Rexroth
Bosch Group

# CS 550/150RC

Desktop Software Manual

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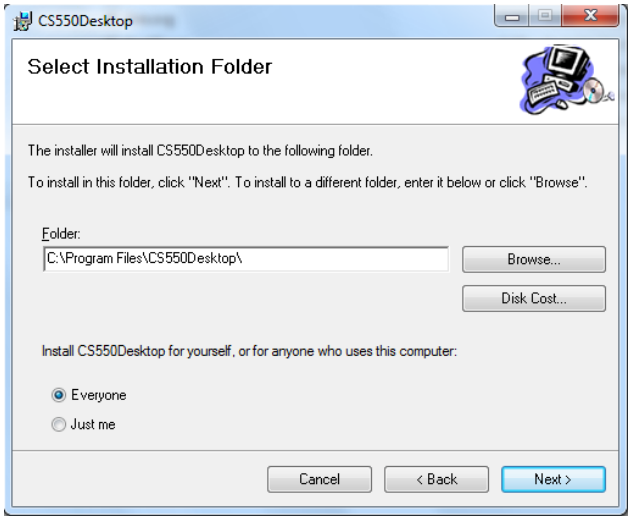
Please check for updates at: www.boschrexroth.ca/compu-spread

# 1 Software Installation

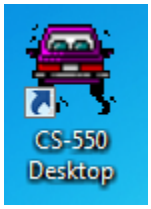
On the CD, if the software installation does not start automatically, double-click on the CS-550Desktop.msi file. If you cannot see what the file type is, allow the mouse to hover over the filename, and you should see a tooltip message that says “Windows Installer Package”.

On the screen that says “Welcome to the CS-550Desktop Set-up Wizard”, click ‘Next’.

On the screen that says “Select Installation Folder”, click ‘Next’. This should look as shown below.

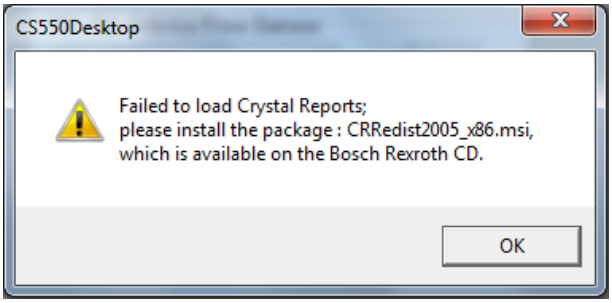



On the screen that says “Confirm Installation”, click ‘Next’.
If you are running Windows 7, there may be a delay here, and you will receive a security warning message entitled “User Account Control”: ‘Do you want to allow the following program from an unknown publisher to make changes to this computer?’ Click ‘Yes’ to proceed.

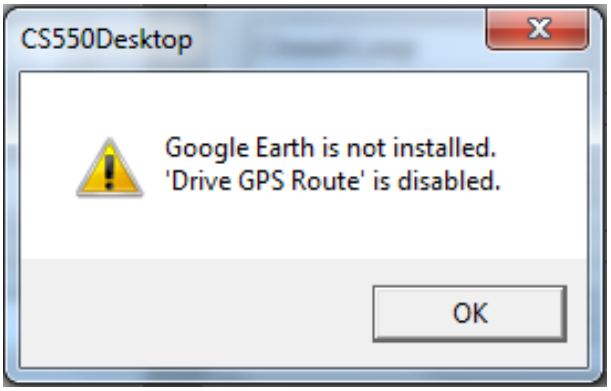



On the screen that says “Installation Complete”, click ‘Close’.
If you accepted the default values above, then the program will be installed in the directory C:\Program Files\CS-550Desktop\ and will be available for use by everyone. The desktop should now contain a shortcut that looks like the icon to the left.

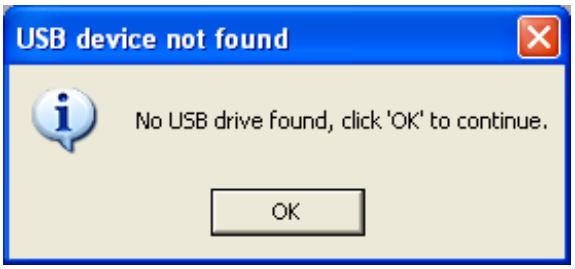
If you wish to view truck parameter reports in a printable form, or if you wish to view logging reports, then you will need to install support for Crystal Reports. On the CD, double-click on the file CRRedist2005_x86.msi and follow the on-screen instructions to do this. If this installation is not performed, and if you try to access truck parameters using the menu item ‘File->Display Truck’, then you may get the warning message shown below.




If you are using the GPS/WiFi option, and if you want to view the GPS route, then you will need to install Google Earth 5. On the CD, double-click on the file GoogleEarthWin.exe and follow the on-screen instructions. On Windows 7, it is recommended that you perform a right-mouse-button click on the file and select the option ‘Run as Administrator’ if it is available. If this installation is not performed and if you try to access GPS data using the menu item ‘File->GPS Data->Drive GPS Route’ then you will receive the warning message shown below.

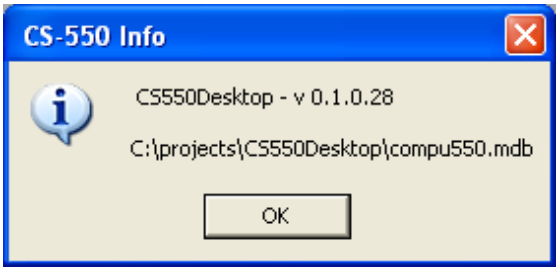


Finally, the first time you run the CS-550 Desktop program, you will probably get the warning shown below.



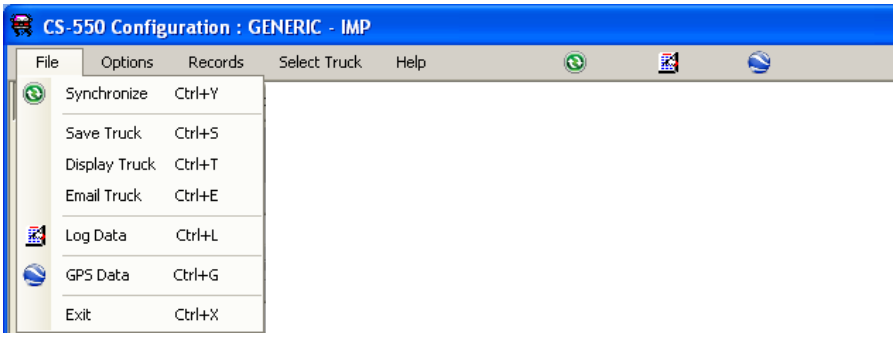

This is because the program automatically checks for the presence of a USB stick every time it starts running. The USB stick is used to transfer data to and from the CS-550 display. To avoid this message, you can insert a USB stick before starting the program, or you can disable the automatic check. To disable the automatic check, click on the menu item ‘Options->Sync at Start’. If you disable the automatic check, you can manually check for a USB stick at any time by using the menu item ‘File->Synchronize’.

If you need to confirm the version number of the software, you can do so by clicking on the menu item ‘Help->About Us’. This will produce a message in the format shown below.



# 2 Menu System

## 2.1 File Menu




### 2.1.1 Synchronize

This will check to see if a USB stick is present. If so, then truck parameter files will be copied in both directions so that the computer's hard disk and the USB drive are exact duplicates of each other. No truck data files will ever be deleted by this procedure. If two versions of the same truck are found, then the newest one will be kept. Log data files will be moved from the USB stick to the computer and will be read into a Microsoft Access database. The original log file will be deleted on the USB stick, but kept on the computer.

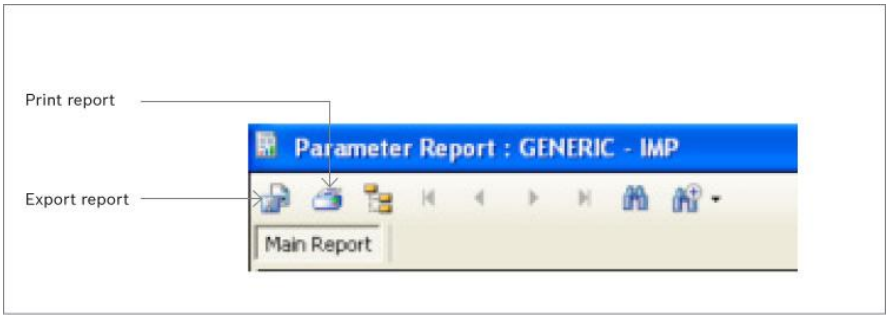
The 'Synchronize' item is also accessible using the icon shortcut (shown to the left) at the top middle of the menu bar.

### 2.1.2 Save Truck

The truck parameters for the current truck will be saved to a .bin file in a sub-directory called 550Data. The file name will have the format 'region_truck_Parm.bin'.

### 2.1.3 Display Truck

The truck parameters for the current truck will be saved to a .bin file in a sub-directory called 550Data. The file name will have the format 'region_truck_Parm.bin'.



### 2.1.4 Email Truck

Similar to ‘Display Truck’, except that the Crystal Report will be emailed as an attachment. The format of the attachment is ‘Rich Text Format’. However, for security reasons, the file will be automatically renamed to be ‘untitled.txt’. The person that receives it will need to rename it to be *.rtf before attempting to view it.

### 2.1.5 Log Data

This will bring up a new dialog window to allow for selection of logging data. For more detail, see Section 4, ‘Logging Reports’. The ‘Log Data’ item is also accessible using an icon shortcut (shown to the left) at the top middle of the menu bar.

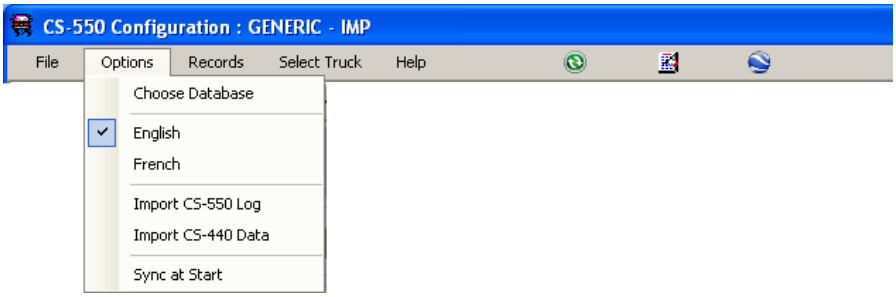
### 2.1.6 GPS Data

This will bring up a new dialog window to allow for selection of GPS trip data. For more detail, see Section 5, ‘GPS Data Reports’. The ‘GPS Data’ item is also accessible using an icon shortcut (shown to the left) at the top middle of the menu bar.

### 2.1.7 Exit

This will stop the program. If you have edited the truck data, you will be prompted to save the data.

