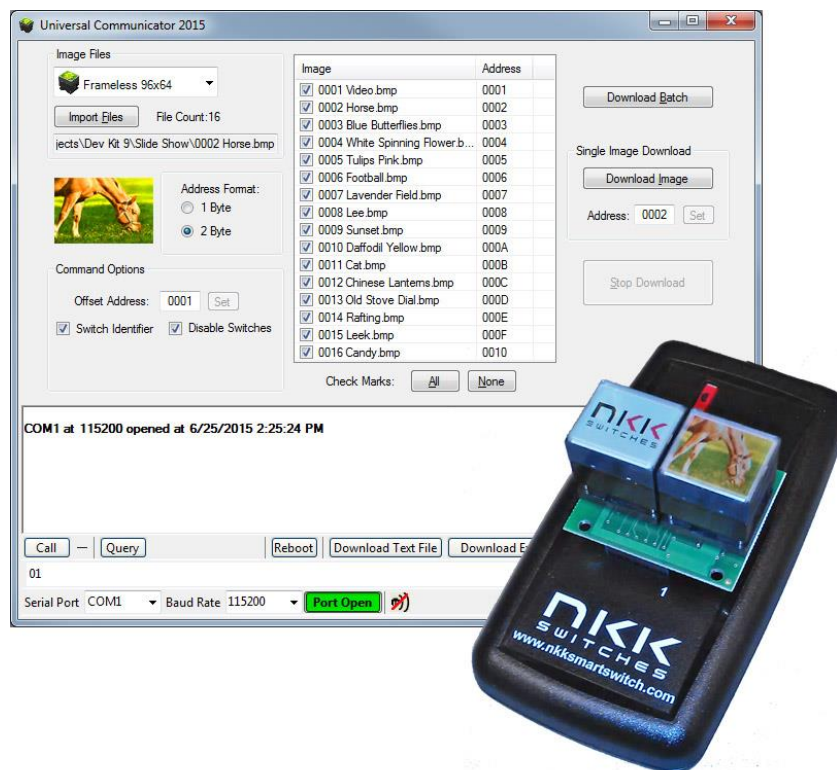7850 East Gelding Drive • Scottsdale, AZ 85260-3420

# Universal Communicator 2015 Manual
Revision A



**NKK SWITCHES**

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# 1.     General Features

The Universal Communicator 2015 (UC2015) is a program to allows for downloading images, attributes, and custom user commands for the IS Development Kits such as IS-DEV KIT-6, IS-DEV KIT-7, IS-DEV KIT-8, and IS-DEV KIT-9.

Current features:
- Import and download batch bitmap images from selected folder.
- Verifies size and bits-per-pixel of images are correct for selected switch.
- Selectable serial ports from available ports.
- Selectable baud rates.
- Selectable address format.
- Download text files and Excel files in both ASCII Hex and Characters for attributes and commands.
- Remembers settings from the previous user session.

Available image formats:

- LCD 36x24 1bit bitmaps. 254 bytes in size.

- LCD 64x32 1bit bitmaps. 318 bytes in size.

- OLED 64x48 switch. 24bit bitmap. 9,272 bytes in size.

- OLED 52x36 display. 64x48 24bit bitmap. 9,272 bytes in size.

- OLED Rocker mono 96x64. 1bit bitmap. 830 bytes in size.

- OLED Frameless 96x64. 24bit bitmap. 18,488 bytes in size.

# 2. Applications

Both the 64x32 LCD and 36x24 LCD are best used to display simple text or icons representing the commands for the buttons with the colors representing status. The OLED 64x48, OLED 52x36 display, and OLED Frameless 96x64 are best used for displaying slide shows of multiple images or a batch of images simulation a video. Such image batches can be obtained through video editing programs such as QuickTime. The attributes and loops are explained in detail in the CL04 Intelligent Controller User's Manual as well as the IS-DEV KIT-9 User's Manual. The OLED Rocker mono 96x64 is best for menus, scale settings, or icons. Note: Universal Communicator 2015 is incompatible with 36x24 LCD on older controllers. Please use the original Universal Communicator instead for that purpose.

# 3. Preface

Universal Communicator 2015 (UC2015) is a free program provided by NKK Switches to help download images and attributes to the Dev Kit controllers.

This user's manual will go through general features and rudimentary commands, like how to download images, manual commands, and text and excel files. It will then go into the more detail of how to format the attributes and commands.

