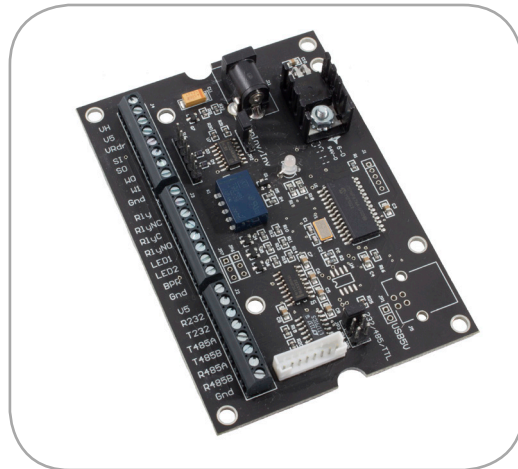# RFID EAS

Wiegand Converter

Configuration Utility
User Manual

Thank You!

Congratulations on the purchase of the Wiegand Converter. RF IDeas knows you will enjoy using the converter board as much as we enjoyed creating and developing it! Configuration is easy so you will be able to quickly take advantage of a more secure environment in your business, school, or organization

Please call our Sales department if you have any questions or are interested in our OEM and Independent Developer's programs.

We look forward to your comments and suggestions for our product line! Please go to www.RFIDeas.com and follow the **Support ⇨ Learning Center** link for more details about our product line.

We are always discovering new applications for our product line(s). There are several software developer's licensing our technology so the solution you are looking for may already be developed.

Thank you,
The RF IDeas Staff

Need Assistance?

      Ph: 847.870.1723
      Fx: 847.483.1129
      E: Sales@RFIDeas.com
          TechSupport@RFIDeas.com

Contents

The Basics

1

Wiegand Converter Overview

Introduction to Reader

This family of Wiegand converters is suitable for OEMs that require up to 64 bits of Wiegand output from a proximity card or other Wiegand device and convert to:

- OEM-W2065AKU AIR ID Playback USB
- OEM-W2USB – v3: USB (output as keystrokes or optional RF IDeas Software Developer's Kit via DLL)
- OEM-W2USB-CHUID USB (output as keystrokes or optional RF IDeas Software Developer's Kit via DLL)
- OEM-W2RS232 – V3m without relay
- OEM-2065AK2 AIR ID Playback RS – 232
- OEM-W2RS232 – v3: RS-232 data in ASCII format
- OEM-W2RS232 – CHUID: RS-232 data in ASCII format
- OEM-W2 - RS-485/422 - v3: RS - 485/422 data in ASCII format

The OEM Wiegand converter requires a regulated power source of 5 VDC or 8 – 16 VDC, 100mA for internal operation.

The RS – 232 communications parameters are:

- 9600 baud
- N no parity
- 8 data bits
- 1 stop bit
- No hardware flow control

All data output is standard ASCII format. The converter contains flash memory and is configurable with RF IDeas free configuration utility. The converter is capable of transferring data from proximity devices with 26 to 64 bit data output lengths.

Installation

Wiegand Converter Installation

The following connection example shows a Wiegand output device (card reader) connected to a typical DTE RS – 232 serial device using an external power supply.

Do not connect the Wiegand reader to LED1 or LED2 unless using your own application

