PLASTIC LOGIC

# USER GUIDE

# Display Evaluation Kit

# PLDEK M_T430U

## Part-No. 301006

Content

# 1 About Plastic Logic's Display Evaluation Kit

Plastic Logic's Display Evaluation Kit (PLDEK) has been designed to be used for a range of activities including:

1. Evaluating Plastic Logic's display technology.
2. Evaluating the appearance of customer and 3rd party content on Plastic Logic displays.
3. Building expertise with Plastic Logic Display systems prior to designing products or systems that incorporate our displays.
4. Application development.

# 2 About this document

This document is a user guide for **TI-MSP430 microcontroller tiny display evaluation kit.** It is only to be used for kits containing a Parrot microcontroller board and a Hummingbird Z9 interface board. It is intended to give sufficient information to:

1. Safely unpack and power up the PLDEK.
2. Start displaying images in .pgm format.
3. Understand how to start using the Plastic Logic software development Kit (SDK).

# 3 Quick Start Guide

**This Quick Start Guide is a subset of the User Guide, which can be found on the SD-Card**

Prior to unpacking the kit, the user is strongly urged to take appropriate ESD and safety precautions.

## 3.1 Safety Points

### Warning:

- **To avoid risk of electric shock or damage to the display, disconnect the display module from its power source before handling it.**
- **Do not touch the connections or circuits whilst the display is in operation.**

### Caution:

- **Follow ESD handling procedures to avoid circuit damage. Use a grounded wrist strap.**
- **Do not press on the display panel or its edges as damage can result.**

