

5 FUNCTIONAL CHECK

These instructions include procedures for a functional check for Datex-Ohmeda S/5 Anesthesia Monitor and S/5 Critical Care Monitor. The functional check is recommended to be performed after monitor installation.

These instructions include a Check form (APPENDIX A) to be filled in when performing the corresponding procedures.

The symbol  in the instructions means that the performed procedure should be signed in the check form. The procedures should be performed in ascending order, by passing those that are not applicable for a particular monitor.

All menu selections related to Datex-Ohmeda products are written in following typeface:

e.g. **Parameters -More...-TONO**

As you enter the service menus, you need following passwords:

Monitor Setup -Install/Service (password 16-4-34)-**Service** (password 26-23-8)

In case you evaluate the measurement accuracy with a patient simulator, add simulator's accuracy specification to the one of the monitor.

5.1 Recommended tools

Tool	Order No.	For product(s)
Sampling line 3.0 m	73319	All Airway modules
Sampling line 2.0 m	73318	Compact Airway Module, M-COVX/M-CAiOVX
Spirometry tube	884101	All Airway modules w/(V)
D-lite	733950	All Airway modules w/(V)
Patient simulator		-Hemodynamic modules
SpO2 finger probe	OXY-F4-N or SAS-F4	Hemodynamic modules w/(S)
OxyTip ® + Reusable Finger Sensor Integrated Finger Sensor	OXY-F4-N	Hemodynamic modules w/(S)
Adult NIBP cuff	572435	Hemodynamic modules w/(NIBP)
Adult NIBP hose	877235	Hemodynamic modules w/(NIBP)
Earphones		EEG Module, M-EEG
Nellcor SpO2 probe		M-NSAT
MemCard -	Menu --	M-MEM
MemCard -	Data --	M-MEM
Screwdriver -		All
Simulator for M-ENTROPY	N-ES	M-ENTROPY
Entropy sensor cable		M-ENTROPY

5.2 Visual inspection

- Make sure that the monitor is switched to standby.
Disconnect the mains power cord from the 8-Module Frame, F-CU8.
If the monitor is connected to the Datex-Ohmeda network, disconnect the Mon-Net cable from the Network Board, B-NET or UPI4NET board, B-UPI4NET.
If the Memory Module, M-MEM is connected, remove any memory cards.
- 1. Check all units visually:
 - all parts are intact, the cables and screws are connected and tightened properly
 - the display power cord is locked to the display
 - modules go in smoothly and lock up properly in all module slots
 - sampling line is connected to a used Airway Module

CAUTION Ensure that the module is properly orientated (i.e. module release latch facing downward) before insertion.



5.3 Functional inspection

5.3.1 General

2. Connect the mains power cord to the F-CU8.
Check that the stand-by LED is lit.
3. Switch the monitor on.
Check that the monitor starts up properly, i.e. the alarm LEDs turn on and off, normal start-up sound is heard from the loudspeaker and monitoring screen appears.
No error messages should appear onto the screen.
4. Configure the screen for those parameters that are connected.
5. Enter the service menus.
When applicable, check that the 'Timeouts', 'Bad checksums' and 'Bad c-s by mod' values of a module are not increasing faster than by 5 per second. Check also that the module memories have passed the internal memory test, i.e. 'RAM', 'ROM' and 'EEPROM' all state OK.
If the Recorder Module, M-REC, is connected, the module should record two lines of start-up information.



Preset measurement settings for those parameters that are connected are, for example:

Recorder -Record Waveforms -Waveform 1 -ECG1
-Waveform 2 -P1
-Waveform 3 -P2
Invasive Pressures -P1 'ART' Setup --Label -ART
-P2 'CVP' Setup --Label -CVP
-P3 Setup -Label -PA
-P4 Setup -Label -P4
-P5 Setup -Label -P5
-P6 Setup -Label -P6

Pulse Oximetry -Pleth Scale –AUTO

or

Others -SPO2 Setup -Pleth Scale –AUTO

Airway Gas -Spirometry View -Scaling -Indep.

-Paw Scale –20

-Flow Scale –15

or

Ventil.-Spirometry Setup -Scaling -Indep .

-Paw Scale –20

-Flow Scale –15

Others -Resp Setup -Size -1.0

-Resp Rate Source –AUTO

-Measurement –ON

-Detection Limit –AUTO

5.3.2 Display(s)

1. Check that the picture on the screen is adjusted correctly. Readjust the picture with the adjustment knobs or with the display menu keys, if necessary.