## 2.2 Options Menu




### 2.2.1 Choose Database

The logging data is stored in a Microsoft Access database called compu550.mdb. The location of this database can be found using the menu item Help->About Us. If there are multiple available logging databases, and if you do not wish to merge these databases, then they need to be stored in separate directories. This menu item allows you to switch from one logging database to another by browsing to a new location. This new location will be remembered for future use.

Please note that all future Synchronizations of data will be performed at the new location, so the old parameter database at the old location will be abandoned and a new parameter database will be started at the new location. The parameter data is stored separately from the logging data, in a subdirectory called 550Data.

### 2.2.2 English/French

This allows you to switch to a new language. The switch will take place only after you close and restart the program.

### 2.2.3 Import CS-550 Log

This allows you to browse to a new location and select a CS-550 database (compu550.mdb) to merge with the current database. Only the logging data will be imported. If you wish to import CS-550 parameter data, and if they are not available on a USB stick, the individual parameter files can be manually copied from the directory 550Data. The parameter files will always have file names in the format region_truck_Parm.bin.

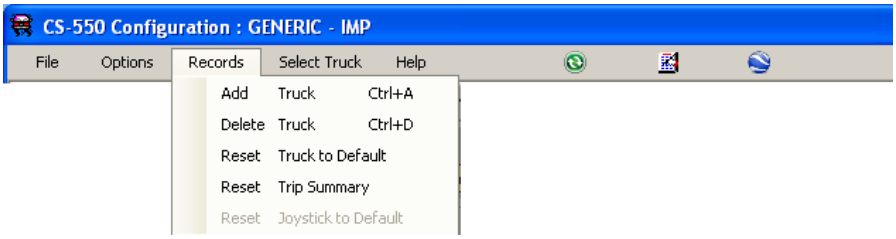
### 2.2.4 Import CS-440 Data

This allows you to browse to a new location and select a CS-440 database (compu.mdb) to merge with the current database. Both logging data and parameter data will be imported. The parameter data will be converted into individual files with names of the type region_truck_Parm.bin in the directory 550Data.

### 2.2.5 Sync at Start

This is a toggle switch to enable or disable automatic synchronization when the program is started.

## 2.3 Records Menu




### 2.3.1 Add Truck

This will bring up a dialog box to allow you to create a new truck by choosing a new region name and truck name. The region name/truck name pair must be unique, not previously used. The names can be 9 characters long, and will be capitalized. Punctuation characters like ?, >, <, : should not be used. The new truck will be a copy of the most recent data for the current truck.

### 2.3.2 Delete Truck

This will delete the current truck. If a USB stick is present then it will also be searched to see if this truck exists on the USB stick. A request for confirmation will be issued, indicating which files will be deleted. In order to delete a truck permanently, it is necessary to delete it both on the hard disk and on the USB stick.

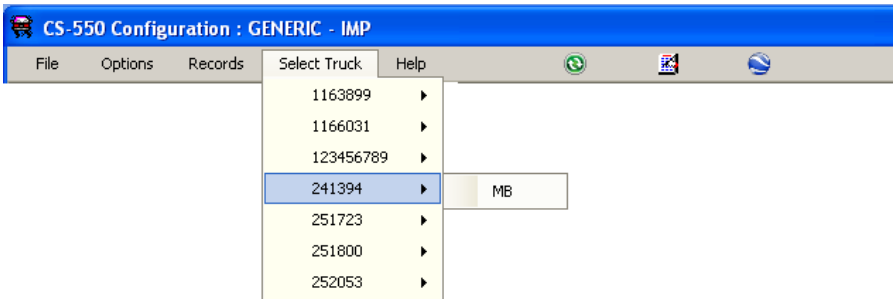
### 2.3.3 Reset Truck to Default

This will set all the truck operating parameters back to factory default. It will also reset the joystick nulling values for joystick outputs back to default, but will not otherwise modify the joystick configuration. The region name, truck name, and system units are unaffected by this reset. A request for confirmation will be issued, before performing the reset.

### 2.3.4 Reset Trip Summary

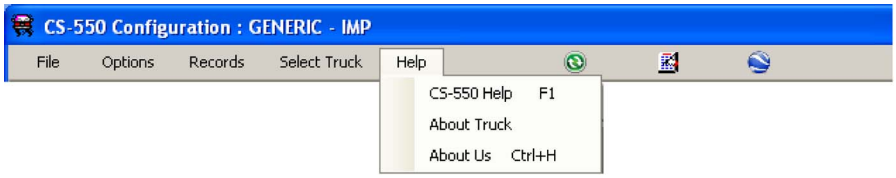
This will clear the trip summary, which is the accumulated spreading data which is shown live on the display. A request for confirmation will be issued, before performing the reset.

## 2.4 Select Truck Menu




When selecting a truck you will first specify the region and then select a truck from within that region. The main menu shows a list of available regions for which truck parameter data is available. When you hover over a region, then the sub-menu shows a list of available trucks in that region. Clicking on this truck name will load a new set of truck data and you will be prompted to save the previous truck, if any changes were made.

## 2.5 Help Menu



### 2.5.1 CS-550 Help

This will load the help file CS-550Desktop.chm, which contains the same text as the current file. The help file is also available by pressing the function key F1.

### 2.5.2 About Truck

This shows the current region name, truck name, and the date of the most recent upload of parameter data. The following information is also shown:

**Firmware Version**

This can be 400 for an RC4-4 platform, or 200 for an RC2-2 platform, with an optional (tow) in either case, if the device is a tow plow. The firmware version could also be in the series 1xx for an imported CS-440 MC-08 or 2xx for an imported CS-440 RC6-9. In this case, both the RC build No. and the Display build No. would be zero.

**RC Build No.**

This is the version number of the firmware in the RC controller. This will be zero if the truck configuration data has never been downloaded into the RC controller.

**Display Build No.**

This is the version number of the firmware in the display. This will be zero if the truck configuration data has never been downloaded into the display.

**File**

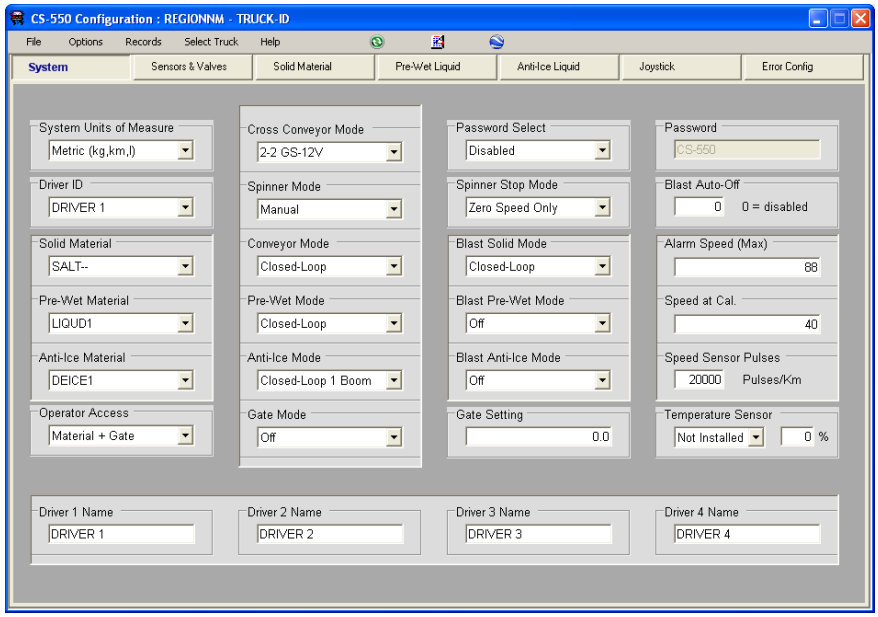
This is the file name of the truck parameter data. It can be found in the subdirectory 550Data and it should follow the format regionname_truckname_Parm.bin.

### 2.5.3 About Us

This shows the current desktop software version number, and the location of the logging database, which is also the location of the 550Data directory that contains the truck parameter data.

# 3 Truck Parameter Configuration

## 3.1 System Tab




### 3.1.1 System Units

The units of measure, Metric or Imperial, can be selected here. After changing the units, it is recommended that you perform a software reset.

### 3.1.2 Driver ID/Solid Name/Pre-wet Name/Anti-ice Name

Select one of four values for Driver ID, Solid Material, Pre-wet Material, Anti-ice Material.

### 3.1.3 Operator Access

This option allows management to limit the operator control over the gate and material selection.

**None**
This option will prevent the operator from making any changes to the gate setting or the material selected.

**Material**
This option will allow the operator to make changes to the material selection.

**Gate**
This option will allow the operator to make changes to the manual gate setting.

**Material and Gate**
This option will allow the operator to make changes to the manual gate setting as well as the material selection.

### 3.1.4 Cross Conveyor Mode

This is a generic term to cover a variety of hardware configurations. For the RC4-4 platform the modes are defined as follows:

**Normal**
This will be the most typical configuration, which supports spinner/conveyor/pre-wet/anti-ice and closed loop gate control. It also supports two additional outputs: reverse, and a GS12V digital output signal which is turned on by a ground-speed input. The four outputs: Pre-wet, Anti-ice, GS12V and Reverse can be redefined to be used for 3 boom anti-icing, in which case they become: Boom left, Anti-ice output, Boom centre, and Boom right.

**Pattern**
This supports closed loop gate control, pre-wet, and two momentary-contact digital outputs to adjust the position of a chute for pattern spreading. It also supports the option of simulated anti-ice output on the pre-wet channel.

**Air Gate**
This supports pre-wet output, reverse output, and a special digital output to move the gate to a fixed location.

**Liquid Plus**
This supports pre-wet, plus 3 boom anti-icing, and reverse.

**Cross Conveyor CA**
This supports closed loop gate control, Pre-wet, and an analog output and two digital outputs for controlling a cross conveyor.

**Cross Conveyor US**
This supports pre-wet, GS12V output, reverse, and two analog signals for controlling cross conveyors.

**Spinner Reverse**
This supports re-direction of the spinner output to either a forward or reverse motor using a live switch. In this mode anti-icing is disabled, and the normal pre-wet output signal will be sent to the spinner connector on the cable. The spinner forward signal is sent to the pre-wet connection and the spinner reverse signal is sent to the anti-ice connection.

For the RC2-2 platform the modes are defined differently. In this case the modes refer to the use that is made of the digital output labeled ‘S7 Reverse’:

**2-2 Anti-ice**
Supports anti-icing output, in addition to the normal pre-wet.

**2-2 Reverse**
Supports conveyor reverse signal.

**2-2 GS12V**
Supports GS12V digital output signal, which is turned on by ground-speed input.

**2-2 Air Gate**
Support a special digital output to move the gate to a fixed location.

**2-2 Spinner Reverse**
Supports spinner reverse, with the same output re-direction as for the 4-4 platform.

### 3.1.5 Spinner Control Mode

This specifies the mode in which the spinner operates.

