SIMRET 4000 INSTRUCTIONS

GETTING STARTED

The Simret 4000 is operated by a single *Click* control. The central OK button may be *single-clicked*, *double-clicked*, or *held-down*. The surrounding arrow buttons are used to navigate menus by moving a highlight bar through a menu of options on the instrument's display screen. Clicking the OK will select the highlighted item. Normally this will be accompanied by a beep from the instrument. The scroll bar on the right hand side indicates the relative position of the item within the menu.

Whenever possible the instrument operates to these simple rules:

- *single-click* to choose a menu item
- *single-click* to return
- *double-click* to enter a 2nd level menu
- *single-click* to return
- *hold-down* (for more than one second) to abandon a course of action
- Use▲ or ▼ to increase or decrease a value.
- Use the arrow buttons to scroll through a menu
- the last option of a menu will return you to the previous menu, or use the◄ button.

SWITCHING ON: To power the instrument, *hold-down* OK and then release. The display will appear when OK is released. The instrument will perform a short self-test and display its software version and when calibration is next due. The ***Start Menu*** will then appear.

The self-test will warn if re-calibration is overdue and if more than 80 tests have been stored in memory. Upload or print the tests if the memory is getting full, then erase to create more space. If the SD card is fitted, tests will be backed-up automatically to create space.

Note the instrument has limited functionality if the LOW battery warning shows.

SWITCHING OFF: To manually switch off, *hold-down* OK in the ***Main Menu.*** If the control has not been operated for about 4 minutes, the instrument will switch itself off unless it has been armed for a test. It will also turn off if its battery is very low.

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EDITING: A built-in editor allows certain number values, names and software switches to be edited in the instrument. First highlight the item then for:

- numbers, *single-click* to edit
- names in a sub-menu, *single-click* to select or *double-click* to edit.
- software switches, *single-click* to change state

When a number or name is being edited, press the arrows until the pointer is at the required digit or letter and *single-click*. The pointer bounces to indicate the letter has been selected. For text edits, a slider of available characters appears. Use the arrows to change the character as required. Then *single-click* to implement the change and move on to the next digit or letter. Finally *double-click* when finished and then *single-click* to select one of the following options:

- **Continue:** continue editing this item
- **Save and quit:** save the new value and return to the menu.
- **Reset value:** reset to the default value and return to the menu
- **Just quit:** revert to the previous value and return to the previous menu.

WIRELESS: The Simret 4000*, Printer & Pedal Pad* are equipped with radio module to allow them to communicate wirelessly at distances of up to 10 metres. New instruments are preconfigured to automatically pair with the printer and pedal pad supplied. The user can also set SIMRET to pair with additional devices (see ***Setup Wireless*** menu).

When the wireless feature is turned ON, the instrument will pair automatically. The instrument will decide if it needs to pair for ***Brake Testing*** or for ***Printing*** and the appropriate warning message will appear on the screen. Preferably, make sure the appropriate remote device is switched on at this time. However, SIMRET will continue trying to pair until the device is switched on and pairing is successful. Successful pairing normally takes just a few seconds, although if many discoverable wireless or WiFi devices are in range it may take a little longer. If the device will not pair, just *single click* to try again or *hold down* and release to abandon and investigate.

To pair with the *Printer*, first make sure the printer is switched-on by pressing its >> button, a green light appears on the printer (no green light means its battery is flat). The *Printer* will then stay on and paired until the SIMRET is switched off or is paired with the *Pedal Pad*. The *Printer* will switch itself off after one minute if it can't pair.

To pair with the *Pedal Pad*, first switch it on by pressing firmly with your foot for about 1 second then releasing. The yellow light will turn off when pairing is successful. The pedal will stay active and paired until the *SIMRET* is switched-off or is paired with the *Printer*.

Wireless devices are identified by their unique Wireless Address (a 12 digit number) and a "Friendly" name. To aid identification, all devices are marked with their wireless friendly names. The friendly name will usually incorporate the serial number of the device.

If wireless is fitted, then at switch-on the instrument will make itself discoverable to other compatible wireless devices. After printing or brake testing you can make the instrument discoverable again by double clicking on the *Main Menu*. The wireless passcode is 1234.

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STORAGE AND CHARGING: Always return the Simret 4000 to its protective Pelicase after use, store accessories in the compartment below. Connect one of the curly captive charging leads to the underside of the *Modulo*, connect the second curly lead to the *PFT*. Connect the supplied (12v DC, 0.8A, centre +ve) battery charger to the socket on the Pelicase front panel. This ensures the Simret 4000, *Printer* and *PFT* are all recharged when the battery charger is connected. The battery charger can also be connected directly to the *SIMRET* or *PFT*.