5.3.3 Keyboard(s)

1. Tests with the ComBar /Command Board, ARK Keyboard and Remote Controller:
Press the **Help** key. Turn the ComWheel in both directions and check that the cursor in the menu moves correspondingly. Highlight **Normal Screen**, press the ComWheel and check that the menu disappears from the screen.



5.3.4 8-Module Frame, F-CU8

1. Check that the fan is running.
2. Check that the clock on the screen shows correct time.
Readjust the time and date, if necessary.



5.3.5 Extension Frame, F-EXT4

1. If the F-EXT4 contains a fan, check that the fan is running.
2. Check that the modules in the F-EXT4 are recognized i.e. the required parameter information is shown on the monitor screen.



5.3.6 Airway Module, G-XXXX

Wait until the message 'Calibrating gas sensor' disappears from the screen.

1. Check that the Airway Module fan is running.
2. If the module contains a membrane key on the front panel, press the key for at least one second and check that it is identified.



For Airway Modules containing the Patient Spirometry option

3. Connect a clean spirometry tube and D-lite to the module. Connect the sampling line to the D-lite. Breathe through the wider side of the D-lite. Check that the flow waveform moves downwards when you breathe in and upwards when you breathe out.



For all Airway Modules, G-XXXX

4. Block the tip of the sampling line with your finger and check that the message 'Sample line blocked' appears onto the monitor screen within 30 seconds.
5. Remove the D-fend and check that the message 'Check D-fend' appears on the screen within 30 seconds.
6. Breathe to the sampling line briefly. Check that the CO2 information is updated on the screen.



5.3.7 Compact Airway Module, M-CXXXXX

Wait until the message 'Calibrating gas sensor' disappears from the screen.

1. Check that the fan is running.
2. If the module contains membrane keys on the front panel, press each of the keys for at least one second and check that they are identified.



Compact Airway Modules w/the Patient Spirometry option

3. Connect a clean spirometry tube and D-lite to the module. Connect the sampling line. Breathe through the wider side of the D-lite. Check that the flow waveform moves downwards when you breathe in and upwards when you breathe out.



For all Compact Airway Modules

4. Block the tip of the sampling line with your finger and check that the message 'Sample line blocked' appears on the monitor screen within 30 seconds.
5. Detach the D-fend and check that the messages 'Check D-fend' appears on the monitor screen within 30 seconds.
6. Breathe to the sampling line briefly. Check that the CO2 information is updated on the screen.



5.3.8 Single width Airway Module, M-miniC

Wait until the message 'Calibrating gas sensor' disappears from the screen.

1. Block the tip of the sampling line with your finger and check that the message 'Sample line blocked' appears on the monitor screen within 30 seconds.
2. Detach the Mini-D-fend and check that the messages 'Check D-fend' appears on the monitor screen within 30 seconds.
3. Breathe to the sampling line briefly. Check that the CO2 information is updated on the screen.



5.3.9 Tonometry Module, M-TONO

1. Press each of the front panel membrane keys for at least one second and check that they are identified.



5.3.10 Hemodynamic Modules

ECG and RESP measurements

1. Check functioning of the front panel membrane key **ECG ,Lead**, if available.
2. Connect an ECG cable to the module. Connect the cable leads to a patient simulator. Check that all ECG and impedance respiration information is shown on the monitor screen as configured on the simulator.
Turn the simulator off. Check that the 'Asystole' and 'Apnea' messages are displayed.



Modules w/temperature measurement

3. Check the temperature channels with a patient simulator.
Check that temperature measurement information is shown on the monitor screen as configured on the simulator.



Modules w/invasive blood pressure measurement

4. Check functioning of the front panel membrane keys.

5. Check the InvBP channels with a patient simulator.
Zero the InvBP channels, then check that the values and waveforms correspond to the simulator settings.



Modules w/SpO2 measurement

6. Connect SpO2 finger probe to the module. Check that the message 'Probe off' is shown when the probe is not connected to a finger.
7. Attach the SpO2 probe to your finger. Check that a reading of 95-99 and a pleth waveform appear on the screen.



Modules w/non invasive blood pressure measurement

8. Check functioning of the front panel membrane keys.
9. Attach an adult NIBP cuff onto your arm and perform one NIBP measurement. Check that the module identifies the cuff, i.e. the text 'Adult' appears in the NIBP digit field for a short time. Check that the module gives a reasonable measured result.



5.3.11 Pressure/Pressure Temp Modules, M-P/-PT

Invasive blood pressure measurement

1. Check the functioning of the front panel **Zero P3** membrane key.
2. Check the InvBP channel with a patient simulator.
Zero the InvBP channel. Then check that the values and waveforms correspond to the simulator settings.



Modules w/temperature measurement

3. Check the temperature channels with a patient simulator.
Check that temperature measurement information is shown on the monitor screen as configured on the simulator.



5.3.12 Dual pressure Module, M-PP

1. Check the functioning of the front panel **Zero P5** and **Zero P6** membrane keys.
2. Check the InvBP channels with a patient simulator.
Zero the InvBP channels. The check that the values and waveforms correspond to the simulator settings.



5.3.13 Cardiac Output Modules, M-COP/-COPsv

Invasive blood pressure measurement

1. Check the functioning of the front panel membrane **Zero P4** key.
2. Check the InvBP channel with a patient simulator.
Zero the InvBP channel. Then check that the values and waveforms correspond to the simulator settings.



Cardiac Output measurement

3. Check the functioning of the front panel **Start C.O.** membrane key.



5.3.14 NIBP module, M-NIBP

1. Check the functioning of the front panel membrane keys.
2. Attach an adult NIBP cuff onto your arm and perform one NIBP measurement.
Check the module identifies the cuff, i.e. the text 'Adult' appears on the NIBP digit field for a short time.
Check that the module gives a reasonable measured result.



5.3.15 Nellcor Compatible Saturation module, M-NSAT

1. Connect a Nellcor SpO2 finger probe to the module. Check that the message 'Pulse search' is shown. Check also that the shown message changes to 'Check probe' within 30 seconds.
2. Attach the SpO2 probe on your finger. Check that a reading of 95-100 and a proper SpO2 waveform appear.



5.3.16 Datex-Ohmeda Oxygen Saturation module, M-OSAT

1. Connect an OxyTip® + Reusable Finger Sensor such as Integrated Finger Sensor OXY-F4-N to the module. Check that the message in the screen 'No Probe' changes to 'Check probe'.
2. Attach the SpO2 probe on your finger. Check that a reading of 95-100 and a proper SpO2 waveform appear.



5.3.17 BIS-Module, M-BIS

1. Connect the BIS module to the monitor frame.
Check that "Cable off" is displayed in the BIS waveform field.
2. Connect the DSC to the module.
Check that "No sensor" message appears to the waveform field.
3. Check the functioning of the front panel membrane keys.
Pressing **BIS key** should open BIS Setup page. Check that "Test DSC" shows PASS
NOTE If sensor is not connected, the Check Sensor key is inoperative.



5.3.18 Entropy Module, M-ENTROPY

1. Check the function of the front panel membrane keys.
2. Connect the Entropy sensor cable and Entropy simulator to the module. See that "Checking sensor" text and image appear to the waveform numeric field. Wait for a while and check that all sensors show "PASS".
3. Check that the EntrEEG waveform and RE and SE values appear on the monitor screen.



5.3.19 Memory Module, M-MEM

1. Insert Menu card and Data card into their slots.
Check that the corresponding icons appear onto the monitor screen.



5.3.20 Recorder Module, M-REC

1. Press the **Record Wave** key and check that the module starts recording the selected waveforms. Press the **Stop** key on the module to stop recording.
Press the **Print Trends** key and check that the module starts recording trends. Press the **Stop** key on the module to stop recording.
2. Check that the quality of the recordings is acceptable.



5.3.21 Network Board, B-NET and UPINET board, B-UPI4NET

1. Check that the Mon-Net cable connector and the Identification plug are clean and intact, then connect them to the Network/UPI4NET Board.
Check that the monitor connects to the S/5 Network, i.e. the network symbol appears under the clock on the upper right-hand corner of the screen. Also a message regarding the connected Central should appear in the message field on the screen.



5.3.22 Interface Board/Module, B-INT/M-INT

1. Make sure that the monitor receives all necessary parameter data from the connected devices. Check the screen configuration and the related interfacing settings, if necessary.

Monitor Setup - Interfacing



5.3.23 Device Interfacing Solution, N-DISxxx

1. Make sure that the monitor receives all necessary parameter data from the connected devices. Check the screen configuration and the related interfacing settings, if necessary.

Monitor Setup - Interfacing - Status Page



5.3.24 General

1. Perform an Electrical safety check and a leakage current test.
Check that the monitor and all connected units function normally after the performed test

