



TESS I

Wireless Control System

Installation and User Manual

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TESS1 Wireless Installation and User Manual
RPM Control Company April 2005 (Rev. 1.1)

1. Introduction:

Thank you for purchasing the TESS1™ Wireless control system. This system will allow you to control the vehicles engine and the hydraulic system wirelessly.

1.1 Service and support

If you need additional information on how to set up or operate your TESS1 Wireless Control, please contact us. We welcome and encourage your comments so we can continue to improve our products and better meet your needs.

Sales, Customer Service and Technical Support

Tel: 1-866-519-9817 (USA and Canada) or 1-519-758-7901

Fax: 1-519-428-2119

E-mail: rpmcontrol@rpmcontrol.com

Web: www.rpmcontrol.com

1.2 Product returns

All product returns require a Return Goods Authorization (RGA) number. Please Contact RPM Control for Technical Support before attempting to return your product. Make sure you return all the items that were shipped with your product.

1.3 Safety

Read the safety instructions before first use of this product.

- Read and understand all instructions.
- Follow all warnings and instructions marked on the product.
- This product should never be placed near heat source.
- This product should be supplied with a maximum power source of 13.8 Volts DC, protected by a 15 Amp. Fuse/Circuit Breaker. If you are not sure of the type of power supply in your Truck, consult your Truck dealer.
- Do not overload the relays circuits, as this can result in the risk of fire.
- Never insert objects of any kind into the products connectors or switches. This may contact intricate electrical components and may cause a short, resulting in electrical shock or fire.
- To reduce the risk of electric shock, do not disassemble this product. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock during subsequent use.
- Avoid using a Remote Controller during an electrical storm. There may be a remote risk of electric shock from lightning.
- Do not use this product near intensive care medical equipment or by persons with pacemakers.
- Due to the radio signals between base station and POD, wearers of hearing aids may experience interference in the form of a humming noise.

- This product can interfere with electrical equipment such as answering machines, TV sets, radios, computers and microwave ovens if placed too close.
- If any one of the following conditions occurs, unplug this product from the battery source and refer servicing to a qualified technician.
 - a. If the product does not operate normally by following the operating instructions.
 - b. If the product has been dropped or damaged.
 - c. If the product exhibits a distinct change in performance.

To reduce the risk of fire or injury to persons, read and follow these instructions:

TESS1 wiring information

- Use caution when installing wires.
- Never install wires during an electrical storm.

Batteries

- Use only the battery pack type listed in this manual.
- Do not dispose of the battery pack in a fire, as they can explode. Check with local codes for battery disposal regulations.
- Do not open or mutilate the battery pack. Released electrolyte is corrosive and can cause damage to the eyes or skin. It can be toxic if swallowed.
- Avoid contact with rings, bracelets, keys or other metal objects when handling the battery pack. These objects could short out the batteries or cause the conductor to overheat, resulting in burns.
- Do not attempt to recharge the battery pack by heating it. Sudden release of battery electrolyte can cause burns or irritation to the eyes or skin.
- Observe the proper polarity, or direction, of any battery. Reverse insertion of the battery pack can result in leakage or explosion.
- Remove the battery pack if the product will not be in service for several months at a time. The batteries could leak over that time.
- Discard any “dead” battery packs as soon as possible to avoid leakage into the product that may cause damage.
- Do not store this product or the battery pack in a high temperature area.
- Battery packs that are stored in a freezer or refrigerator should be protected from condensation during storage and defrosting. Battery packs should be stabilized at room temperature before using.
- Your battery pack is rechargeable and can be recycled once it outlives its usefulness.

Before disposing of used battery packs, please check with your local Municipal Waste Management Systems for approved disposal methods.

Save these instructions

2. Getting Started:

Your new TESS1 wireless control system consists of one receiver to interface with your trucks electrical systems and one to five transmitters to wirelessly control engine and hydraulic functions. Simply follow the installation instructions below to complete the receiver electrical and programming requirements.

2.1 Installation Instructions

Pin# 1 Connect to chassis ground

Pin# 2 To ECM switched feed wire. (See **Note 1**)

Pin# 3 Refer to the ECM Jump Configuration & ECM Set RPM Guide Sheet.

Pin# 4 Connect to Emergency Hydraulic Pump Relay.

