

OPTW-100 MAN 220919

OPTW-100 - Product Overview

The OPTW-100 is designed to provide isolation between different Wiegand sources. The input side (J1) and output side (J2) are electrically isolated, using optical-couplers to transmit the Wiegand signal from the input side to the output side of the OPTW-100.

There are three main applications in which the OPTW-100 is used:

- 1) Connecting two Wiegand readers to one access controller Wiegand port;
- 2) Connecting one Wiegand reader to two different access controllers;
- 3) Connecting Wiegand devices that operate the Wiegand lines at different voltage levels.

The OPTW-100 is necessary when the Wiegand devices in these applications operate the Wiegand data lines at different voltages. The OPTW-100 may also be used in applications where Wiegand devices are not able to be electrically connected, such as issues with power supplies or pull-up resistors.

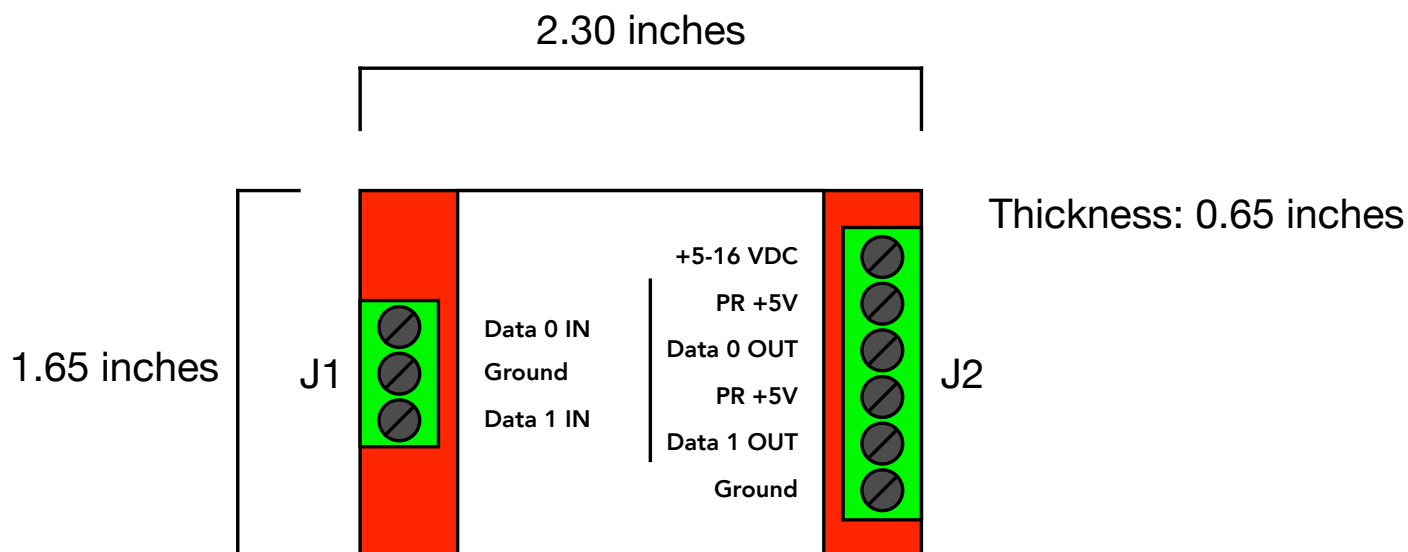
Included in the packaging is the OPTW-100, Cypress Warranty, and the Quick Start Guide.

| Specifications | | | |
|----------------|---|--------------------------------|--|
| Product | OPTW-100 | UPC: 816684007910 | <i>Wiegand Optical Isolator</i> |
| Physical | Dimensions | | 2.30" x 1.65" x 0.65" (58.42 x 41.91 x 16.51 mm) |
| | Weight | | 0.0625 pounds (1 ounce) (28.35 grams) |
| Environmental | Storage Temperature | | -55°C to 150°C |
| | Operating Temperature | | -40°C to 100°C |
| Electrical | J2 Header Input Voltage | | 5-16 Vdc (12V Typical) @ 20mA |
| | Wiegand Input Voltage Rating | | 5-24Vdc |
| | Wiegand Output Voltage Rating | | 5 Vdc |
| Range | Wiegand | Typical 500 foot Wiegand limit | |
| Applications | Electrically isolate Wiegand devices | | |
| | Connect two Wiegand readers to one access controller Wiegand port | | |
| | Connect one Wiegand reader to two different access controllers | | |

Table of Contents

| Topic | Page |
|--|-------------|
| Overview and Specifications | 2 |
| Physical Dimensions & Pin Designations | 3 |
| When to Use the Output Pull-up Resistors | 3 |
| Two Readers to One Panel Wiring Diagram | 4 |
| One Reader to Two Panels Wiring Diagram | 5 |
| One Reader to One Panel Wiring Diagram | 6 |

