transponder and reader engineered systems

tres900

Installation Guide

Shipping Box Contains

Everything that is included in the box being shipped to a customer should contain the following items:

- Bracket Assembly
- Reader Assembly
- Power Supply - tres-PSS12-035
- Documentation on CD ROM
- Printed Documentation (Quick Start Guide and a checklist)

Everything will be securely inserted inside the box so items do not shift during shipping and handling. We pay special attention to the bracket assembly.

tres900 CD

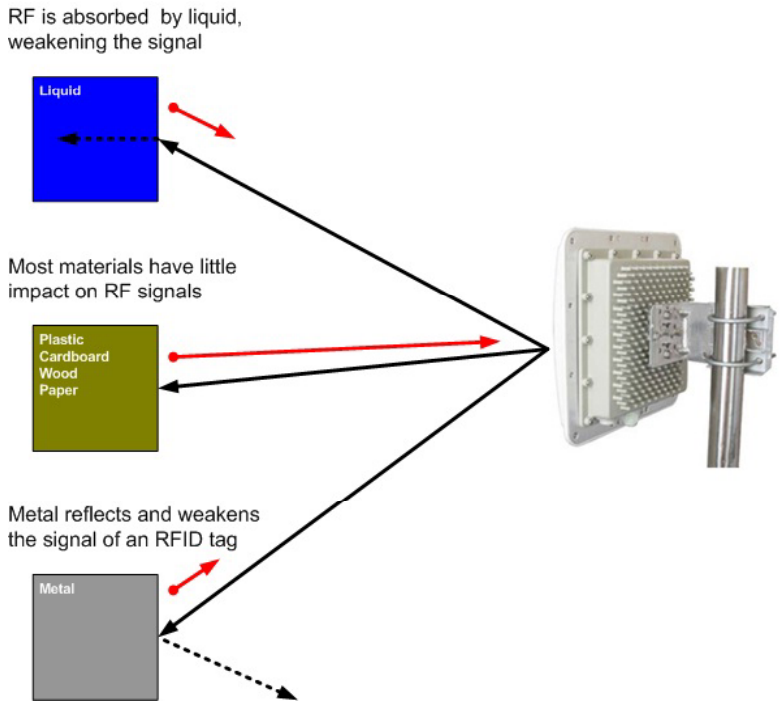
- \CoolTerm
  - Coolterm.exe: freeware terminal program (like HyperTerminal)
- \Documents
  - tres900 Quick Start Guides, tres900 Operations Manual, tres900 Reader Specification, etc.
- \Drivers
  - ZNetCom2.exe: Ethernet installation driver
- \Fliers
  - Sales brochures for the product
- \Utilities
  - Treslevel.exe: Reader output power control program