Pin# 5 Tee into the starter wire from the key switch. (See **Note 2**)

Pin# 6 Not Used

Pin# 7 To ECM switched feed wire. (See **Note 1**)

Pin# 8 Refer to the ECM Jump Configuration & ECM Set RPM Guide Sheet.

Pin# 9 Not Used.

Pin# 10 To the On/Off switch (PTO). 12 volt ignition fused. (15 amps) (see **Note 3**)

Note 1: The ECM switched feed wire has to be cut. The one wire will be joined to **pin#2** and the other wire will be joined to **pin# 7**.

Note 2: Safety Interlocks can be installed in pin #1 & #10

Note 3: This 12v signal must be stay latched at all times during the TESS I Wireless operation.

2.2 Programming

Requirements:

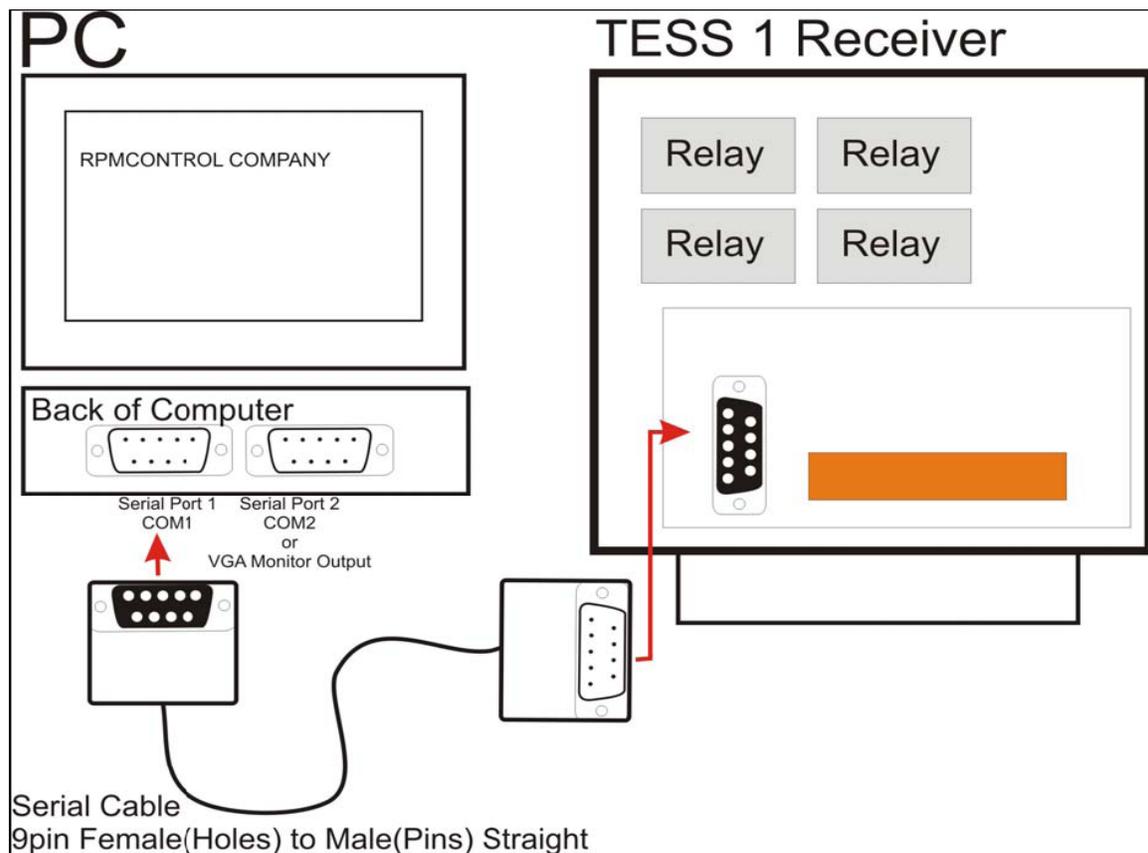
PC or Laptop with Windows® 98, ME, 2000, XP, XP PRO

Serial Cable 9 pin Female to Male Straight or USB Communications Cable USB to 9 Pin Male Straight.

Software HyperTerminal (included in Windows OS package)

NOTE: If your computer does not have a 9 pin communications port you will require a USB communications cable with a 9 pin male connector. Before proceeding please install the appropriate drive for this device.