When switched-on, the instrument display's battery icon, on the top right of the *Start* and *Main* menus, will indicate when the charger is connected and the instrument is taking charge. A full battery recharge takes about 12 hours (overnight), the instrument should be given a top-up charge each month. Operating time from full re-charge is normally over 8 hours.

If the instrument is switched-off, the pass and fail lights will flash when the charger is connected.

The Simret 4000 *Printer* requires 58mm width thermal printer paper with a maximum roll diameter of 32mm. No printer ribbon is required.

To switch the *Printer* on, press the button marked **>>.** A green light appears while the printer is on. Press >> to feed extra paper. To switch off, press and hold || . Please refer to the Electronic Printer Mechanism (EPM) instruction extracts at the end of this document for more information about the printer and changing paper rolls.

WIRED OPERATION: If you do not wish to use the wireless features of the SIMRET 4000, the *Printer* or the *Pedal Pad* can be physically connected to the *SIMRET's* 8 pin DIN connector.

In particular, when a wired *Pedal-Pad* is connected to the DIN connector with the cable provided, the *SIMRET* will not make any attempt to connect wirelessly. In this case, after arming for a test, just depress the pedal to trigger the instrument.

RE-CALIBRATION: Your Simret 4000 is a precision instrument and must be recalibrated annually by an accredited laboratory. This gives you the optimum re-assurance that the **brake ratio** measurements will always be accurate and correct, ensuring the safety of your operatives and plant. For a small annual fee, Turnkey offers an **Extended Warranty** for the Simret 4000 which includes annual re-calibrations, all materials and labour costs in the event of breakdown, and an unlimited technical support helpline. Please see our website for more information or call 0800 195 8887.

IN THE EVENT OF A FLAT BATTERY: If your SIMRET 4000 has been left neglected and not used for many months its battery may become fully discharged (NiMH batteries typically self-discharge at about 10% per month) and as a consequence the display will not appear (or disappears immediately) when the instrument is switched-on. If this happens, just connect the charger and wait a 30 minutes before trying to switch on again. If the display now appears correctly, switch off and give the instrument a full re-charge. If no display appears or the instrument does not start correctly or appears to malfunction, the instrument must be reset. Do this by pressing and releasing the RESET button, this is the right hand side push-button when viewed from the rear of the instrument. You may need a ballpoint pen or pencil to depress it properly. Note that if they battery has become discharged, the time and date will have to be re-entered but no results or settings will have been lost.

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BRAKE TESTING

Always observe safe working procedures when accelerating and stopping the vehicle.

Simret 4000 can be used to measure either **brake effort** or deceleration. For heavy vehicles, **brake effort** measurement is recommended as best practice in the latest (May 2007) Guidance from the Health and Safety Executive.

The reason is simple, for the same brake performance, the **brake effort** (also known as **brake ratio**) will be the same regardless of ground slope. Deceleration, on the other hand, depends on the slope and, for example, the deceleration on a 10% downhill gradient will be 10% less than on level ground.

To measure **brake effort** the instrument needs to know its orientation relative to the ground. On the original Simret 3000 instrument, you turned the adjustment screw until the slope reading matched that of the ground on which the vehicle was standing. In otherwords, the instrument was exactly parallel to the ground. On the Simret 4000 this is done electronically and you use the ▼▲ buttons to set the slope when prompted to do so.

Brake effort measurements are recommended for heavy quarry vehicles where the test track may not be level, or indeed may be on a deliberate gradient to ensure that the brakes are forced to generate their fully developed effort during the test in order to reach a plateau (see Guidance document for more information).

The instrument should be positioned so the *clickcontrol* is toward the rear of the vehicle, the large arrow on the underside pointing toward the front of the vehicle. Preferably, it should be placed against a forward bulkhead so that it cannot slide forward under severe braking. Although the tilt of the instrument relative to the ground surface is automatically recorded and used to compensate the results, the very best results will be obtained when the instrument base is parallel to the road surface.

The instrument is best used with the *Pedal Pad* attached to the brake pedal. This informs the instrument when the brakes are applied so it can then measure the delay time of the braking system. This is the time interval between applying the brakes and the deceleration start threshold being reached. For heavy vehicles this may be quite significant and a considerable distance may be travelled as evidenced by the distance time graphs produced by the instrument.