Section 4 describes the basis controller set up.

Section 5 provides a starter guide for the user interface.

Section 6 covers downloading images. This section is designed for those who wish to simply start using the Universal Communicator 2015 without getting into the attribute details.

Section 7 covers downloading text and Excel files.

Section 8 covers attribute format details.

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# 4. Controller Setup

The dev kits come with a controller and a logic board. The controller must be connected to the computer via a RS232 serial cable. The logic boards can be attached to the controller in several ways depending on the product. For all possible attachment ways J1 of Logic Board has to be attached to J1 of controller with pin 1 matching to pin 1.

**Note: Attaching logic board to controller without matching pin 1 to pin 1 will cause damage.**

The illustrations below show two possible ways to attach Logic Boards to Controller. The red line of the ribbon cable must be on pin 1 on each header.

Controller and logic board(s)



Controller and logic board without cable
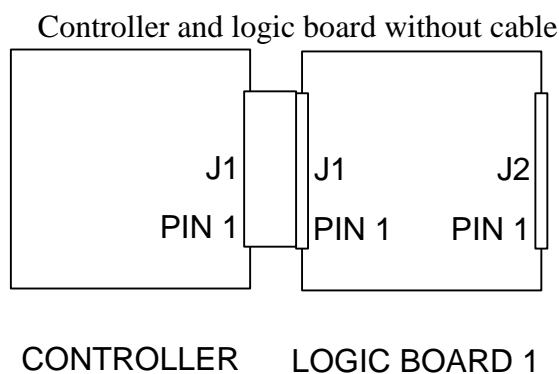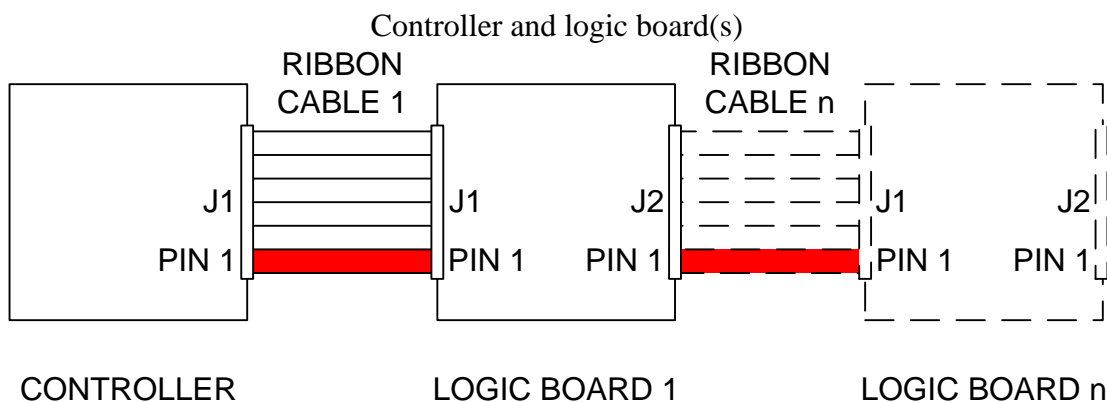


The most controllers are powered by 9V and must be turned on to operate.

