

M Machine Setup

GPS System Schematic

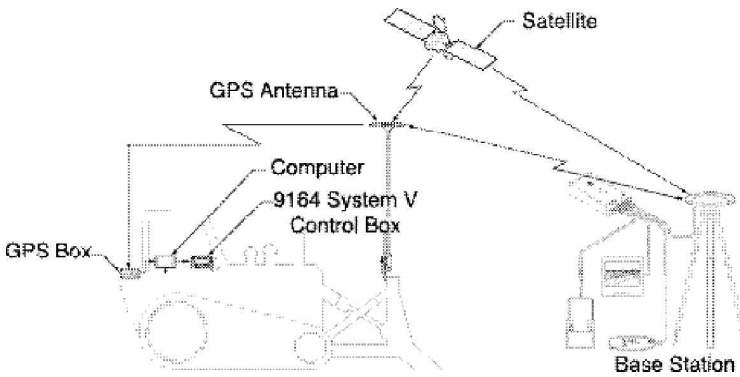


Fig 3.00

GPS Receiver

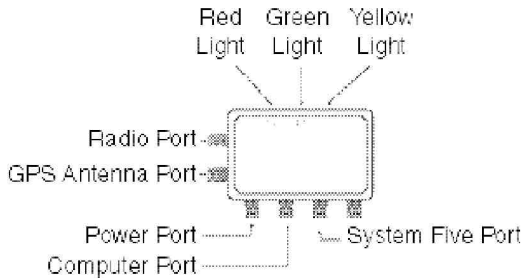


Fig 3.01

The Topcon GPS receiver attaches to the machine with magnetic mounts. It should be mounted so that these LEDs are visible and the connectors are easily removed.

The power supply cable must be connected to a 12 or 24V source on the machine. Note that the power for the main computer is routed through the GPS receiver so if the receiver is disconnected, no power is supplied to the computer. Three lights on top of the box provide status on power, satellites, and radio signal. The red light indicates power. The flashing green, middle light, indicates the number of GPS satellites. Flashing red and green lights indicate GLONASS satellites. The yellow light will indicate radio signal. When the red and green lights flash together it indicates GLONASS satellites. Most systems will use radios that are internal to the GPS receiver and for these the yellow radio light will flash once a second when data is received from the base station.

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Check that all connectors are fastened properly and that no cross threading has occurred on the GPS and radio antenna connectors. If the LEDs do not light as expected refer to the troubleshooting guide in the rear of this manual.

GPS and Radio Antennas

GPS Antenna

Make sure that the GPS antenna is properly affixed to the vibration pole on the blade of the machine and that the pole is firmly secured. Ensure that the antenna cable connection is not cross threaded. Also check the cable junction at the base of the antenna pole (or on the hood of the bulldozer) is connected.

Radio antenna

The radio antenna is usually attached to the roof of the machine using a mag-mount. Make sure that the antenna is mounted vertically, clear of obstructions and as high as possible on the machine to maximize signal reception.

Computer/Display

The computer/display unit should be mounted to provide best visibility to the operator while not obstructing his/her view of the blade. The computer has an internal battery so that it can be used for brief periods detached from the machine, but for general operation on the machine ensure that the small power connector coming from the GPS receiver is attached. This power connector is spliced together with the communication cable to the GPS receiver. At the computer end, the communication cable must be plugged to the connector on the rear marked as COM1.

On the top of the computer/display there are several buttons, the green on/off button being the most important. Below the LCD display are three “mouse” buttons which generally are not used for the GPS application. To power on the unit press the green on/off button. It will take a minute or two for the system to boot-up. The LCD screen has an integrated touch screen and all programs are manipulated by pressing the screen with your finger. To power the unit down once it is up and running make sure to use the “Shutdown” option under the “Start” button at the very bottom-left of the screen.

Creating a Machine Configuration File



Every machine is configured differently, from width of blade and height of antenna mast to specific radio configuration options. Before grading, you must create a unique profile of the machine for the 3DMC Control application. Double-click the “Machine Builder” icon on the computer’s display (Windows desktop) to create a new file...

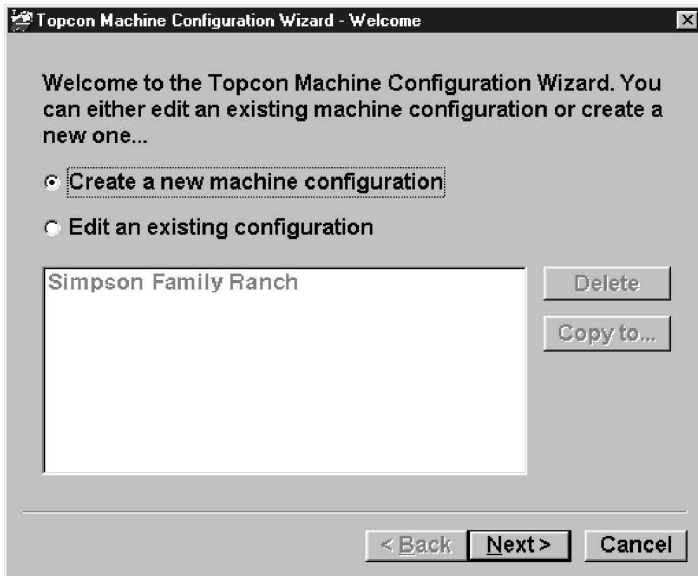


Fig 3.02

Give the machine configuration a name (up to 32 characters), chose machine type and location of antenna on the blade (left, right or middle). Left and right side are as viewed from the cab behind the blade.

Topcon Machine Configuration Wizard - Name and type

Specify the name, machine type, sensor type and units of measurement. The name should uniquely identify the machine, e.g. "Bob's D5M with GPS"

Configuration name: D&R

Machine type: Bulldozer

Sensor type: GPS Antenna

Sensor location: Middle

Measurement units: Meters

< Back Next > Cancel

Fig 3.03

Next measure the width of the blade and position and height of the antenna relative to the cutting edge of the blade, slope distance is measured by holding one end of a tape measure at the cutting edge and pulling it tight to the rim of the antenna. If the antenna is positioned past the end of the blade then you must measure to a point that is an imaginary extension of the cutting edge and not back to the blade itself. If the antenna is mounted on a Topcon TM1 control mast (that can be raised or lowered electrically) then care should be taken not to adjust the height of the mast after measurement is made.

Measure the offset that the mast is behind the cutting edge of the blade. If for some reason it is situated in front of the blade then use a negative number (e.g. -0.25'). This offset is significant when working on very steep slopes so take care to measure this and all values carefully.

Select the appropriate antenna type. For bulldozers and motorgraders this is usually the “Topcon Machine Antenna”.

Bulldozer

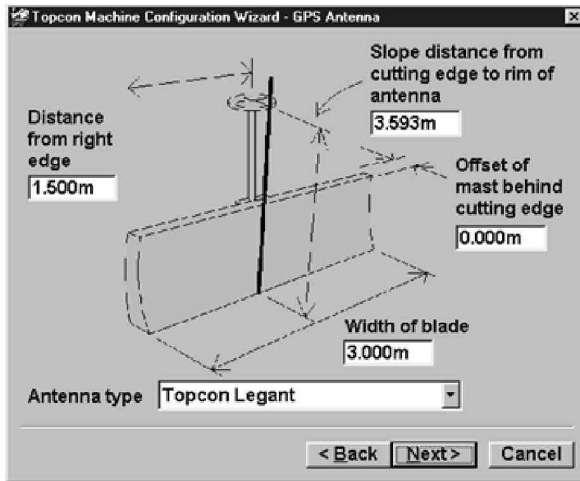


Fig 3.04a

Motorgrader

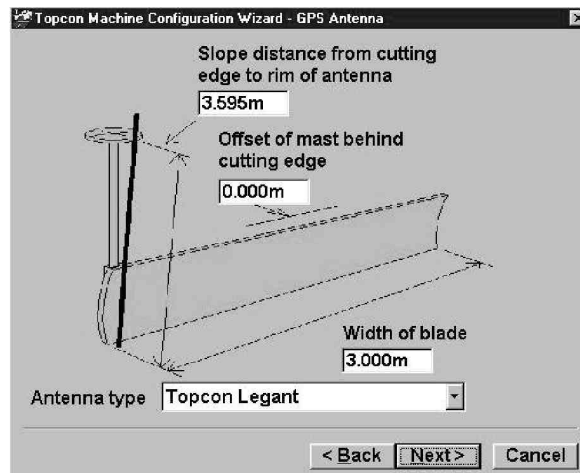


Fig 3.04a

Next you will need to choose the correct radio configuration for your system. This is extremely important. Incorrect selection will result in no radio communication between the base station and machine GPS which means no grading-quality positioning.

Please check with your 3DMC dealer to confirm the type of radios supplied with the system and/or inspect the radio unit supplied with the base-station kit. If the base radio is a Pacific Crest PDL then your machine's radio will be also. As a general rule, select the highest baud rate possible for the given radio type. However, it is possible to use radios that are mounted externally and connected through the GPS receiver's auxiliary port. Most systems have radios that are internal to the GPS receiver and so the radio port should be set to "Internal port".

The data format should be set according to what type of system you have and what system compatibility you require. Earlier systems (installed prior to January 2001) will work only with DBEN format. All later systems are capable of either CMR or RTCM 2.1 operation. Both of these are industry standards that offer compatibility with other manufacturer's GPS systems. For further information relating to manufacturer inter-operability please ask your 3DMC dealer.

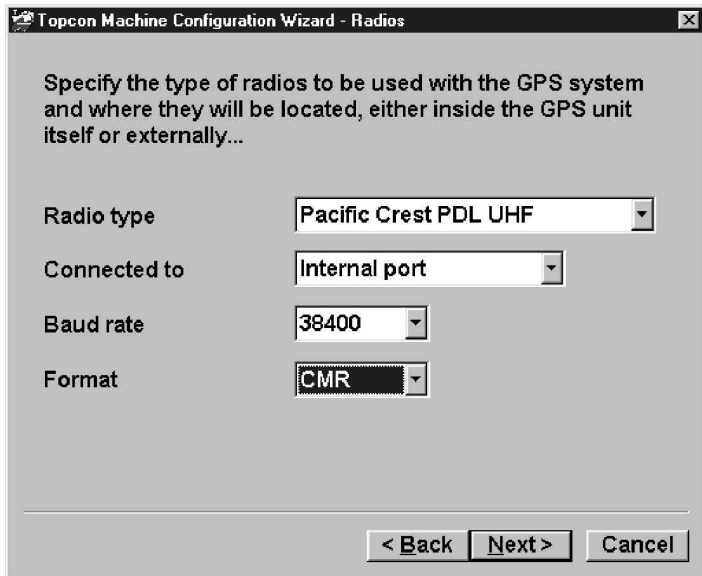


Fig 3.05

Press “Next” to complete the machine configuration and then, finally, save the file by pressing the “Finish” button.