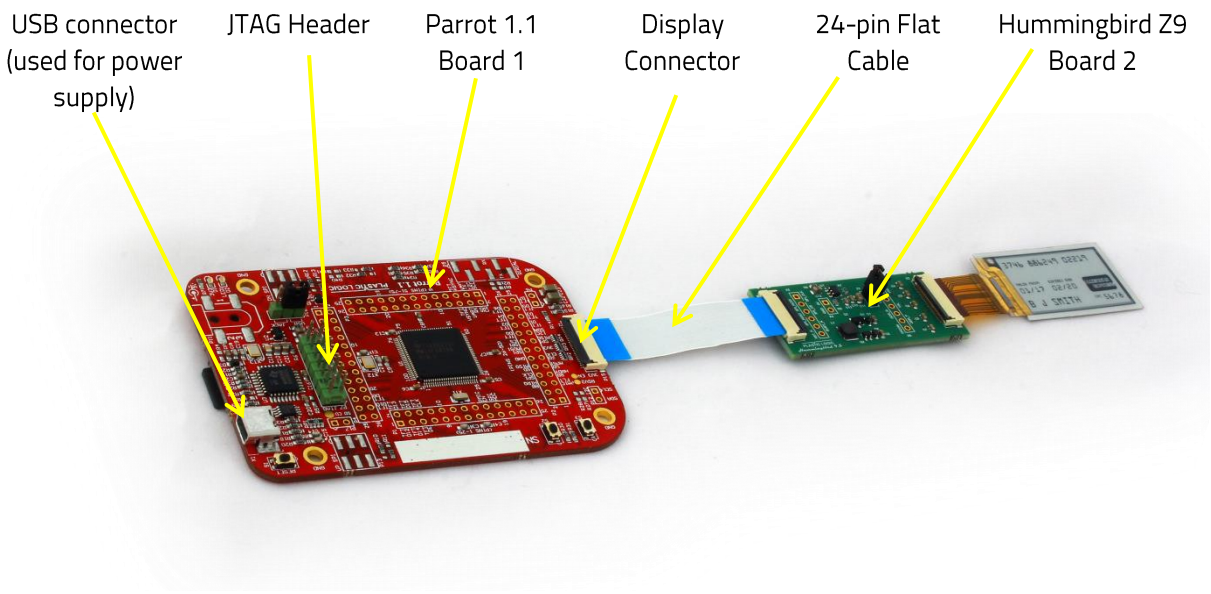
### Important Notice

**The Plastic Logic Display Evaluation Kit ("the Kit") is intended for use for ENGINEERING DEVELOPMENT, DEMONSTRATION OR EVALUATION PURPOSES ONLY and is not considered by Plastic Logic to be a finished end-product fit for general consumer use. Persons handling the Kit must have electronics training and observe good engineering practice standards. As such, the kit being provided is not intended to be complete in terms of required design-, marketing-, and/or manufacturing-related protective considerations, including product safety and environmental measures typically found in end products that incorporate such semiconductor components or circuit boards. The kit does not fall within the scope of the European directives regarding electromagnetic compatibility, restricted substances (RoHS), recycling (WEEE), FCC, CE or UL, and therefore may not meet the technical requirements of these directives or other related directives.**

## 3.2 Unpacking the Kit

The kit is shipped with the items listed in the table below. Please ensure that the items listed on the next page have been included in your kit.

| No. | Item | Description |
|---|---|---|
| 1 | Board 1 | Plastic Logic Parrot 1.1 microcontroller board |
| 2 | Board 2 | Plastic Logic Hummingbird Z9 interface |
| 3 | Flat Ribbon Cable | Cable to connect board 1 and 2. This cable is already connected to the Z9-board at one side. |
| 5 | Micro - SD Card | Contains slide-show images, display specific waveforms and voltages, documentation, source code. The Micro-SD card is mounted in the socket of board 1. |
| 6 | SD Card Adaptor | Adaptor from µSD to standard SD form-factor |
| 7 | USB cable | Currently only used for power supply |

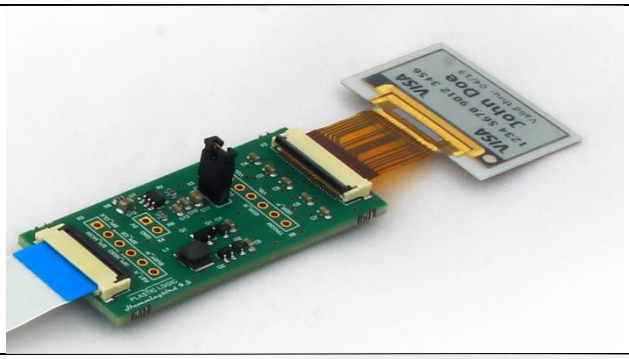
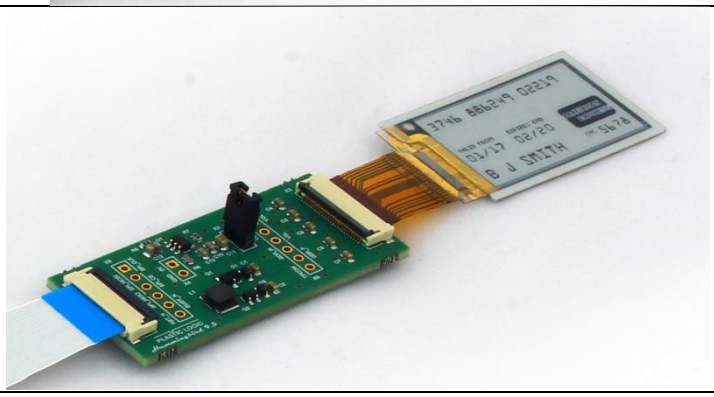