For heavy vehicles it is recommended that the *Pedal Pad* is always be used as the external start trigger.

For other situations the internal self-start trigger can be used. However, this does not allow the brake delay time to be determined and the calculated stopping distance will be less accurate as it is evaluated only from the time the brakes start to act rather than when they are applied.

The instrument is normally set to take 40 measurements per second. This is the NORMAL sampling rate and is good for most situations. The FAST 400 measurement per second sampling rate can be selected in special situations, but be warned calculations take 10 times as long and 10 times the memory is used per test.

The instrument records information for about 2 seconds before the start trigger and up 6 seconds (as set by the ***End Delay)*** after the vehicle has stopped. Events in these periods can be seen on the graphs. On the graphs a shaded area means a negative reading.

To accurately determine the speed and stopping distance, the instrument needs to know the gradient of the ground in order to eliminate any static offsets caused by the acceleration due to gravity. You may opt to measure these at the point of arming or at the point of coming to rest. Whichever one is most representative point of the test course should be used. If you choose to measure the gravity offset at the end, you may also elect to pause while the brakes are released to unlock the vehicle's suspension. If you don't use the pause, make sure you set the End Delay long enough for the

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suspension to stop bouncing (confirm by looking at graph). The slope is measured as the blue arming light goes out.

If the **Auto-Align** feature is selected, the instrument does not have to be accurately aligned with the direction of travel. It will sense which direction the vehicle first accelerates for the test (to 5 kph) and use that as the reference direction. It is important the initial direction coincides with that when the brakes are applied.

Note that if you're measuring **brake effort** with **auto-align**, the instrument will try to force you to confirm the ground slope at the end of the test. It has to do this because it doesn't know the proper direction of the slope until after the test. You can override this by selecting NO for slope at stop during the arming menu, in which case the instrument will assume it is positioned in the vehicle exactly parallel to the ground.

Over the years Turnkey has produced many documents about brake testing, please contact our Technical Support Department for further information.

support@turnkey-instruments.com

simret.eu

0800 195 8887

"*Guidance on brake testing for rubber-tyre vehicles operating in quarries, open cast coal sites and mines*" (published in May 2007 by EPIC in conjunction with OPERC and the UK Health and Safety Executive, ISBN 978 0 947974 62 6).

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Start Menu

The top line shows the % of memory used, the present time and a battery condition indicator. The latter shows LOW if recharge is needed right away and CHG while being recharged. The instrument will turn itself off if the battery gets too low. If the battery goes completely flat you will have to reset the clock but the stored results will be preserved.

Test Brakes: *single-click* to proceed straight to brake testing. The instrument will attempt to connect with the *Pedal Pad*

More… : *single-click* to proceed to the ***Main Menu.***

While this menu is visible the SIMRET 4000 can be connected to other compatible devices.

Main Menu

Double-click anywhere to make discoverable if wireless is on. The code is 1234.

Examiner Identity: *single-click* to show a list of up to eight examiners names, ▲▼ to highlight then *single-click* to select or *double-click* to edit (see *Editing*).

Plant Identity: *single-click* to show a list of up to 99 plant or vehicle identities. ▲▼ to highlight then *single-click* to select or *double-click* to edit (see *Editing*).

Site Conditions: *single-click* to show a list of up to 16 site conditions or user notes, ▲▼ to highlight then click again to select or *double-click* to edit.

Measure GRADIENT: *single-click* to measure the slope gradient. The instrument continuously measures and displays the slope gradient in percent. A negative number means a downward gradient. If a very accurate measurement is required, first trim the instrument zeros (see *Trim Zeros* in the **Setup Instrument** menu)**.** The cross slope and temperature are shown at the bottom of the display. Click again to return to the main menu. The maximum slope is limited to 25% (1 in 4).

BRAKE TESTING: *single-click* to arm the instrument for the next brake test. The display shows the examiner, vehicle name, trailer (optional) and site conditions for the test together with the test reference number. Highlight and *single-click* to change any of these (see *Editing*). When ready, *single-click* **Proceed**.

Click again to confirm the vehicle is stationary and you are ready to proceed with the test. The instrument should be properly located in the vehicle and the vehicle should be on a gradient representative of the test course.

All the subsequent calculations of deceleration, speed and distance will be referenced to the gradient measured at this point (i.e. the gradient at arming). Alternatively, if measure slope at stop is selected (see **Change Settings** menu), all calculations will be reference to the gradient measured at stop when the vehicle has come to rest.