**Closed Loop**
The controller receives a signal from a feedback sensor that measures the spinner RPM. Spinner speed can be controlled to give a previously calibrated spread width.

**PPS Mode**
"Precision Placement System". In this mode the spinner speed is proportional to ground speed, using a previously calibrated relationship.

**Manual**
The spinner does not have any feedback from either the ground speed sensor or the spinner speed sensor, instead the speed is specified by means of a preset percentage of output.

**Half Lane**
The spinner speed and spread width will increment in units of half a lane as the spinner knob position is increased. The conveyor output will be proportional to the spinner output, so that the amount spread per lane remains constant. The pre-wet output will also be proportional to the spinner output, so that the pre-wet application rate in liter/tonne remains constant. The spinner control mode will be manual, and the conveyor and pre-wet control modes should be either open loop or closed loop.

**Full Lane**
Same as ‘Half Lane’ mode, except that the spinner speed and spread width will increment in units of a full lane as the spinner knob position is increased, and the conveyor and pre-wet will increase proportionately.

### 3.1.6 Conveyor Control Mode
This specifies the mode in which the conveyor operates.

**Closed Loop**
This is a closed loop controller which uses a feedback signal from both the ground speed sensor and the conveyor speed sensor to apply the desired application rate in units of weight per distance travelled.

**Open Loop**
This uses feedback from the ground speed sensor to apply the desired application rate as above. The conveyor speed sensor is not used, but the conveyor speed is calculated based on valve position.

**On/Off**
This is a manual mode of operation in which the conveyor is interlocked with a ground speed sensor, so the conveyor shuts down if the ground speed is zero.

**Manual**
In this mode, the controller does not have any feedback from either the ground speed sensor or the conveyor speed sensor, the application rate is determined by means of a preset percentage of conveyor output.

**gm/sq.m.**
This is a closed loop control mode in which both solid and liquid application rates are specified in terms of weight per area (square meters) rather than weight per distance. The width of the spread area is calculated based on the spinner RPM.

**KOMBI**
This is a closed loop control mode similar to gm/sq.m. in which the total application rate is specified in terms of weight per area. The liquid application rate is specified as a percent of the total, rather than as weight per area.

### 3.1.7 Pre-wet Control Mode
This specifies the mode in which the pre-wet controller operates.

**Off**
This deactives the pre-wet controller.

#### Fixed Pre-wet
Select the fixed pre-wet mode if the pre-wet system consists of a limited flow pump driven by the conveyor motor exhaust oil.

#### Closed Loop
In this mode the liquid system has an inline flow meter which measures flow rate using a pulse rate. The controller will control the liquid flow to be a constant fraction of the conveyor solid flow. The fraction is specified as liters/tonne or gallon/ton.

#### Manual
The application rate is determined by means of a preset percentage of liquid output.

#### On/Off
This is a manual mode of operation in which the pre-wet is interlocked with a ground speed sensor, so the pre-wet shuts down if the ground speed is zero.

#### Return Oil to Pre-wet
Similar to fixed pre-wet, but with an additional on-off control signal which is needed to enable the flow.

### 3.1.8 Anti-ice Control Mode
This specifies the mode in which the anti-ice controller operates.

#### Off
This deactives the anti-ice controller.

#### 1 Boom
This is a closed loop controller which uses a feedback signal from both the ground speed sensor and the anti-ice flow meter to apply the desired application rate in units of volume per distance travelled.

#### 3 Boom
This is a closed loop controller which uses a feedback signal from both the ground speed sensor and the anti-ice flow meter to apply the desired application rate in units of volume per distance travelled per boom activated. The volume of output is proportional to the number of booms that are on, and there are digital outputs to activate each boom.

#### Manual
The application rate is determined by means of a preset percentage of anti-ice output.

### 3.1.9 Gate Control Mode

This specifies the mode in which the gate is connected to the system.

#### Manual

Gate position is fixed, and the value of the gate height must be specified by the operator at startup, or during calibration.

#### Read Back

A read-back device is attached to the gate. The controller will read and use the actual gate position. Gate height must be manually adjusted.

#### Closed Loop

A read-back device is used and the gate is under hydraulic control as well. The gate will be controlled to close at zero ground speed, and to minimize variations in conveyor RPM when running. The gate operating position can be manipulated directly from the controller for calibration purposes.

### 3.1.10 Password Select

A USB key protects the system programming mode. If further security is desired, the password function can be enabled.

#### Disabled

No password is used, and only the USB key is needed to enter programming mode.

#### Enabled

A password will be generated and will be needed each time the programming mode is entered.

If the password is enabled, a text box will allow you to enter a password. This should be 3 characters long, and consist only of numbers, in the range 0 - 999.

### 3.1.11 Spinner Stop Mode

For safety reasons it is preferred that the spinner be stopped whenever there are operating conditions which do not require the spinner. There are four possible situations that can occur:

#### Always On

If this is selected the spinner will always be turning whenever a spinner rate is selected by the operator.

#### Zero Speed Only

The spinner will stop whenever the vehicle stops.

**Pause Only**
The spinner will stop whenever the system is in the Pause mode.

**Zero Speed and Pause**
The spinner will stop whenever the vehicle is stopped or the system is in the Pause mode.

### 3.1.12 Blast Solid Mode
This specifies the control mode for the conveyor when blasting.

**Max Output**
This is a manual control mode in which the conveyor runs at maximum output when Blast is activated. The conveyor will stop if the ground speed is zero. The maximum output value can be adjusted during calibration.

**Stationary Max**
This is a manual control mode in which the conveyor runs at maximum output when Blast is activated. The conveyor will continue to run even if the ground speed is zero.

**Closed Loop**
This is a closed loop blast control mode in which the conveyor will deliver a fixed amount of weight per distance. The blast rate can be adjusted during calibration.

**Off**
This deactivates the Blast function.

### 3.1.13 Blast Pre-wet Mode
This enables or disables pre-wetting the material while in Blast mode. If pre-wetting in the Blast mode is turned on, the "Pre-wet Rate" and "Solid Reduction" settings will still apply, the same as in normal operation.

### 3.1.14 Blast Anti-ice Mode
This enables or disables anti-icing while in Blast mode. If anti-icing in the Blast mode is turned on, the anti-ice rate can be adjusted during calibration, both for manual-mode anti-icing and for closed loop anti-icing.

### 3.1.15 Gate Setting
This allows the setting of the gate opening for normal spreading operation. It is used only when the gate control is manual. The gate setting can be set during calibration, or in the operator’s screen, if the Operator Options permits access.

### 3.1.16 Blast Auto-off

**Auto-off Mode**

Specify a time in seconds. Use 0 to disable this feature. If time is non-zero then the blast function will automatically be deactivated once the time has expired.

### 3.1.17 Alarm Speed

This is the ground speed at which an alarm will sound and will be displayed on the console. The "Alarm Speed" is not activated when the spread rate is zero or the controller is in the Pause mode.

### 3.1.18 Speed at Calibration

This is the ground speed at which the speed sensor calibration will be performed.

### 3.1.19 Speed Sensor Pulses

This is the number of pulses per km (mi) for the speed sensor. If this value has been provided by the manufacturer of the transmission, then enter it here. Otherwise, a sensor calibration should be performed by driving at the desired Speed at Calibration.

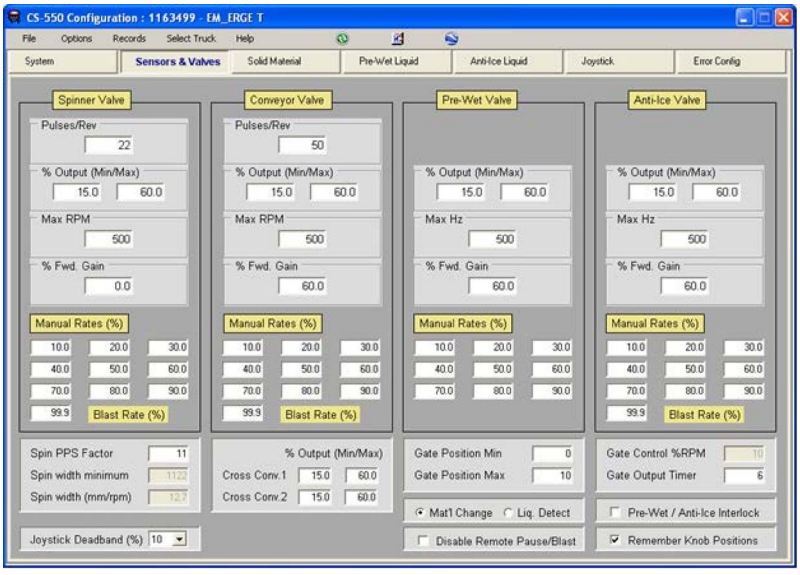
### 3.1.20 Temperature Sensor

There are currently two types of preconfigured temperature sensors that are selectable. Select either "Not Installed", "Sprague", or "Controls". The text box beside the sensor contains the % correction of the application rate per degree of temperature change.

### 3.1.21 Driver Names

There are 4 text boxes to specify driver names. The names can be 8 characters long, and will be capitalized.

## 3.2 Sensors & Valves Tab



### 3.2.1 Sensor Pulses per Revolution

The process of sensor calibration tells the controller the quantity of material that discharges from the main conveyor per revolution of the shaft. In order to relate the shaft revolutions to the quantity actually measured by the controller, which is tachometer pulses per second, the controller needs to know how many pulses per revolution the sensor produces.

The number of pulses per revolution will vary depending on the make of the sensor, and should be obtained from the manufacturer.

In the case of a liquid flowmeter, there is no physical shaft whose RPM can be measured, therefore, the ‘pulses per rev.’ is not used. Instead a direct relationship is measured between accumulated tachometer pulses and accumulated liquid volume of output.

### 3.2.2 Valve Nulling Parameters

The process of "Nulling" sets the minimum and maximum outputs to the conveyor/spinner/liquid valve. This process can only be completed in the vehicle. See the Valve Nulling section of the CS-550/150 Calibration Manual.

#### Minimum Valve Output

This value reflects the % output required to start the conveyor (or liquid pump) and is an indication of the amount of friction present in the delivery system.

#### Maximum Valve Output

This value reflects the % output required to attain maximum conveyor (or liquid pump) speed, this is the point at which further opening of the valve does not increase the conveyor (or liquid pump) speed.

#### Maximum RPM

This is the RPM at the maximum valve output. For a closed loop controller, it will be calculated automatically during the auto-nulling event. For an open loop controller, it could be obtained from a manufacturer’s spec sheet or by comparison with similar closed loop results. For a liquid pump, the measured value will be a pulse rate in Hz (pulses/sec) instead of RPM.

### 3.2.3 Valve Output Forward Gain

This is the percentage of valve output increase, introduced on conveyor start up, when the vehicle starts to move, to overcome hydraulic motor pulsing and provide for instant, continuous movement of the conveyor.