Reader Wire Color

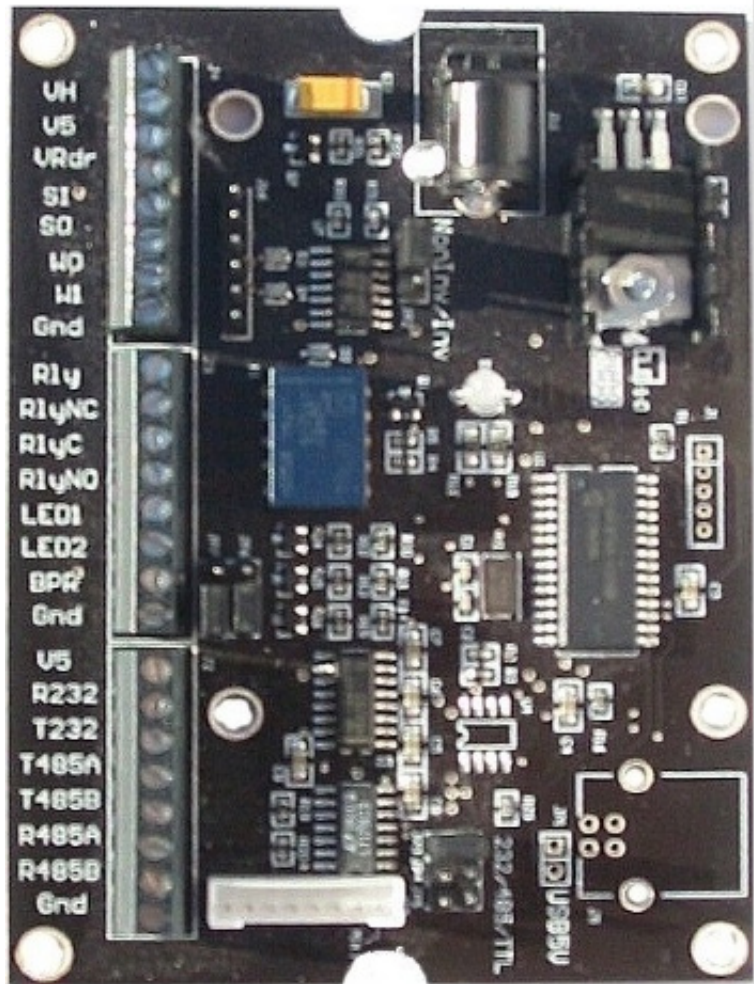5 volts VRdr - Red

WO - Green
W1 - White
Gnd - Black

DTE Device
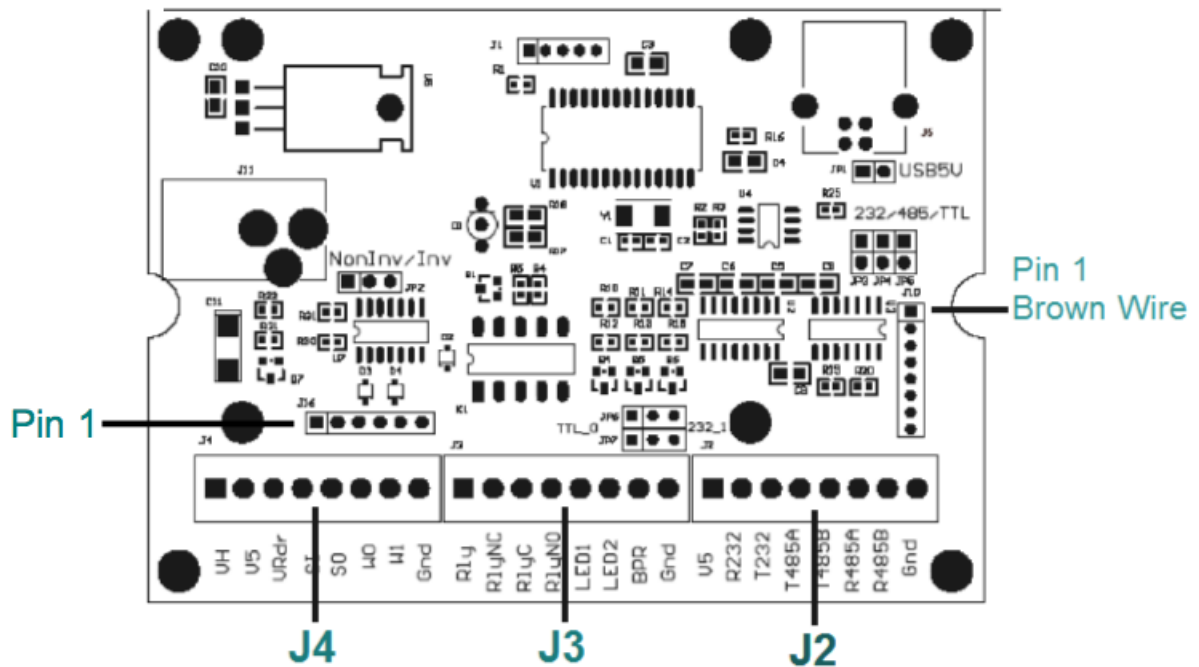TX - 3 Pin
RX - 2 Pin

GND - Pin 5

Attach the USB cable before connecting the power.

Note: Verify jumper JP1 is NOT connected if using an external power supply.

Terminal Block Locations

J4 TERMINAL BLOCK	
Function	**Description**
VH	INPUT: Voltage (High), Power supply input from your power supply. The supply must be 8 – 16 VDC @100ma maximum. The on-board 5V regulator handles 1A combined consumption so external consumers connected to the 5V bus are limited to 900mA
V5	INPUT: This pin requires a regulated 5 VDC @100 ma
VRdr	OUTPUT: 5vdc at up to 50ma - usually red wire from device
SI	INPUT: Serial In when using in TTL mode and jumper JP5 connected On Playback OEM version this is used for the Receive RS – 232
SO	OUTPUT: Serial Output when using in TTL mode and jumper JP5 connected On Playback OEM version this is used for the Transmit RS – 232

J4 TERMINAL BLOCK	
Function	**Description**
W0	INPUT: Data 0 Wiegand – usually green wire from device Cable: 5 conductor (#22 AWG) stranded with continuous shield for typical Wiegand installations
W1	INPUT: Data 1 Wiegand - usually white wire from device Cable: 5 conductor (#22 AWG) stranded with continuous shield for typical Wiegand installations
Gnd	DC Ground – usually black wire from device