OPTW-100 - Physical Dimensions & Pin Designations



J1 Header:

Data 1 IN - Wiegand Data Input 5-24 VDC

Ground - Common Data Ground

Data 0 IN - Wiegand Data Input 5-24 VDC

J2 Header:

+5-16 VDC - Power Input, 12 VDC @ 20mA typical

PR +5V - Connection to pull-up resistor, 1.5K @ 5VDC

Data 0 OUT - Wiegand Data Output 5-24 VDC

PR +5V - Connection to pull-up resistor, 1.5K @ 5VDC

Data 1 OUT - Wiegand Data Output 5-24 VDC

Ground - Power Ground and Common Data Ground

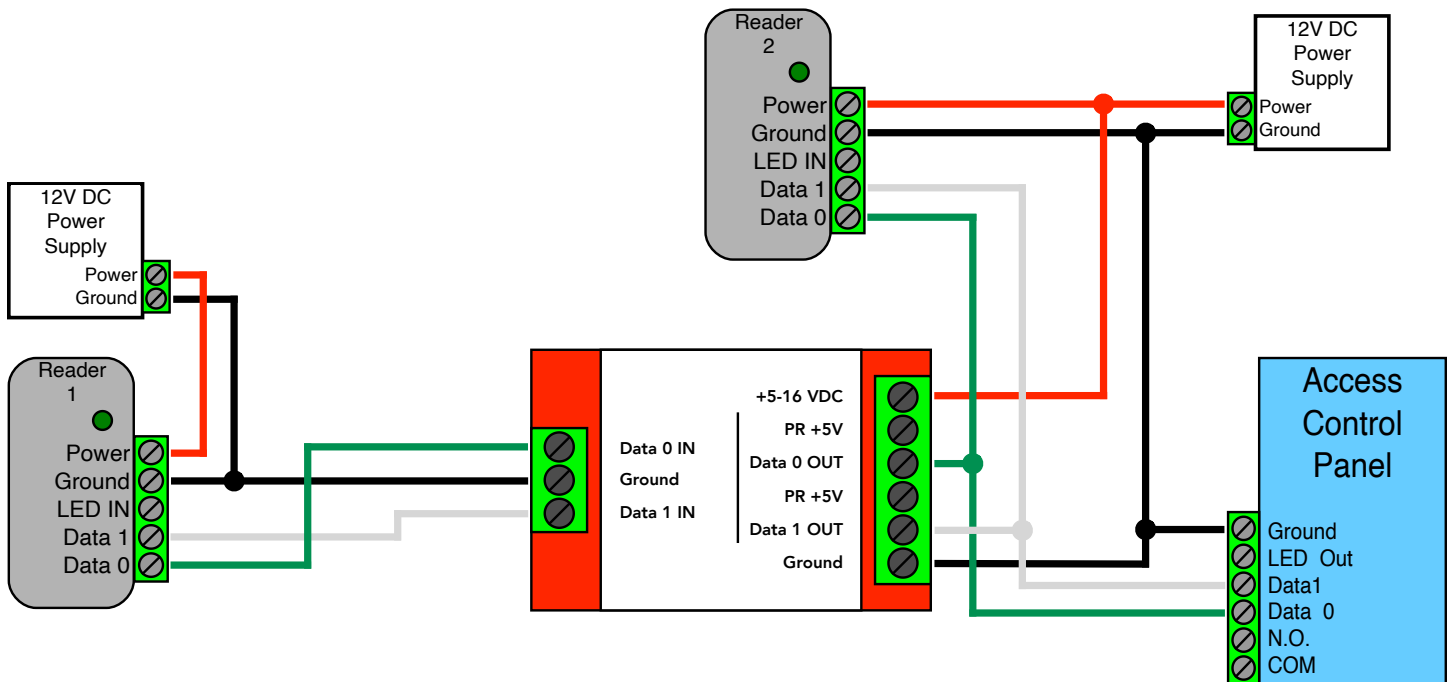
OPTW-100 - Bench Testing

When installing the OPTW-100 with new access control equipment, bench testing is recommended. Refer to the wiring diagrams on pages 4, 5, and 6; find the wiring diagram that matches your application and set up a bench test accordingly.

In many applications, the access control equipment is already installed and a bench test is not practical. In these applications, install the OPTW-100 with the existing access control equipment and test the system thoroughly.