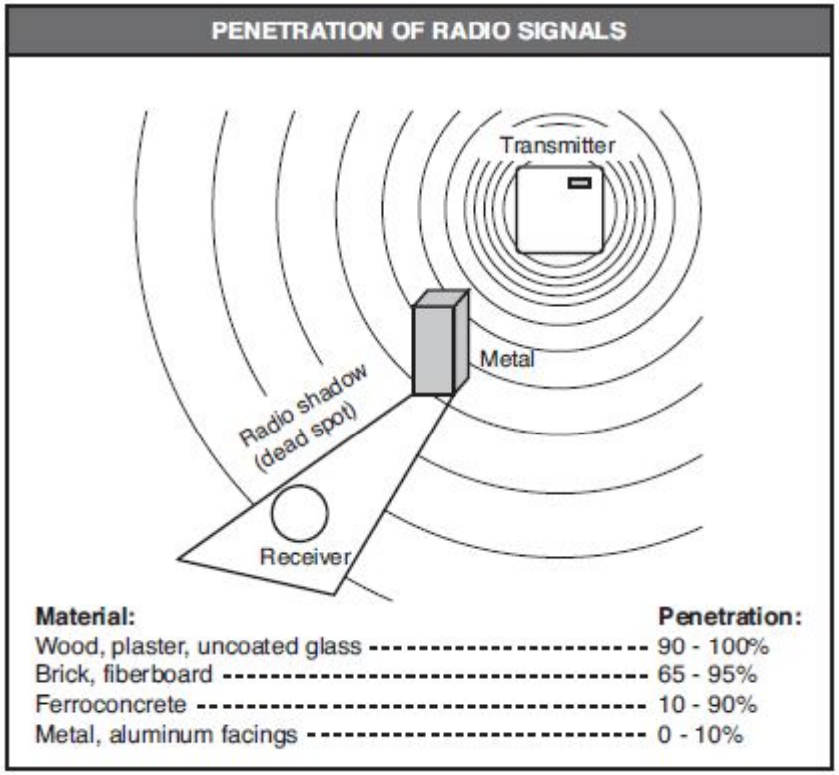
Electromagnetic Interference

Transmission line-related radio-frequency interference is the indirect effects of transmission line and is produced by the physical interactions of line electric fields. The electromagnetic interference or EMI created by power transmission lines can interfere with radio waves. This can result in interference with RFID, radio, and cell phone signals. Both electricity and RF used to transmit data vibrate at certain frequencies. The electrical effects of transmission lines can be reduced through shielding or burying the transmission lines. **Contact your local power company for assistance in suppressing EMI.**

RFID Obstructions

Be sure your readers have a clear view of any tags.





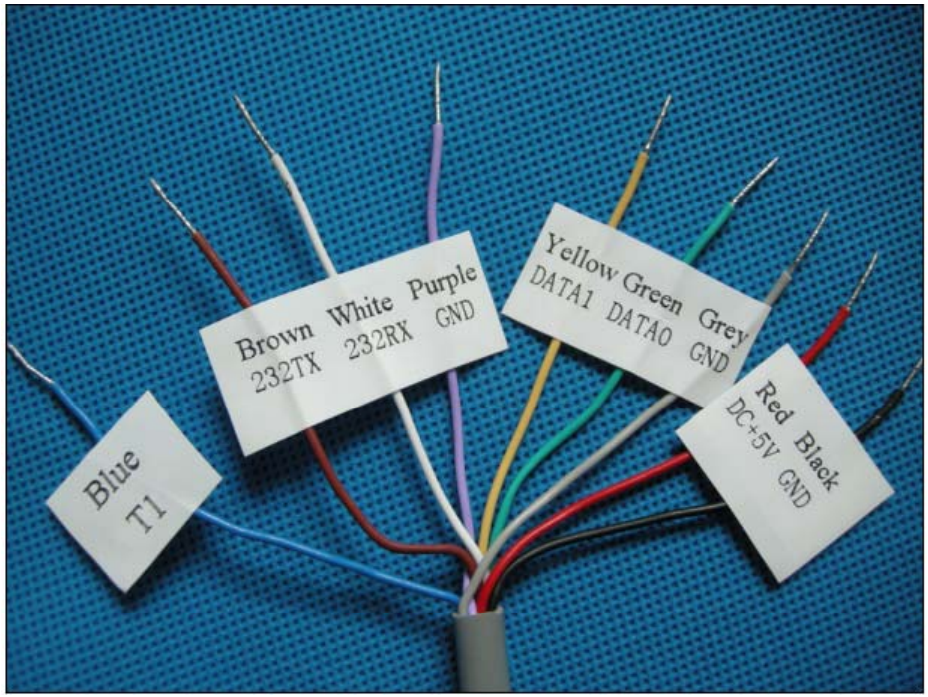
Cable Guide

Selecting the correct wire will enhance the performance and reliability of your system. The size of the wire must be large enough to carry the maximum current expected without undue voltage losses. All wire has a certain amount of resistance, this resistance causes a drop in the voltage from the source to the load. The wire guide provides the minimum wire size needed to limit voltage drops to 5% at a given distance in a 12V system.