2.2.1 Setup for Programming TESSI Receiver:

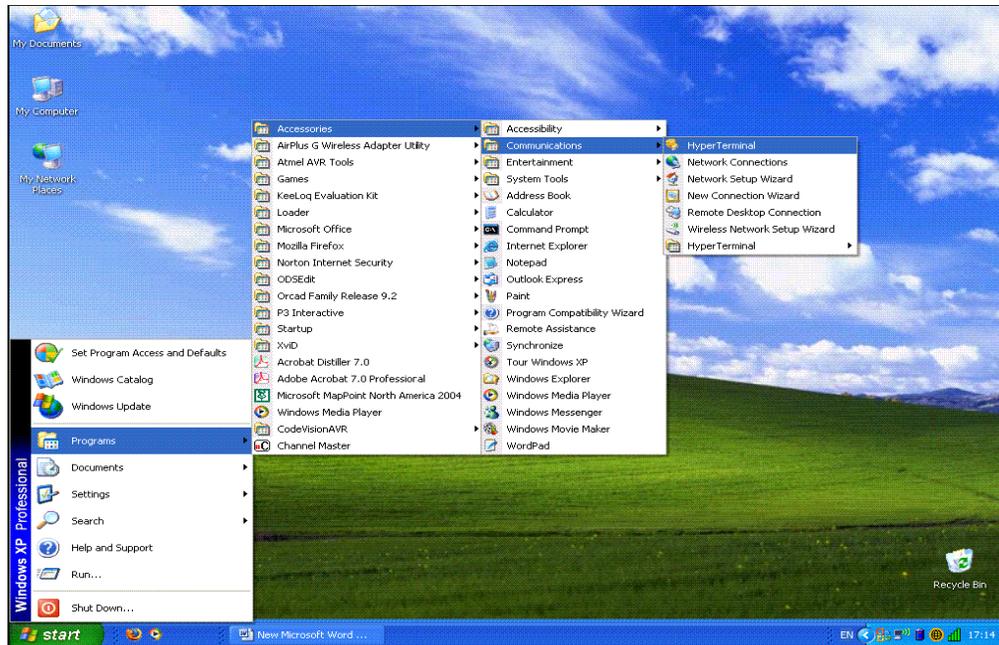


After connecting PC to TESS I Receiver by Serial Cable, prepare a 13.8V Power Supply and Ground. Connect the **13.8V power supply to Pin#10** and the **Ground to Pin#1** but do not power the system up yet!

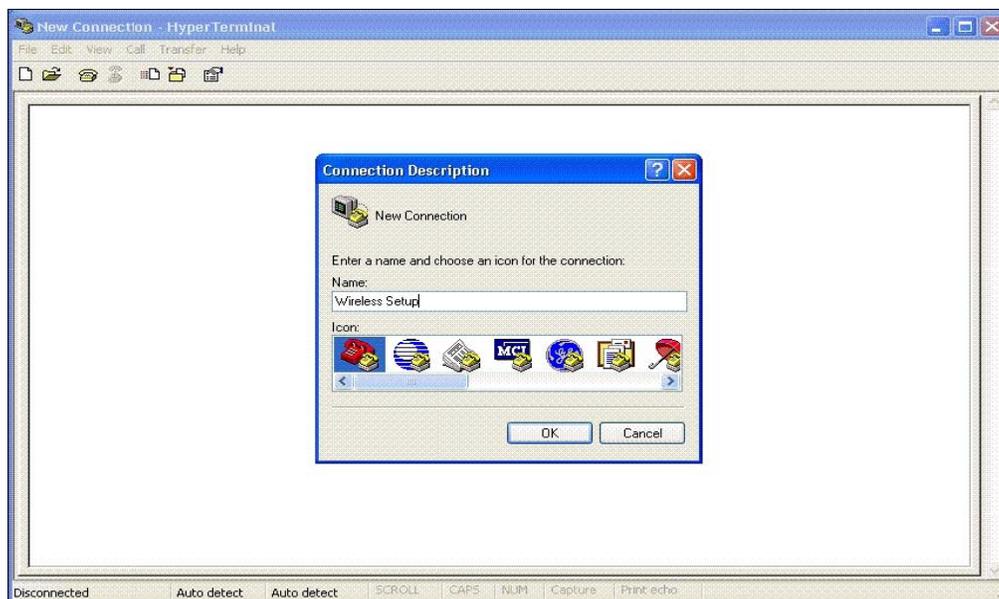
If you have already installed the TESS I in the vehicle, turn the Key OFF.