# 5. Universal Communicator 2015 Controls

There are two parts to the user interface of the Universal Communicator 2015 (UC2015). The top part focuses on handling the files and addresses as well as various settings. The bottom section handles communications through the RS232.
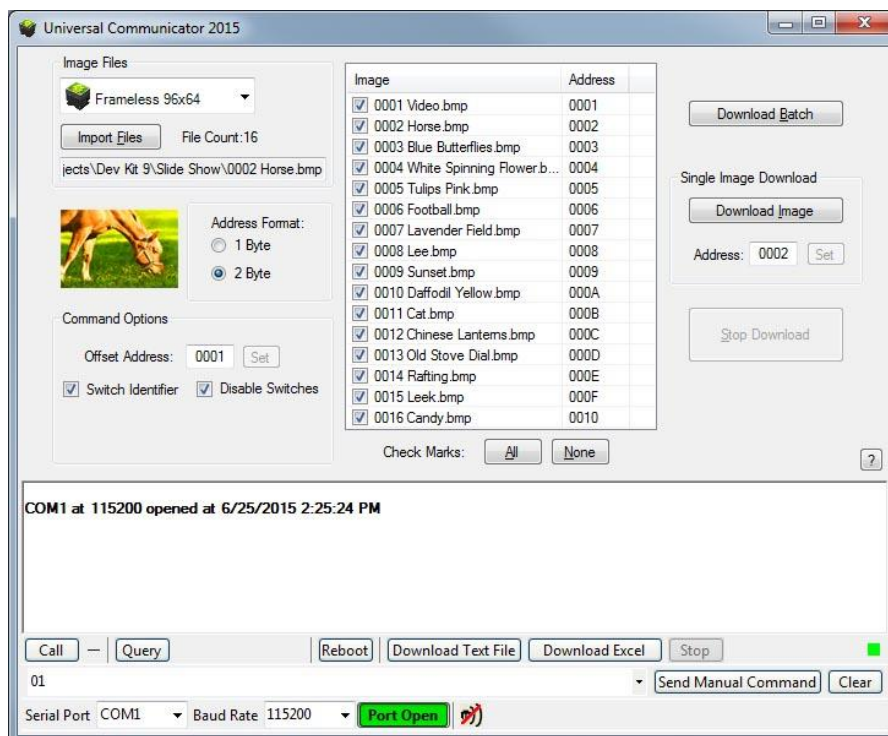


## File Control

The top section starts with the Images Files. The switch type is first selected and then the image files' folder. The UC2015 will only import the file names of the right dimension size for the switch selected. It will also display the file count and full directory name. The image files must be in bitmap format.
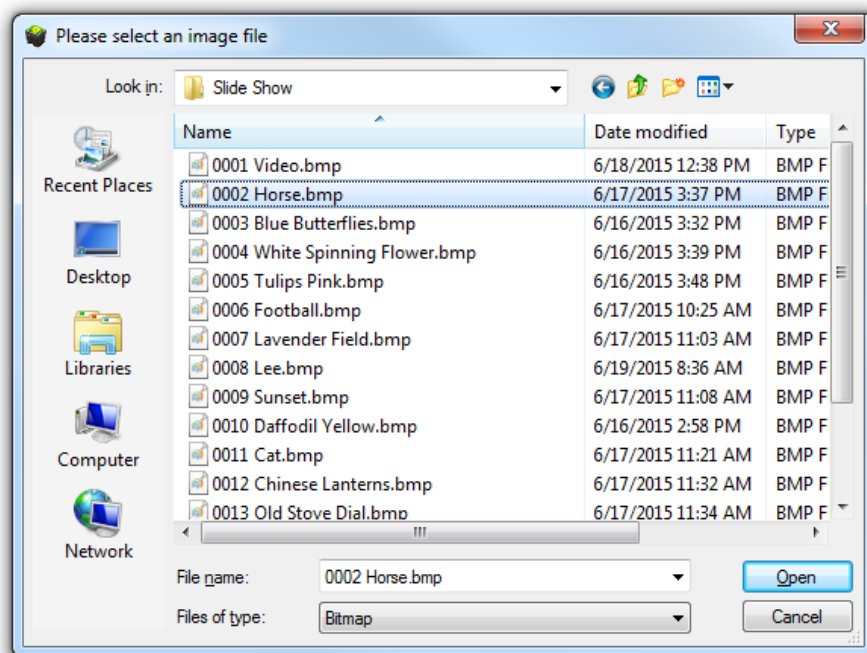
7850 East Gelding Drive  •  Scottsdale, AZ  85260-3420
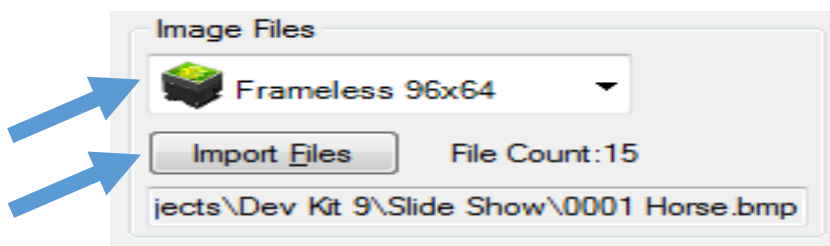
To import files select a switch from the drop down menu.

Frameless 96x64
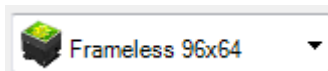
Then click on the Import Files button.