### 3.2.4 Manual Application Rates

Manual operation output settings (% of max. pump speed): These settings set the conveyor output for each of the 9 settings of the application rate dial, while in manual mode. Each setting is a percentage of the maximum pump speed.

### 3.2.5 Manual Blast Rate

This is the percent output to the conveyor/spinner/anti-ice valve while in the manual blast mode. The pre-wet valve does not have a special blast rate if it is in manual mode. The spinner blast function can be disabled by setting this rate to zero. This is the default.

### 3.2.6 Spinner PPS Factor

This is the factor that controls the speed of the spinner while in PPS mode (Positive Placement System). It is in units of RPM per mph, so the spinner speed is proportional to the vehicle speed.

### 3.2.7 Spinner Width Settings

Spinner spread-width parameters - The spread width of the spinner, in mm, is calculated using the formula:

width = ‘width minimum’ + spinner RPM * ‘width (mm/rpm)’

This spread width is used only if the conveyor is in “gm/sq.m.” or “KOMBI” mode.

### 3.2.8 Joystick Deadband

The deadband specifies the width of the joystick neutral zone in units of % of total range. The default is 10%.

### 3.2.9 Cross Conveyor Nulling Values

These are minimum and maximum output values for the cross conveyors, similar to the nulling values for the spinner/conveyor outputs. They will apply to either the dual conveyors of the ‘Cross Conveyor US’ configuration or the single conveyor output of the ‘Cross Conveyor CA’ configuration. If no cross conveyors are used, then these maximum output values will be used to determine the strength of the closed loop gate control outputs.

### 3.2.10 Gate Min/Max

These are the actual gate positions when calibrating the gate feedback sensor.

In Imperial units, normally 0 - 10 inches.
In metric units, normally 0 - 25 cm.

These gate settings are used only if you are in ‘Gate Read-Back’ mode or ‘Closed Loop Gate’ mode.

### 3.2.11 Gate Control % RPM Range

For the closed loop gate controller, this is the range of variation allowed in the conveyor RPM setpoint before the gate will be opened or closed to stabilize the RPM. The default value is +/- 10%. A smaller value will give more precise control of RPM, but at the risk of having the gate controller oscillate, or hunt, indefinitely for a solution. The optimum value will depend on the speed of response of the gate to any signal to move.

### 3.2.12 Gate Output Timer

This is the number of computer cycles that a digital output will be sent to the gate when adjusting it manually using the operator display. If the gate is overshooting the desired position, reduce this number. If the gate movement is too slow, increase this value.

### 3.2.13 Material Change/Liquid Detect Input Switch

On the AUX connector, on the main RC4-4 harness, pin 1 can be allocated to be used either as a digital input to switch between different materials (1->3, 2->4), or it can be used to detect low pressure in the liquid pump, which will trigger a liquid shutdown. The radio button will specify which function is being used: the default is ‘material change’.

### 3.2.14 Pre-wet/Anti-ice Interlock

Normally, the pre-wet and anti-ice controllers will be run as independent outputs. However, in some case it may be necessary to interlock them so that only one output can be active at one time. This will need to be done if you are driving both liquid outputs using a single valve with an asymmetrical spool. This checkbox will enable the interlock: the default behavior is ‘no interlock’.

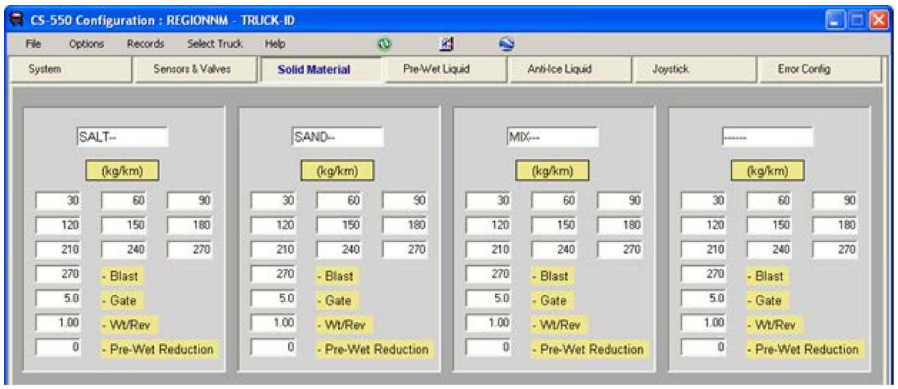
### 3.2.15 Disable Remote Pause/Blast

On the AUX connector, on the main RC4-4 harness, pin 6 is Remote Blast and pin 8 is Remote Pause. The Remote Pause/Blast feature can be disabled by selecting this checkbox, in which case these two digital inputs can be used for other purposes, such as inputs to the GPS tracking system.

### 3.2.16 Remember Knob Positions

This option will allow the controller to remember the previous knob positions on the next reboot. If the ground speed is not zero on startup, then the knob positions will be set to zero.

## 3.3 Solid Material Tab




### 3.3.1 Solid Material Name

There are 4 text boxes to specify solid material names. The names can be 6 characters long, and will be capitalized.

### 3.3.2 Solid Application Rate

An application rate can be entered here in units of kg per km, or lbs per mile. These rates are used when the controller is either in open loop or closed loop mode. Each box corresponds to a position of the application rate dial.

### 3.3.3 Solid Blast Application Rate

The blast application rate can be entered here in units of kg per km, or lbs per mile. This rate will be used when the Blast button is pushed and the controller is either in open loop or closed loop mode.

### 3.3.4 Gate Position at Calibration

This is the gate setting used during the calibration of the weight per revolution. It is recommended that this gate setting be similar to the gate setting normally used for this material during spreading operations.

### 3.3.5 Weight per Revolution

This setting refers to the weight of material discharging from the main conveyor for every revolution of the conveyor.

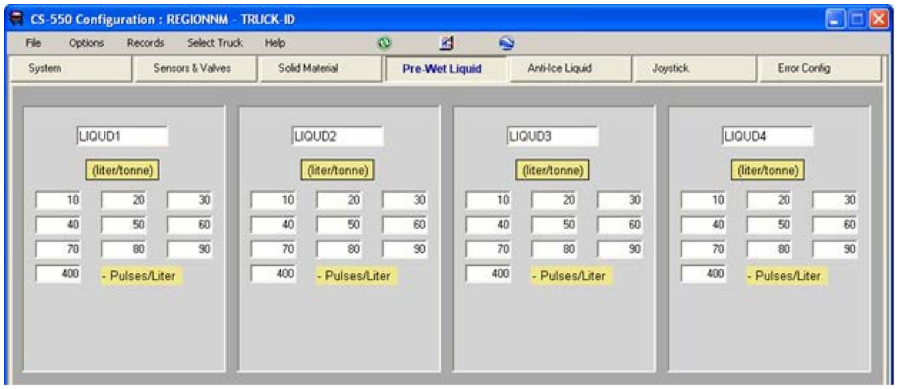
Note: This number will automatically be generated as a result of the weight calibration process. (See the Material Calibration section of the CS-550/150 Calibration Manual.) When in closed loop mode, the controller will calculate weight per revolution during the calibration. When in open loop mode, the controller will calculate weight per minute, which is the weight delivered while running at maximum output for one minute.

If the calibration is checked using a timed catch test, and if it is found that the calibration is off, then this number can be manually adjusted to bring the calibration into line with the catch test.

### 3.3.6 Pre-wet Reduction

The percentage reduction of solid material whenever the pre-wet is activated can be set with this option. The figure entered is a percent reduction of the solid spread rate setpoint while spreading.

## 3.4 Pre-wet Liquid Tab




### 3.4.1 Pre-wet Material Name

There are 4 text boxes to specify pre-wet material names. The names can be 6 characters long, and will be capitalized.

### 3.4.2 Pre-wet Application Rate

An application rate can be entered here in units of liters per tonne, or gals per ton. These rates are used when the controller is in closed loop control mode. Each box corresponds to a position of the pre-wet application rate dial.

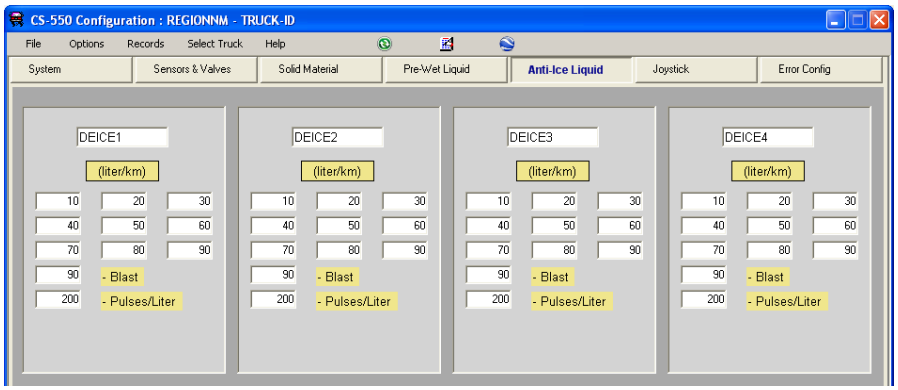
### 3.4.3 Pre-wet Pulses per Litre

This setting refers to the number of feedback sensor pulses per volume of liquid delivered by the pump.

Note: This number will automatically be generated as a result of the pre-wet calibration process. (See the Material Calibration section of the CS-550/150 Calibration Manual.)

If the calibration is checked using a timed catch test, and if it is found that the calibration is off, then this number can be manually adjusted to bring the calibration into line with the catch test.

## 3.5 Anti-ice Liquid Tab




### 3.5.1 Anti-ice Material Name

There are 4 text boxes to specify anti-ice material names. The names can be 6 characters long, and will be capitalized.

### 3.5.2 Anti-ice Application Rate

An application rate can be entered here in units of liters per km, or gals per mile. These rates are used when the controller is in closed loop control mode. Each box corresponds to a position of the anti-ice application rate dial.

### 3.5.3 Anti-ice Blast Application Rate

The blast application rate can be entered here in units of liters per km, or gals per mile. This rate will be used when the Blast button is pushed and the controller is in closed loop control mode.