POWER	**WIRE GAUGE**									
W(VA)/Amps	8awg	10awg	12awg	14awg	16awg	18awg	20awg	22awg	24awg	26awg
5W/.42A	2,222	1,426	898	564	354	224	139	87	55	35
10W/.83A	1,124	722	454	285	179	113	71	44	28	18
20W/1.67A	559	359	226	142	89	56	35	22	14	9
30W/2.50A	373	240	151	95	60	38	23	15	N/A	N/A

Power Requirements

The Reader can be powered from 8 to 16 volts DC (1.5A @ 12V) regulated, linear or switching power sources. The Reader should be operated from a grounded supply that has the same ground reference as the host.



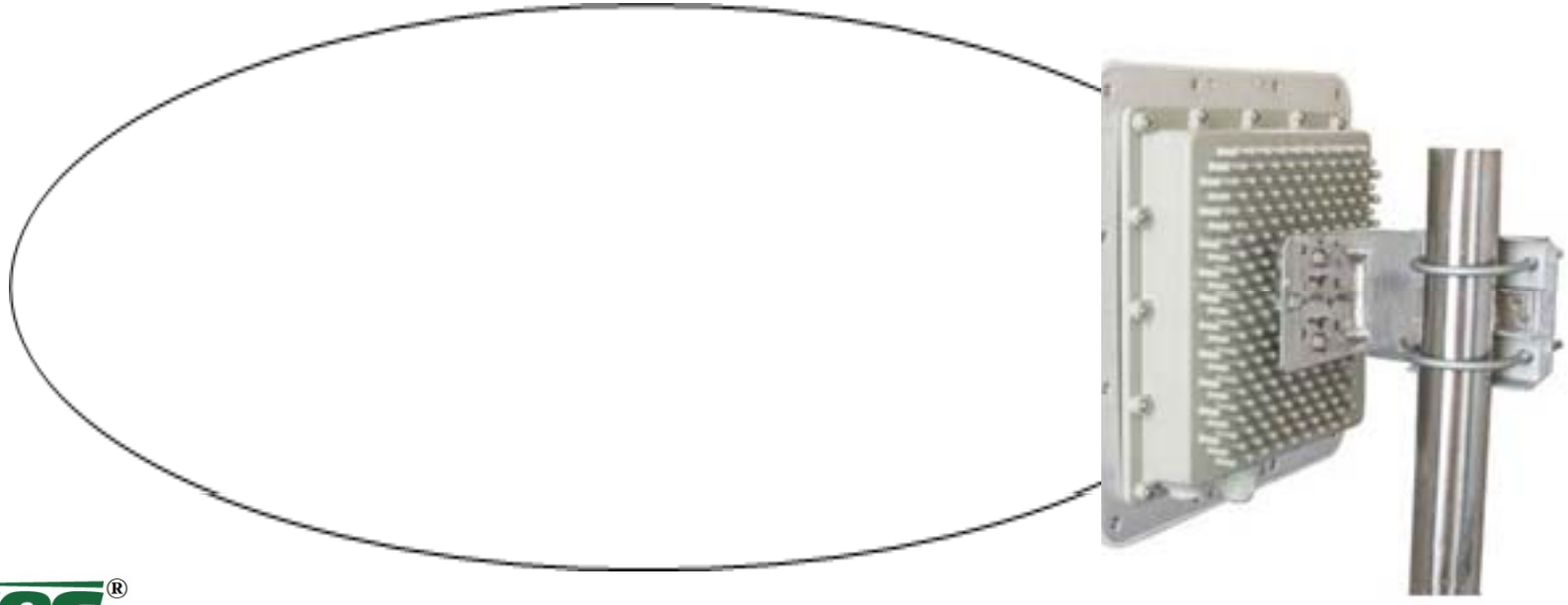
Power Requirements

The recommended power supply is the tres-PSS12-035: Power Supply, 85-264VAC, 35W, 12VDC @ 3A regulated, which is supplied with each Reader. The Reader unit Warranty is based on its use. **Caution:** Wiegand Output use **GREEN** wire for Data 0 and **YELLOW** wire for Data 1.