Import Files

Select any bitmap image file in the folder that has the desired images. The program will only collect the names of the images that are the right size for the switch. Depending on the number of images it may take a few seconds to check and gather the names. The program will indicate that it is in process by displaying "Importing…"

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The image names and addresses are displayed. When an image is selected it is also displayed.

The address format sets the address to either one byte (01) or two bytes (0001). The two byte is the default as this is what is required for most controllers.

Default: 2 Bytes.

The command options include the following:

| | |
|---|---|
| • Offset Address | The starting address for the first image of the batch download. |
| • Set Button | Sets the selected Offset Address. The "Tab" and "Enter" button also set it. |
| • Switch Identifier | Adds an identifier character to the commands. Only older controllers do not need this. Default: Checked. |
| • Disable Switches | This sends the command to disables the timers and the switch read for the duration of the image downloads. The timers and switch read is enabled once the download is done. Default: Checked. |

The Image List is a list of names of the selected bitmap image files. Each row displays the name of the file, the associated address and a check box. The names will be in Windows alphanumeric order.

Good practice is to group associated images in one folder. Adding a prefix number to the name of the files will keep them in the desired order.

The check box is to select the file for downloading. The All or None buttons check or uncheck all the files.

The address is the memory location on the controller to which the image data will be downloaded to. This can be adjusted using the Offset Address.

| Image | Address |
| --- | --- |
| ☑ 0001 Horse.bmp | 0001 |
| ☑ 0002 Swan.bmp | 0002 |
| ☑ 0003 Blue Butterflies.bmp | 0003 |
| ☑ 0004 White Spinning Flower.b... | 0004 |
| ☑ 0005 Tulips Pink.bmp | 0005 |
| ☑ 0006 Football.bmp | 0006 |
| ☑ 0007 Lavender Field.bmp | 0007 |
| ☑ 0008 Leek.bmp | 0008 |
| ☑ 0009 Sunset.bmp | 0009 |
| ☑ 0010 Daffodil Yellow.bmp | 000A |
| ☑ 0011 Cat.bmp | 000B |
| ☑ 0012 Chinese Lanterns.bmp | 000C |
| ☑ 0013 Old Stove Dial.bmp | 000D |
| ☑ 0014 Rafting.bmp | 000E |
| ☑ 0015 Candy.bmp | 000F |

Check Marks: [ All ] [ None ]

When the Download Batch button is clicked the image data is imported and converted into the proper switch formation and then downloaded to the controller to the selected address.

The Download Image button only sends one image to the address selected. This Address can be any address and is independent of the address in the Image List. The Set button sets the selected Offset Address. The "Tab" and "Enter" button also set it. The image does not need to be checked to be downloaded.

[ Download Batch ]

Single Image Download
[ Download Image ]
Address: 0002 [ Set ]

The Stop Download button terminates the download at the end of the current file.

During download the image number and the remaining time will be displayed after the first image has been downloaded.

[ Stop Download ]

**Downloading...**
**Image: 6**
**Time remaining:**
**0h 1m 14s 978ms**

The Help button gives the program About information and a button opening the manual.

[ ? ]

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# Serial Port Control

```
COM1 at 115200 opened at 6/18/2015 10:34:42 AM
84 83 84 84 83 84 84 84 83 84 84 83 84 84 84 83 84 84 83 84
26 52 58 61
36 43 46 30 34 56 31 30 79 84 84 83 84 84 83
```

Call ✅ | Query   6CF04V10 | Reboot | Download Text File | Download Excel | Stop   ⬛

[                                ] ▼ Send Manual Command | Clear

Serial Port COM1 ▼ Baud Rate 115200 ▼ **Port Open** 📡

The Main Display shows messages from both the controller and the UC2015. Text can be copied from the display.

| Message Type | Description | Color |
|---|---|---|
| Actions Preformed | Info about operational actions. | Black |
| Warnings | Info on terminations or 6E errors from controller. | Orange |
| Errors | Info on operational errors. | Red |
| Incoming Data | Data received from the controller. | Green |
| Outgoing Data | Data transmitted to the controller. | Blue |

The Call button sends out a 01 and waits for a 61 in response. If it receives a 61 it know the controller is present.

Call ✅ Controller present.       Call ❌ No controller present.

The Query button get information about the type of controller is connected.

Query   6CF04V10

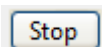The Reboot button restarts the controller as if it had been turned off and on.

Reboot

The Download Text File sends data from a text file to the controller.