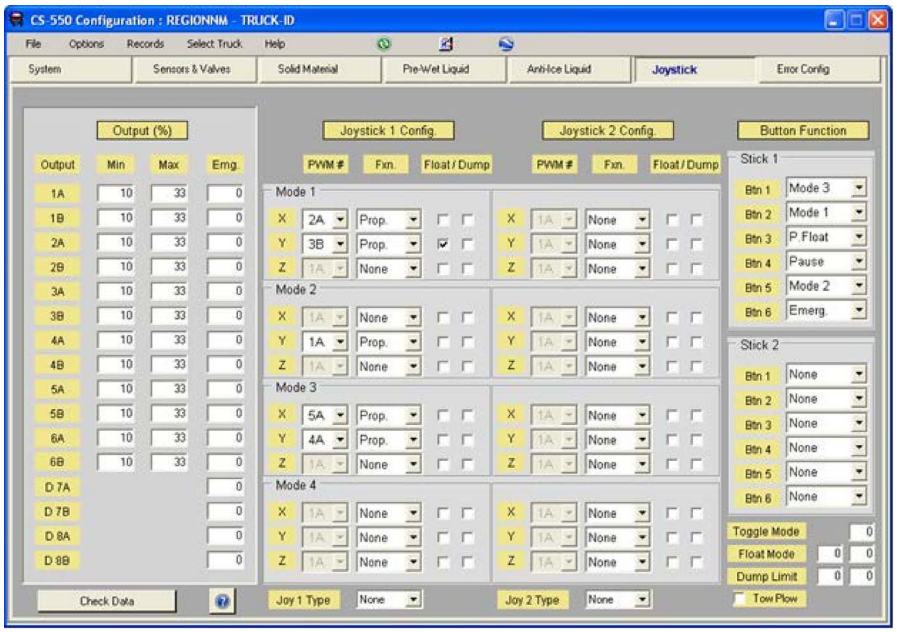
### 3.5.4 Anti-ice Pulses per Litre

This setting refers to the number of feedback sensor pulses per volume of liquid delivered by the pump.

Note: This number will automatically be generated as a result of the anti-ice calibration process. (See the Material Calibration section of the CS-550/150 Calibration Manual.)

If the calibration is checked using a timed catch test, and if it is found that the calibration is off, then this number can be manually adjusted to bring the calibration into line with the catch test.

## 3.6 Joystick Tab




### 3.6.1 Joystick Nulling Parameters (Output %)

The process of "Nulling" sets the minimum and maximum outputs to the joystick.

**Minimum Joystick Output**

This value reflects the output required to start movement of the output device.

**Maximum Joystick Output**

This value reflects the maximum output you wish to send to the device.

**Emg. Joystick Output**
This is the output you wish to send to the device when you push the emergency button.

There are a total of 16 possible outputs. These are arranged in groups of two. In each group, ‘A’ is normally the ‘down’ direction and ‘B’ is normally ‘up’. Twelve of these outputs are analog signals, so the range of output is from 0 to 100%. The remaining four are digital outputs which are either on or off. The Emg. setting for these four outputs is either 1 or 0, to enable or disable the emergency output.

### 3.6.2 Joystick Configuration Parameters

**Output PWM #**
The joystick inputs are organized first by joystick number, where the first joystick in the system would always be called Joystick 1, and the second joystick, which is optional, would be Joystick 2. Then the input signals are organized into four modes, where the mode switching is done with a joystick button. The four modes operate exclusively of each other, so only one mode is active at any time. However, it is possible to have the same input or output present in more than one mode, since they do not interfere with each other. Finally the input signals are organized by axis, X or Y or Z. For each axis, it is necessary to allocate one output, either A or B, from the 8 pairs of outputs that are available. The other member of the pair will be allocated automatically to the other direction of movement of the axis. The normal allocation would be that X axis left movement, and Y axis forward push, and Z axis counter-clockwise twist would be called ‘down’ and would be allocated to an ‘A’ output. Therefore the default allocation is always ‘A’ for all axes. If this output direction is not suitable, then use the corresponding ‘B’ output from the same pair.

**Function Type**
Each joystick axis can operate in four possible modes. These modes are: disabled, proportional output, on/off at 5%, on/off at 10%. The on/off modes are modes in which the normal proportional output of the joystick has been converted in the software to an on/off signal with a different threshold of movement to trigger the switch, either 5% or 10% of the full stroke.

**Float Enable**
The power float output can be disabled by moving a specific joystick axis in the ‘B’ direction. This checkbox indicates which axis will be used. Only one axis, and only one mode, can be chosen for this task. If two Power Floats are configured then two joystick axes need to be chosen.

**Dump Limit Enable**
The dump limit enable function can disable the joystick output to a specific ‘B’ output if a digital input is received. This checkbox specifies which joystick axes will be affected. Multiple axes and multiple modes can be simultaneously selected for this function, but in each case only the ‘B’ output will be affected. Alternatively, if either the ‘Auto-raise’ feature or the ‘Tow Plow Deploy’ feature is enabled, then this checkbox will specify which joystick axis is to be used. In the case of ‘Auto-raise’ and ‘Tow Plow Deploy’, only a single axis should be chosen. Note that the ‘Dump Limit’ and ‘Auto-raise’ and ‘Tow Plow Deploy’ features are mutually exclusive, only one feature can be enabled.

### 3.6.3 Joystick Type
If no joysticks are present, then both ‘Joy 1 Type’ and ‘Joy 2 Type’ should be ‘None’. If one joystick is present then choose ‘Joy 1 Type’ as ‘CH_11’. If two joysticks are present then set ‘Joy 2 Type’ as ‘CH_21’.

### 3.6.4 Joystick Button Configuration Parameters
The joystick buttons are organized by joystick number, where ‘Stick 1’ corresponds to the first joystick in the system and ‘Stick 2’ is the second, optional, joystick. Each button can be assigned to one of the following functions:

**None**
Disabled

**Mode 1 - Mode 4**
One of four modes which are mutually exclusive; defined in the ‘Joystick Configuration’ section. These mode switching buttons are interlocked so that only one mode can be active. All double-pushes of more than one button will be ignored. Latched output.

**Emergency**
Activates the emergency outputs configured in the ‘Output (%)’ section. Momentary contact.

**Pause**
Puts the controller into ‘Pause’ mode. Latched output.

**Blast**
Puts the controller into ‘Blast’ mode. Latched output.

**Power Float**
One of the input signals required to activate power float output. Latched output.

**Low Oil Override**
This specifies that this joystick button will be used as a ‘Low Oil Override’. Momentary contact.

**Spin Reverse**
Activates a spinner reverse digital output signal. Latched output.

**Aux A**
Activates a digital output signal. Momentary contact.

**Aux B**
Activates a digital output signal. If both ‘Aux A’ and ‘Aux B’ are used, then the outputs will be interlocked so that only one output is active. All double-pushes of both buttons will be ignored. Momentary contact.

**Dump Limit**
One of the input signals required to activate dump limit. Momentary contact.

**Power Float 2**
One of the input signals required to activate the second power float. Latched output.

**PTO**
One of the input signals that can be used to re-activate the PTO output. Momentary contact.

### 3.6.5 Joystick Toggle Mode Parameter

The normal behavior of the joystick mode-switching buttons is that pushing a button will cause that mode to be activated,  and then the system will stay in that mode until some other mode button is pushed. This is the default behavior, which is obtained by setting the joystick toggle mode parameter to zero. An alternative behavior is to specify one mode as being a toggle mode using this parameter. Only one toggle mode can be chosen and it must be a mode that has previously been defined by allocating a button to it. For the toggle mode, pushing the mode button will temporarily activate the mode, and then releasing the button will cause the mode to revert back to the previous mode. All the other mode buttons will behave as normal, unaffected by this.

### 3.6.6 Power Float Configuration Parameters

The right-hand-side text box specifies the Power Float functionality:

**0**
Disabled.

**1**
Reset option. This is the same as the Non-Reset option except that, when the Power Float output has been interrupted by sending a joystick output, then it is necessary to put the joystick into neutral and also release the joystick button before the Power Float can be reactivated.

**2**
Non-Reset option. This is the default. When both the joystick button and the proximity switch are active, then the Power Float output will be activated. Activating the appropriate joystick output will shut off the Power Float. It can be reactivated by moving the joystick to neutral.

The left-hand-side text box specifies some additional Power Float options:

**0**
Proximity switch required, one Power Float.

**2**
Proximity switch required, two Power Floats.

### 3.6.7 Dump Limit/Auto-raise Configuration Parameters

The right-hand-side text box specifies the dump limit functionality:

**0**
Disabled.

**1**
Dump limit enabled. This will disable a specific joystick ‘B’ output if a limit switch is encountered. The output disable can be overridden with a joystick button.

**2**
Tow plow deploy enabled. This will disable a specific joystick ‘B’ output unless the joystick mode button is pushed. The mode button serves two purposes here: It acts as a latched output to switch into tow plow deploy mode, and it also acts as a momentary contact to momentarily enable output to this axis.

The left-hand-side text box specifies the Auto-raise functionality:

**0**
Disabled.

X
Time in seconds for the Auto-raise feature. This will activate a specific joystick axis ‘B’ output for X seconds if a digital input signal is received, typically from a ground-speed sensor. This axis will be activated regardless of what mode the joystick is in. The Auto-raise will be activated only once, when the digital input signal is initially turned on. It will turn off after X seconds regardless of the status of the digital signal. The Auto-raise can be restarted by turning off the digital signal and then turning it back on.

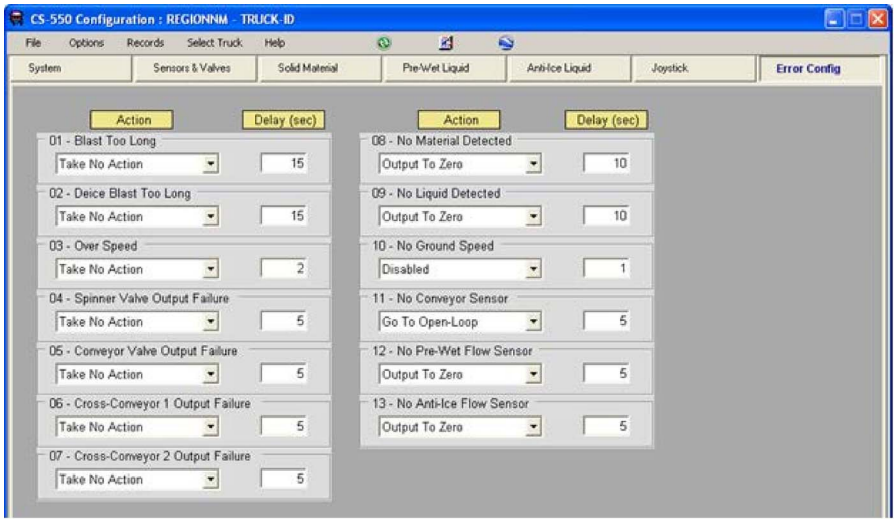
The three options: ‘Dump Limit’, ‘Tow Plow Deploy’, and ‘Auto-raise’ are mutually exclusive, meaning that either the left text box or the right text box should be zero.

Independently of the above three options, there is a fourth option called ‘Emergency/Pause Interlock’. This will force the controller into a ‘Pause’ state if the joystick emergency button is pushed. This is a momentary contact. This option can be enabled by adding 4 to the right-hand-side textbox regardless of what the original values of either textbox were.

### 3.6.8 Tow Plow Configuration

This checkbox will indicate that the controller is a tow plow. The main truck controller in a tow plow set-up will not receive any special designation, but the tow plow controller will be indicated with this checkbox. The tow plow controller is not allowed to have a joystick and it uses different CAN ID’s than the main truck controller.