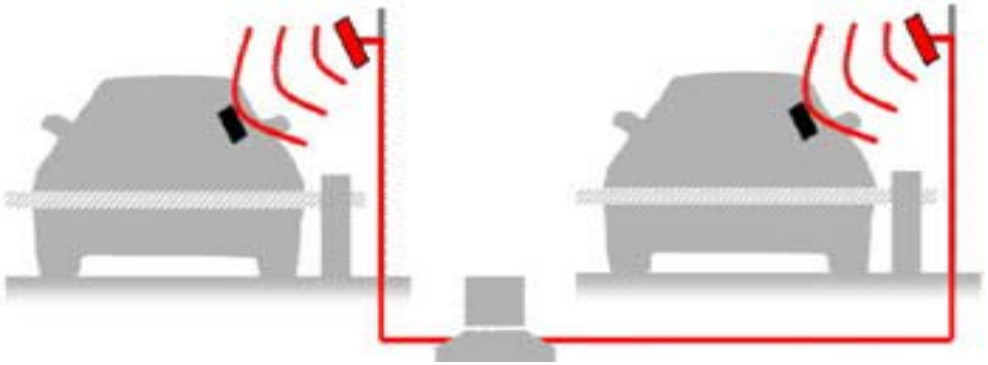
Color	Signal Name	Function
Brown	RS232 TX	RS232
White	RS232 RX	RS232
Purple	RS232 GND	Ground
Yellow	DATA1	Wiegand
Green	DATA0	Wiegand
Gray	Ground	Wiegand
Blue	T1	Reader Control
Red	Power +V	+8 to +16 volts
Black	Power -V	-volts ground

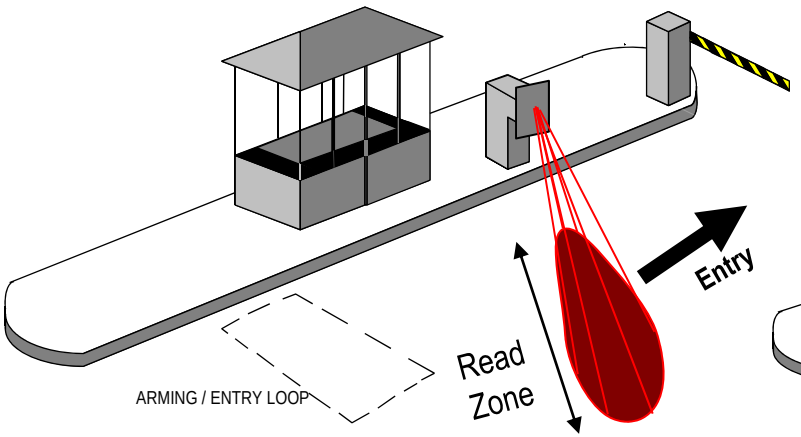
Mounting Reader

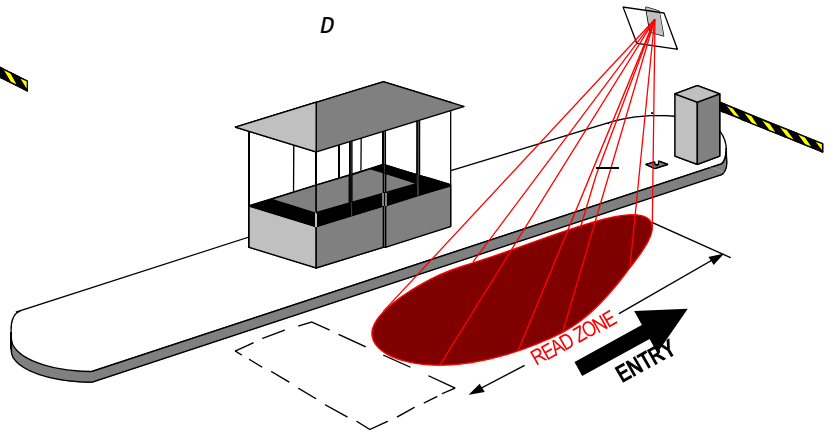
The mounting bracket is designed specifically for mounting the tres900 Reader. The Reader could be installed on a pole or on wood, concrete, or brick structures and aim the antenna toward the zone of desired coverage. The Figure below shows how the bracket looks assembled on a 2 in OD round pole. The tool of choice is a 3/8” (10 cm) wrench.