J3 TERMINAL BLOCK	
Function	**Description**
Rly	OUTPUT: External input switched to ground connected to relay coil. Can only be driven low. The other side of the coil is 5v. Grounding this pin energizes the coil. Not supported on OEM-W2RS232-V3M
Rly NC	OUTPUT: Relay normally closed when not energized Not supported on OEM-W2RS232-V3M
Rly C	OUTPUT: Relay Common Not supported on OEM-W2RS232-V3M
Rly NO	OUTPUT: Relay normally open when not energized Not supported on OEM-W2RS232-V3M
LED1 Green	OUTPUT: Open collector switched to ground when LED is green. This tracks the on-board LED Not supported on OEM-W2RS232-V3M
LED2 Red	OUTPUT: This is open collector switched to ground when LED is red Not supported on OEM-W2RS232-V3M
Bpr	OUTPUT: Beeper Open collector switched to ground by serial protocol only Not supported on OEM-W2RS232-V3M
Gnd	DC Ground

Note: The relay, LED and beeper functions above can be controlled using the software developer's kit (SDK) on USB and Serial models. The serial model can be also controlled with ASCII commands without the use of the SDK.
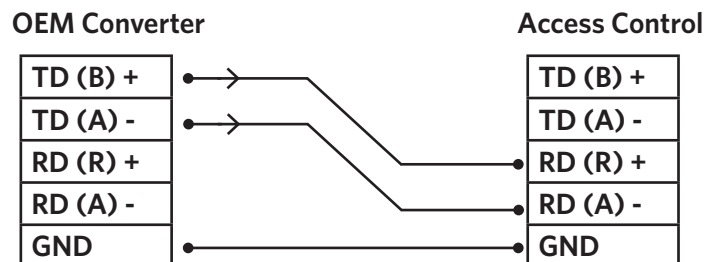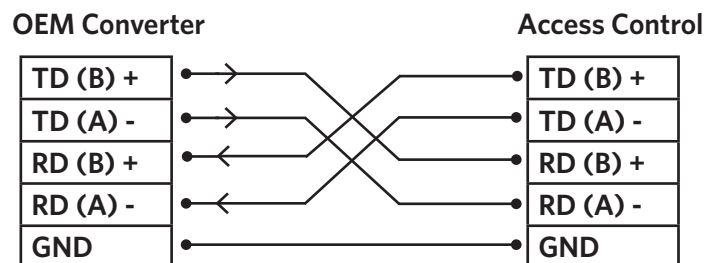
J2 TERMINAL BLOCK	
Function	**Description**
V5	INPUT or OUTPUT: This pin as input requires a regulated 5 VDC @100 ma when input, 5 VDC @ 50ma output when VH is supplying power
R-232	INPUT: Receive RS – 232 data
T-232	OUTPUT: Transmit RS – 232 data
T-485A/422	OUTPUT: Differential Output: Transmit RS –485/422 data; R19 terminates this transmit line 120 ohms
T-485B/422	OUTPUT: Transmit RS – 485/422 data

J4 TERMINAL BLOCK	
Function	**Description**
R – 485A/422	INPUT: Differential Input: Receive RS – 485/422 data R20 terminates this transmit line 120 ohms
R – 485B/422	INPUT: Receive RS – 485/422 data
Gnd	DC Ground

RS - 485/422 Connections

The RS – 485/422 physical connection must be a 4-wire, point-to-point connection to the host. Multi drop (bridged) connections are NOT supported as the board does not tri-state the transmitter.
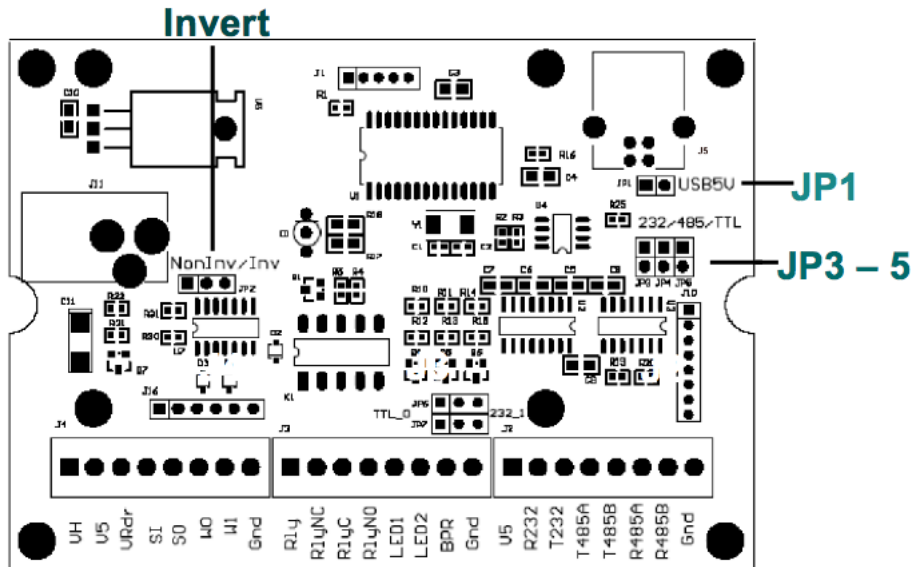
The TX lines may drive multiple receivers that are bridged together but no two TX pairs from different modules should ever be connected together.
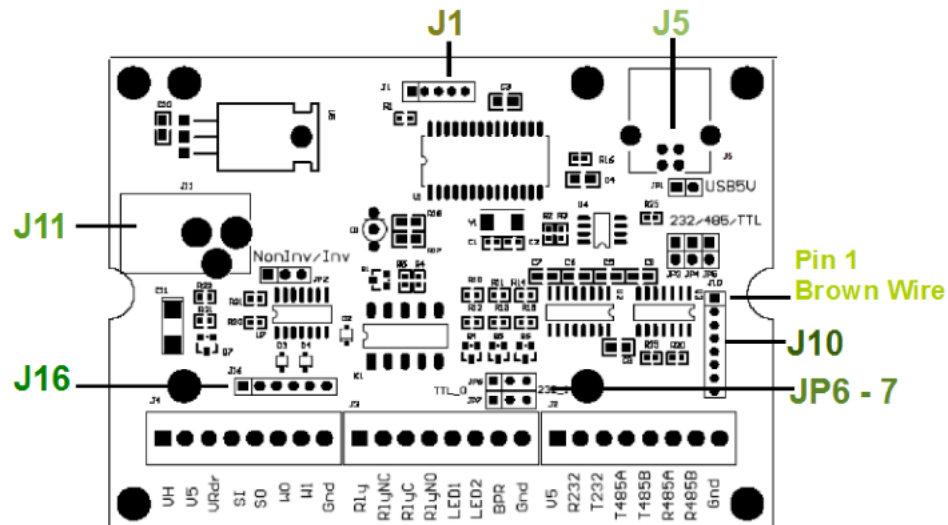

2-Wire Simplex Communications

Jumper Locations

Jumpers	
Function	**Description**
NonInv/Inv	The non-inverted Wiegand setting is normally high and pulsed low
	The inverted form is normally low and pulsed high
JP1	This jumper has no effect on serial devices
	When JP1 is installed, it connects the USB port + 5V to the W2U board's + 5V bus
	VH should not be used. Any current draw from the 5V and VRdr terminals should not exceed 50mA. Use this jumper only when no external power supply is available
	Remove this jumper if board is externally powered. This could damage the board if connected while powering via J11, VH, V5, or J10
JP3 / JP4 / JP5	Choose an RS – 232, RS – 485/422, TTL depending on the serial interface required for the specific application. All transmit paths are live, however this selects only one of the receive ports.

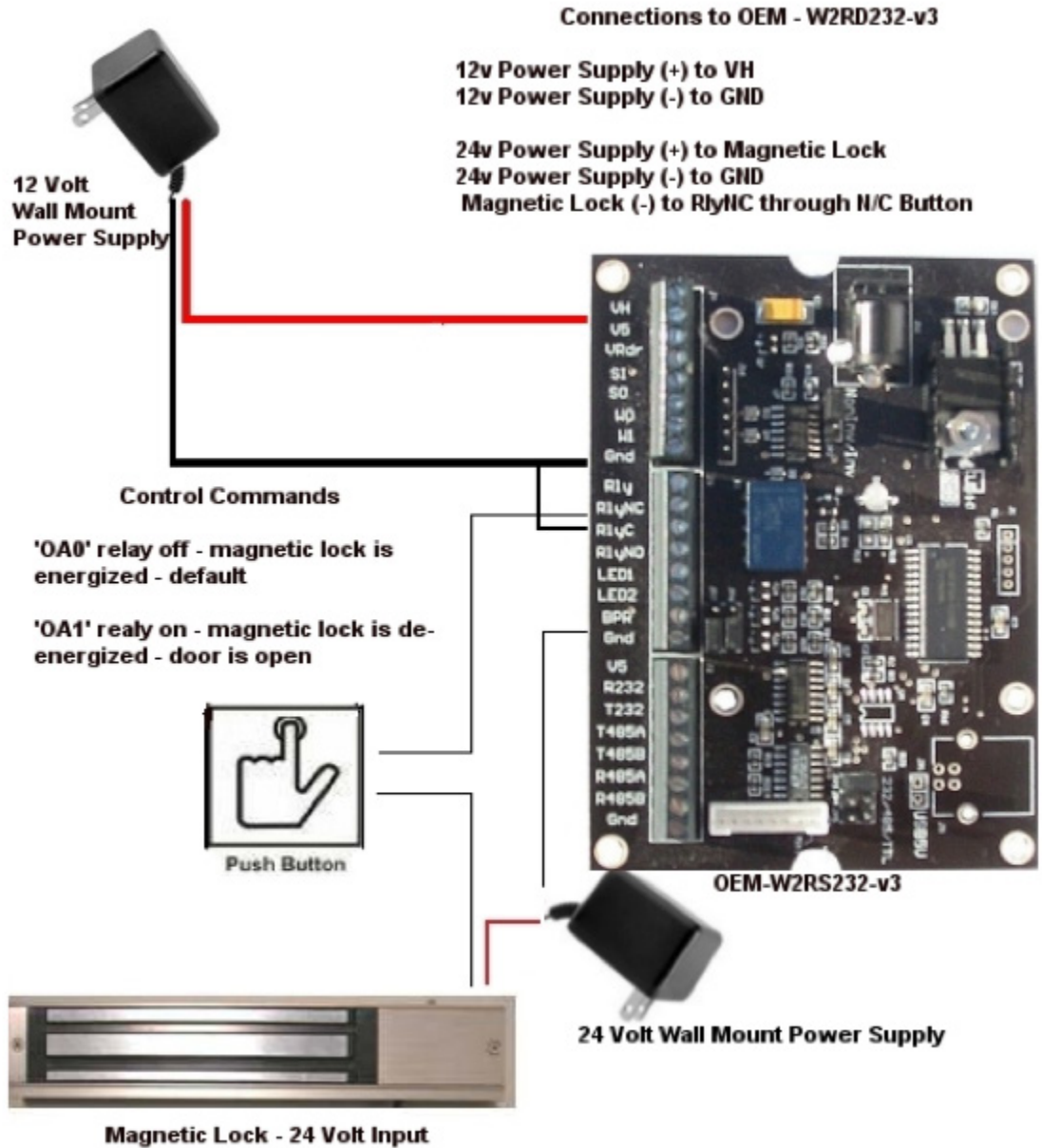| Connectors	
Function	**Description**
J1	Internally used
	Do not connect to this port
J5	USB port
JP6 / JP7	Only used when the Wiegand converter is programmed as an OEM-W2065AK2
J10	J10 is a polarized connector. Connect the serial cable with the 2m white plug into J10.
	• Pin 1 Ground (connect to pin 5 below)
	• Pin 2 TX (output from board)
	• Pin 3 RX (input to board)
	• Pin 4 (Connect also to pin 6, pin 8 below)
	• Pin 5 Ground
	• Pin 6 (Connect also to pin 4, pin 8)
	• Pin 7 This pin requires a regulated 5 VDC @100 ma
	• Pin 8 (Connect also to pin 4, pin 6 above
J11	INPUT: Voltage (High), Power supply input from your power supply. The supply must be 8 – 16 VDC @100ma maximum
J16	Mirrors J4 Pin 1 5v Pin 2 same as VRdr Pin 3 Reader reset (Indala) Pin 4 W0 Pin 5 W1 Pin 6 Ground

Lock Connection

Push Button Magnetic Lock Connection

Connections to OEM - W2RD232-v3

12v Power Supply (+) to VH
12v Power Supply (-) to GND

24v Power Supply (+) to Magnetic Lock
24v Power Supply (-) to GND
 Magnetic Lock (-) to RlyNC through N/C Button

12 Volt
Wall Mount
Power Supply

Control Commands

'OA0' relay off - magnetic lock is
energized - default

'OA1' realy on - magnetic lock is de-
energized - door is open

Push Button

OEM-W2RS232-v3

24 Volt Wall Mount Power Supply

Magnetic Lock - 24 Volt Input

Note: The DC jack can also be used with the 12 volt power supply.

Control Commands

'OA0' relay off - magnetic lock is energized - default

'OA1' - relay on - magnetic lock is de-energized - door open

12 Volt
Wall Mount
Power Supply

VH
V5
VRdr
SI
SO
HO
HI
Gnd
Rly
RlyNC
RlyC
RlyNO
LED1
LED2
BPR
Gnd
V5
R232
T232
T485A
T485B
R485A
R485B
Gnd

Connections to OEM - W2RS232-v3

Power Supply (+) to VH
Power Supply (-) to GND

Magnetic Lock (+) to VH
Magnetic Lock (-) to RlyNC

Jumper GND to RlyC on the OEM
Board

OEM-W2RS232-v3

Magnetic Lock - 12 Volt Input

Note: The DC jack can also be used with the 12 volt power supply.

Control Protocol

4

A secondary control protocol has been added to the version of the Serial OEM Prox (SOP). This protocol enables the user to easily send control and associated configuration commands to the SOP via a terminal emulator or other serial ASCII applications. All commands are case sensitive where the alpha characters are capital. Successful reception and completion of the requested operation is indicated by the return of an ASCII carriage return (0x0D) from the SOP. The communication parameters are 9600-N-8-1 (9600 baud, 8 data bits, no parity bit, and 1 stop bit).

Relay

Form C relay with exposed open collector switch to Gnd coil drive. The 'Rly' terminal is the relay coil driver collector and is not really "open" as it is tied to +5V through the relay coil and has a diode across the coil for transient protection. This is always under user control. No delays to relay operation can be set.

CONTROL OUTPUT COMMANDS	
Relay	
"OA0"	Output A (relay) OFF
"OA1"	Output A (relay) ON

Beeper

Beeper (BPR) switch to Gnd. This is always under user control.

CONTROL OUTPUT COMMANDS	
Beeper	
"OB0"	Output C (beeper) OFF
"OB1"	Output C (beeper) ON

Configuration Commands

LED1 (red) and LED2 (green) are configured to represent valid card reads by default. The last issued configuration assignment is kept in non-volatile storage in the SOP so power cycling returns the control to its last state. The non-volatile memory is EEPROM and has a finite (1,000,000 cycle and 40 year) lifetime. Configure the application so it does not approach this limit.

Send one of the following configuration commands to switch the control assignment:

CONFIGURATION COMMANDS	
Control Assignment	
"CLE"	LED1 and LED2 controlled externally
"CLI"	LED1 and LED2 controlled internally (default)

LED

LED1 OC switch to Gnd

- •Under user control after configured for 'external' control.
- •Follows on-board red LED when configured for 'internal' control.
    - •If configured for 'internal' control, nothing will happen and no response.

CONTROL OUTPUT COMMANDS	
LED	
"OC0"	Output A (red) OFF
"OC1"	Output A (red) ON

LED2

LED2 OD switch to Gnd

- •Under user control after configured for 'external' control.
- •Follows on-board green LED when configured for 'internal' control.
    - •If configured for 'internal' control, nothing will happen and no response.

Note: If the LED is configured using these commands, it will not be controlled by the Card Reader.
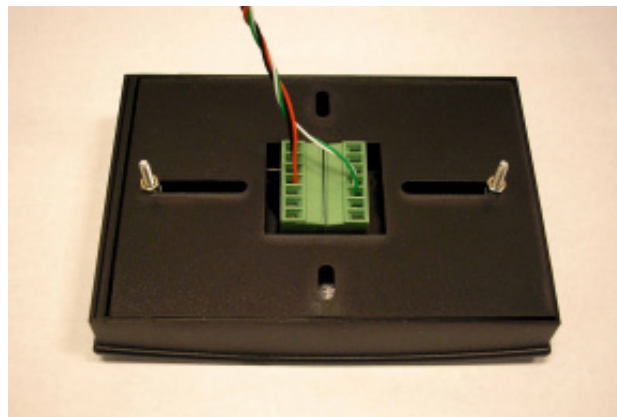
Communication Timeouts

Successive characters must be spaced at less than 2 seconds apart or the command will fail once an opening command character is received.
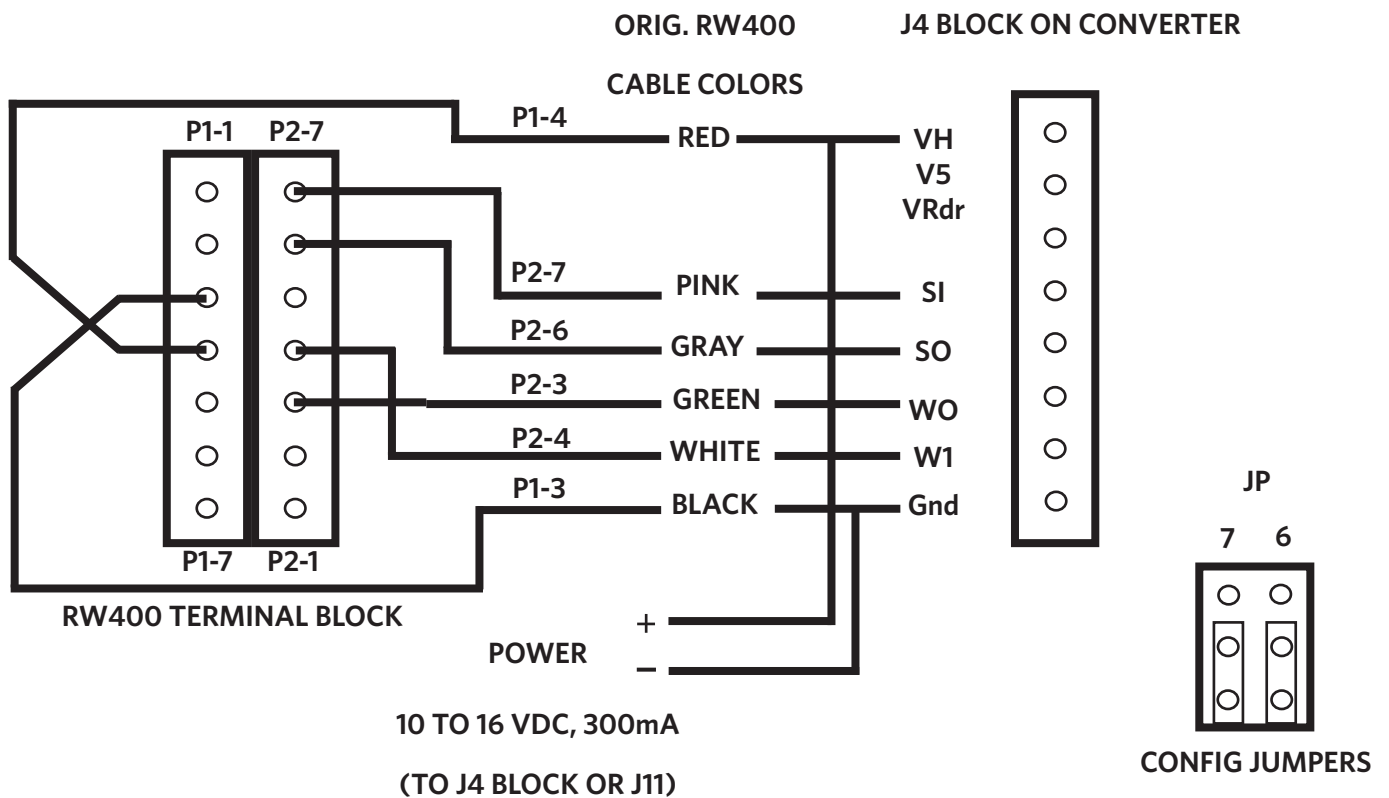
There are two serial protocols in operation at a time. Wait two seconds before switching from one to the other if the application requires both.