2.2.2 Setup for HyperTerminal:

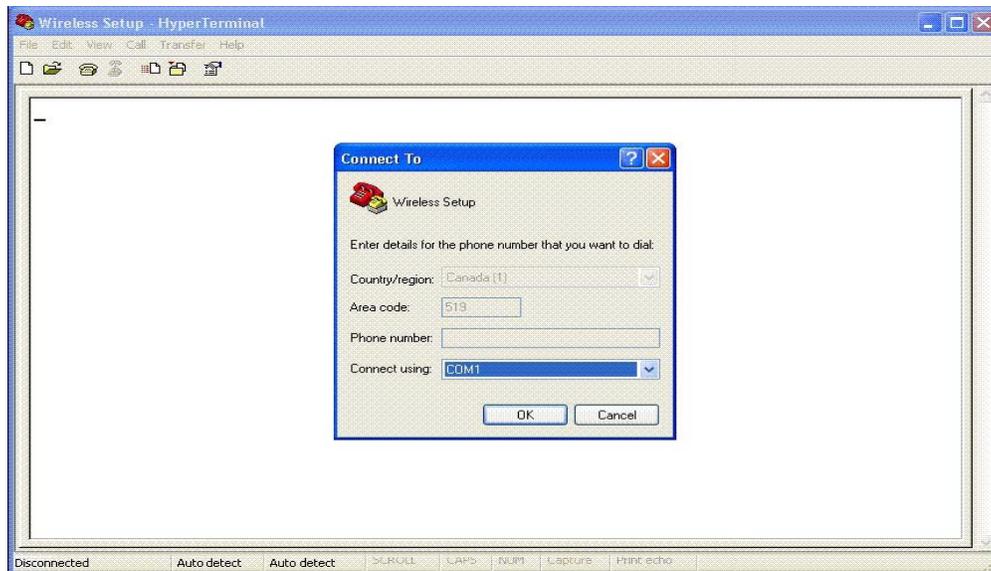
1: Start HyperTerminal which is located in Start -> Programs -> Accessories -> Communications folder as shown below.



2: Click on HyperTerminal in the Communications folder. The Communications Description dialog box will pop up to create a New Connection. Under the "Name" heading, type the name for your new connection for example "Wireless Setup" select the desired icon for your connection and click "OK".



3: Next is the “Connect To” dialog box. Under the “Connect using” drop down menu choose the COM port where you are connecting your serial Cable to (this may vary form PC to PC). In this case we are using“COM1”. Click OK.



4: Next is the “COM1 properties” (your COM number may vary) dialog box. In this window set the following parameters.

