5 Functional check

These instructions include procedures for a functional check for Datex-Ohmeda S/5 FM. The functional check is mandatory after monitor installation.

These instructions include a "Functional check form, Datex-Ohmeda S/5 FM" which may be used when performing the procedures. The symbol  in the instructions indicates that the check form contains space to record the results of the particular procedure. The procedures should be performed in ascending order, bypassing 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 - Gas Unit.***

As you enter the service menus, you need the 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.

An electrical safety check and a leakage current test are recommended to be performed prior to the monitor installation.

5.1 Recommended tools

NOTE: Use only properly maintained, calibrated and traceable measurement equipment for the specified calibrations and adjustments to ensure accuracy.

For product(s)	Tool	Order No.
Airway modules		
N-FC(REC)	Calibration gas	755580
	Regulator	755534-HEL
N-FC(REC)	CO_2 Sampling line 3m/10 ft	733163
Hemodynamic modules		
E-PSM(P)	**Multi-Link ECG accessories, IEC**	
	- Multi-link 3-leadwire set	412682-003
	- Multi-link 5-leadwire set	412681-003
	- Multi-link 5-leadwire set, C2-C6	416467-004
or	**Multi-Link ECG accessories, AHA**	
E-PSM(P)	- Multi-link 3-leadwire set	412682-001
	- Multi-link 5-leadwire set	416681-001
	- Multi-link 5-leadwire set, V2-V6	416467-003
E-PSM(P)	SpO_2 finger probe	OXY-F-UN
	SpO_2 Interconnect Cable	OXY-ES3
	Temperature test set	884515-HEL
	Adult NIBP cuff hose with cuff ID	2021285-001
	NIBP cuff	2753E
	Infant cuff hose without cuff ID	414874-001
	MemCard – Data or Menu	

For details on recommended accessories see the "Supplies and Accessories" catalog.

Table 7 Patient simulators' compatibility with each hemodynamic module

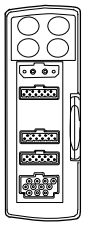
Module	Parameter	Patient simulator		
		M1010831	**MedSim**	**Lionheart & MPS450**
E-PSM(P) 	ECG	Cable included	Multilink ECG acc.	Multilink ECG acc.
	T	2016998-001	2016998-001 and M1010832	2016998-001 and M1010846
	InvBP	Cable included	M1010858 and 2005772-001	M1010862 and 2005772-001

Table 8 Adapter cables for hemodynamic patient simulators

Patient simulator	Adapter cables for simulators	
Hemodynamic patient simulator	- Dual temperature adapter cable	2016998-001
Hemodynamic patient simulator	- Dual Inv.BP adapter cable	2005772-001
Medsim	- Temperature adapter cable	M1010832
Medsim	- Inv.BP adapter cable	M1010858
Lionheart & MPS450	- Temperature adapter cable	M1010846
Lionheart & MPS450	- Inv.BP adapter cable	M1010862

5.2 Visual inspection

Make sure that the monitor is switched to standby.
Disconnect the mains power cord from the monitor.
If the monitor is connected to the Datex-Ohmeda Network, disconnect the Mon-Net cable from the monitor.

1. Check all units visually.

   Check that all parts are intact and that the cables and screws are connected and tightened properly. Especially check the following parts:

   – sampling line is connected to the extension module.

   Check that modules go in smoothly and lock up properly.

5.3 Functional inspection

WARNING Handle the water trap and its contents as you would any body fluid. Infectious hazard may be present.

5.3.1 General

1. Connect the mains power cord.
   Check that the Mains power LED is lit.
2. Switch the monitor on.
   Check that the monitor starts up properly, i.e. a normal start-up sound is heard from the loudspeaker, the alarm LEDs turn on and off, and the monitoring screen appears.
   No error messages should appear on the screen.
3. Configure the screen for the parameters that are connected.
4. Enter the ***Service Menu***.
5. When applicable, check from the corresponding ***Parameters*** submenu that the Timeouts, Bad checksums and Bad c-s by mod values of inserted modules 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 connected, the recorder should record two lines of start-up information.

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

Print/Recorder - ***Record Waveforms - Waveform 1 - ECG1***
- Waveform 2 - P1
- Waveform 3 - P2

Invasive Pressures - ***P1 'ART' Setup -- Label – ART***
- P2 'CVP' Setup -- Label – CVP

Others -***SPO2 Setup - Pleth Scale –AUTO***

Airway Gas - ***CO2 Setup - Resp Rate Source – AUTO***
- Measurement – ON
- Detection Limit – AUTO

5.3.2 Display

1. Check that the picture on the screen is displayed properly.

5.3.3 Keyboard(s)

Tests with the Command Bar:

– Press the **Monitor Setup** key. Turn the ComWheel in both directions and check that the cursor in the menu moves correspondingly. Select ***Normal Screen*** and check that the menu disappears from the screen.
Check the rest of the menu keys by pressing them one by one.

Tests with the Remote Controller:

– Enter the ***Keyboard*** service menu.

– Check the function of the ComWheel.

– Press all keys. Check that each key produces a sound from the loudspeaker, or the Message count value in the service menu increases.

5.3.4 Frame unit

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

5.3.5 Extension Module with CO_2 measurement

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 message 'Check D-fend' appears on the monitor screen within 30 seconds.

Breathe to the sampling line briefly. Check that the CO2 information is updated on the screen.

5.3.6 Multiparameter Hemodynamic Modules

ECG and RESP measurements

1. 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 appear on the screen.

Temperature measurement

2. Check the temperature channels with a patient simulator.

   Check that temperature measurement information is shown on the monitor screen as configured on the simulator.

Invasive blood pressure measurement

3. Check the function of the module and side panel membrane keys.
4. Check the InvBP channels with a patient simulator.
5. Zero the InvBP channels and check that the values and waveforms correspond to the simulator settings.

SpO2 measurement

6. Connect an 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

Non invasive blood pressure measurement

8. Check the function of the module and side panel membrane keys.
9. Attach an adult NIBP cuff onto your arm and check that the module identifies the cuff, i.e. the text 'Adult' appears in the NIBP digit field for a short time.

   Perform a NIBP measurement and check that the module gives a reasonable measured result.

5.3.7 Data Card and Menu Card function

1. Insert a Data card or a Menu card to the slot.

   Check that the corresponding symbol appears on the monitor screen.

5.3.8 Recorder

1. Press the **Start/Stop** sidepanel key and check that the module starts recording the selected waveforms. Press the **Start/Stop** sidepanel key again to stop recording.
2. Check that the quality of the recordings is acceptable.

5.3.9 Network connection

1. Check that the Mon-Net cable connector is clean and intact, then connect it to the Network connector on the backside of the monitor.

   Check that the monitor connects to the network, i.e. the network symbol appears 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.

5.3.10 Wireless Network Option

1. Check that the WLAN signal strength symbol scrolls between zero and full or stays fixed on the monitor screen.
2. Check that the wireless LAN network symbol appears on the upper right-hand corner of the screen when the monitor connects to the Datex-Ohmeda Network.

NOTE: If the monitor does not connect to the Datex-Ohmeda Network, check the WLAN configuration on the monitor and on the network.

5.3.11 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. Check also via the Interfacing menu that the connected DIS module status is correct:

   Monitor Setup - ***Interfacing - Status Page***

5.3.12 General

- Switch the monitor to standby
- Perform final cleaning
- Fill in all necessary documents