## 3.7 Error Configuration Tab



### 3.7.1 Error Configuration

Error messages are divided into two categories: ‘Errors’ which are configurable, and ‘Warnings’ which are not configurable. Configuring an error message consists of choosing a severity level for the error, which will determine what is done when it occurs, and choosing a timeout value, which is the number of seconds the controller will allow the error condition to exist before reporting it.

The following severity levels can be used:

- Disabled – Error is disabled, not reported.
- Take no Action – Issue a warning and continue normal operation. Intended for non-critical errors, such as over-speed error.
- Go to Open loop – The conveyor goes to open loop operation. Typically reserved for conveyor feed-back sensor failure.
- Go to Manual – Force a controller into manual operation. Typically reserved for ground-speed sensor failure. This severity code is context-sensitive: if triggered by a liquid sensor then only that liquid controller will be affected; otherwise all the controllers will be affected.
- Output to Zero – Force a controller output to be zero. The operator will need to restart the controller by shutting the main power source OFF and ON again. This severity code is context-sensitive: if triggered by a liquid sensor then only that liquid controller will be affected; otherwise all the controllers will be affected.

The following configurable errors can occur:

| Error Number | Description | Explanation |
|---|---|---|
| Error 1 | Blast Too Long | The time limit for the Blast function has been exceeded. |
| Error 2 | De-ice Blast Too Long | The time limit for the Anti-ice Blast function has been exceeded. |
| Error 3 | Over-Speed | The vehicle has exceeded the maximum allowable speed. |
| Error 4 | Spinner Valve Output Failure | An open circuit has been detected in the conveyor output. This could also be caused by setting a maximum nulling output value too large. |
| Error 5 | Conveyor Valve Output Failure | An open circuit has been detected in the conveyor output. This could also be caused by setting a maximum nulling output value too large. |
| Error 6 | Cross conveyor 1 Output Failure | An open circuit has been detected in the cross conveyor output. This could also be caused by setting a maximum nulling output value too large. |
| Error 7 | Cross conveyor 2 Output Failure | An open circuit has been detected in the cross conveyor output. This could also be caused by setting a maximum nulling output value too large. |

| Error Number | Description | Explanation |
|---|---|---|
| Error 8 | No Material Detected | The material detect sensor has detected an empty hopper. |
| Error 9 | No Liquid Detected | The liquid pump pressure is too low. |
| Error 10 | No Ground Speed | This is caused by an instantaneous loss of ground speed signal, most likely a cable break. |
| Error 11 | No Conveyor Sensor | This is caused by a long term, persistent, loss of conveyor speed signal, most likely a cable break or sensor misalignment. |
| Error 12 | No Pre-wet Flow Sensor | This is caused by a long term, persistent loss of pre-wet flow signal, most likely a cable break or sensor misalignment. |
| Error 13 | No Anti-ice Flow Sensor | This is caused by a long term, persistent, loss of anti-ice flow signal, most likely a cable break or sensor. |

### 3.7.2 Warning Messages

Warning messages are for information purposes only; the controller will not take any action, and the message will disappear automatically after four seconds. The following warning messages can occur:

| Error Number | Description | Explanation |
|---|---|---|
| Error 20 | Output Non-Zero | This is a safety function to prevent the controller from accidentally sending an unexpected output when the controller is turned on, or when the user leaves programming mode and enters normal operation mode. The outputs will be kept at zero until the error condition is removed. To recover, set the application rates to zero or exit Blast mode. |
| Error 21 | Unload Not Allowed | An attempt was made to enter Unload mode while the truck was moving, which is not allowed. The Unload command will be ignored in this case. |
| Error 22 | BB3 System Error | This is an unrecoverable error in the RC controller. Try rebooting the controller to see if it goes away, otherwise report the failure to Bosch Rexroth. This error can also occur if an attempt is made to run a joystick without having an RCE controller present. |
| Error 23 | | This is a communication failure between the RC controller and the display. It will show up in the logging history in the RC controller after the display is re-connected. |

| Error Number | Description | Explanation |
|---|---|---|
| Error 24 | RCE Communication Failure | This is a communication failure between the RC controller and the RCE controller in a system with a joystick. It will automatically shut down the joysticks. The status of this communication can also be monitored using the display item called DIG which is available by double-tapping on the gear icon while in normal operation mode. The item called DIG at the bottom right corner of the display should normally be zero. It will be E0 if this error occurs. |
| Error 25 | Joystick 1 Communication Failure | This will shut down the joystick outputs, and will show up as a 40 in the live DIG display item. |
| Error 26 | Joystick 2 Communication Failure | This will shut down the joystick outputs, and will show up as a 80 in the live DIG display item. |
| Error 27 | No Gate Sensor | Gate sensor failure, most likely caused by cable break. This will force the gate control into Manual. |
| Error 28 | Gate Position is Zero | This will occur only if the gate position is zero while in gate read-back mode. The conveyor will not be allowed to move until this is fixed. |
| Error 29 | No Ground Speed Simulation | This is just an information message to indicate that ground speed simulation mode has been stopped. |
| Error 30 | Under-Application: Spinner | The spinner cannot meet the desired RPM setpoint. This should not happen in manual mode, but could happen if the spinner is in PPS mode and the ground speed is high. |
| Error 31 | Under-Application: Conveyor | The conveyor cannot meet the desired RPM setpoint. Caused by too high application rate or too high ground speed or incorrect calibration. |
| Error 32 | Under-Application: Pre-wet | The pre-wet pump cannot meet the desired flow setpoint. Caused by too high application rate or too high ground speed or incorrect calibration. |
| Error 33 | Under-Application: Anti-ice | The anti-ice pump cannot meet the desired flow setpoint. Caused by too high application rate or too high ground speed or incorrect calibration. |
| Error 34 | Over-Application: Conveyor | The solid application rate is above setpoint. Most likely caused by a minimum null value for conveyor output that is too high, so the conveyor never stops. |
| Error 35 | Over-Application: Pre-wet | The pre-wet application rate is above setpoint. Most likely caused by a minimum null value for the pre-wet pump output that is too high, so the pump never stops. |

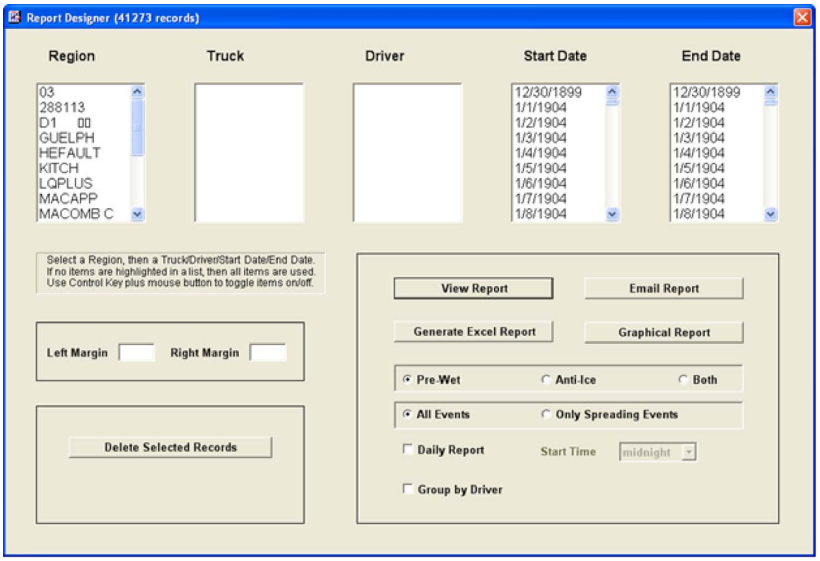
| Error Number | Description | Explanation |
|---|---|---|
| Error 36 | Over-Application: Anti-ice | The anti-ice application rate is above setpoint. Most likely caused by a minimum null value for the anti-ice pump output that is too high, so the pump never stops. |
| Error 37 | Calibration: Ground-Speed Pulses Too Low | Calculated pulses per km is too low during calibration. Possibly caused by no sensor feedback, or try recalibrating the ground speed sensor. |
| Error 38 | Spinner Maximum RPM Too Low | During auto-nulling, the calculated maximum RPM was too low, most likely caused by no sensor feedback. |
| Error 39 | Conveyor Maximum RPM Too Low | During auto-nulling, the calculated maximum RPM was too low, most likely caused by no sensor feedback. |
| Error 40 | Pre-wet Maximum Hz Too Low | During auto-nulling, the calculated maximum Hz was too low, most likely caused by no sensor feedback. |
| Error 41 | Anti-ice Maximum Hz Too Low | During auto-nulling, the calculated maximum Hz was too low, most likely caused by no sensor feedback. |
| Error 42 | Wrong Spinner Control Mode | An attempt was made to perform auto-nulling of a spinner while it was in manual. |
| Error 43 | Wrong Spinner Control Mode | Not Used. |
| Error 44 | Wrong Pre-wet Control Mode | An attempt was made to perform auto-nulling, or volume calibration, of a pre-wet pump while it was in manual. |
| Error 45 | Wrong Anti-ice Control Mode | An attempt was made to perform auto-nulling, or volume calibration, of an anti-ice pump while it was in manual. This error could also be caused by an I/O conflict between a cross conveyor mode and the anti-ice pump output, in which case the anti-ice pump will be disabled. |
| Error 46 | Wrong Cross conveyor Mode | An attempt was made to go into Reverse while this output was being used by a cross conveyor mode. The Reverse command will be ignored in this case. Could also be caused by attempting to use gm/sq.m. mode while there was an I/O conflict with a Cross conveyor CA mode, in this case gm/sq.m. mode will not be allowed. Could also be caused by attempting to use closed loop gate control while in Cross conveyor US mode or Liquid-Plus mode, in which case the gate control will be forced into gate read back mode. |
| Error 47 | Wt. Per Revolution Too Low | During conveyor weight calibration, the calculated weight per revolution was too low, most likely caused by typing in zero for the weight. |
| Error 48 | Wt. Per Revolution Too High | During conveyor weight calibration, the calculated weight per revolution was too high, most likely caused by no conveyor sensor feedback. |