Read Zone & Mounting Technique







Parallel Surfaces Rule

Passive RF tag actually gets its' power from the reader. That is to say that, the reader is emitting RF and the tag must be able to absorb that RF, accelerate the signal and the reflect it back to the reader. Therefore, if the surface of the reader and tag are close to parallel, this principal will result in better tag reads. Below is an example of this rule not being followed:

In this instance, the fact that vehicles were turning through the read zone meant poor performance when the reader was mounted on the white post. Once the reader was moved back closer to the operator, it worked much better!

Tag Orientation - Vertical Plane

Vertical orientation is desired, aim the antenna at a spot down the road from the gate where you want to start reading tags. From this spot forward, the detection area will increase as you get closer to the gate. The tags must be vertically oriented for optimum read range. The Windshield tag must be mounted on windshield glass for optimum read range.

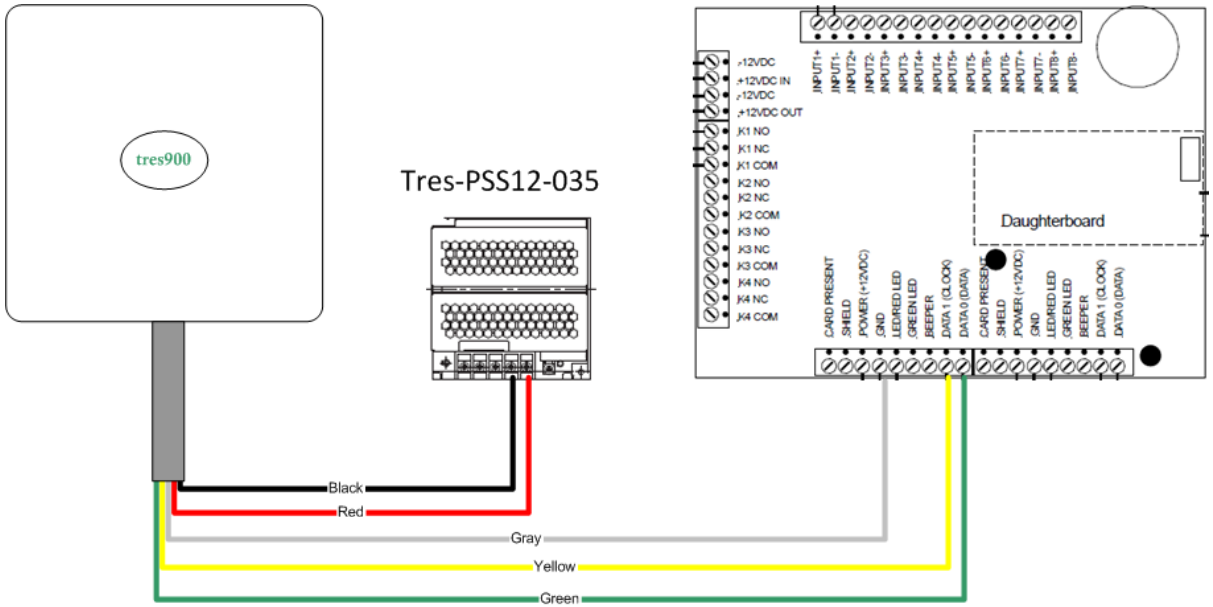
Tag Vehicle Installation

Ensure the Tag is mounted in a vertical position for optimum read range. Windshield sticker should be 2 inches away from any metal posts on all sides. Prior to installation, make certain the desired location complies with all state and local vehicle codes/ laws. **Caution: some windshield contain metal so an exterior tag should be used.**

