 More Information

Please visit https://www.mpicosys.com/products/picolabel/ for more information.

11 Legal Information

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