OEM-W2065 Connection Diagrams

Use the following diagrams to configure the reader to function as a playback device using model numbers W2065AU or W2065AK2.

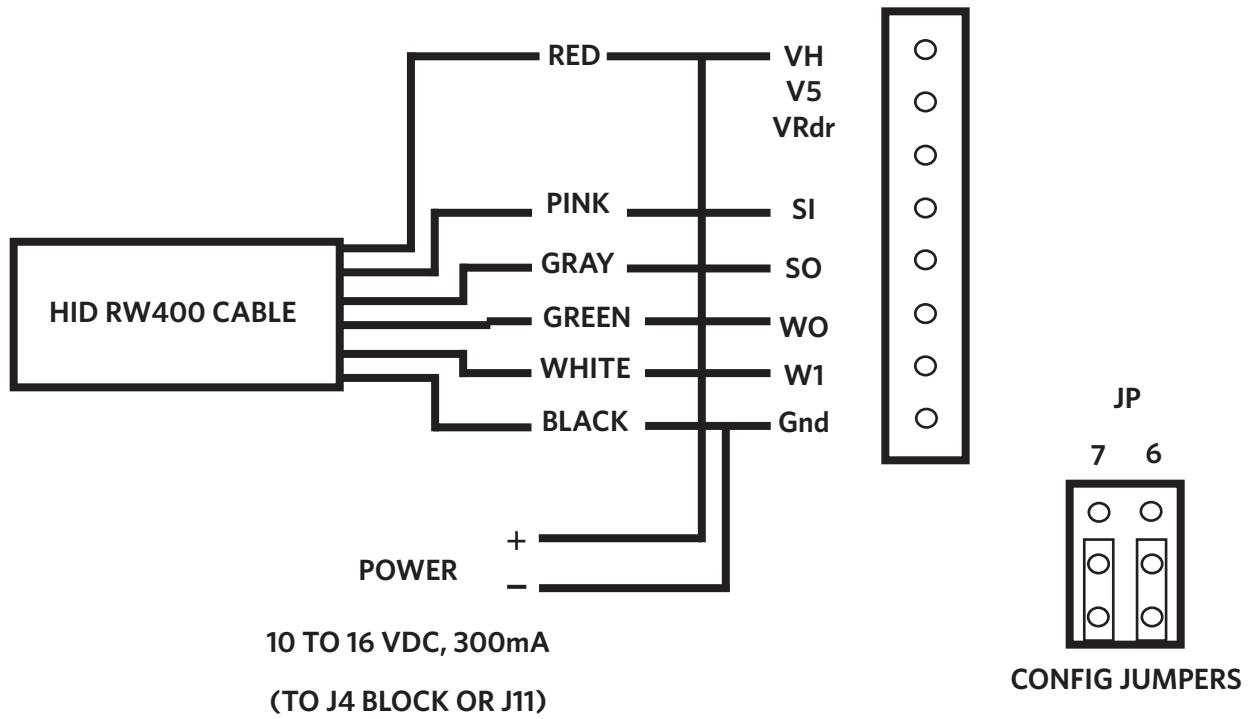**RW400 Reader Terminal Block Termination**

HID 6121BKT0000

ORIG. RW400 CABLE COLORS

J4 BLOCK ON CONVERTER

P1-4	RED	VH V5 VRdr
P2-7	PINK	SI
P2-6	GRAY	SO
P2-3	GREEN	WO
P2-4	WHITE	W1
P1-3	BLACK	Gnd

P1-1   P2-7

P1-7   P2-1

RW400 TERMINAL BLOCK

POWER + −

10 TO 16 VDC, 300mA

(TO J4 BLOCK OR J11)

JP

7   6

CONFIG JUMPERS

RW400 Reader Termination With a Cable

HID 6121BKN0000

J4 BLOCK ON CONVERTER

HID RW400 CABLE		
RED	VH	
	V5	
	VRdr	
PINK	SI	
GRAY	SO	
GREEN	WO	
WHITE	W1	
BLACK	Gnd	

POWER + −

10 TO 16 VDC, 300mA

(TO J4 BLOCK OR J11)

JP

7   6

CONFIG JUMPERS

Glossary

Term	Definition
ASCII	American Standard Code for Information Interchange
AWG	American Wire Gauge
Bpr	Beeper
DLL	Dynamic Link Library
GND	Ground
LED	Light Emitting Diode
OC	Open Collector
OEM	Original Equipment Manufacturer
RS-232	Recommended Standard 232 is a standard for serial binary data signals that are commonly used in computer serial ports
SDK	Software Developer's Kit
SOP	Serial OEM Prox
VH	Voltage High – 8 to 16 volts

Support

Precautions

Do not mount the device directly on a metal surface. This could interfere with the RF signal and the operation of the device.

The device may not recognize valid cards in the presence of high RF fields. If current readings are erratic, take the following step:

· Move the equipment from any known transmitters nearby.

Contact Technical Support at 866.439.4884 for more information.

Before You Call Technical Support

Please make sure you've identified your reader model and credential type being used. Have this information ready so that your call will be routed to the correct specialist.

For Assistance:

> Ph: 847.870.1723
> E: TechSupport@RFIDeas.com

Talking To The Technician

Provide the reader model being used to the Technical Support Specialist.

Explain your problem to the specialist.

Be prepared to provide the following information:

- Error/problem explanation
- What you were doing when the problem occurred
- What steps you have taken to resolve the problem, including results from each steps

Listen and follow the steps provided by the specialist. Let the specialist know what happens when you perform the steps.

<div align="center">**END-USER LICENSE AGREEMENT**</div>

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FCC Compliance Statement

FCC ID: M9MPCPROXHUSB100 (HID USB model)	FCC ID: M9MBUPCPROXH100 (HID RS-232 model)
FCC ID: M9MPCPROXM101 (Indala model)	FCC ID: M9MBUPCPROXA100 (AWID)
FCC ID: M9MRDR6X8X (Kantech, Indala, Casi-Rusco)	FCC ID: M9MPCPROXP100 (Pyramid)
FCC ID: M9MPCPROXC101 (Casi-Rusco model)	FCC ID: M9MRDR7P71 (FIPS 201 13.56MHz)
FCC ID: M9MRFID1856I100 (MIFARE/iCLASS models)	FCC ID: M9MRDR7L81 (Legic 13.56MHz)
FCC ID: M9MRDR7081 (iCLASS Module based)	FCC ID: M9MRDR7580 (iCLASS MIFARE and Other 13.56MHz)
FCC ID: M9MRDR7581 (iCLASS MIFARE and Other 13.56MHz)	FCC ID: M9MRDR7081AKF (iCLASS MIFARE and Other 13.56MHz)
FCC ID: M9MRDR7081AKE (iCLASS MIFARE and Other 13.56MHz)	FCC ID: M9MRDR75DX (iCLASS MIFARE and Other 13.56MHz)
FCC ID: M9MRDR758X (iCLASS MIFARE and Other 13.56 MHz)	FCC ID: M9M8058XCCL (Multi-protocol and Contact model)
FCC ID: M9M758XCCL (MIFARE and Contact model)	FCC ID: M9M7580CCL (MIFARE and Contact model)

"Pursuant to FCC 15.21 of the FCC rules, changes not expressly approved by RF IDeas might cause harmful interference and void the FCC authorization to operate this product.

Changes to this product not expressly approved by RF IDeas will void the user's authority to operate the equipment.

Note: This device complies with Part 15 of the FCC Rules and Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. This product complies with FCC OET Bulletin 65 radiation exposure limits set forth for an uncontrolled environment.

The reader may not recognize value cards in the presence of high RF fields. If the current reading is erratic, the user shall take the following step: Move the equipment from any known transmitters nearby. For more information contact Tech Support at 866.439.4884.

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Other Products & Accessories

Software Developer's Kit
Allows independent developer's to use their application to read proximity access badge Read ID data of more than 1 billion cards in the field

PVC Label Proximity Card
Credit card size with paper release liner, 500 cards per box

Proximity Cards, Labels, Key Fobs
Complete selection of various manufacturers proximity cards, labels and key fobs. Marked with data code and ID number, available in several Wiegand formats

pcProx Read/Write Contactless
Reads and writes directly to the smart cards

pcProx Writer and Playback
Desktop read-only for iCLASS and NXP and smart cards

pcProx Playback Starter Kit
Plays back card sector data in ASCII or keystrokes

pcProx Sonar
Presence detector configured as a keyboard

PS/2 to USB Power Tap
Powers a USB RF IDeas device from a PS/2 port

Mounting Brackets
Further adjust the standard mounting of the device angle