Wiegand Output

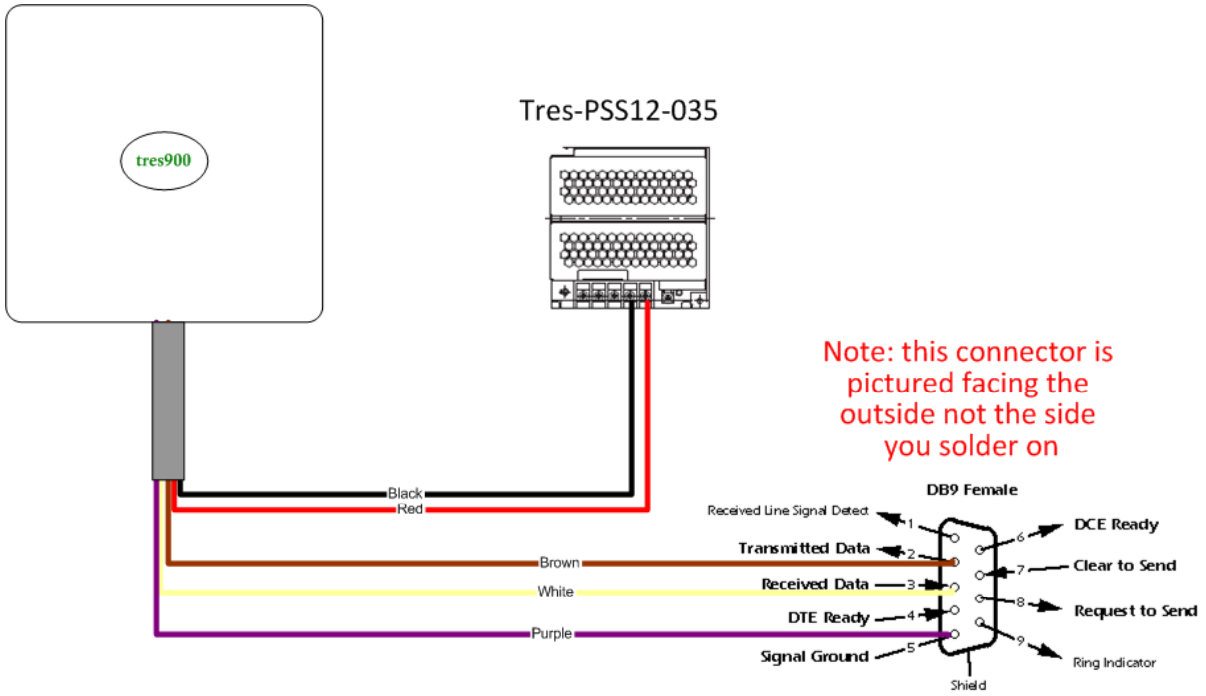
Standard Wiegand protocol; Data 0 (**GREEN** wire) and Data 1 (**YELLOW** wire) normally resting at +5 volts and moving to zero voltage (**GRAY** wire - Ground) on logic 0 or logic 1.

Shielded (22 AWG for ≤ 25’ and 16 AWG up to 500’ per Wiegand specification) insulated, stranded wire is recommended.



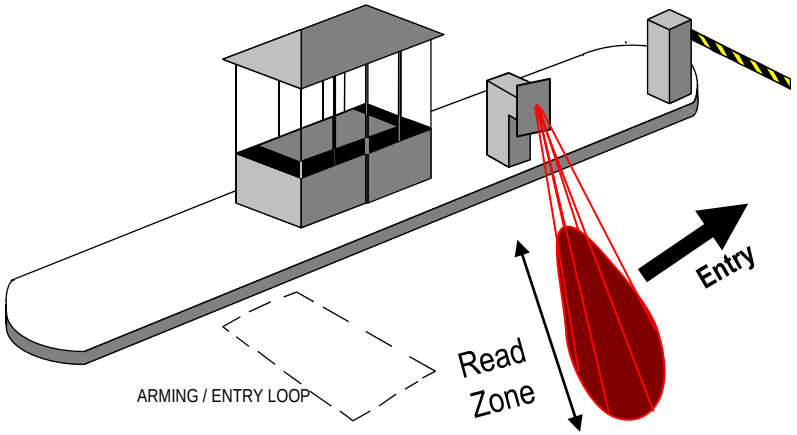
Serial Output (RS232)

This is a standard RS232 Serial interface that can be read by any computer that accepts RS232 communications. The Readers will output data through simultaneous output ports and can be monitored with a terminal program that displays ASCII data.



