IQvitals® +
Digital Vital Signs Device

midmark™

Service + Parts Manual

MODEL NUMBERS

1-100-1630

1-100-1635

1-100-1610

1-100-1615

Language of origin: English

FOR USE BY QUALIFIED PERSONNEL

FOR USE BY MIDMARK TRAINED TECHNICIANS ONLY

TP204 Rev. C

3-100-1154 Rev. C

Table of Contents

General Information

SYMBOLS

DANGER
Indicates an imminently hazardous situation which will result in serious or fatal injury if not avoided. This symbol is used only in the most extreme conditions.

CAUTION
Indicates a potentially hazardous situation which may result in minor or moderate injury if not avoided. It may also be used to alert against unsafe practices

WARNING
Indicates a potentially hazardous situation which could result in serious injury if not avoided.

EQUIPMENT ALERT
Indicates a potentially hazardous situation which could result in equipment damage if not avoided.

Note
Used for special instructions or additional information.

SCOPE

The Midmark® Digital Vital Signs Device and IQvitals® Service and Parts Manual is intended for use only by experienced BioMed service personnel. This manual provides information regarding troubleshooting, maintenance and performance checks, and calibration verification, as well as guiding service personnel through the identification and replacement of field serviceable components for these devices.

For detailed information regarding the operation and functions of the Digital Vital Signs Device and IQvitals® devices, refer to the applicable device Operation Manuals (see Related Documents).

RELATED DOCUMENTS

One or more of the following documents may need to be referenced in addition to the information contained within this Service and Parts Manual.

Document Name	Midmark Part #
Digital Vital Signs Device Operation Manual	21-78-0001
Barrier-Free® Exam Chair with Digital Scale	003-10027-99

DEVICE WARRANTY

Any device covered under the Midmark Limited Warranty term shall be serviced by Midmark only. Service by any person or entity other than Midmark on a Midmark device will void the Warranty and the device will not be eligible for coverage under an extended service agreement.

To confirm the Limited Warranty term for a specific device, contact Midmark Support Services and provide the device serial number (see Device Model Number and Serial Number Location).

DEVICE MODEL NUMBER + SERIAL NUMBER LOCATION

To identify and order service parts, it is important to have the correct device model number of the device to be serviced. Both the device model number and the serial number are located on the bottom of the device.

Device Number	Kit Part Number	Device Model Number
IQvitals® (touchscreen)	4-000-0500 Rev C	1-100-1610
IQvitals (touchscreen) with SpO_2	4-000-0510 Rev C	1-100-1615
Digital Vital Signs Device	4-000-0500 Rev D	1-100-1630
Digital Vital Signs Device	4-000-0510 Rev D	1-100-1635

Device Model Number and Serial Number Label

TP204 Rev. C

DEVICE SPECIFICATIONS

General Performance	
Category	Specification
Product Name	IQvitals® + Digital Vital Signs Device
Product Type	Non-invasive, automated, multi-parameter vital signs device
Product Weight	Digital Vital Signs Device = 3.9 lb (1.77 kg)
Product Dimensions	10.5" L X 4" W X 7" H (0.27 x 0.10 x 0.18 m)
Power Requirements	100–240 VAC 1.2 A max
Battery Requirements	• Battery Type: Rechargeable, 10.8 V lithium ion • Low Power Indicator • Automatic Shutdown on low power • Operating Time: Approximately 8 hours • Leakage Current: Meets AAMI/IEC/CSA 60601-1 requirements • Battery Charge Time: 4 hours to fully charge, 3 hours for 95% charge
Type of Protection (Electrical)	Class I
Degree of Protection (Water)	IPX1. Protection against dripping water
Disinfecting Method	Per the instructions in the Maintenance/Cleaning Chart section of this service manual
Degree of Safety (Flammable Anesthetic Mixture)	Not suitable for use in the presence of a Flammable Anesthetic Mixture
EMC Standard	Per IEC 60601-1-2 and FCC Part 15 (Emissions Class B)
Device Connectivity	USB (Client) and serial (not supported in Digital Vital Signs Device)
Accessory Connectivity	USB 1.1 (Master) — IQvitals USB 2.0 (Master) — Digital Vital Signs Device