If the instrument has been set to measure Brake Ratio (instead of Deceleration), you will be prompted to tell in instrument the exact gradient at this point (unless ***Slope at Stop*** is

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selected). The gradient measurements will only be displayed and printed if the instrument is set to measure Brake Ratio (as recommended for heavy vehicles).

To obtain the most accurate results, the instrument should be aligned in the vehicle to move parallel to the ground. If the instrument is misaligned by more than 25%g a warning will be added to the results.

When ready, highlight the type of brake being tested and click.

The instrument is now fully armed for the brake test, accelerate to test speed and apply the brakes. The BLUE armed light will illuminate and the display will show the speed increase when accelerating. Note you must accelerate to 5kph (or mph) before you can trigger the test.

The Test Reference number is shown at the top of the display together with whether the internal or external start trigger will be used (see *Change Settings*). The Test Reference Number will auto increment after each successful test. You must accelerate to at least 5 kph (or mph) before braking otherwise the instrument will not trigger. This allows you to hold the instrument on the brake while arming and also allows the instrument to determine its direction of travel (but see ***Allow Coasting*** in **Change Settings**).

Until you reach a speed of 5 kph (or mph), you may still elect to measure the ***Slope at Stop*** and to ***Pause*** before doing so, move the highlight and click ON or OFF as required (see **Change Settings**). The instrument will beep as this speed is passed. This is also the speed to which the auto alignment is set If the Speedo Beep feature is enabled, the instrument will instead beep once at 10 kph (or mph), twice at 20 and so on.

To abandon the test, *hold-down* OK.

At the end of the test, a results summary will be displayed. At this stage you can elect to accept or reject the test. If any errors or warnings have been detected, you can elect to view these before accepting or rejecting the test results.

After a successful test the BLUE light will go out, if it flashes it means the instrument has detected potential errors. The GREEN pass or RED fail light indicate whether or not the vehicle has exceeded the chosen pass threshold, if these flash it means that calibration is overdue.

Once accepted you may either:

- Proceed with another test for that vehicle
- Review the results in more detail
- Change the instrument settings
- Adjust the test parameters
- Finish testing.

A simple ON-OFF Pedal Pad or Hand Switch can be connected to the DIN socket as an external trigger (but see also the wirekess Pedal Force Transducer).

Do not move off until the Pass or Fail light appears.

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Review Results: *single-click* to review the stored test results. Change the test number to be reviewed by highlighting, clicking and changing to the required test. The display shows the results summaries as you move though the stored tests. *Single-click* when the required test is reached.

Single-click **More** to see more detailed results for the test including the instrument set-up used and any errors or warnings given. The test can also be selected for later printing (***Mark for Print***) or later erasing (***Mark for Erase***). If printing is selected, you may optionally choose to print graphs, either individually or overlaid, and the test settings. Any error report will always be printed.

Single-click **Graph** to display a graph of the test results. Scroll through the graph with ▲▼, or *hold-down* to animate. *Double-click* or ►◄ to change the graph, the *options* to the right of the graph will flash, use ►◄ to scroll between these options:

- *change plot* (e.g. brake ratio, distance, speed, etc)
- *change span* (e.g. 0 to 100%, 0 to 50%, etc)
- *change zoom*. (e.g. expand time axis, etc)

Single-Click at the required option. The axis name will then flash, ▲▼ and *single-click* again to select the required axis name, span or zoom.

The fixed solid line on the graph is the time reference line. The dashed lines represent the times of the external start trigger (if enabled), and the start and end of deceleration.

Single-click to close the graph and review other results.

Single-click **Print** to print this test now, regardless of the whether or not the test has been marked for print. The printer will turn on automatically if it has been paired previously, if not switch-on first by pressing its >> button to pair. Printing graphs and settings may be skipped depended on the chosen options. If the graphs are printed, they can be overlaid or printed individually. The solid lines on the graphs correspond, as above, to the external start (if used) and the start and end of deceleration. Press and hold the OK to abandon a print.

Single-click **Quit** to return to the previous menu

Wireless: *single-click* to temporarily switch radio communications ON or OFF

Setup Instrument: *single-click* for the **Set-Up Menu** to change the set-up of the instrument. You may need a PIN number to do so.

Print Selection: *single-click* to print all the tests that have been selected or marked for print during **Review Results**. If *Mark for Print* was the default instrument set-up, all prints will be automatically marked for print when they are accepted. You may choose to print two copies of each test, and deselect or mark for erase after printing. Press and hold to abandon the print.

Erase Selection: *single-click* to erase all those tests that have been marked for erase. Any freed memory space will be recovered; this may take a few seconds depending on how many tests are already stored in memory. You will be prompted to confirm.

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SD memory card backup

The 2GB SD card is a factory option and this menu will only be available when fitted and the memory card has been inserted into the slot on the side of the instrument (behind the yellow cover).

A 2GByte SD card must be used. High capacity SDHC cards are not compatible.

SD Card Backup: *single-click* to review the memory card Folders. Change the Folder number to be reviewed by highlighting, clicking and changing to the required number between 0 and 999. As you move though the folders, the display shows the time and date the folder was saved and the serial number of the instrument that saved it. *Single-click* when the required Folder is reached.

Single-click **Save** to backup this instrument's entire internal memory to that Folder number. The display first asks you to confirm you wish to erase and overwrite the Folder's current contents. Backing up the entire memory takes about 50 seconds The Folder is given the (un-hidden) name SSSSSnnn.TKI, where SSSSS is a the five character instrument serial number and nnn is folder number between 000 and 999.

Single-click **Load** to retrieve the SD card Folder into the instrument's memory. This will overwrite the instrument's internal memory, but you will be able to append new tests if space allows. Retrieving takes about 50 seconds.

Single-click **Quit** to return to the previous menu

The contents of the SD card can be imported into the Turnkey Winsim application.

Automatic Backup: if the SD card is fitted, whenever the instrument switches-off with its internal memory more than 80% full or containing more than 75 tests, the internal memory will be automatically backed-up to the next Folder Number on the SD Card. The internal memory will then be erased. This will be repeated when it is next full until all 1000 folders have been used (75,000 tests).

If the automatic backup isn't needed as the instrument switches off, then the internal memory is just backed up in Folder 0 but not erased. Thus after switch-off the SD Card is always ready with the latest results backed up (in Folder 0).

Automatic backup does not happen if the low battery warning is on.

WIRELESS PEDAL FORCE TRANSDUCER

The wireless Pedal Force Transducer can be used as either a simple ON/OFF external trigger or as an indicator of the applied pedal force in kgF (1kgF=9.8 Newtons), or both.

When measure Pedal Force is selected, the recorded pedal force will be substituted for the velocity time graph in the results. Don't forget to set ***I/O Expansion*** on to use the wireless PFT (otherwise the analog port on the DIN connector will be measured). When the *Brake Testing* menu is first selected, the display will indicate that the PFT is being zeroed (click OK to abandon). Do not apply force to the transducer during zeroing, once 'Zeroing PFT' disappears from the display the brake can be applied to hold the vehicle during the remainder of arming, or repeat brake tests.

The PFT is also zeroed when the *Measure Gradient* mode is selected. Again, do not apply force to the transducer during zeroing. After zeroing, the gradient measurement display indicates the force being applied to the PFT. This is a useful check on its calibration which

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can be adjusted if required via the **Adjust Values Menu.** The applied force at which the PFT triggers the start of braking is also shown in this menu

To use as a simple ON/OFF trigger pad, just set the measure *Pedal Force* setting off. The PFT will then use a fixed setting of about 5 kgF to trigger the start and the ***Gradient Measurement*** mode displays 'BRAKE ON' when a force greater than the internal trigger setting is applied.

The instrument will sense if a wired Pedal Pad is connected to the DIN socket. In this case the instrument will use the connected Pedal Pad (and not attempt to pair) either as an analog pedal force transducer or as a simple on/off trigger switch. The ***Gradient Measurement*** mode will display either the applied pedal force or 'BRAKE ON' as above (providing external trigger is enabled). Note that the instrument will not attempt to zero an analog PFT connected in this manner and you must adjust its zero manually in the **Adjust Values** menu.

Setup Instrument Menu

The Editor PIN may be required to access this menu

Adjust Values: *single-click* to select the **Adjust Values** menu.

Change Settings: *single-click* to select the **Change Settings** menu.

Setup Wireless: *single-click* to select the **Setup Wireless** menu (Wireless must be ON).

Trim Zeros: *single-click* to accurately trim the zero readings of the instrument by following the on screen instructions. Any flat surface may be used, it need not be horizontal.

Erase all Tests: *single-click* to erase all the tests in the instrument's memory, regardless of whether marked for erase or not. You will be prompted to confirm

Set Time and Date: *single-click* to set the time and date by following the on screen instructions

Adjust Contrast: *single-click* and ►◄ to adjust the contrast of the display

Adjust Backlight: *single-click* and ►◄ to adjust the brightness of the backlight. The brighter it is the more battery power will be used. To conserve power, the light turns off if there has been no input for about 2 minutes.