Bits per second: 9600

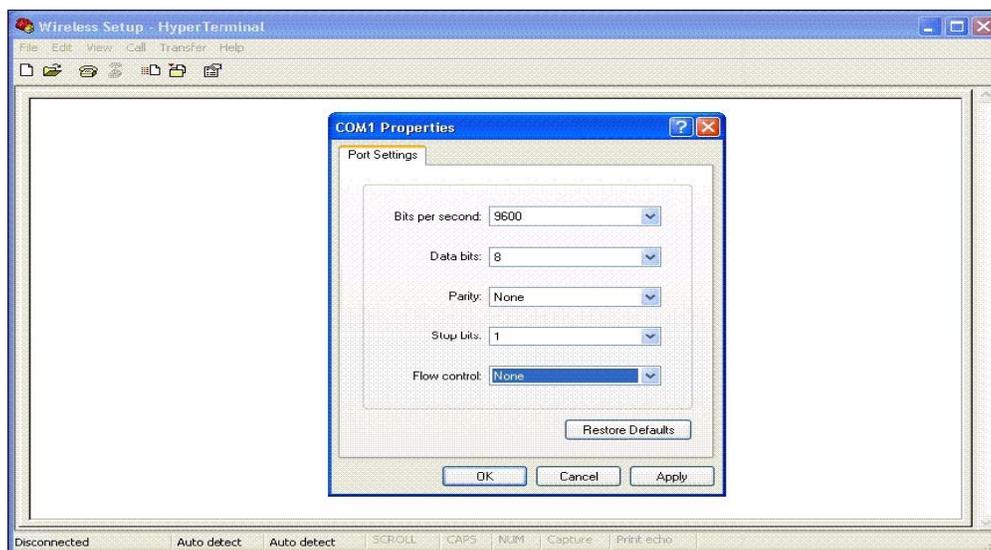
Data bits: 8

Parity: None

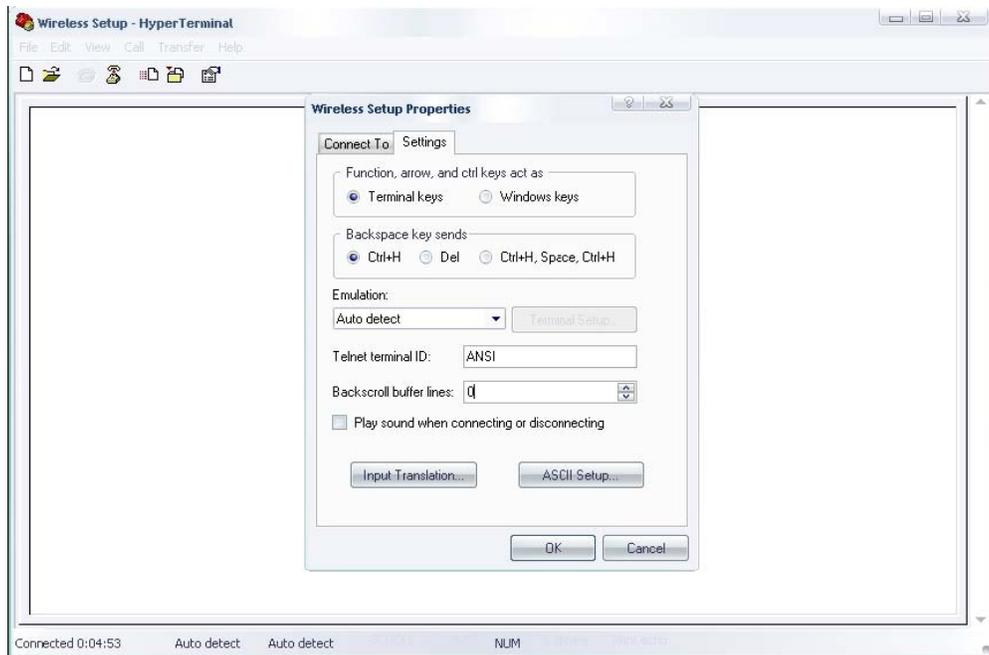
Stop bits: 1

Flow Control: None

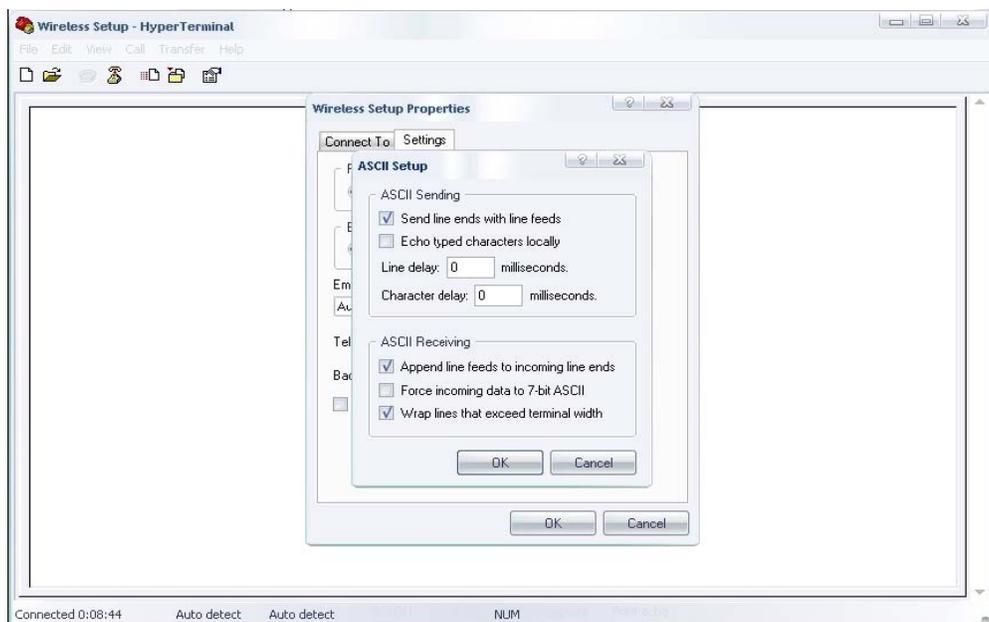
Click Apply and then OK.