COMPLIANCE CHART

Model	Fire Code Rating	Complies To (All Models):						Electrical Ratings:		
		Safety			EMC	NIBP	SpO_2			
		AAMIES 6060 1-1(2005)	CSA C22.2.60601.1 (2008)	IEC 6060 1-1 (2005)	IEC 60601-1-2 (2007), Class B	IEC 8060 1-2-30 (2009)	ISO 80601 1-2-61(2011)	VAC +/- 10%	Amps	Cycles (Hz)
1-100-1610	UL 94 V-0	•	•	•	•	•		100 – 240	1.2	50/60
1-100-1615	UL 94 V-0	•	•	•	•	•	•	100 – 240	1.2	50/60
1-100-1630	UL 94 V-0	•	•	•	•	•		100 – 240	1.2	50/60
1-100-1635	UL 94 V-0	•	•	•	•	•	•	100 – 240	1.2	50/60

Warnings

WARNING
Do not use this device for any purpose other than its specified intended use.

WARNING
Digital Vital Signs Device is not intended for continuous monitoring. Do not leave a patient unattended while taking measurements with this device.

WARNING
Digital Vital Signs Device is not intended for use during patient transport.

WARNING
To ensure patient safety, only use supplies and accessories that are supplied with the Digital Vital Signs Device and recommended by Midmark. Using unapproved accessories can affect patient and/or operator safety.

WARNING
Regularly inspect the blood pressure cuff, SpO_2 cable and other accessories for damage. Replace accessories as needed.

WARNING
Digital Vital Signs Device is not intended to be hand-held during operation.

WARNING
Do not connect more than one patient to the device at the same time.

WARNING
Do not route the cables of the device in a way that they may present a stumbling hazard.

WARNING
Digital Vital Signs Device is not intended for use in the following cases:

- Neonatal patients
- Apnea monitoring
- In a magnetic resonance imaging (MRI) environment
- In an electrostatic unit (ESU) environment
- Applications requiring arrhythmia detection

WARNING
FLAMMABLE ANESTHETICS: An explosion hazard exists if the monitor is used in the presence of flammable anesthetics.

WARNING
BLOOD PRESSURE MEASUREMENT: Avoid frequent and prolonged blood pressure measurements, which can result in petechia, ischemia, purpura or neuropathy. In addition, be sure that the blood pressure hose does not become kinked during a measurement. If left unattended, this could result in sustained pressure in the blood pressure cuff.

WARNING
BATTERY HANDLING: Digital Vital Signs Device contains a lithium ion battery. The following precautions should be taken regarding these batteries:

- Do not immerse in water.
- Do not heat or throw in fire.
- Do not leave in conditions over 60°C or in a heated car.
- Do not attempt to crush or drop.
- Only use the battery that comes with the Digital Vital Signs Device
- Follow the instructions in the Disposal section of the device Operation Manual when any Digital Vital Signs Device device is taken out of service.

Cautions

Review the following information to avoid damage to the device and to ensure proper operation:

Caution
Familiarize yourself thoroughly with the operational procedures of the device prior to use.

Caution
Substitution of components different from those supplied could result in measurement error.

Caution
Do not operate the Digital Vital Signs Device device near high-frequency emissions (e.g. microwaves).

Caution
The Digital Vital Signs Device is intended for indoor use only.

Caution
The device and its accessories are not intended to be sterilized by any method. Attempting to do so may permanently damage the equipment.

Caution
In case of malfunction, call the Midmark Support Services department at 1-800-624-8950, option 2, and be prepared to describe the problem.

Caution
To ensure proper operation, perform routine inspection and maintenance on the device according to the instructions in this Service Manual.

