Overview

The wiegand decoder assembly is comprised of a custom embedded microcontroller circuit and display unit along with an optional removable memory card. The unit interfaces with most RFID reader units that support a standard wiegand interface. The wiegand data stream is captured, decoded, displayed and then optionally stored in a standard ".txt" file that can be easily read on any personal computer. Some of the main features of the unit are as shown below.

- Captures and decodes wiegand code information from a wide variety of RFID readers.
- Displays card content information including wiegand code, format, facility code, and card number.
- Supports multiple card formats including various 26-bit, 34-bit, 35-bit, 36-bit, 37-bit and 46-bit credentials.
- PIC32 Microcontroller used to manage all decode and display functions.
- SD card stores all data from every credential read (when installed).
- Utilizes very low power 160x128 organic LED (OLED) display. Switch selectable display color.
- Simple 4-wire hookup to RFID reader.
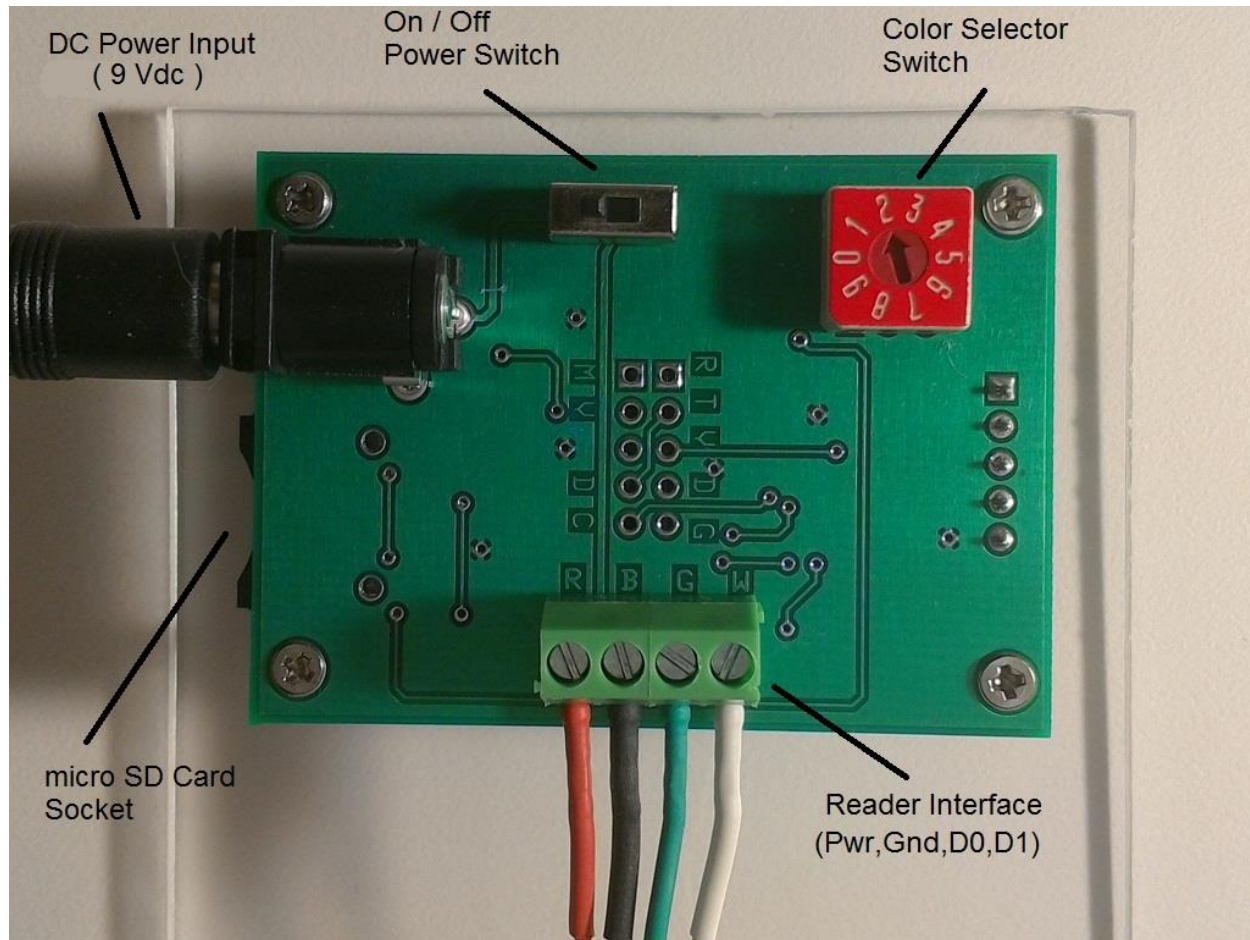- 9Vdc Wall Power Adapter Included

Figure 1. Wiegand Decoder Rear View

Setup / Operation:

Note: The RFID Wiegand converter requires the attachment of a commercial RFID reader that outputs a wiegand data stream. The converter decodes the wiegand data stream according to multiple formatting standards and displays the information on the OLED display.
Connection to the commercial reader should be as follows:

Pin 1 - Red Wire – 9Vdc Power to Reader (*Optional – see note below)
Pin 2 - Black Wire – Ground connection to Reader (required)
Pin 3 - Green Wire – Data 0 signal from Reader (required)
Pin 4 - White Wire – Data 1 signal from Reader (required)

* Power Connection to reader should be used only if reader is capable of operating with a 9Vdc 500 milliamp power source. The reader can alternatively be powered by a separate power supply.