Defragment Memory: *single-click* to confirm that the memory is fully defragmented and all free space is available for use.

Format SD Card: *single-click* to format the SD Card to make it visible to a personal computer (FAT16 file system). Sets all the Folder names to FFFFFnnn.TKI (nnn=000 to 999, hidden file attribute) but does not overwrite previously stored data. Folders are in the BACKUP subdirectory of the TURNKEY root directory

Configure Printer: *single-click* to configure printer fonts and timeouts. Also resets the wireless module to its factory defaults in case of problems.

Calibration Report: *single-click* to print calibration report.

User PIN: single-click to change the PIN required to use the instrument. Make a note of it! (5424)

Editor PIN: single-click to change the PIN required to set-up the instrument. Make a note of it! (4748)

Main Menu: *single-click* to return to ***Main Menu.***

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Adjust Values Menu

Use the built-in editor to adjust any of these values. The default values are shown

Test Number: the test reference number between 1 and 30000, it is automatically incremented after each test.

Pass B1 > 25.0 %g: pass threshold for the 1st brake type (normally 'Service')

Pass B1 > 25.0 %g: pass threshold for the 2nd brake type (normally 'Secondary')

Pass B1 > 25.0 %g: pass threshold for the 3rd brake type (normally 'Parking')

Pass B1 > 25.0 %g: pass threshold for the 4th brake type

Trig at 10.0 %g: the deceleration threshold for start of braking

Stop at 10.0 %g: the deceleration threshold for end of braking

Trig hold 0.50 sec: the minimum time the deceleration must be sustained over the start threshold to be a true start of deceleration. The true start time is the start of this time.

Stop hold 0.20 sec: the minimum time the deceleration must be sustained below the stop threshold to be a true end of deceleration. The true stop time is the start of this time.

End Delay 2.5 s: delay before measuring the stop point slope gradient. Only if 'Slope at Stop' has been selected.

Peak over 0.20 sec: the minimum time the peak reading has to be sustained.

Dive 5.0 deg/g: compensation for the tilt of the vehicle (in degrees tilt per g of deceleration) caused by the movement of its suspension as it decelerates

PFT trig 20.0 kgF: trigger point for Pedal Force Transducer in kg force. Only if PFT is enabled in settings.

2.5V PFT 100.0 kgF: PFT calibration, force required for 2.5 Volts output from PFT

0.0V PFT 0.0 kgF: PFT calibration, force required for 0.0 Volts output from PFT

Card Folder 0: the next SD memory card folder to be used (in range 0 to 999). Only if the SD card feature has been enabled by the factory.

Filter type 2: the amount of smoothing applied to the readings for the graphs. Zero means no smoothing is applied.

Lifetime 24 hr: the length of time from the last brake test that the pass/fail lights will remain illuminated. Set to 0 to disable the pass/fail lights.

- **Save Changes:** save the changes made.
- **Reset ALL:** revert to default values (shown above), then need to Save Changes too!
- **No changes:** revert to the previous values

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Setup Wireless Menu

SIMRET 4000 *maintains two Device Lists of up to 8 devices identified by their Wireless Addresses and their Friendly Names*

Wireless Search: searches for local wireless devices that are in a connectable state. This takes about 30 seconds, but click at anytime to terminate. Results are shown as Friendly Names in the **Devices Found** table, see below. To be discovered, wireless devices such as the printer or pedal pad must be switched on first.

Devices found: shows the results of the last search (if available) as Friendly Names. Click on a name to add it to the wireless Device Lists at the location following that of the device currently paired as the printer (see **Warning** below) and set the instrument ready to pair with the new device as the printer. Alternatively, scroll to and click on ***Go back*** the end of the table to do nothing.

Warning:- this will overwrite the existing wireless Device Address and Friendly Name at that location

Make Connectable: allow the *SIMRET* to be discovered by other compatible wireless devices. The code is 1234.

Printing pair: *single-click* on one of these to form a pair for printing:

Device Address: *single-click* to show the Device List as wireless addresses; ▲▼ to highlight then *single-click* to select or *double-click* to edit (see *Editing*). The instrument will automatically try to pair with the chosen device before printing.

Friendly Name: *single-click* to show the Device List as friendly names; ▲▼ to highlight then *single-click* to select or *double-click* to edit (see *Editing*). The instrument will automatically try to pair with the chosen device before printing.