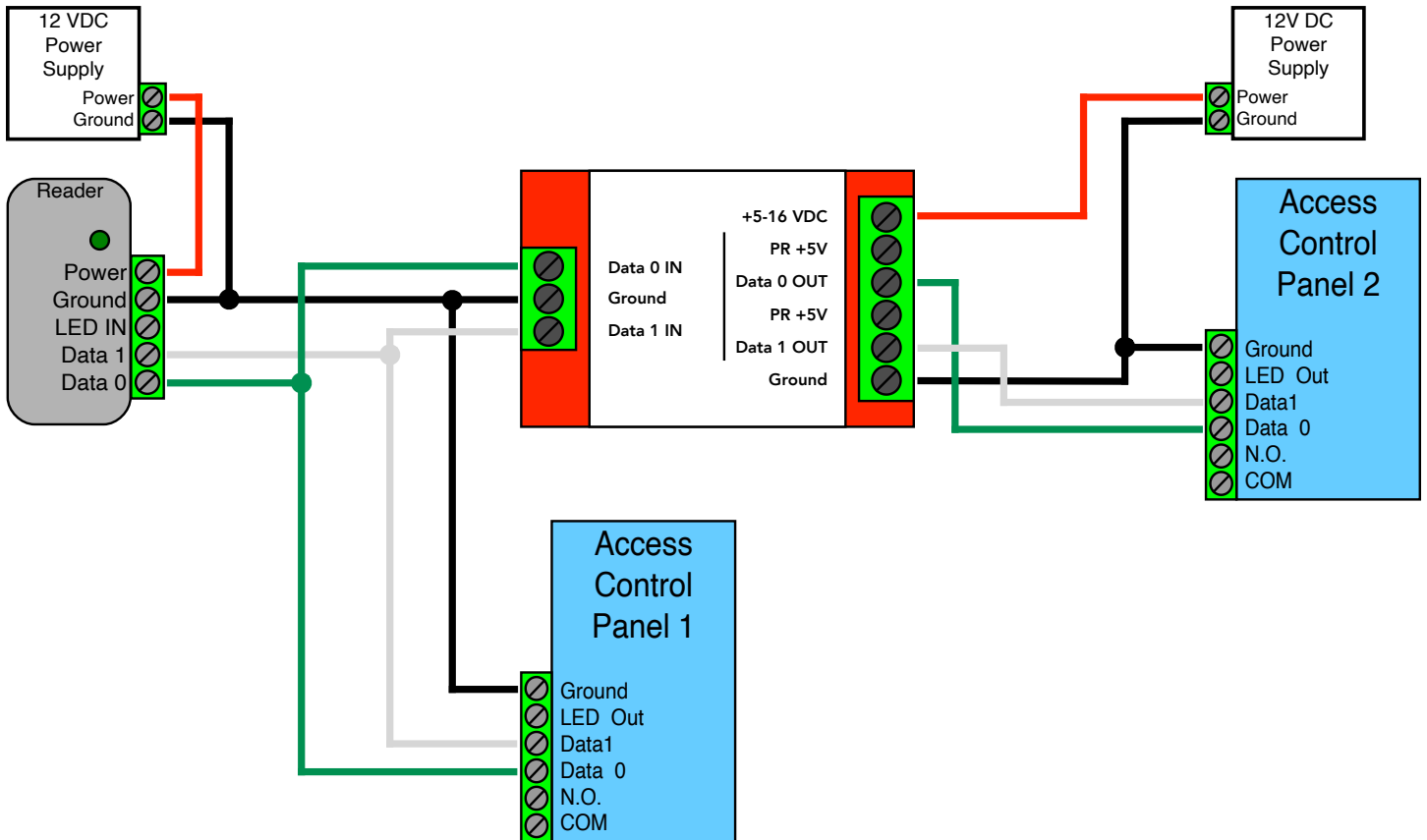
OPTW-100 - Two Readers to One Panel Wiring Diagram

The wiring diagram below shows how to connect two Wiegand readers to one access control panel Wiegand port, using the OPTW-100 to electrically isolate Reader 1 from Reader 2 and the access control panel while passing the Wiegand signals from both readers to the access control panel.