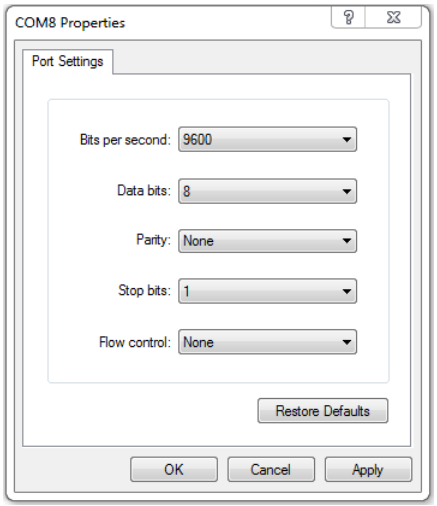
Trigger Function

If the Reader is configured for triggering mode, the reader will only read a tag when the **BLUE** trigger wire (T1) is tied to ground. Normal ways to accomplish this is by using a Loop Detector or the preferred detection system is the tres Smartloop to detect the presence of a vehicle to open a gate, or as a safety device to prevent the gate from closing on a vehicle in its path.



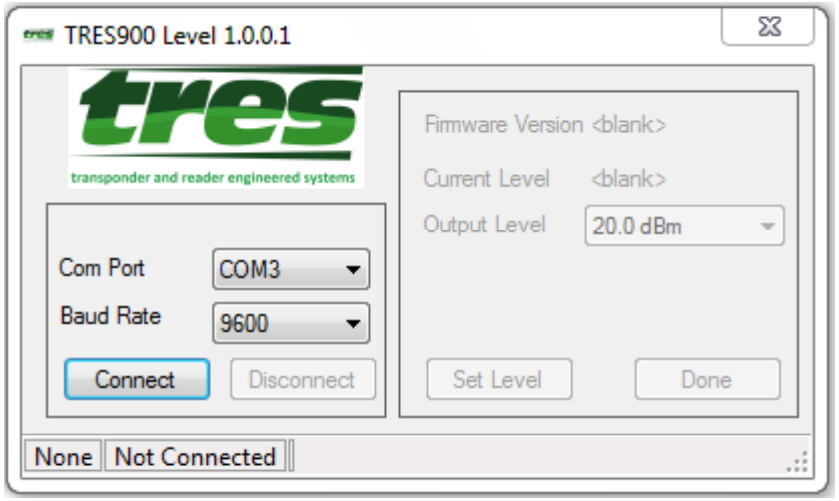
Terminal Program Setting

The default communication settings are 9600, 8, N, 1. Execute this file so HyperTerminal can open in a window on your PC. Upon powering the Reader you should see a start up message displayed to your screen, this indicates the Reader has performed a self test and is ready to be operated. You are now ready to read Tags and have them reported to your PC.



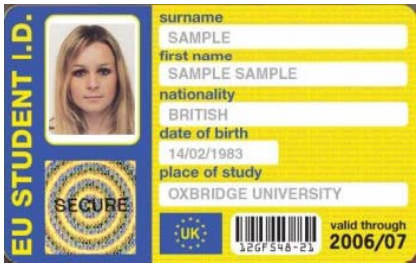
Power Level Control

The program in the CD called “treslevel.exe” is a handy utility that allows you to control the output power of the Reader. What this means is if you are getting 30’ read range but only want 15’, then change the Output Level from 30.0 dBm to 20.0 dBm. Once installed you connect your Reader to the PC via RS232 port and run this program.



Tag Programmer

The tres900 has a tag Programmer and software package that allows our factory and you to program 26 bit Wiegand data to any EPC Gen2 inlay/credential ….. Including custom programming of our tags/credentials



Troubleshooting Guide

Q: To confirm that the unit is operating properly

- Confirm the beeper is audible when a good tag is presented or when power is first applied. If it is not, remove power.
- Check that the **RED** and **BLACK** wires are installed correctly
- Check the voltage at the Reader pigtail cable, if you under cabled the voltage drop would be too much to power up the Reader.

