

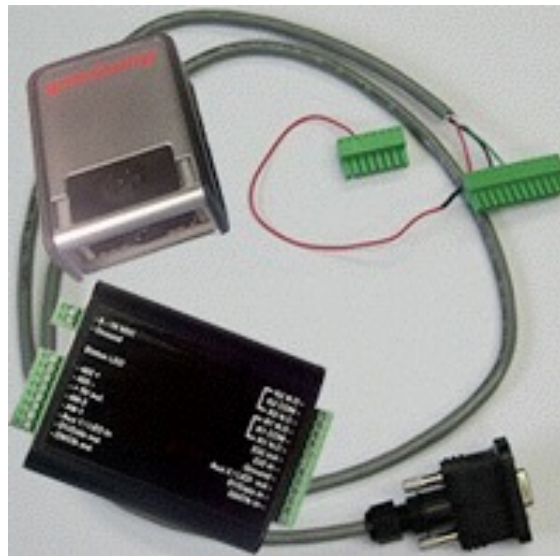
# CYPRESS

INTEGRATION SOLUTIONS

## ***TSP-2000 Series***

Operations Manual

*Barcode Scanner  
with Wiegand Converter*



TSP-2104



TSP-2000\_MAN\_010114

## Overview and Features:

The Cypress TSP series of products provide bar code to wiegand solutions for turnstyle and visitor pass applications.

Units are preconfigured to capture barcodes and provide the wiegand representation of the barcode characters - limited to the available conversions as indicated in this manual. Customization is available upon request, engineering fees are additional.

The TSP-2104 barcode scanner has a sleep mode with IR wake-up and deliver excellent scanning of 1D barcodes. Formats include Code 39, UPC, Code 32, Code 2 of 5, Code 128 and others.

The TSP-2104 has scan area of 1280 x 960 pixel array. 30% minimum reflectance difference. Reads 1D, PDF417 and 2D bar codes - Pitch 45° and Skew 65° and QR codes.

The TSP-2104 offer different wiegand output options as identified on the included Wiegand Converter application table.

### Included items:

Configuration Guides - ( TSP-2104 for additional customization if needed )

Custom interface cable

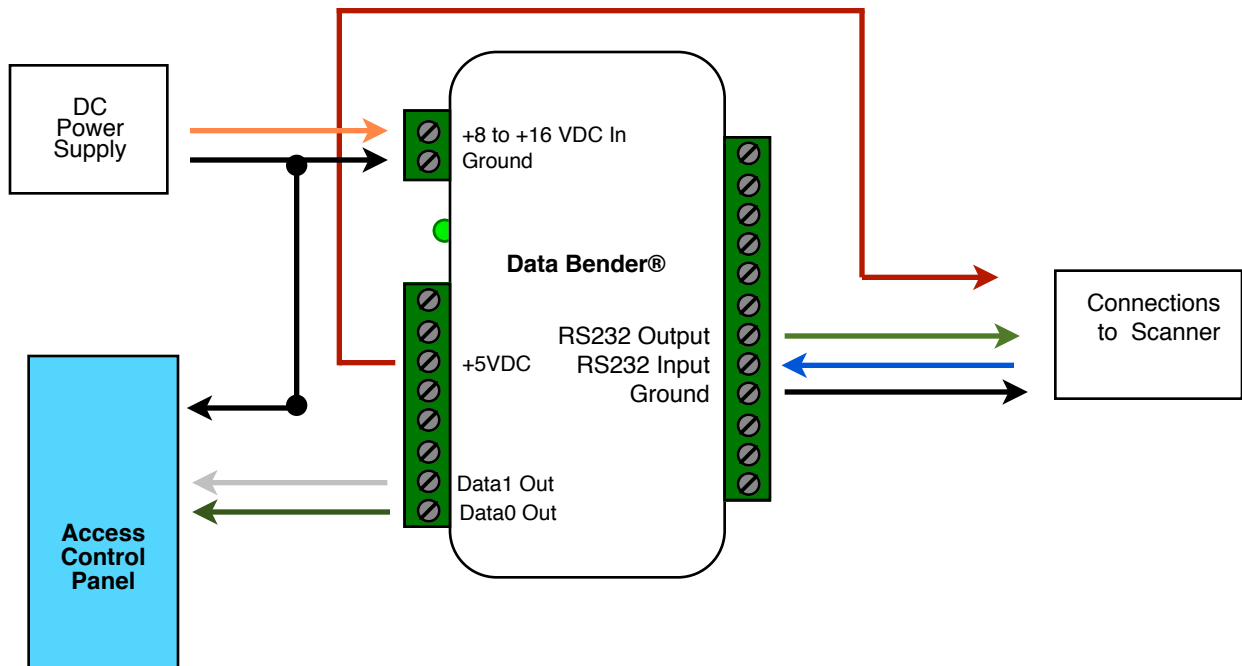
Scanner

Data Converter

### Technical Specifications

|                  |                                                                |                                     |
|------------------|----------------------------------------------------------------|-------------------------------------|
| PHYSICAL         | 4.125" X 2.875" X .75" - ALUMINUM HOUSING (CVX-2104 CONVERTER) |                                     |
|                  | 2.9" X 1.97" X 1.0" ( TSP-2104 ) SCANNER - VUQUEST 3310g       |                                     |
| Temperature      | Storage ( -55 C to +150 C )    Operating ( -40 C to +85 C )    |                                     |
| Humidity         | 95% (non-condensing)                                           |                                     |
| Power            | Input                                                          | Unreg input 8 to 16 vDC @ 100ma Max |
|                  | Output                                                         | +5vDC @ 250ma                       |
| Scanner output   | Interface                                                      | RS-232                              |
|                  | Format                                                         | ASCII                               |
| Converter output | Interface                                                      | Wiegand                             |
|                  | Format                                                         | Wiegand                             |
| Misc             | Relay                                                          | Contacts - 1a @ 120Vac              |
| Warranty         | 1 year conditional                                             |                                     |
|                  |                                                                |                                     |

## Wiring Diagram for TSP-2104



### Scanner Mounting Specifications

The 3310g has three M3 x 0.5 mm threaded inserts on the bottom of the scanner for mounting with screws.

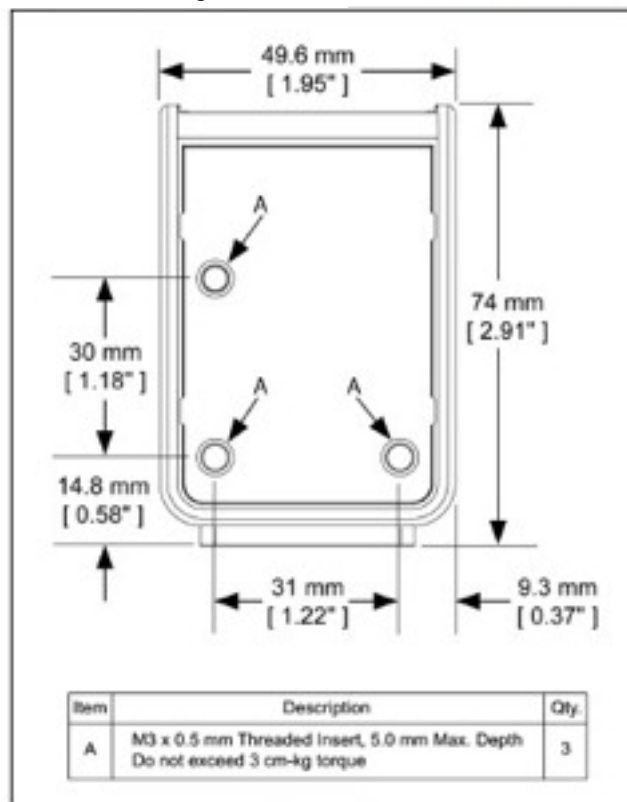


Figure 10.

# TSP-2104

## 3100g Scanner

### Specifications

| <b>Parameter</b>                           | <b>Specification</b>                                                |
|--------------------------------------------|---------------------------------------------------------------------|
| Dimensions (Typical):                      |                                                                     |
| Height                                     | 1.02 inches (26mm)                                                  |
| Length                                     | 2.91 inches (74mm)                                                  |
| Width                                      | 1.97 inches (50mm)                                                  |
| Weight                                     | 2.5 ounces (70g)                                                    |
| Wavelength:                                |                                                                     |
| Illumination LED                           | 633nm                                                               |
| Aimer LED                                  | 528nm                                                               |
| Image Size                                 | 844 x 640 pixels                                                    |
| Skew Angle                                 | ±65°                                                                |
| Pitch Angle                                | ±45°                                                                |
| Motion Tolerance:                          |                                                                     |
| Enhanced Streaming<br>Presentation Trigger | up to 240 inches per second for 13 mil UPC                          |
| Symbol Contrast                            | Grade 1.0 (20% or greater)                                          |
| Voltage Requirements                       | 4 - 5.5 VDC at input connector                                      |
| Current Draw @5VDC                         | Scanning 450mA, 2.3W      Standby 90mA, .45W                        |
| Power Supply Noise Rejection               | Maximum 100mV peak to peak, 10 to 100 kHz                           |
| Temperature Ranges:                        |                                                                     |
| Operating                                  | +32°F to +104°F (0°C to 40°C)                                       |
| Storage                                    | -4°F to +158°F (-20°C to 70°C)                                      |
| Humidity                                   | 5 to 95% non-condensing                                             |
| Mechanical Drop                            | Operational after 30 drops from 4.9 feet (1.5m) to concrete at 23°C |
| Vibration                                  | Withstands 5G peak from 22 to 300 Hz                                |
| ESD Tolerance                              | Up to 15kV direct air<br>Up to 8 kV indirect coupling plane         |
| Solids and Water Protection                | IP53                                                                |

The scanner has a view finder that projects a bright green aiming beam that corresponds to the scanner's horizontal field of view. The aiming beam should be centered over the bar code, but it can be positioned in any direction for a good read.

The aiming beam is smaller when the scanner is closer to the code and larger when further away from the code. Symbolologies with larger bars or elements should be read farther from the unit and those with smaller bars should be read closer.

If the code being scanned is highly reflective, it may be necessary to tilt the code up to 15 to 18 degrees to prevent unwanted reflection.

**Linear bar code**

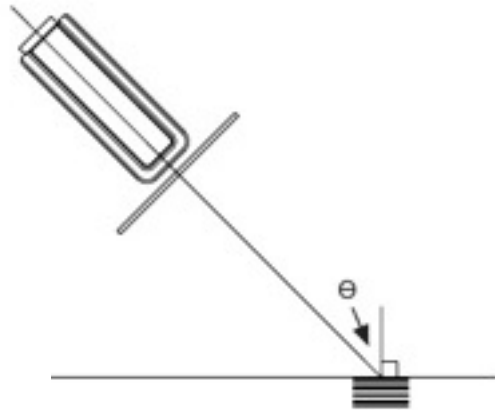


**2D Matrix symbol**



## TSP-2104 - Barcode specifications

- Avoid specular reflections, caused by ambient and internal light sources.
- The bar code should be slightly off perpendicular to the axis of the scanner.
- To reduce specular reflections the skew angle can vary significantly depending on the application such as: ambient illumination sources, code size and code type.
- Excessive angles should be avoided.
- Other factors, such as surface qualities, mounting distances, secondary windows and external illumination can easily impact these recommendations.
- If a secondary window is used, the window should be mounted as close to the front of scanner as possible at a 90° angle to the optical axis to avoid specular reflections.
- For secondary windows, Honeywell recommends the following:
  - Optical quality glass
  - >95% transmission in the nominal 650nm wavelength
  - Anti-reflective coating on both sides
  - Avoid window thickness above 2mm
- A skew angle of 15° to 20° between the normal of the bar code's surface and the optical axis of the imager is sufficient to avoid specular reflections.
- Avoid pitch angles above 20° to prevent code compression.



### Depth of Field

#### Typical Performance

| Bar code           | Standard Range (SR)           |
|--------------------|-------------------------------|
| 5 mil Code 39      | 55 mm - 159 mm (2.2" - 6.3")  |
| 7.5 mil Code 39    | 35 mm - 239 mm (1.4" - 9.4")  |
| 10 mil Code 39     | 26 mm - 330 mm (1.0" - 13.0") |
| 20 mil Code 39     | 47 mm - 553 mm (1.9" - 21.8") |
| 13 mil UPC         | 39 mm - 435 mm (1.5" - 17.1") |
| 6.7 mil PDF417     | 36 mm - 178 mm (1.4" - 7.0")  |
| 10 mil PDF417      | 38 mm - 289 mm (1.4" - 11.4") |
| 10 mil Data Matrix | 47 mm - 216 mm (1.9" - 8.5")  |
| 20 mil Data Matrix | 33 mm - 414 mm (1.3" - 16.3") |