Brake Testing pair: *single-click* on one of these to pair for the pedal-pad:

Wireless Address: *single-click* to show the Device List as wireless addresses; ▲▼ to highlight then *single-click* to select or *double-click* to edit (see *Editing*). The instrument will automatically try to pair with the chosen device before brake testing.

Friendly Name: *single-click* to show the Device List as friendly names; ▲▼ to highlight then *single-click* to select or *double-click* to edit (see *Editing*). The instrument will automatically try to pair with the chosen device before brake testing.

Go Back: go back to ***Setup Instrument*** Menu

Note if you are experiencing problems with the wireless setup try using the Configure Printer option in the Setup Instrument Menu to reset it to its factory defaults.

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Change Settings Menu

Highlight the item and single-click to change its state. The default states are shown Note some items will only appear conditionally depending on the state of other items.

Wireless **No**
YES to switch on wireless
NO to switch off

Swap RF port **Yes**
YES is normal setting
NO for special versions

I/O expansion **No**
YES for input/output expansion
NO for no expansion

Auto-alignment **Yes**
YES to auto-align with direction of travel
NO for manual alignment

Brake Effort **Yes**
YES to measure brake effort or ratio
NO to measure deceleration

Allow Coasting **Yes**
YES for rail coasting mode
NO for normal operation

Metric Units **Yes**
YES for results in metric units
NO for imperial units

metre/sec/sec **No**
YES for results in metres/sec/sec
NO for %g or g

Results in %g **Yes**
YES for results in units of %g
NO for units of g

External trig **Yes**
YES to start at external trigger
NO to self-start at deceleration

Delay in Mean **No**
YES to include the brake delay in the mean calculation
NO to exclude (gives higher readings)

Only show MFDD **No**
YES to show MFDD results only
NO to show MEAN, PEAK, MFDD

MFDD markers **Yes**
YES to mark 80% and 10%V on graphs
NO for no MFDD markers

Calc. Distance **Yes**
YES to calculate stopping distance
NO do not calculated

Slope at stop **No**
YES use gradient at stop as reference
NO use gradient at arming

Pedal Force **No**
YES to use pedal force transducer
NO don't use

Sampling Rate **NRML**
NRML=40 samples/sec
FAST=400 samples/sec

Beeper **ON**
ON means beeper is on

Speedo Beep **ON**
ON means Speedo Beep is on at 10, 20, 30, and 40 kph/mph

Screen light **ON**
ON means screen light is on

PIN for edit **No**
YES means PIN number required for changing setup

PIN to use **No**
YES means PIN number required to use instrument

Mark for print **Yes**
YES to mark all tests for print selection

Print graphs **Yes**
YES to print graphs
NO don't print graphs

Overlay graphs **Yes**
YES to print graphs overlaid
NO print separate graphs

Print settings **Yes**
YES to print test settings with results
NO don't print settings

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- **Save Changes:** save the changes made.
- **Reset ALL:** revert to default values (shown above), need to Save Changes too!
- **No changes:** revert to the previous values.

NOTES ABOUT SETTINGS

- When measuring ***Brake Effort*** you will be prompted to set the exact slope on which the test is being carried out. If ***Slope at Stop*** is set to NO, you will be prompted to tell the instrument the slope of the ground on which it is being armed. Use the up and down arrow keys for this purpose. This is equivalent to adjusting he instrument parallel to the ground surface on the original Simret 3000.
- If, on the other hand, you select ***Slope at Stop***, you will be prompted adjust the slope at the end of the test. You may also select ***Pause at End*** on the arming menu, this allows you to release the vehicle's suspension before taking the end slope measurement. If you don't use the pause, the slope measurement is made after the ***End Delay*** time. The default value of this is 2.5 seconds but may be increased up to 6 seconds from the stop (to allow time for the suspension to stop bouncing). The end slope measurement is made just after the Blue arming light goes out, so only move off when the pass/fail light appears. The instrument continues to record during the ***End Delay*** time. If ***Slope at Stop*** is set to NO, the instrument only records for about 1.5 seconds after the stop and uses the arming slope for the speed and distance calculations
- Note that if you have selected ***Auto-Alignment*** the instrument will force you to confirm the slope of the ground at the end of the test (for it doesn't know the axis for measurement until after the test has begun). Effectively ***Auto-Alignment*** sets ***Slope at Stop*** ON if ***Brake Effort*** is being measured.
- ***Allow Coasting*** is mainly for railway use and is only available if ***Auto-Alignment*** is off and the ***External Trigger*** is set. Normal (40/second) sampling has to be selected too. When coasting is selected, the instrument may be armed while the locomotive is coasting at constant speed. No speed increase is needed to activate the trigger and the post-arming speedometer is not shown. In the coasting mode it is recommended that ***Slope at Stop*** is chosen (see above) as the arming slope may not be that accurate. In addition the instrument will stay powered indefinitely when armed (If ***Coasting*** is NOT selected, it will power-off after being armed for about 4 minutes).
- Inserting a DIN connector with a Pedal Pad or Hand Switch attached will override the wireless settings and the instrument will not attempt to connect to a wireless device when arming for a test. Similarly, it will not make itself discoverable to other wireless devices if a DIN USB lead is inserted for uploading.
- If the ***Input/Output Expansion*** is off the pedal force is measured via a transducer connected to the analog input on the DIN connector. If I/O Expansion is on the pedal force is measured digitally either via the RS232 port on the DIN connector or wirelessly. Note that inserting a DIN connector will override the wireless settings and force the RS232 port to be used if ***I/O Expansion*** is ON, or the analog port if ***I/O Expansion*** is OFF.