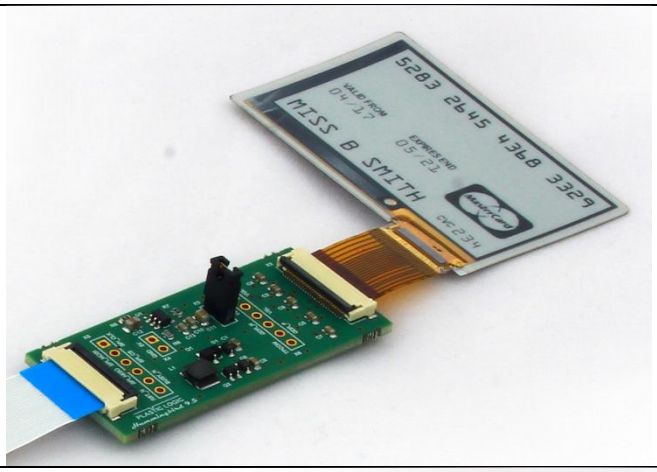
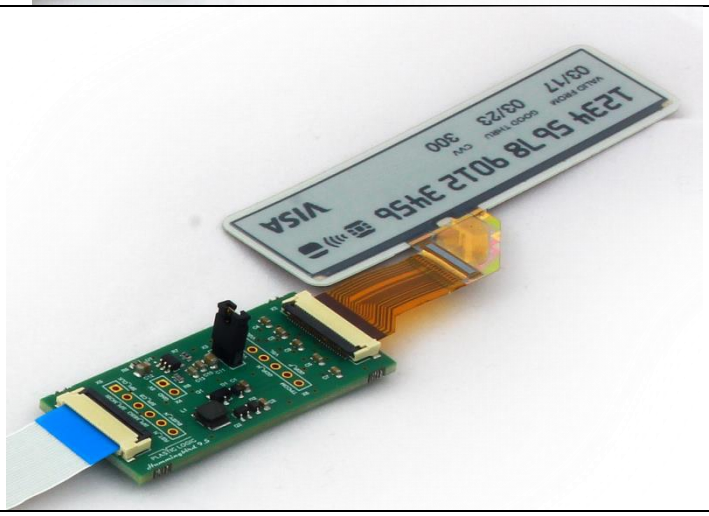

Note: Image shows M_T430U with C_HBZ9.5 and S014_T1.

## 3.3 Connecting up the Kit

Connect the Parrot board with the Z9 board using the Flat Ribbon Cable. Plug in the display into the display connector of the Hummingbird Z9 board. It is important to connect the display before powering up the kit to avoid damages of any parts.

**Attention:** Do not change or remove the display during the kit is powered up!

| Display | |
|---|---|
| S011_T1.1 |  |
| S014_T1.1 |  |

| | |
|---|---|
| S031_T1.1 |  |
| S021_T2.1 |  |

### 3.3.1Setting the Display Type

The Display Type should be set on the SD Card so the MCU can setup the Display Settings accordingly. On the root folder of the SD-Card is a file named display-type.txt.
There the first line specifies the display type.

**Valid Types are:**

- S011_T1.1,
- S014_T1.1,
- S021_T1.1 and
- S031_T3.1

## 3.4 System Boot and Image Display

After the display is plugged in please connect the USB connector to power the Parrot 1.1 board. The image slide-show will start almost immediately.

# 4 Troubleshooting

In case of any problems please email techsupport@plasticlogic.com

# 5 Generate own images for the slideshow

## 5.1 Image format PGM

For simplicity the MSP430 code only supports image files in the PGM graphics file format. This is a simple, uncompressed, grey-scale file format. For further details please check http://en.wikipedia.org/wiki/Netpbm_format.

## 5.2 Generated or convert

PGM files can be generated or converted by several image software tools. A good free option is for example GIMP (http://www.gimp.org/downloads/).

If you generate new images or convert existing images they have to follow these rules:

- Portrait orientation
- 240 pixel in column direction

GIMP export:

- File → Export As …
- Choose "PGM image (*.pgm)"
- Change file-name extention to .pgm
- Click "Export" button
- Choose "Data formatting" = "Raw" and click "Export" button

## 5.3 Copy new images to the SD card

1. Disconnect the Parrot-board from power
2. Remove µSD-card from Parrot-board
3. Use your own laptop or card-reader to copy images into the µSD-card. You can use the standard SD-card adapter which is part of the Eval-Kit.
4. Copy your image to the corresponding image folder ("S011_T1.1" or "S021_T1.1")
5. Put the µSD-card back to the Parrot-board
6. If you power the Parrot-board now again, you should see your new images played in the slide-show

# 6 Setting Display Specific Waveform and VCOM

Waveform and Vcom voltage is programmed into the display controller internal non-volatile memory (MTP). Different to other Plastic Logic displays there is no need to set waveform and/or Vcom from user perspective.