#### Guaranteed Performance

| Bar code           | Standard Range (SR)           |
|--------------------|-------------------------------|
| 5 mil Code 39      | 64 mm - 145 mm (2.5" - 5.7")  |
| 7.5 mil Code 39    | 59 mm - 221 mm (2.3" - 8.7")  |
| 10 mil Code 39     | 42 mm - 308 mm (1.7" - 12.1") |
| 20 mil Code 39     | 64 mm - 488 mm (2.5" - 19.2") |
| 13 mil UPC         | 55 mm - 410 mm (2.2" - 16.1") |
| 6.7 mil PDF417     | 48 mm - 160 mm (1.9" - 6.3")  |
| 10 mil PDF417      | 49 mm - 274 mm (1.9" - 10.8") |
| 10 mil Data Matrix | 62 mm - 195 mm (2.4" - 7.7")  |
| 20 mil Data Matrix | 47 mm - 377 mm (1.9" - 14.8") |

*Note: Performance may be impacted by bar code quality and environmental conditions.*

# Wiegand Converter DIP Switch Application Table

**Customization Available**

| #  | DIP SWITCH SETTING |   |   |   |   |   |   |   | INPUT         |               | OUTPUT        |              |
|----|--------------------|---|---|---|---|---|---|---|---------------|---------------|---------------|--------------|
|    | 1                  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Interface     | Format        | Interface     | Format       |
| 31 | X                  | X | X | X | X |   |   |   | TEST          | TEST          | RS-232 (9600) | Test String  |
| 46 |                    | X | X | X |   | X |   |   | SERIAL        | 0 - 248 BITS  | SERIAL        | 0 - 248 BITS |
| 65 | X                  |   |   |   |   |   | X |   | RS-232 (9600) | 10 Dec        | Wiegand       | 26 bit       |
| 66 |                    | X |   |   |   |   | X |   | RS-232 (2400) | 10 Dec        | Wiegand       | 26 bit       |
| 67 | X                  | X |   |   |   |   | X |   | RS-232 (1200) | 10 Dec        | Wiegand       | 26 bit       |
| 68 |                    |   | X |   |   |   | X |   | RS-232 (9600) | 12 Hex        | Wiegand       | Variable     |
| 69 | X                  |   | X |   |   |   | X |   | RS-232 (2400) | 12 Hex        | Wiegand       | Variable     |
| 70 |                    | X | X |   |   |   | X |   | RS-232 (1200) | 12 Hex        | Wiegand       | Variable     |
| 71 | X                  | X | X |   |   |   | X |   |               |               |               |              |
| 72 |                    |   |   | X |   |   | X |   |               |               |               |              |
| 73 | X                  |   |   | X |   |   | X |   |               |               |               |              |
| 74 |                    | X |   | X |   |   | X |   |               |               |               |              |
| 75 | X                  | X |   | X |   |   | X |   |               |               |               |              |
| 76 |                    |   | X | X |   |   | X |   |               |               |               |              |
| 77 | X                  |   | X | X |   |   | X |   |               |               |               |              |
| 78 |                    | X | X | X |   |   | X |   |               |               |               |              |
| 79 | X                  | X | X | X |   |   | X |   | RS-232 (9600) | ASCII         | Strobed       | ABA          |
| 80 |                    |   |   |   | X |   | X |   | RS-232 (2400) | ASCII         | Strobed       | ABA          |
| 81 | X                  |   |   |   | X |   | X |   | RS-232 (1200) | ASCII         | Strobed       | ABA          |
| 82 |                    | X |   |   | X |   | X |   | RS-232 (9600) | ASCII         | Strobed NoPU  | ABA          |
| 83 | X                  | X |   |   | X |   | X |   | RS-232 (9600) | ASCII Decimal | F/2F          | 12 digit ABA |
| 84 |                    |   | X |   | X |   | X |   |               |               |               |              |
| 85 | X                  |   | X |   | X |   | X |   |               |               |               |              |
| 86 |                    | X | X |   | X |   | X |   | RS-232 (9600) | ASCII Decimal | Wiegand       | 36 bit       |
| 87 | X                  | X | X |   | X |   | X |   | RS-232 (9600) | ASCII Decimal | Wiegand       | 37 bit       |
| 88 |                    |   |   | X | X |   | X |   |               |               |               |              |
| 89 | X                  |   |   | X | X |   | X |   |               |               |               |              |
| 90 |                    | X |   | X | X |   | X |   |               |               |               |              |
| 91 | X                  | X |   | X | X |   | X |   |               |               |               |              |
| 92 |                    |   | X | X | X |   | X |   |               |               |               |              |
| 93 | X                  |   | X | X | X |   | X |   |               |               |               |              |
| 94 |                    | X | X | X | X |   | X |   |               |               |               |              |
| 95 | X                  | X | X | X | X |   | X |   |               |               |               |              |