Q: Reader just beeps and keeps beeping, about 3 x per second

- Not enough power from the power supplier, Insufficient power,
- Check the voltage at the Reader pigtail cable, if you under cabled the voltage drop would be too much to power up the Reader. Verify the voltage supplied to the Reader is between 8 and 16 VDC

Q: Reader does not recognize a tag (no beep, no outputted tag data)

- If no beep, check to see if another tag works, maybe damaged tag. Verify Reader operations by connecting to a computer through the RS232 port and running a Terminal program.

Troubleshooting Guide

Q: Tag data to panel is scrambled or Reader beeping and host not responding

- One or more of the Reader's wiring connections are incorrect. Power down the receiver/panel and verify the wiring connections are correct. Check that Data 0 (**GREEN** wire), Data 1 (**YELLOW** wire) and ground (**GRAY**) are properly attached between the tres900 to the host panel.
- Earth Ground should terminate at the back of the Reader through the mounting brackets or through the Readers Power Supply Ground wire (negative feed).
- Cable between Reader and panel is too long, check Wiegand specifications
- Check to insure the tres900 tag number and site code are properly programmed in the host panel.
- Check the Wiegand timing that your host is looking for and insure their timing scheme is within the SIA standard parameters.

Q: Read Range too short

- Ground loop could be an issue here, see if earth ground terminates at the reader. Check by powering reader without reader ground wire connected. Earth ground should terminate at the Reader, check your panel or power supply.
- Tag orientation should be in a vertical position for the Readers Antenna maximum performance and distance.

LIMITED WARRANTY

Transponder & Reader Engineered Systems, Inc. warrants its tres900 tag readers, cards and tags to the original purchasers to be free from defects in material and workmanship for a period of one (1) year, when they have been installed and used in accordance with Transponder & Reader Engineered Systems instructions and have not been abused, modified or tampered with. The warranty period commences with the date of shipment and extends to the time indicated above.

Scope of Warranty: Transponder & Reader Engineered Systems sole liability is limited to the repair or (at Transponder & Reader Engineered Systems option) the replacement of the defective product or part when sent to Transponder & Reader Engineered Systems facility (freight and insurance charges prepaid) after first obtaining Transponder & Reader Engineered Systems Return Merchandise Authorization (RMA). All replaced parts shall become the property of Transponder & Reader Engineered Systems. In the event that no defect is found during the follow-up evaluation, Transponder & Reader Engineered Systems reserves the right to bill the customer for labor and time expended

Transponder & Reader Engineered Systems will provide advance replacement of tres900 asset/vehicle tag readers submitted for warranty claim provided that the customer requests advance replacement at the time an RMA is issued. If the product to be returned is not received by Transponder & Reader Engineered Systems within 30 days of RMA issuance, or warranty is determined to be void under the conditions of this warranty statement, customer will be billed for advance replacement items subject to normal credit terms and conditions.

LIMITED WARRANTY

This express warranty is extended by Transponder & Reader Engineered Systems to the original purchaser and may not be assigned or transferred to any other party. This is the complete and exclusive warranty for tres900 asset/vehicle tag readers and tags sold by Transponder & Reader Engineered Systems, and this warranty may not be enlarged by any other statements, verbal or written, that are not a part of this warranty statement without Transponder & Reader Engineered Systems express written consent.

Warranty Exclusions

- Defects or damage resulting from use of the product in manners other than normal and customary.
- Defects or damage from misuse, accident, vandalism, neglect or attempted modification.
- Defects from improper installation, testing, operation, maintenance, alteration or modification.
- Damage due to improper wiring of devices not in accordance with published installation instructions.
- Attempted disassembly or repair without written authorization from Transponder & Reader Engineered Systems.
- Power surges due to malfunctioning control panel or lightning.
- Dye sublimation or thermal transfer surfaces not associated with the tags/cards' electronics, magnetic stripes or bar codes on the surface of the cards

EXCEPT AS STATED ABOVE, TRANSPONDER & READER ENGINEERED SYSTEMS MAKES NO WARRANTIES, EITHER EXPRESS OR IMPLIED AS TO ANY MATTER WHATSOEVER, INCLUDING WITHOUT LIMITATION, THE CONDITION OF ITS PRODUCTS, THEIR MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.