1. Make sure that the 9Vdc wall adapter power supply is attached to the unit.
2. Connect the reader wires to the screw terminal block as shown in Figure 1 above.
Pin 1 (Red) is on the left and pin 4 (white) is on the right. These terminal block pins are labeled on the circuit board based on the normal reader wire color (Red, Black,Green,White).

3. If desired, select the color of the display by rotating the "Color Selector" switch to one of the following positions using a small screw driver.

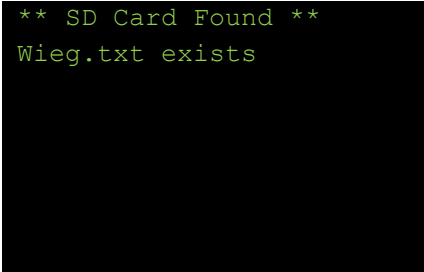|	
0 – White	4 – Red
1 – Green	5 – Purple
2 – Blue	6 – Orange
3 – Cyan	7 – Yellow

Note: Positions 8 and 9 are unused and will result in a code of "0" (White).

3. Turn on the unit using the small slide switch located on the top back of the unit. After allowing a 4-second delay for the reader to power up, the display should indicate one of the three messages shown below based on the state of the optional micro-SD card.
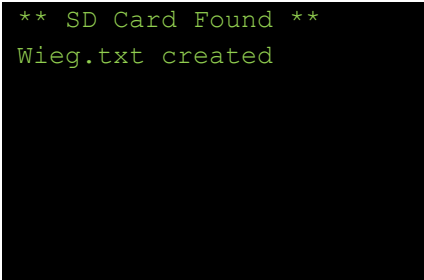
```
** No SD Card **
```

No SD Card Detected
Wiegand Data will be displayed
but not stored.

```
** SD Card Found **
Wieg.txt exists
```

SD Card Detected
Existing storage file detected
Wiegand Data will be displayed
and stored.

```
** SD Card Found **
Wieg.txt created
```

SD Card Detected
No storage file found.
A new file will be created.
Wiegand Data will be displayed
and stored.

4. Place a credential near the reader. The wiegand information sent out by the reader is captured and displayed. A typical card read is shown in the Figure 2 example below.
Line 1 displays the hexadecimal wiegand code that was received from the reader.
Line 2 displays the wiegand length/format information.
Line 3 displays the decoded Facility Code information.
Line 4 displays the decoded card number information.

Line 5-8 will contain additional decoded card information for wiegand codes that are associated with other supported card formats. In these cases the information received will be decoded for "each" format that is supported by the wiegand decoder firmware.

```
Wieg = 0x00000132096e
Format = 26-bit
Fac Code = 153 [H10301]
Card No. = 1207
```

Figure 2. Example Display for 26-bit card read.

If an SD card has been installed, the same decoded credential information will be appended to the "wieg.txt" file that is stored on the SD card.

SD Card Data Format

Data is written to the wieg.txt file in a standard ASCII text format (See example below) A series of asterisks is used to delineate the information generated from each credential read.

Whenever the unit is power cycled, a "Power Cycle" message is also appended to the "wieg.txt" data. The wiegand decoder unit does not support any Real-Time-Clock capability and therefor no time stamp information can be included with the stored data.

SD Card file contents – Example:

```
Wieg = 0x00000132096e
Format = 26-bit
Fac Code = 153 [H10301]
Card No. = 1207
***************************
Wieg = 0x3566802740c0
Format = 46-bit
Fac Code = 10957
Card No. = 1286240
***************************

---------Power Cycle---------

Wieg = 0x00046461529b
Format = 35-bit
Fac Code = 803 [Corp1000]
Card No. = 43341
***************************
Wieg = 0x000f085888c8          [Note that 3 different 36-bit formats are decoded]
Format = 36-bit
Fac Code = 100 [Napco]
Card No. = 8662084
Fac Code = 900 [Simplex]
Card No. = 2901092
Fac Code = 44 [Keyscan]
Card No. = 17508
***************************
```

[Important Note 1:]
Since the "wieg.txt" file does not contain any current date information the user must consider an alternative means to identify the data. If the user desires to identify a stored text file with a particular event or specific date it is recommended that Windows Explorer be used to rename the "wieg.txt" file to reflect the recently collected data contents. As an example the "wieg.txt" file might be renamed to "wieg_070416.txt" to identify credential data that was collected on July 4, 2016. Once the file has been renamed, the "wieg.txt" file will no longer exist and a new empty "wieg.txt" file will again be created during the next power up cycle of the wiegand decoder unit.

[Important Note 2:]
The micro SD card is a very small and fragile device. Care should be exercised when installing or removing the card.
The SD card can be removed or inserted while DC power is On or Off. However, for certain installations the physical removal or insertion of the card can be done more easily if the DC power plug is removed first.