



## Changes in the PC Tafonius Software seen in upgrading to Version 1160

In this version of the software changes have been made in a number of areas. These changes are described below.

### Intro Screen

Probably the first change you will notice when running the new software for the first time is the absence of the Introductory or Splash screen. This has been removed as it slowed up the start-up of the program and caused occasional problems in slower machines. Loading of the program now takes typically 15-30 seconds depending on the model of ELO fitted.

### Buffer Volume

In previous versions of the software the Buffer Volume was fixed at 2.5L. This represented 'extra' volume that was allowed in the cylinder over and above the selected Tidal Volume. For most purposes this was satisfactory but did require manipulation of the Tidal Volume to accommodate horses taking large spontaneous breaths. The Buffer Volume is now a user-controllable value and is set by a new button located on the Tidal Volume button.



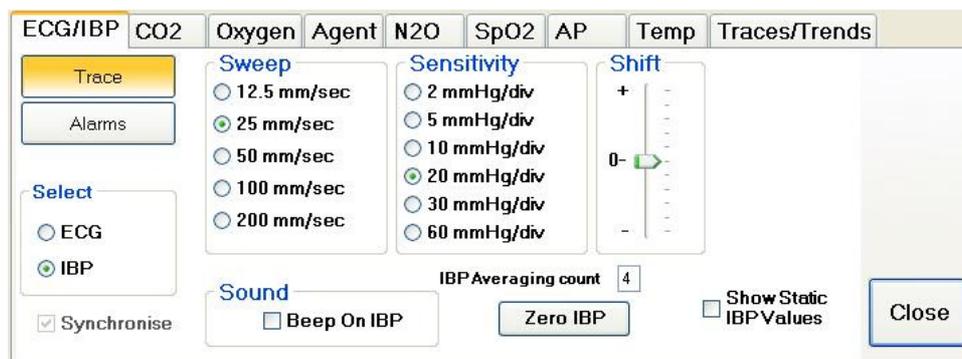
The Buffer Volume can be set to any value between 0 and 20. The size of the Buffer Volume is added to the Tidal Volume to determine the maximum capacity of the cylinder. In the button shown above, the piston will not fill above a level of 15L (TV=10, BV=5). Note that when the Ventilate button is pressed, only the 10L will be delivered to the patient. This change allows for much easier control of circuit volume. The default value for the Buffer Volume can be set in the Initial Settings, accessed using the Configure Button and then the Initial Settings tab. To save these settings, be sure to save the active Preset, either after the change has been made, or on leaving the program.

### Data Averaging in IBP Measurements

The Systolic, Diastolic and Mean values of the blood pressure system were based on a beat-beat basis in previous versions. Now, the number of pulses used to average the data can be selected by the user, up to a maximum of 16. To use this feature enter the number of samples over which to average the data in the edit box found in the IBP Attribute tab. The simplest way to bring

up this tab is to touch the IBP button at the top left of the screen. The following Attribute panel will then appear.

### IBP Attribute tab



Also in this IBP Attribute tab the IBP Values can be set to Static. This means that the value shown in the IBP button will be the continuous and instantaneous pressure. No Algorithm is applied to detect Systolic and Diastolic Values.

### Zero IBP Button

On pressing this button a confirmatory beep is heard to indicate that the zeroing process has been applied.

### CPAP

The CPAP function has not changed, but the transition between CPAP values has been modified to allow a smoother implementation. The transition to the new CPAP value is now made in small steps, each step taking 50ms. So, setting a new CPAP value of 20 when the existing value is 0 will produce a slow ramp up to the 20cm CPAP over 1 second. This new feature prevents abrupt changes in patient airway pressure.

If the machine has support for CPAP in both Tafonius mode and Auxiliary mode then, when changing between Tafonius Mode and Auxiliary mode, the CPAP value is maintained.

### Assist Mode

This is a new feature to the software and can be accessed by touching the Inspiratory Flow button at the bottom of the screen. A new small green square button then appears with the word "Assist" on it. The value in this new button is the flow rate in Litres per minute required to trigger a single ventilation phase. Note that therefore the Assist mode is flow-triggered and not pressure-triggered. To use the Assist mode, the Flow Trigger button must be visible and the machine must be set to ventilate by pushing the "Push To Ventilate" button. When this is done the machine will deliver one breath and then begin a wait phase, where the inspiratory flow is measured. If the inspiratory flow



matches or exceeds the level set by the Assist button then the full Tidal Volume will be delivered. If a sufficient flow is not detected within a period equal to 3 x the normal breath cycle then a mandatory breath of the full Tidal Volume is delivered. This reduced ventilation rate is shown by the set Respiratory Rate, which will be reduced to one third once the Assist button is pressed. Leaving Assist mode will return the Respiratory Rate to its previous value unless the user has made a change during Assist Mode. The default value for the Assist threshold can be set in the Initial Settings, accessed using the Configure Button and then the Initial Settings tab. To save these settings be sure to save the active Preset, either after the change has been made, or on leaving the program.