| Error Number | Error Number | Description |
|---|---|---|
| Error 49 | Pre-wet Pulses Per Gallon Too Low | During calibration of pre-wet volume output, the pulses/gal was too low, most likely caused by no flow sensor feedback. |
| Error 50 | Pre-wet Pulses Per Gallon Too High | During calibration of pre-wet volume output, the pulses/gal was too high, most likely caused by typing in zero for the volume. |
| Error 51 | Anti-ice Pulses Per Gallon Too Low | During calibration of anti-ice volume output, the pulses/gal was too low, most likely caused by no flow sensor feedback. |
| Error 52 | Anti-ice Pulses Per Gallon Too High | During calibration of anti-ice volume output, the pulses/gal was too high, most likely caused by typing in zero for the volume. |
| Error 53 | Spinner mm at Zero RPM Too Low | During calibration of the relationship between spinner RPM and spinner spread width, a value of 0 mm at zero RPM was used. |
| Error 54 | Spinner mm Per RPM Too Low | During calibration of the relationship between spinner RPM and spinner spread width, a value of maximum spread width was used that was less than the mm at zero RPM. |
| Error 55 | Gate Movement Too Low | During calibration of gate maximum and minimum position, the difference between minimum and maximum height was less than 1 inch. |
| Error 56 | Gate Zero in Manual | While in manual gate control mode, the operating gate position was specified to be zero. |
| Error 57 | Gate at Calibration Too Low | While calibrating the weight per revolution for a specific material, the gate position at calibration was specified to be zero. |
| Error 58 | Spinner PPR Too Low | A value of zero was used for spinner pulses per revolution. |
| Error 59 | Conveyor PPR Too Low | A value of zero was used for conveyor pulses per revolution. |
| Error 60 | Spinner Output Range Too Low | The difference between maximum and minimum spinner nulling values was less than 5%. |
| Error 61 | Conveyor Output Range Too Low | The difference between maximum and minimum conveyor nulling values was less than 5%. |
| Error 62 | Cross Conveyor 1 Output Range Too Low | The difference between maximum and minimum cross conveyor nulling values was less than 5%. |

| Error Number | Description | Explanation |
|---|---|---|
| Error 63 | Cross Conveyor 2 Output Range Too Low | The difference between maximum and minimum cross conveyor nulling values was less than 5%. |
| Error 64 | Pre-wet Outrange Range Too Low | The difference between maximum and minimum pre-wet nulling values was less than 5%. |
| Error 65 | Anti-ice Output Range Too Low | The difference between maximum and minimum anti-ice nulling values was less than 5%. |
| Error 66 | Joystick 1 Output Range Too Low | The difference between maximum and minimum joystick nulling values for one of the six outputs was less than 5%. |
| Error 67 | Joystick 2 Output Range Too Low | The difference between maximum and minimum joystick nulling values for one of the six outputs was less than 5%. |
| Error 68 | Theoretical Maximum Conveyor RPM Too High | Based on the specified application rate setpoints, and the maximum ground speed, the maximum theoretical conveyor RPM required has been calculated to be more than twice the actual conveyor capacity, which will lead to serious under-application problems. The actual controller RPM setpoint will be clamped at this value to prevent the controller from becoming unstable, and the conveyor should be re-calibrated to determine the source of the problem. |
| Error 69 | Theoretical Maximum Pre-wet Hz Too High | Based on the specified application rate setpoints, and the maximum ground speed, the maximum theoretical pre-wet pump flow required has been calculated to be more than twice the actual pump capacity, which will lead to serious under-application problems. The actual pump flow setpoint will be clamped at this value to prevent the controller from becoming unstable, and the pre-wet pump should be re-calibrated to determine the source of the problem. |
| Error 70 | Theoretical Maximum Anti-ice Hz Too High | Based on the specified application rate setpoints, and the maximum ground speed, the maximum theoretical anti-ice pump flow required has been calculated to be more than twice the actual pump capacity, which will lead to serious under-application problems. The actual pump flow setpoint will be clamped at this value to prevent the controller from becoming unstable, and the anti-ice pump should be re-calibrated to determine the source of the problem. |

# 4 Logging Reports

Clicking on the icon to the left will bring up the Logging Report dialog shown below.



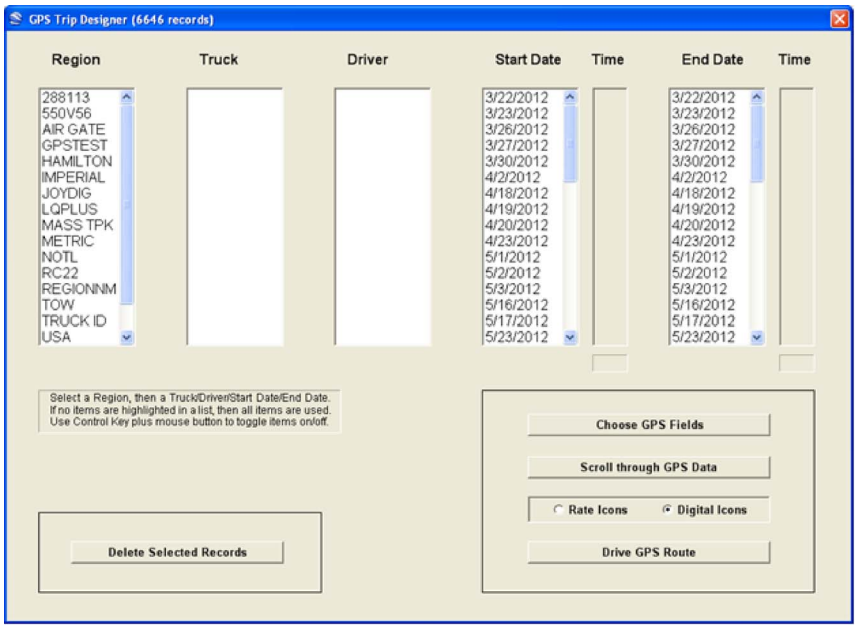

This allows for selection of logging data involving multiple trucks. The logging reports can be either Crystal Reports, or Excel reports, or a graphical pie chart report; the default is Crystal Reports. Clicking on ‘View Report’ will produce a Crystal Report in a multi-page format that is suitable for either printing or exporting to a file, similar to the Truck Parameter Report. Clicking on ‘Email Report’ will email the same report as an attachment, and the person who receives it will need to rename the attachment from ‘untitled.txt’ to ‘something.rtf’ in order to view it as a Rich Text Format file.

When selecting data, if nothing is selected in a specific category (such as ‘Truck’, for example), then all the items in that category will be used. Any selection can be toggled on or off by holding down the Ctrl key while clicking on an item. The number of records currently selected will be displayed at the top in the title of the dialog box. Due to space limitations, the liquid data will be displayed in one of three formats: pre-wet only (letter size), anti-ice only (letter size), or both (legal size). Clicking on the option ‘Only Spreading Events’ will produce a report in which calibration events, unload events and zero application rate have been removed. The reports can be grouped by date and by driver, if desired.

If desired, logging data can be selectively deleted using this dialog screen. Due to the fact that different printers may use different alignment at the edges, there is an option to adjust the margins, in case a letter is missing at the left or right edge.

# 5 GPS Data Reports

Clicking on the icon shown to the left will bring up the GPS Trip Report dialog shown below.

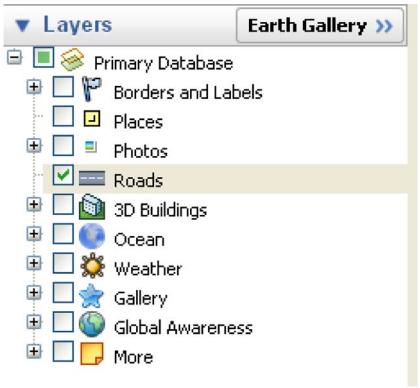



This allows for selection of GPS data, similar to the logging data selection procedure. The GPS data will be displayed using Google Earth. Click on ‘Drive GPS Route’ to display the entire route as a blue/green line (blue for non-spreading events, green for spreading events). The waypoints on the route will be displayed as balloons. The balloon style can be chosen to represent either the solids’ application rate or the status of the digital inputs. If ‘Rate’ is chosen, then for a spreading event the balloon will be green with either a ‘B’ for Blast or a number from ‘1’ to ‘9’ indicating the application rate. For a non-spreading event the balloon will be blue with either a ‘P’ for Pause or a ‘0’ for zero application rate. If ‘Digital’ is chosen, then the balloon will represent the status of six possible digital inputs. Clicking on a balloon will bring up a snapshot of the truck status at that point. The fields to display in this status report can be chosen by clicking on ‘Choose GPS Fields’. When choosing fields, use the Ctrl key to allow a specific field to be selected or de-selected without affecting any of the other fields.

Not all of the data points will be displayed as balloons when the map first loads. The number of balloons that are displayed is controlled by the Google slider at the top left.


Only the points that are between the Start time marker and the End time marker will be displayed. These markers can be dragged to focus on a specific time. You can dynamically drive the entire route by dragging the end time marker from start to finish. You can also automatically drive the route by clicking on the ‘Drive’ button.

There are various types of additional information that can be overlaid onto the map. In particular, the option to display road names is useful; this can be selected as shown below.

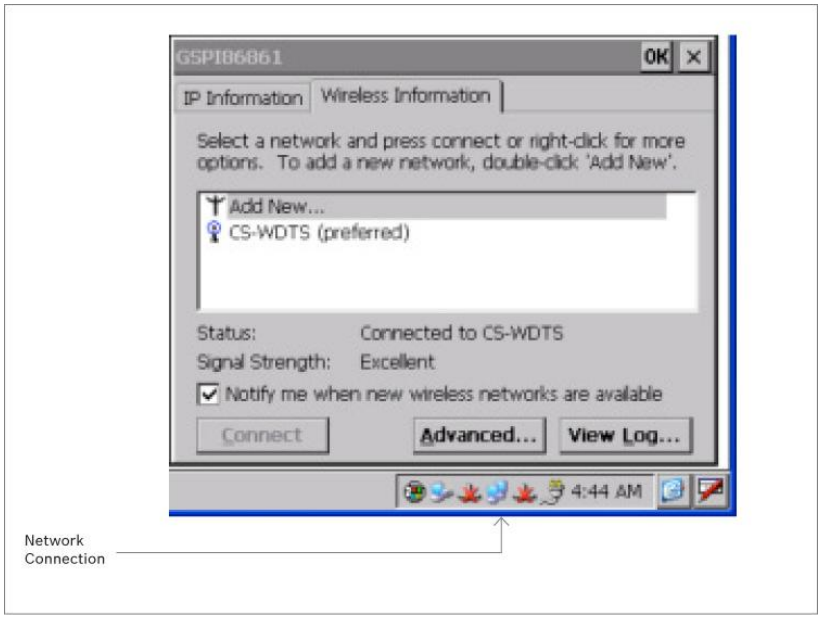



When using Google Earth, the data is stored in an intermediate file called ‘google.kml’ in the same directory as this program. This file can be double-clicked at any time to view it in Google Earth independently of this program, or it can be emailed to others. An alternative view of the data, outside of Google Earth, is obtained by clicking on ‘Scroll through GPS Data’. This will show a numerical table of the data. This table can be copied and pasted into Excel by selecting some rows and using Ctrl-C and Ctrl-V. If desired, GPS data can be selectively deleted using this dialog screen.