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- Besides the conventional Mean (between the start and stop thresholds) and Peak values of brake effort or deceleration the instrument also measures the Mean Fully Developed Deceleration (MFDD). This is defined as the mean deceleration between 80% and 10% of the test speed and is now used internationally as the standard measure of brake performance. When ***MFDD markers*** is on, marker lines are placed on the graphs at the 80%V and 10%V points. These are in addition to the graph marker lines at the start and stop deceleration thresholds and the external trigger point. Note if *brake effort* (or *brake ratio*) is being measured, the Mean Fully Developed Effort or Ratio is determined.
- ***Swap RF Port*** must always be set to YES for the Simret 4000
- If ***Only show MFDD*** is YES, the PASS and FAIL warning lights are based on the MFDD reading; if NO, the PASS and FAIL lights are based on the MEAN deceleration between the start and stop thresholds. Similarly if ***Only show MFDD*** is YES, the MFDD (rather than the MEAN) is shown on the *accept results* and *review results* screens.
- The *brake delay time* and the start and stop transitions, generally speaking, have no effect on the MFDD reading which is the mean deceleration between 80% of the speed at braking and 10% of the speed at braking. If ***Only show MFDD*** is YES, the *brake delay time* is still the time between the pedal actuation and the start threshold.
- If ***Only show MFDD*** is YES, the MEAN and PEAK readings are excluded from the detailed *more results* screen and from the printout.

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Turnkey ID Exporter Program

The **Turnkey ID** program allows plant details, site conditions, operator names and other information to be downloaded to the instrument from a Windows personal computer. The executable program ***IDexporter.exe*** (supplied on the CD or available from the Turnkey website) should be copied to a convenient directory on your computer. Backup files of the plant names you use etc., will also be created in that directory.

If your PC is equipped with a **Turnkey Wireless Adaptor**, the instrument will be discovered by it and a wireless connection made whenever it is switched on and discoverable (e.g. in the *Start Menu* and *Main Menu*).

Alternatively, use a **Turnkey USB Link** to physically connect the instrument's DIN connector to a USB port on your computer. The instrument will sense the DIN connector and override the wireless, if fitted.

Start the ***IDexporte***r program and use the radio buttons to select the com port to which the wireless Adaptor or USB link is attached.

For wireless, click on *Search* and the program will search for available devices and produce lists of available Friendly Names and Wireless Addresses. Click on the name of the instrument you wish to connect.

For a wired connection, click on ***Connect*** button.

If the instrument is switched on and in the *Start Menu or Main Menu*, it will connect automatically and upload its serial number, calibration due date and its local time. It will stay connected and switched-on as long as the program is running.

The information that may be exported to the instrument is shown on seven tabbed pages labelled *Company*, *Examiner*, and so on. Click on a tab to select a page. On the selected page, type in the names or information you wish to download. You are allowed 16 characters per line; the number of lines that will be sent is shown at the bottom of the page.

Click ***Export*** to download the selected page of information to the instrument. Click ***Import*** to upload existing information from the instrument. Click ***Save*** to save the page of information to your Windows directory for future use; for example, if you want to download the same plant list to several instruments. Note that each tabbed page must be exported (or imported) and saved in turn as required.

If you have several different groups of plant names, create copies of the program in different directories to suit.

Click ***Set Time*** to set the instrument to your PC's time and date.

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NOTES

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