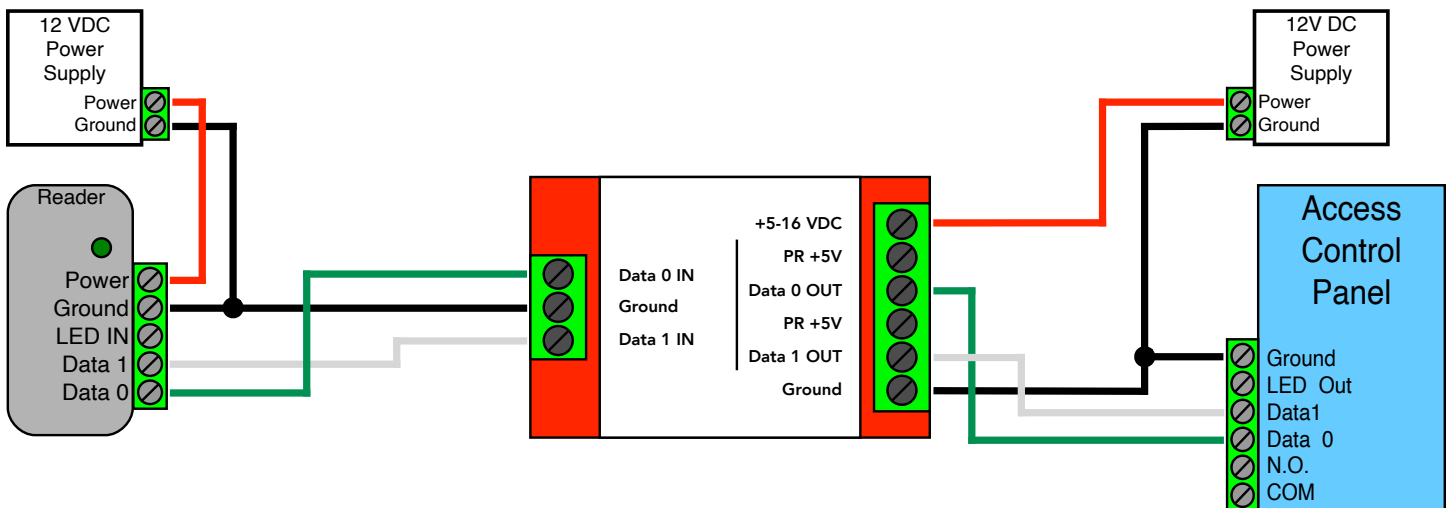
OPTW-100 - One Reader to Two Panels Wiring Diagram

The wiring diagram below shows how to connect one Wiegand reader to two access control panels, using the OPTW-100 to electrically isolate the Wiegand reader and Access Control Panel 1 from Access Control Panel 2 while passing the Wiegand signals to both access control panels.



OPTW-100 - One Reader to One Panel Wiring Diagram

The wiring diagram below shows how to connect one reader to one access control panel, using the OPTW-100 to electrically isolate the reader from the access control panel.



OPTW-100 - Troubleshooting

If Wiegand signals are unable to be passed through the OPTW-100, check the following:

The troubleshooting steps below assume 5VDC Wiegand devices

Common ground connections:

- Wiegand input devices must share a common ground connection with the J1 header.
- Wiegand output devices must share a common ground connection with the J2 header, unless they are powered with the same power supply.

Wiegand input data voltage levels:

- Measure DC voltage between Data 0 IN and Ground, and again between Data 1 IN and Ground on the J1 header. Normally the voltage levels should be at 5VDC or equivalent high voltage if using Wiegand devices that operate at higher voltages.
- If the voltage levels are below 4.4VDC, then disconnect the Wiegand device(s) from the J1 header and measure the devices while they are not connected to anything. The J1 header Wiegand inputs are open collector and will be at 0VDC while no devices are connected.
- If the voltage levels of the Wiegand device(s) are below 4.4VDC while it is not connected to other devices, then the problem lies with that device and not the OPTW-100. This may be able to be recovered using external pull-up resistors. Connect a 1K to 2K through-hole resistor to the low data line and a 5VDC output. This will pull the voltage up to 5VDC. If the voltage level for a Wiegand data line is below 1VDC, then the line is clamped to ground and cannot be recovered.

Wiegand output data voltage levels:

- Measure DC voltage between Data 0 OUT and Ground, and again between Data 1 OUT and Ground on the J1 header. Normally the voltage levels should be at 5VDC or equivalent high voltage if using Wiegand devices that operate at higher voltages.
- If the voltage levels are below 4.4VDC, then disconnect the Wiegand device(s) and measure the voltage of the Wiegand lines on each device separately (including the OPTW-100 J2 header).
- If the voltage is between 4.4VDC and 1VDC then reconnect the Wiegand device(s) to the J2 header and jumper the PR +5V pin. This will pull the voltage back up to 5VDC and allow Wiegand data to be passed.
- If the voltage is below 1VDC on any of the Wiegand devices, then that line is clamped to ground and cannot be recovered.

OPTW-100 - When to Use the Output Pull-up Resistors

The PR +5V pins can be jumped to the Data 0 OUT and Data 1 OUT Wiegand output pins to pull up the voltage to 5VDC. The PR +5V pins are used when the Wiegand data voltage on the output side is below 5VDC or when the other Wiegand devices connected to the Wiegand output do not have their own pull-up resistors.

When using Wiegand devices on the output side that operate the Wiegand data lines at a voltage other than 5V, the PR +5V pins should not be used. If the PR +5V pins are jumpered to the Wiegand outputs operating at more than 5VDC, they will act as pulldown resistors and pull the voltage down to 5VDC. This will cause the Wiegand data lines to not pass data.