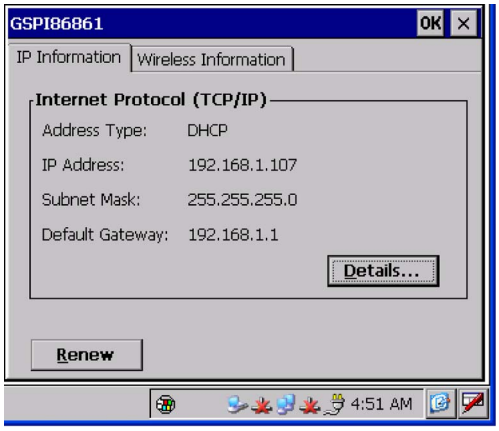
# 6 CS-550 WiFi Data Transfer

## 6.1 Initial WiFi Set-up

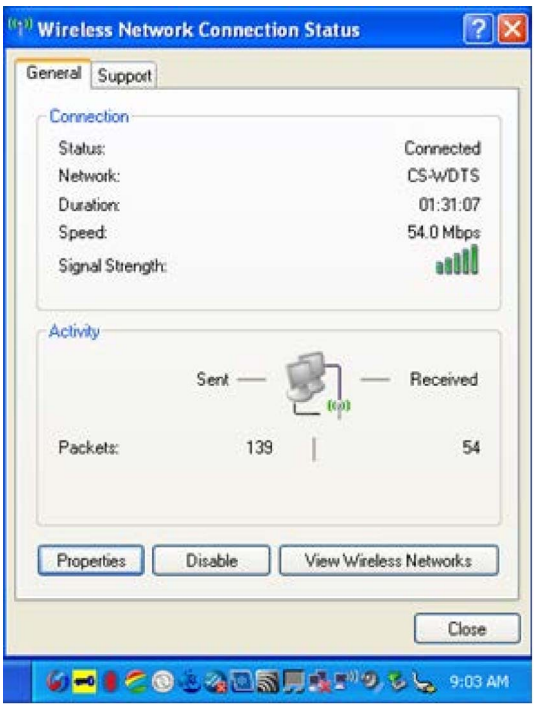
As an alternative to the use of a USB stick to transfer data from the CS-550, it is also possible to use a WiFi connection. The presence of a WiFi connection can be confirmed as follows. On the Windows taskbar on the CS-550 display, double-click on the network icon to produce display shown below.



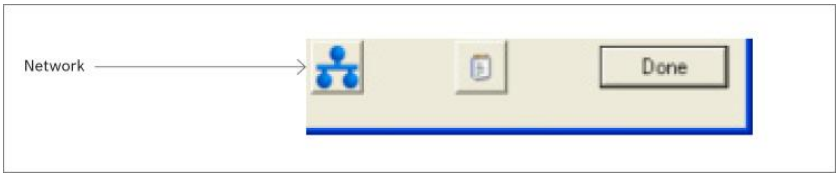

The title should say ‘GSPI86861’. The tab called ‘Wireless Information’ should contain a connection called ‘CS-WDTS’ and the status should say ‘Connected’. The next piece of information that is needed is the display’s IP address. You will need this later when setting up the WiFi data transfer program. This is shown in the ‘IP Information’ tab. You will need this later when setting up the WiFi data transfer program.



On the computer, you can confirm the WiFi connection by double-clicking on the WiFi network icon on the taskbar to produce the display shown below.




This should also show that the connection CS-WDTS is present and that the status is ‘connected’. If you are not able to locate the WiFi connection icon on the taskbar, then it may be that the adapter is not running. In this case, an independent check of the WiFi status can be obtained by clicking on the ‘Network’ icon in the CS-550WiFi program, described below.



This will run the DOS command ‘ipconfig/all’. If the WiFi adapter is running, then you should get a response like what is shown below.

Ethernet adapter Wireless Network Connection:

| | | |
|---|---|---|
| Connection-specific DNS Suffix | : | wel.us.bosch.com |
| Description | : | Intel(R) WiFi Link 5100 BG |
| Physical Address | : | 00-26-C6-55-7C-F0 |
| Dhcp Enabled | : | Yes |
| Autoconfiguration Enabled | : | No |
| IP Address | : | 192.168.1.109 |

This will also give you the IP address of the computer, which you normally will not need. If the WiFi adapter is not running, you may see a response that looks like what is shown below.

Ethernet adapter Wireless Network Connection:

| | | |
|---|---|---|
| Media State | : | Media discontinued |

Finally, if all of the above tests are passed, and if you are still not able to communicate using the CS-550WiFi program described below, you can independently confirm that the connection is present using the DOS command ‘ping’. The presence of the computer’s wireless adapter can be confirmed using the same IP address shown above, and the response in DOS should look like this:

C:\Documents and Settings\username>ping 192.168.1.109
Pinging 192.168.1.109 with 32 bytes of data:
Reply from 192.168.1.109: bytes=32 time<1ms TTL=128

The presence of the CS-550 display can also be confirmed using the IP address from the display, and the response should look like this:

C:\Documents and Settings\username>ping 192.168.1.107
Pinging 192.168.1.107 with 32 bytes of data:
Reply from 192.168.1.107: bytes=32 time=24ms TTL=128

If either of these tests fails, then you will get a response like this:

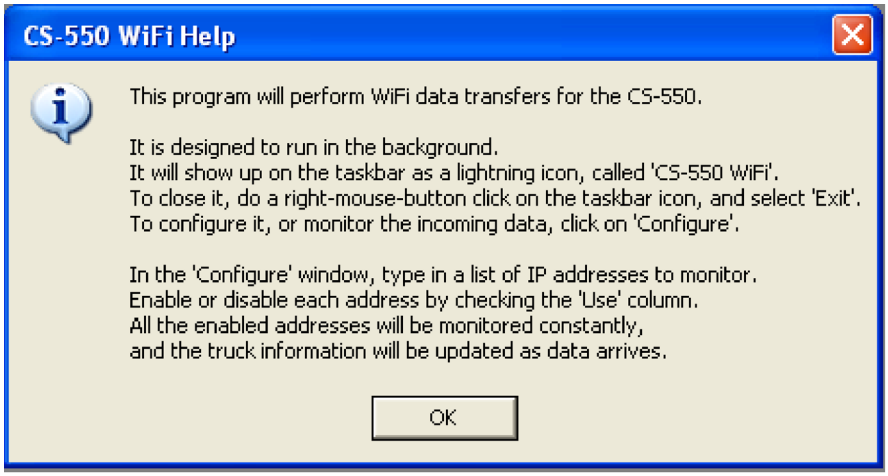
Pinging 192.168.1.106 with 32 bytes of data: Request timed out.

## 6.2 WiFi Data Transfer


The WiFi data transfer system is designed to constantly monitor for the presence of new trucks and to upload the data from them automatically using a program called

CS-550WiFi.exe. This program does not need to be installed separately, it just needs to be copied from the CD to the same directory as the program CS-550Desktop.exe. This will normally be the directory C:\Program Files\CS-550Desktop\. After copying it, you may wish to create a shortcut on the desktop by performing a right mouse button click on it, and selecting the option ‘Send To->Desktop (create shortcut)’. This shortcut should will look like the icon to the left.

The first time you run the program you will get the message shown below.




Follow by the message shown below.


As indicated, the program is designed to run in the background, minimized on the taskbar. The first thing that needs to be done is to add some IP addresses. Click on the ‘Add’ button and then click on the IPAddress field in the first line, where it says ‘---.---.---.---’. Type in the CS-550 display address obtained in Section 6.1 above, for example 192.168.1.107. Then click on the ‘Use’ field to enable the checkbox, and then click on ‘Run’ which will start the monitoring activity. If the connection with the truck is established, then the checkbox called ‘Connected’ will receive a check mark, and the program should appear as below.


In the case of a successful connection, the Region Name, and Truck ID, and Parameter Date will show the last successful transfer of parameter data for this truck, and the Log Date field will show the date of the last successful transfer of log data.

The general purpose of this dialog is to allow configuration of different IP addresses that you wish to monitor. This will be described below. When the configuration is complete, click on the ‘Done’ button. This will minimize the icon for the program so that it appears on the taskbar at the bottom right corner of the screen, as shown below.


The program will now run continuously in the background, checking to see if new trucks have arrived. If you wish to stop it completely, perform a right mouse button click on the icon on the taskbar, and select ‘Exit’. In the same menu that shows ‘Exit’, you can also choose ‘Configure’, which will return you to the above dialog, which allows you to either configure the IP addresses or check the status of the communication.

During the ‘Configure’ step, you can add and delete IP addresses, and enable or disable the monitoring of these addresses. First click ‘Stop’ to stop the monitoring process. To delete an address, click on the appropriate row, so that the cursor in the left column moves to that row. Then click the ‘Delete’ button. You will get a warning message asking you to confirm this deletion. If you select ‘Yes’ then this truck will disappear. Note that this does not delete any of the data that had previously been received from this truck. It simply means that this truck will no longer be monitored in the future. You may need to do this, for example, if a truck’s IP address changed because the CS-550 display was changed. To add a new truck to the list, click on ‘Add’ and create a new IP address as done above. When finished, then click on ‘Run’ to start monitoring. If you want this IP address to be used immediately, then click on ‘Use’ before clicking on ‘Run’. If a syntax error was made

in typing the IP address, for example not enough '.', or some illegal characters, then the IP address may be cleared, in which case you will need to stop the monitor, click on that row, and delete the address, which will be blank at this point. Note that only two fields can be changed by the user, namely the IP address field when you are adding a new address, and the 'Use' field which enables monitoring. All the other fields contain data that will be read from the truck and cannot be modified.

It is not necessary that all the trucks be monitored all the time. If you have trucks that are temporarily not in use, you can temporarily avoid monitoring them by clicking on 'Stop', then uncheck the 'Use' column, and then click on 'Run'. Only those trucks that have a check mark in the 'Use' column will be monitored for activity. Most of the fields in this table represent historical data, meaning that they show information only on the last successful connection. The one field that shows 'live' data is the 'Connected' field. This field will automatically show a check mark when a new truck arrives, and the check mark will automatically disappear when the truck leaves or is turned off. The actual data transfer from the truck occurs only when the connection is first established. No further data transfer from this truck will be attempted until the truck first leaves and then reappears.

Once the configuration of IP addresses is complete, if you do not wish the dialog box to be present, you can click on 'Done'. The program will continue monitoring, until you close it by clicking on the taskbar and selecting 'Exit'. When you restart the program it will automatically go into monitoring mode, as though you had pressed the 'Run' button. The title bar of the 'Configure' dialog box will indicate whether the program is 'Running' or 'Stopped'.

There are three other icons in the dialog box, entitled 'Help', 'IP Config', and 'Log file'. The 'Help' button shows the software version number and the initial startup message. The 'IP Config' button shows information on the wireless adapter card, for diagnostic purposes. The 'Log file' button displays a text file called CS-550WiFi.log. This is a history of recent IP addresses which have been used, and it indicates how much data was read from each truck. It also reports any error messages that occurred, which may be useful for diagnostic purposes. The size of this file has been limited to 25K, which will be roughly 500 messages.

Notes: