

RT Video Overlay Unit



The RT series (RTB, RTS, RTX) is designed to connect in-line between a composite (analogue) video camera and video recording device (mini-DV, VHS, DVD recorder etc.). Connections at the rear of the unit allow vehicle data (rpm, throttle, indicators etc.) to be input into the RT, which then overlays a graphic of this data onto the video. A GPS input at the front connects to the antenna supplied to measure speed.

Installation

The RT can be installed in any vehicle and powered from a 12v battery or the vehicle's own 12V supply. The unit can be mounted in any position in the vehicle, although it is recommended to position it away from areas of excessive vibration, heat sources (engine, exhaust, etc.) and where it could be exposed to rain or water. The unit can be secured using self-adhesive pads, heavy-duty fastening strip (such as 3M Dual Lock) or optional brackets.

Connect a camera or other video source (for example from a Picture in Picture unit) to the 'VIDEO IN' socket, using a short BNC-BNC cable if necessary.

Connect a monitor or video recorder to the 'VIDEO OUT' socket.

Connect the GPS antenna to the 'GPS ANT.' socket at the front of the unit. The GPS antenna should be mounted on the outside of the vehicle on a flat surface. It can be positioned on the dashboard, but it needs to have a clear view of the sky in order to acquire as many satellites as possible.

There are several connections at the rear of the unit for connecting to the vehicle. The connections are made using two green connector blocks. Wires can be attached to these connectors via screw terminals. A 12v DC input socket powers the unit. This should only be connected once all other connections have been made to the RT. A locking DC power plug cable is available as an option to prevent the cable from pulling out accidentally.

Vehicle Data Inputs

The vehicle data inputs are labelled on the rear of the unit as follows:



5V This is a regulated 5 volt DC output for powering external sensors where fitted.

0V This is a Ground (0v) or signal return for any inputs on the RT. This should be used to provide a signal ground when the RT is not earthed through the vehicle's electrics i.e. when the RT is powered from an independent battery. If a vehicle's 12V supply is used to power the RT, this terminal can be left unconnected.

BRAKE This is a 12V digital input corresponding to the 'Brake' indicator on the video overlay (see screenshot below). Connect this input to a brake light or to the switched side of the brake pedal switch. When the brake is applied, a white dot appears on screen to the left of the throttle bar.

R IND This is a 12v digital input for connection to the right hand indicator light. Connect this input to the switched side of an indicator light or other switch. A right arrow will appear on screen when a voltage above 5 volts is applied to this input.

L IND This is a 12v digital input for connection to the left hand indicator light. Connect this input to the switched side of an indicator light or switch. A left arrow will appear on screen when a voltage above 5 volts is applied to this input.

The R IND, L IND and BRAKE inputs can be used to monitor other on/off type inputs if desired.

RS232 For use with PC programming cable

PROG For use with PC programming cable

THROT Throttle position input. This should be connected to the throttle position sensor (TPS) on an engine fitted with one (all fuel injected cars & most modern vehicles with ECUs). Determine which wire from the TPS carries a voltage varying with the throttle opening (usually around 0.2v at idle to 4.5v at full throttle). This is best done by turning the ignition on and

probing the connector or wire with a voltmeter. Alternatively, ask the manufacturer for a wiring diagram.

If the car does not have a TPS fitted, an optional sensor can be obtained which can be fitted to the throttle pedal and is powered from the 5v output on the RT.

CAN MPH Reserved for future use

CAN RPM This can be used as an alternative to using the 'Tach Input' connection where there is a 12v square wave signal from the vehicle's ECU, electronic tachograph or ignition system available. In this case, connect a 7K5 Ohm resistor between this input and the signal. Note: It is very important that the voltage does not exceed 12V when connecting to this input, or your RT unit may be damaged. If in doubt, please contact us first. In some cases (e.g. wasted spark ignition systems) using this connection method can result in more reliable rpm readings, particularly in throttle-off or 'over-run' conditions. A jumper inside the unit will need to be changed for this input to function correctly. The jumper is positioned on the main circuit board inside the unit. If you prefer us to carry out this modification, please return the unit to the address below.

CAN+ CAN bus high input. Used to connect to the car's CAN Bus to sense speed and RPM when the optional CAN translator board is installed (contact Drivedata for more information).

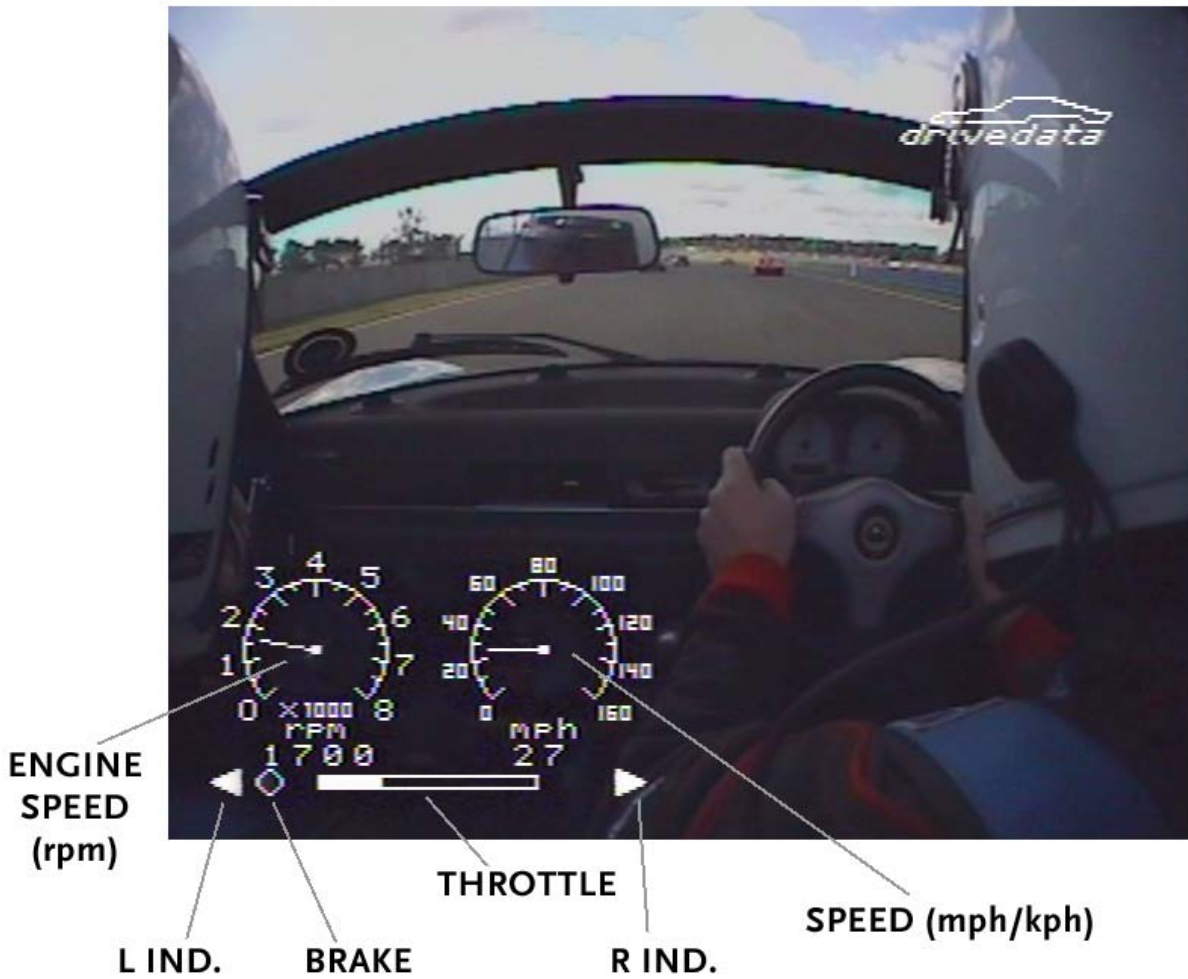
CAN- CAN bus low input. Used to connect to the car's CAN Bus to sense speed and RPM when the optional CAN translator board is installed (contact Drivedata for more information).

TACH GND RPM input signal return. Connect to vehicle ground or the RT's 0v input if unit is powered from an independent power source.

TACH INPUT RPM signal input. This should be connected to the negative side of the ignition coil (low tension circuit). If the vehicle has more than one coil (coil per plug or wasted spark systems) then connect to just one of the coils. If an unreliable or no rpm reading is obtained using this method, it may be possible to connect to an ECU RPM output if available or even an electronic tacho (rev counter) if fitted. For further information on these options, please contact Drivedata and we will be pleased to help determine the best connection method.

If the RPM dial on the display is working, but the RPM figure does not match the actual RPM, your unit may need to be reprogrammed by Drivedata. Please contact us if this is the case.

Example screen layout



N.B. Your RT layout may be different to the example above. Some of these graphics may be disabled on your version. Contact us for upgrade information & pricing. Other versions include left hand drive, kph speed, 0-16000 rev counter, lap times and full data logging capabilities.

Powering the RT

Plug the 2.1mm power cable plug into the socket on the rear panel (12V) and plug the other end into the vehicle's accessory socket. Alternatively, you can hard wire the power cable into the vehicle's 12v supply, noting the polarity of the connector – centre pin is positive.

IMPORTANT: If you are powering the unit directly from a 12v battery or other un-fused supply, we recommend fitting a 2 Amp fuse in the supply cable.

When the RT is powered up, the 'ON' LED will be lit red. If a video signal is present on the VIDEO IN socket, the LED will change to green and you should see the video and overlay on a monitor connected to the VIDEO OUT socket. Please note that if there is no video coming in on the VIDEO IN socket, you will see nothing on the output and the LED will be red.

Calibrating the throttle input

If you are using the throttle position indicator, you will now need to calibrate the RT for full throttle. Turn on the vehicle's ignition (but do not start the engine) and open the throttle to its maximum position. You will see the throttle bar at the bottom of the display move to the right. Insert a small screwdriver carefully into the 'Throttle Adjust' hole on the front of the unit and turn the screw until the on screen display indicates full throttle. At idle, the bar may read just above zero throttle, which is normal.

RT Configuration Software

The configuration software is a Windows PC utility which enables you to set up the on-screen display on your Drivedata Video Overlay Unit.

Installation

Insert the CD-ROM supplied into the CD/DVD drive of your PC or laptop. Installation should begin automatically. If not, use Explorer to navigate to the CD-ROM's folder and double click the 'install.exe' file. Follow the on-screen instructions to install the software on your PC.

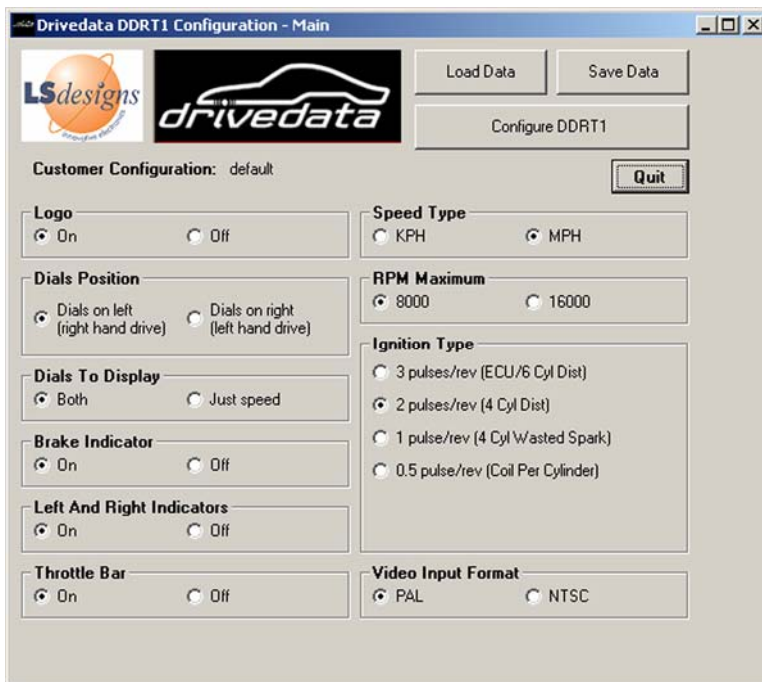
Now connect your RT unit to a spare serial port on your PC, using the cable provided. Both green connectors must be attached to the RT for the utility to work properly. Connect a video source to 'Video In' and a monitor to 'Video Out' and power the unit on.

You should see a 'Drivedata DDRT1 Configuration' shortcut on your desktop. Double click this to open the utility. You will be asked which serial port you are using to communicate with the unit. Enter the COM port number e.g. "1" , "2" etc. and press return.

If you select a COM port which does not exist or is not being used for the DDRT you may see an error "Run Time Error". In this case, you may need to uninstall the software and reinstall it before you can select a different port and run the software again.

If you get an error "Error 76 Can't find path" when running the software for the first time, uninstall the software and reinstall, making sure that the program files are installed in the 'Program Files' folder and not the 'Programs' folder.

Once the software is running you should now see the following screen:



Simply check the options you require and click the 'Configure DDRT1' button to change the on-screen display.

You can save and load profiles to your PC using the 'Save Data' and 'Load Data' buttons.

The 'Quit' button exits the program.

The RT in use

Now start the engine and check that the RPM dial and brake indicator are working properly.

If you pull away immediately, you may notice that the speed indicator is not working initially. The GPS antenna will take a little time to lock on to enough satellites to measure your speed accurately, so this is normal. After 2-3 minutes, the speed indicator will start to function correctly. In areas of dense tree cover or in very built up areas the GPS signal may be lost for a few seconds which will cause the speed dial to flick between 0mph and the true speed.

Please note that the GPS speed readout on the RT is much more accurate than most vehicle's speedometers. Typically, a car's speedometer will read 5-7mph over the actual speed. The RT gives you a true reading of your actual speed, accurate to within 1mph.

All inputs to the RT are protected using opto-isolators, which isolate the internal voltages and inputs from any external sources. This means that the RT cannot interfere with any of your vehicle's electronics and even if the car or the RT unit was to develop a fault, no serious damage to either would result.

If you find that the engine is not running correctly when the RT is connected to either the RPM circuit or throttle sensor, the most likely cause is poor earthing. In this case, ensure that the 'OV' input on the RT is connected to the 'Tach Gnd' input and to the vehicle's earth.

If you have any technical questions or need assistance in fitting your RT unit, please contact Drivedata by e-mailing us at: info@drivedata.com

Your RT is covered by a limited warranty. We will replace a faulty unit within 12 months of purchase free of charge if a fault develops during normal use. If a unit has been damaged in any way as a result of improper installation, we reserve the right to charge the appropriate repair costs. Drivedata (UK) and its representatives accept no liability for any damage or accidents to persons or property caused as a result of fitting or using our products. It is your responsibility to check that use of our equipment is legal in your country.

Specification

Video	
Video Inputs	1 (more by using the Drivedata PP1 or PQx combiners)
Video outputs	1
Format	Composite video 75 Ω 1V peak – peak. PAL/NTSC (software selectable)
Connectors	BNC.
Power	
Supply requirements	10-13V DC, 120mA internally regulated & filtered
Connector	D.C. Socket 2.1mm, locking-type (requires screw-locking plug)
Dimensions (mm)	
L x W x H	180 x 105 x 30
Weight	Main Unit - 450g, GPS Antenna & Cable - 100g