5: Now a new Window will open with the name “Wireless Setup - HyperTerminal”. Under “File” select “Properties” the “Wireless Setup Properties dialog box will come up. Select the “Settings” tab. Change the “Back scroll buffer Lines” to 0.



6: Now click on “ASCII Setup” button and check the following boxes, Click OK to close the “ASCII setup” dialog box and OK again to close the “Wireless Setup Properties” dialog box.



7: Now save your settings for future use. Go to File -> Save and your new connection will be saved to your Hard Drive. The next time you start HyperTerminal, go to File -> Open and pick up your saved connection. Now you are set for programming.

2.2.3 Main Programming of TESS1 receiver:

Before you start, check all your cable connections (Serial Cable and Power Cable). When you have everything connected, Power Up the receiver. On your computer screen you should see the following text:

"Firmware version "date" Controller has been restarted. Now on your Computer Keyboard push the "SHIFT" + "!" keys. You should now see the "Welcome at SETUP Utility for Remote Control" menu. From this menu, you can select the programming operation that you wish to perform.

```
Firmware Version January 03, 2008 V 3.01 TESS 303 6 relay, 7th relay is activated on startup
START Option = DISABLED

Welcome at SETUP Utility for Remote Control !

TryToo.ca and RPM Control Company !

What are you want to do ?
Programming OUTPUT                                0
Program NEW TRANSMITTER push                       1
Erase ALL TRANSMITTERS push                         2
For Exit push                                       E
```

2.2.3.1 Programming Channels/Outputs

From the main Setup Menu type "0" to Program Output Channels. The following statement will appear showing you your current channel states, channel options, and "Channel 1 value is 0" options menu.

```
Setup for Programming Outputs
Output #1 is MOMENTARY
Output #2 is LATCHED
Output #3 is MOMENTARY
Output #4 is MOMENTARY
Output #5 is MOMENTARY
Output #6 is MOMENTARY
Output #7 is MOMENTARY
Output #8 is MOMENTARY

Do you still want to change configuration?
Y=Yes, N=Continue with present configuration.
```

The word Channel corresponds to an Output. The TESS1 wireless uses channels 1, 2, 4 and 8 as outputs.

Channel 1 corresponds to the "Start Button" on Transmitter (Controller)

Channel 2 corresponds to the "Throttle Button" on Transmitter (Controller)

Channel 4 corresponds to the "Stop Button" on Transmitter (Controller)

Channel 8 corresponds to the "Emergency Pump" on the Transmitter (Controller)

Channel Options:

- a) Using the value 000 for a channel will cause a Momentary output and will be active only when the button is pushed.
- b) Using the value 255 for a channel will cause the output become latched on and the Channel will stay Latched on until the same button is pressed again which will cause the output to become inactive.
- c) Using a value anywhere between 000-255 for a channel will cause a timed output, this means when button is pressed, the output will be latched on then when the value, that was chosen has expire it will unlatch the output. Example: If a value of 10 is used, when you press button and release it, the output will be active for 10 seconds and then become inactive.

If you want to change the value for one or more channels or outputs follow these steps:

- 1) Input the value that you require for the Channel 1 or check present value so you can re-enter it back (See note 2). Example: If you are going to set this channel/output for momentary signals, enter "000" for Channel 1.
- 2) The following options will appear, "Do you want to proceed to the next channel press Y, or to exit the routine press E". If you want to program the next channel/output press on the Y key, if you are done making changes press on the E key, which will bring you back to the main menu in the Setup Utility. You should now see your new current configuration for all channels. Please review your new channel configurations to be sure that you have configured them properly.

NOTE 1: Improper channel configurations may cause damage to the systems that they control.

NOTE 2: Once you have entered the Output Channels programming menu you will have to reprogram the first channel enable the Exit function.