Download Text File

The Download Excel File sends data from an Excel sheet to the controller.

Download Excel

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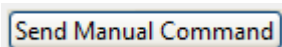The Stop button stops the text or Excel download.

Select to skip command check. Only select this if there is no controller attached. Default: Green.

Manual Input to send to the controller.

This button sends the manual input to the controller.

The Clear button clears the Main Display and the Manual Input.

The Serial Port dropdown menu displays all available serial ports on the computer. Select the one that is attached to the controller.

The Baud Rate must be selected to be the same as the controller.

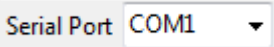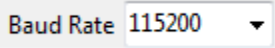Port Open/Close button toggles the serial port open and closed.
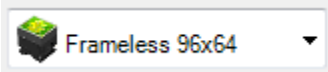
Port is open.          Port is closed.

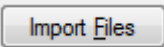Select to display transmitted image data. This is used only when the raw image data is needed to be copied or viewed. Default is off.

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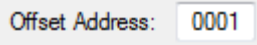
# 6. Quick Guide to Downloading Images

These are the instructions for downloading an image or a batch of images.

1. Plug in the controller to the computer and turn it on.

2. Start the program.

3. Select the Serial Port [Serial Port | COM1 ▼] that is attached to the controller.

4. Select the proper Baud Rate [Baud Rate | 115200 ▼] that is standard for the dev kit. For IS-DEV KIT-9 it is 115200 for all others it is 57600.

5. Open the port. [Port Open]

6. Select the switch type that matches the dev kit. [Frameless 96x64 ▼]

7. Click on the [Import Files] button.

8. Select a file in the folder with the desired images.
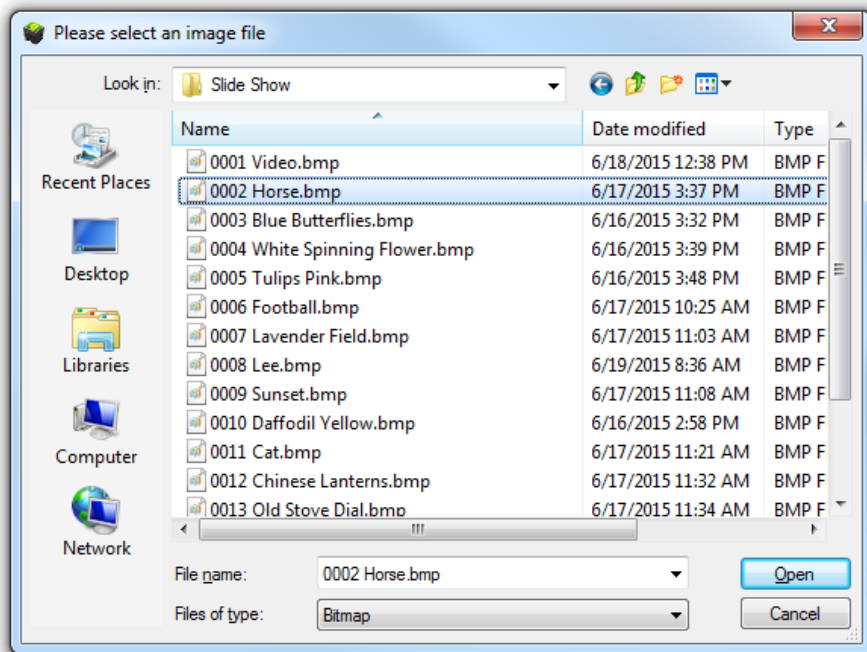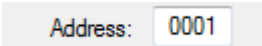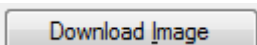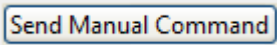


9. Wait for the images to be imported into the program.

10. Click on [Query] 6CF04V10 to verify that the controller and computer are talking to each other.

11. Verify that the ✅ is displayed.

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**12.  For batch images:**

1.  Set Offset Address if desired.  Offset Address:  0001

2.  Click the  Download Batch  for the whole batch.

3.  Wait for the program to download all the selected images then reboot.  Reboot
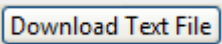
**13. For single image:**

1.  Select an image.

2.  Change the Address if desired.  Address:  0001

3.  Click the  Download Image  for one image.

4.  Wait for the program to download the selected image then reboot.  Reboot

5.  To see the image type in 2E 31 [address] in ASCII hex format (ex 30303031) into the

    manual input ▼ and press the  Send Manual Command

    button.

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# 7. Quick Guide to Downloading Text and Excel Files

These are the instructions for downloading text and Excel files. The instructions assume that the controller and UC2015 are set up and ready to go.

**Downloading text files.**

1. The text file must have "RAW DATA" as the first line or UC2015 will not accept it.

2. The next line should be "CHARACTER" as the second line.

3. Click on the Download Text File button. Download Text File

4. Select the desired txt file and open it in the Open File Dialog.

5. The program will check that it has the right set up.

6. Then the program will download the information in the file one line at a time. It will skip any text or line preceding with a ";" character.
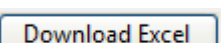
7. Wait for the program to finish download then reboot Reboot to see the desired effects.

**Downloading Excel files.**

1. The Excel file must have "RAW DATA" as the first line or UC2015 will not accept it.

2. The Excel line should be "CHARACTER" as the second line.

3. Click on the Download Excel File button. Download Excel

4. Select the desired Excel file and open it in the Open File Dialog.

5. The program will check that it has the right set up.

6. Then the program will download the information in the file one line at a time. It will skip any text or line preceding with a ";" character.

7. Wait for the program to finish download then reboot Reboot to see the desired effects.

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# 8. Setting Up the Attribute Format

These are the instructions for setting up the format for attributes in a text or Excel file. The instructions assume that the controller and UC2015 are set up and ready to go. The instructions are the same for either the text or Excel files so the instructions are going to be focused on Excel. Excel just makes it easier to manipulate the data. Setting up attributes can be as complex as desired and their methodology, such as loops and branches, is beyond the scope of this document. More can be found in the IS-Dev Kit-9 user's manual.

The first cell in the Excel file must say "RAW DATA". Without this the UC2015 will reject the file. The cell below it should say "CHARACTER". Without this flag the UC2015 will treat the data as ASCII HEX. If comments need to be added the ";" character must be used. Rows with nothing in them are ignored but it is best practice to add a ";" in lines left to help with spacing. It is also best to have the cells set to treat all data as text. Don't use "01" or "24" commands in a text or Excel file.

Example for Excel file with just two commands.

| RAW DATA | |
|----------|------------------------------------|
| CHARACTER | |
| ; | This is a comment. |
| ; | |
| & Q Z | ; Stops timers and switch scan. |
| ; | |
| & R X | ; This is just the query command. |

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To create an attribute file it is just the same format with some added commands. The addresses should be between 0000H and FFFFH and in the four character format. The command to download an attribute is "*" (2A). The next character is the switch type identifying character.

Switch Type Identifying Character

| Switch type | ASCII HEX | Character |
|---|---|---|
| LCD 36x24 | 51 | Q |
| LCD 64x32 | 52 | R |
| OLED 64x48 | 53 | S |
| OLED 52x36 | 54 | T |
| OLED Rocker mono 96x64 | 55 | U |
| OLED Frameless 96x64 | 56 | V |

The third column is the displayed image address. The fourth and fifth columns are for switch press (at the end of a loop these are locations where the switches will display when the timer runs out.) The end timer is the end of the loop. The $6^{th}$ and $7^{th}$ columns are the timers T1 and T2. To get the full timer they are multiplied together. T1 x T2= time in milliseconds to show each image.

Example of typical attributes for OLED Frameless 96x64.

| ; | | Sw typ | Addr | sw1 | sw2 | end addr | t1 | t2 | |
|---|---|---|---|---|---|---|---|---|---|
| * | | V | 0001 | 0000 | 0000 | 0002 | 1F | 1F | ; Photo 1 |
| * | | V | 0002 | 0020 | 0097 | 0000 | 00 | 00 | ; Photo 2 |
| * | | V | 0003 | 0000 | 0000 | 0004 | 1F | 1F | ; Photo 3 |
| ; | | Surfer | Riptide | Video | | | | | ; |
| * | | V | 0097 | 0005 | 000D | 010D | 01 | 32 | ; Video start sw1 |
| * | | V | 0098 | 0005 | 000D | 010E | 01 | 32 | ; Video start sw2 |
| * | | V | 010D | 0000 | 0000 | 0000 | 00 | 00 | ; Video end sw1 |
| * | | V | 010E | 0000 | 0000 | 0000 | 00 | 00 | ; Video end sw2 |