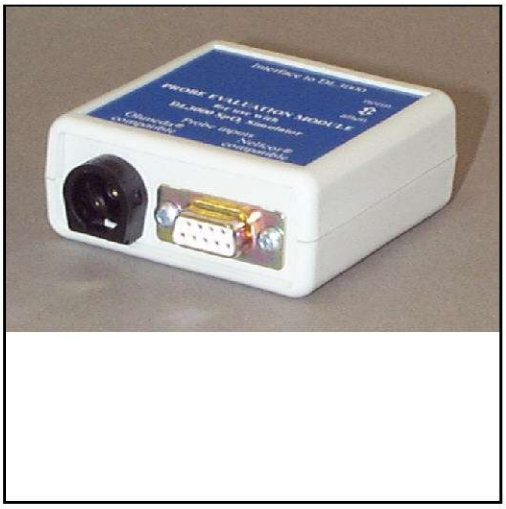
Part No : 0093300.

DL - 3000M/ES SpO_2 Probe Analyser Module.



Operating Instructions.

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Instructions contained within are for use with the DL-3000M/ES Module and in conjunction with the DL-3000 SpO_2 Simulator : Operating Instructions.

Module Support : The DL-3000M/ES SpO_2 Probe Analyser Module.

The DL-3000M/ES is a SpO_2 probe evaluation module for use with the DL-3000 pulse oximetry simulator. It's primary use is for testing and assessing SpO_2 finger probes but can also be used with 'Y' multi-site probes and disposable probes. The DL-3000M/ES module is designed for use with Nellcor and Ohmeda original and compatible probes, or generic probes.

Probes can be quickly and easily tested and assessed for optical integrity, functionality of the red and infrared emitters, the photodiode(s) and resistor if present.

Pulse oximeter probe LEDs degrade over time with the output being dependent on the particular LED / detector combination. A degraded probe may operate perfectly satisfactorily when tested by a bio-medical engineer or technician with a strong pulse and high SpO_2. On a genuine patient the probe may fail, due to change of patient characteristics (darker skin colouration or larger finger diameter) and/or change in patient condition (possibly a weak pulse and low SpO_2 value).

The DL-3000M/ES module allows the user to independently monitor the light levels from the probe and also determine whether any internal probe resistors are functioning. It is compatible with DL-3000's having software supporting the use of the module. This is indicated in the software version number by the letters 'm1' in the latter part of the code (software version is revealed by depressing F2 at 'Select Function' menu).

The module allows the DL-3000 to directly display the relative light output of the probe and whether the probe internal resistance lies within limits. Software selection is automatic on switch on, when the module connection is sensed.

The module consists of an enclosure, a two way toggle switch and three connectors.

- The 15 pin D connector attaches to the DL-3000 via the system interface connector, using the supplied ribbon cable assembly.

- The 9 pin female, D connector (Nellcor or compatible probe connector) and 9 pin female, 'hypertronics' connector (Ohmeda or compatible probe connector) can be used to connect to the probe, or via adapter cables to a specified manufacturers probe. Adapter cables to connect to other manufacturers probes are available from Viamed Ltd.

- The toggle switch allows the relative light output of the probe to be scaled, when testing probes with new or high intensity LEDs. The upper position ('norm.') is normal, the lower position

('atten.') is attenuated by a factor of five.

- Light levels are displayed as three digit integer numbers. The values presented are good indicators of light output and can be used as an indication of probe LED degradation. No units are specified as this is a relative comparison of one probe to another.

The module activates the light sources alternately and the output of the probe detector is used to gauge the intensity of each pulse. Very intense light pulses may cause the module to saturate and the DL-3000 to display the maximum relative light output of 255. In this situation the toggle switch should be placed in the lower ('atten') position.
The module also allows the user to monitor internal resistors within the probe and appropriate messages are generated on the DL-3000 display of, 'Resistor In Range', 'Resistor Short Cct' and 'Resistor Open Cct' for the three stated conditions.

Note.

In module mode, SpO_2 simulation facilities are disabled. The module must be disconnected from the DL-3000 before these facilities are re-enabled. User selectors F1 to F4 and 'Enter' have no function. The DL-3000 should be off when the module is connected or disconnected.
Initial display on switch on, with a normal probe resistance will be :-

ResistorRed xxx In RangeI/Rxxx xxx : A value from 0 to 255.

- The lower left quarter of the display shows the status of any resistor enclosed in the probe,

'In Range', is displayed when the resistance sensed is within 2.5 to 900kΩ.

'Short Cct' is displayed when the resistance sensed less than 2.5kΩ.

'Open Cct' is displayed when the resistance sensed is greater than 900kΩ.

Resistive checks are carried out from the two pins in the plug around a loop containing the probe internal resistor. Short circuit checks imply that the resistive checks carried out by the module are low and not that any point of the resistive loop is short circuit to any other wire within the cable.

- The right half of the display shows 'Red xxx', for the red emitter (LED) and 'IR xxx',for the infrared emitter (LED). "xxx" is a value from 0 to 255.

The value indicates the relative red and infrared light intensity transmitted by the probe. The higher the value, the higher the light intensity. Whilst these values are good indicators of relative light output, they are not an actual light measurements, but can be used as indicators of LED degradation.

Probe comparisons should be made under the same ambient conditions as emissions from sources such as fluorescent lights can affect an output from the probes detector.

Two error messages can be generated whilst in module mode. These are as follows :-

1. 'Module reset error check for null ret'.
2. 'Module i.d. error no data received'.

These errors are both hardware generated and could be a result of a fault with either the module or module to DL-3000 connector lead.

In the unlikely event of faults occurring with the DL-3000 module or the request for further information on it's use, please contact Viamed Ltd.