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DIVE ASSISTANT

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Release Notes 2.0

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This document contains the most important release notes for the Dive Assistant version 1.1. Due to the ongoing development of the application, pay attention to the exact version of the installed libraries and applications.

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1 Changes in the application (2.0.14353).

1.1. New functionalities.

- Made a number of changes in the user interface, including:
 - improved menu,
 - new icons,
 - new shortcuts,
 - possibility to hide tabs,
 - added visible grips for ease scaling tables,
 - added table view orientation switching.
- Added MOD presentation on config tab.
- Added presentation of vital capacity drop VCdrop.
- Added English translation of license agreement..
- Added new functionality to define user diving cylinder sets. The editor allows to define single, twin or stage sets and mixtures of Nitrox and Trimix.
- Added multi-gas dive planning.
- Changed the handling of web links to more flexible.
- Added redirection button to product registration form.
- A number of changes aimed at improving the responsiveness of the application.
- Added advanced chart showing the M-Values characteristic.
- Added advanced chart showing final tissue saturation.
- Added support for Rock Bottom air spare calculation.
- Added limit of the minimum fraction of oxygen in breathing mix to 10%. Lower values found to be unreasonable at depth up to 100m / 330ft.
- Added support for new dive plan warnings.
- Due to significant extension of application, major version has been changed to 2.0.

1.2. Fixed problems.

- Fixed handling of the activation keys. As a result of a problem with the application clocks can occur occasionally application crashes.
- Fixed an issue with the display of the information window. Attempted to display some information at the same time could occur an uncontrolled stop of applications

and an exception is thrown.

- Fixed refreshing of summary dive information..
- Fixed advanced chart showing tissue saturation. While drawing graph for multi-gas profiles based on nitrox and trimix could occur uncontrolled interrupt of application.
- Fixed handling of Alt-F4. Closing some windows using Alt-F4 could later cause an error and stopping the application.
- Fixed polish localization.

2 Changes in diving engine (1.1.14353).

2.1. New features.

- Global change of serialization mechanism used when writing data to files.
- Added algorithm for calculating CNS reduction on surface.
- Implementation of vital capacity decrease as a result of the increased oxygen partial pressure VCdrop.
- The implementation of the algorithm that calculates the difference in vital capacity as a result of a higher oxygen partial pressure VCdelta.
- Minor improvements of functionalities responsible for the control of oxygen.
- Extended model of breathing mixtures in order to better control the profiles and the needs of future development.
- Added an advanced implementation of the gas model to provide a more flexible modeling of mixtures.
- Has been redesigned cylinder set list object. The current implementation is much faster. Also added support for internal events to facilitate integration with the application. Note, the new version is not fully compatible with the previous version of the engine.
- The implementation of an algorithm for approximation ZH-L coefficients for various gases on the basis of tables for nitrogen and the advanced gas model.
- Implemented an additional checkpoints and verification in engine code. The most important changes are:
 - adding to the multiple functions the new control system for the acceptable range of pressure values and the depth of the input and output of the calculations for a faster response to potential errors in the data,
 - compatibility checks of deco algorithms and gas model.
- A number of changes of organizational character in the structure of the source code.
- Added to model a new level of describing a single tissue.
- Added simplified method of calculation of the required supply of breathing air using so called Rock Bottom rule.
- Added functions for calculating the exposure time Texp based on saturation of the

tissue compartment.

- Added the function to calculate the speed of tissue saturation at step plan. New functionality can help detect potential counter diffusion (ICD) and the risk of DCS type III.
- Added support for detecting emerging threats when planning:
 - the risk of isobaric counter diffusion ICD,
 - exceeding the rock bottom reserve of breathing gas.
- Due to significant improvements minor version number has been changed to 1.1.

2.2. Fixed problems.

- Fixed rounding problem in diving cylinder model. As a result of rounding errors may occur to the difference between the nominal parameters and the current values, which causes an exception interrupt of applications.
- Fixed functionality for calculating fractions of gas mixtures defined by the user. The previous version worked properly for the build-in set, but can report bugs for a dynamically defined sets in the latest version (after adding the cylinder editor).
- Fixed an issue with the functionality of determining the allowable ambient pressure for a set of tissues. With entering the partial pressure of the missing gas a value 0 instead of NaN was possible to break the application. Currently, the value 0 is not taken for the calculation (treated the same way as NaN).
- Removed restriction on the auxiliary function that calculates the maximum operating pressure of the breathing mixture. At low oxygen fraction MOD may be higher than the 100m. Limitations when planning remained.
- Extended implementation of the functionality of the determination of the maximum operating pressure MOP and the maximum operating depth MOD.
- Fixed a number of minor, identified problems.
- Improved determination of deep stops. After gas shift could have been forced to increase the depth in GF mode.

3 Known problems and limitations..

- Although we used a number of advanced algorithms and subsequent versions of the application detects more and more potential risks and calculate safer profiles, use of application does not guarantee that during a dive or after the dive there will be no signs of injuries and diseases associated with diving. Remember that serious diving accidents may end up even death. All dives are done at your own risk.
- No algorithm does not reflect the real processes of diving. Each person also has other physical and mental limitations. So always follow the rules provided for training

dive. Profiles should be reviewed in two independent sources (eg. decompression tables and the application or dive computer).

- The current implementation of Rock Bottom was developed for no-decompression dives. For more complex dive profiles, this function may not return results. Status can be checked on detail data tab.
- Dive engine detect potential cases of decompression sickness and isobaric counter diffusion. There is no guarantee, however, that the DCI or the ICD will not occur. Multi-gas diving are extremely complex and can only be performed by trained technical divers.
- The application allows you to plan dives with gas switching. But it is not enough to be the only tool or resource for planning with such dives. Each dive with decompression or gases shifting is technical diving. They are extremely complex and require a lot of experience, and take into account a number of factors, which in this application is not processed. Furthermore, the individual organizations use various recommendations, such as the use of additional detox stops or gas blends used.