### Oxygen blending

It is now possible to blend oxygen with room air to create fractional inspired oxygen levels of between 21 and 100%. This is a new feature and we welcome feedback from users on the behaviour and performance of this feature. The air required for this blending is acquired from a pump inside of Tafonius that has been fitted, but not used, since the machine was made. The air is pulled in through a small microbial filter situated on the front panel behind the PC monitor. Tafonius can regulate the addition of air and or oxygen to deliver the correct blend. To use this feature, you will need to turn the manual flow meters for your normal gases off. At the moment the feature expects the use of Oxygen and Air on your machine only. **If you routinely use Nitrous Oxide and this is fitted to your machine the feature will not work properly and should not be used.**

To activate the feature, touch the Oxygen button on the middle right of the screen. This brings up the Oxygen Attribute panel and there you will find a small tick-box labelled "Enable", under the legend "FiO2 Control".



Place a tick in this tick-box by touching/clicking on it. This causes two new buttons to appear in the Oxygen button. One is labelled FGF for Fresh Gas Flow and the other is labelled FiO2.



Note that the Oxygen value is shown as Disabled at start-up until the unit has initialised. The feature will not work unless the oxygen sensor has self-calibrated and the Oxygen levels are being measured.

Touch the button labelled FGF and select your total required fresh gas flow, e.g. 5L/min for a 500kg horse. Then touch the FiO2 button and select the required FiO2 value as a percentage, e.g. 60. The machine will now add gas every 15 seconds equivalent to a minute rate of the set FGF rate. The correct blend of oxygen and air will be added to achieve the desired FiO2 level based on the measured inspired oxygen level. For this feature to work effectively, you must have a working oxygen sensor and a horse that is either breathing well spontaneously or is being ventilated. This is because the mixing of gases in the circuit is dependent on circulation through the patient circuit and a patient that is not breathing regularly will not mix these gases sufficiently to allow successful control of the mixture. Please note that at any time additional gas can be added using the manual flow meters. The initial values for FGF and FiO2 can be set in the Initial Settings, accessed using the Configure Button and then the Initial Settings tab. To save these settings, be sure to save the active Preset, either after the change has been made, or on leaving the program.

### Warning Messages

The text associated with the red Critical Message Box has been updated to include information on how to proceed should a critical error occur. For example the text may now advise to change to Auxiliary mode or to change to Manual mode, or to wait 30 seconds to see if the fault can be resolved. During this emergency mode the Dump valve is open to allow normal spontaneous breathing and also to avoid any build up of airway pressure, whilst the piston is immobilised.

### Low Breathing Pressure Alert

If a ventilated breath is delivered and the resulting maximum airway pressure is measured as less than 4cm H2O then an alert is given. This is in the form of the small yellow bar towards the bottom of the screen and an audible beep. The message will persist for 4 seconds before clearing automatically.

Low Breathing Pressure (<4cm H2O)



### Logging

There are now increased entries in the SD file to log more of the actions and events in Tafonius. The following entries have been added or amended:

- All Low Breathing Pressure events are logged.
- Every change of a ventilation parameter, such as TV, RR is logged.
- The piston position/volume is now logged in Litres for every file entry
- The Start and Stopping of the Vacuum pump is now logged
- Any error messages arising from the VIX drive or from faulty Position Sensors are now logged.
- The I:E ratio has been corrected as this showed an incorrect value on some machines
- The Expiratory time has been amended as this also showed an incorrect value on some machines.
- Changeover from Battery to Mains or vice versa is now logged

### Mains/Battery indication

To improve the awareness of the machine running on batteries the AC icon at the bottom left-hand side of the screen is shown in red and flashed repeatedly.





## Hardware Changes

### VIX Drive

A VIX Power Adaptor interface has been designed to improve stability of the supply voltages to the VIX drive and remove any fluctuations due to varying battery voltages. These Adaptors can be fitted during a routine Service.

### Manual shutter valve

An optional manual shutter valve is now available to fix to the manual take-off port on the absorber pan. This manual shutter valve allows the user to switch over to manual mode in seconds and replaces the previous hose connections.



Pulling the lever upwards immediately connects the manual breathing circuit to the main patient circuit.