2.2.3.2 Programming New Transmitter

From the main Setup Menu type "1" to Program a new Transmitter. The following statement will appear "Push any Button on the Transmitter Right Now". It is always a good idea to erase all transmitters before starting to program a new or existing transmitter into the system.

```
Firmware Version January 03, 2008 V 3.01 TESS 303 6 relay, 7th relay is activated on startup
START Option = DISABLED

Welcome at SETUP Utility for Remote Control !

TryToo.ca and RPM Control Company !

What are you want to do ?
Programming OUTPUT                                0
Program NEW TRANSMITTER push                       1
Erase ALL TRANSMITTERS push                         2
For Exit push                                       E

Push any Button on Transmitter Right NOW_
```

When you have prepared the Transmitter for programming push any button on the transmitter and it will be programmed into the receiver. If you wait too long before pushing the button on the transmitter, it will automatically leave the programming screen and return to the main menu.

```
TryToo.ca and RPM Control Company !

What are you want to do ?
Programming OUTPUT                                0
Program NEW TRANSMITTER push                       1
Erase ALL TRANSMITTERS push                         2
For Exit push                                       E

Push any Button on Transmitter Right NOW

Learn Has NOT been succesfull! Please Try Again

What are you want to do ?
Programming OUTPUT                                0
Program NEW TRANSMITTER push                       1
Erase ALL TRANSMITTERS push                         2
For Exit push                                       E

-
```

Once you have program the transmitter in it will return back to the main menu, to program a second or a third, etc up to five transmitters, just follow the same steps as before.

Note: you should always make sure that the number of transmitters that are programmed into the receiver is the same as what is actually on the truck.

2.2.3.3 Stop Before Start Feature

This feature was design to protect the engines starter from being engaged while the engine is still running. The way this works is the stop button would have to be pushed for 4 seconds before the starter will be allowed to engage. When the system is used properly the operator would never know that this feature is there.

To know whether or not this feature has been activated, on the startup screen when the TESS 1 Wireless is turn on, it shows you on the screen as shown below.

```
Firmware Version January 03, 2008 V 3.01 TESS 303 6 relay, 7th relay is activat
ed on startup
START Option = DISABLED
_
```

To change this feature you would go into the main menu by pushing the shift key and the ! key at the same time. Then you would push the shift key and the letter O key at the same time and then a menu will come up to allow you to enable or disable this feature as shown below.

```
Firmware Version January 03, 2008 V 3.01 TESS 303 6 relay, 7th relay is activat
ed on startup
START Option ENABLED

Welcome at SETUP Utility for Remote Control !

TryToo.ca and RPM Control Company !

What are you want to do ?
Programming OUTPUT                                0
Program NEW TRANSMITTER push                       1
Erase ALL TRANSMITTERS push                         2
For Exit push                                       E

Option for START button?
0 = DISABLED
1 = ENABLED
```

The program will automatically exit you out to the main menu after you choose one of the options.

2.2.3.4 Erase All Transmitters

From the main Setup Menu type “2” to Erase All Transmitters. This procedure will erase all previously programmed Transmitters from memory. All Transmitters will need to be reprogrammed back to the Receiver. It is recommended that all transmitters be erased from the system before adding or replacing an existing transmitter.

2.2.3.5 Exit

To exit push the “E” key. This option will allow you to exit the Setup Utility Program.

Note: If for any reason one of the above procedures locks up during programming, turn the Receiver OFF for 5 seconds and then back on to restart the system.

2.3 Receiver Setup

The Tess 1 Wireless System is equipped with internal relay jumpers to accommodate positive & negative signal outputs. Jumper settings are dependent on your vehicle ECM electrical system and required auxiliary output signals.

To reconfigure the output signals of your TESS I Receiver you will need to remove the cover to access the relay jumpers. Please refer to the “TESS203 Quick Reference Sheet” for a detailed internal Receiver layout.

NOTE: Disconnect the receiver power source or turn the vehicle key switch to OFF before proceeding.

2.3.1 Jumper Settings

Each relay is equipped with its own jumper set directly below requiring a standard mini fuse to complete the jump. Refer to DIAGRAM 1 for proper jumper insertion location of positive or negative output signals.

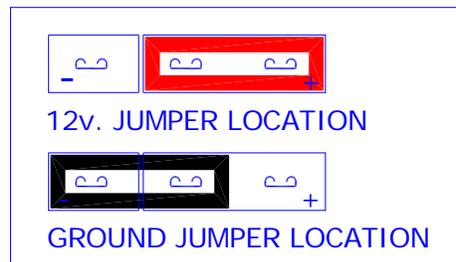


DIAGRAM 1

Pin # 5 (Ch 1) - Remote Starter Output - Jump Positive

Pin # 3 (Ch 2) - Remote Throttle Increase - Refer to “Engine ECM Jump Configurations” for required output to your engine ECM.

Pin # 2 & 7 (Ch 4) - Remote Engine Stop - No Jumper

Pin # 4 (Ch 8) - Emergency Hydraulic Pump - Determine the output required to operate the E-Pump Solenoid (Positive signal or a Negative signal)

2.3.2 Engine ECM Jump Configurations

Positive Input Engines: Volvo, International, Mack

Negative Input Engines: Cat, Cummins, Detroit, Mercedes

NOTE: Use this guide to correctly set the proper output signal to the ECM. Incorrect signal input could cause damage to the ECM.

2.3.3 Jumper Fuse Ratings

Your TESS I system is capable of handling a load output of up to a maximum of 15 amps (minimum 3). For more information on load ratings please contact a qualified service Technician or contact us for further information.

2.3.4 Relay Indicator LED's

Each relay channel is equipped with its own on board LED indicator. With the Receiver powered up and by pressing any of the function buttons, you will see a small green LED indicator light beside its corresponding relay. If you do not see an indicator light while pressing a function button please review the troubleshooting section of this manual.

2.3.5 Relay States

Below is a description of the TESS I standard relay states for each one of its functions. To modify any of the standard manufactures setting please review the programming instructions mention earlier.

Momentary Relays – Ch 1 ~ Engine Start, Ch 4 ~ Engine Stop, Ch 8 ~ E-Pump

Latched Relays – Ch 2 ~ Throttle Increase

2.4 Troubleshooting

The receiver of the TESS1 Wireless has three Diagnostic LED (Light Emitting Diode) Lights that can be use to diagnose some of the basic problems that may show up.

Green – This light will light up when ever the system is given a 12v dc signal and ground at the appropriate inputs on the connector.

Blue – This light will flash when you push any button on the transmitter. When the light is flashing, the receiver is receiving data from transmitter. If you are pressing the button on the Transmitter, and blue LED is not flashing, the following should be checked:

1: Battery in the transmitter could be weak or dead. Check Battery Voltage, when you pressing any button on Transmitter. The voltage should be between 2.8-3.6V.

2: Your Transmitter is not programmed in Receiver Memory. Follow procedure on the above in section “Programming”

RED – When this light is flashing with beeping sound. The last Transmitter which sent a signal to the receiver has a battery with Low Power. You have to exchange battery.

If you are unable to find the solution to the problem, you will have to contact Technical Support at RPM Control Company.

Phone: 1-886-519-9817 – 1-519-758-7901

Email: rpmcontrol@rpmcontrol.com

3. Appendix:

3.1 Specifications

3.1.1 TESS1 receiver:

Dimensions:	4"x4"x2"	100mm x 100mm x 50mm
Power Supply (V):	13.8 V	
Consumptions Standby (A):	0.25 A	
Max Output Current (max 1 Output)	up to 15A continuously	
Receiver Sensitivity	-112 dBm	
Antenna Impedance	50 Ohms	

3.1.2 TESS1 Transmitter/Controller:

Dimensions:	4"x4"x2"	100mm x 100mm x 50mm
Power Supply (V):	3.6 V - 1/2AA type Battery	
Consumptions Standby (uA):	100 uA	
Consumptions Transmitting (mA):	4 mA	
RF Power Output	0 dBm duty cycle 25%	
Encryption Method	KeeLoq® by Microchip	

3.2 Compliance

FCC ID: TWOTESS1

IC: 6300A-TESS1

This device complies with Part 15 of the FCC Rules. 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

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

3.3 Warranty

This system is covered by a Limited Life Time Manufacturers Warranty and a Basic 1 year warranty. The Limited Life Time Manufacturers warranty will cover any defects in the systems which have occurred during the manufacturing of this product. The basic 1 year warranty covers any component that has failed prematurely under intended use of this product. The above warranties do not cover any labor costs, unless otherwise deemed warrantable by the manufacture.