Caution
Do not make any modifications to the device. Any modifications made will void the warranty.

Caution
Refer servicing to qualified personnel.

Caution
ARRHYTHMIA PATIENTS: The Digital Vital Signs Device is designed to operate in the presence of cardiac arrhythmias. However, the pulse rate meter may be adversely affected in some cases.

Caution
BLOOD PRESSURE MEASUREMENT

- Do not allow the blood pressure cuff or hose to come into contact with fluids. If this occurs, See the Cleaning section of the device Operation Manual for drying instructions.
- Check the hose and cuff frequently for signs of damage or debris. An obstruction in the hose may interfere with inflation and deflation, resulting in inaccurate readings.
- To obtain accurate blood pressure readings, keep the limb and cuff motionless.
- The blood pressure cuff should be at the same level as the patient's heart. If you cannot place the NIBP cuff at this level, add 1.4 mmHg to the measured pressure values for each 2 cm above the heart level, or subtract 1.4 mmHg for each 2 cm below heart level.
- Blood pressure measurements may not be accurate if the patient is convulsive or experiencing tremors.
- Check for kinks in the blood pressure hose if the device reports a measurement problem.

Caution

- Read instructions provided with the sensor to understand the best application technique and all relevant safety information.
- Do not apply the sensor on the same limb as the NIBP cuff. During blood pressure measurements, the perfusion is temporarily reduced, which can result in inaccurate pulse oximetry readings.
- Elevated levels of carboxyhemoglobin or methemoglobin can result in inaccurate pulse oximetry readings.
- Bright light can create problems with the pulse oximetry measurements, resulting in inaccurate readings. If the sensor is in a place where it may be exposed to bright light, cover it with opaque material.
- Pulse oximetry readings may be inaccurate in the presence of excessive motion artifact or tremors.

MAINTENANCE/CLEANING CHART

The following chart provides instructions for cleaning the IQvitals® and the Digital Vital Signs Devices. The devices should be cleaned monthly or as warranted. Before cleaning, refer to the cautions listed in the following charte or refer to the Cleaning section of the Operation Manual for each device.

Part	Recommended Cleaning Method
IQvitals® + Digital Vital Signs Device	Procedure 1. Disconnect the unit from the wall outlet. 2. Put on gloves and protective eyewear. 3. Prepare the enzymatic detergent or disinfectant solution in separate containers according to the manufacturer's instructions. 4. Apply detergent to the product using a soft cloth. If the material is dried on, allow it to sit for one minute. 5. Wipe smooth surfaces with the cloth. 6. Use a soft-bristle brush on visibly soiled areas and irregular surfaces. 7. Remove the detergent from the product using a cloth dampened in distilled water. 8. Repeat as necessary. 9. Apply the disinfectant solution to the affected area using a soft cloth. Allow the product to sit for five minutes. 10. Wipe away excess solution and clean the product again with a cloth dampened in distilled water. 11. Allow two hours for drying.
SpO_2 Sensor	Procedure 1. Remove the sensor from the patient and disconnect the sensor cable from the device prior to cleaning. 2. Refer to the cleaning instructions from the sensor manufacturer.
Temperature Probe Covers	Temperature probe covers are intended for one-time use only.
NIBP Cuff	Refer to the cleaning instructions from the cuff manufacturer.

DISPOSAL

The disposal of Midmark Diagnostic Devices and their accessories should be carried out according to local medical waste disposal policies and procedures. Do not discard these items in unsorted municipal waste. Contact your local waste disposal agency for guidance on proper recycling or disposal.

Certain items contain electronic circuit boards or lithium ion batteries that should not be incinerated, crushed, disassembled or exposed to extreme heat. Do not put the lithium ion battery in a refuse container. Lithium batteries and electronic components should be recycled appropriately.

Troubleshooting

SECTION A

DEVICE DESCRIPTION

IQvitals® + Digital Vital Signs Device

The IQvitals® and Digital Vital Signs Device contain a Main Board, an I-O Board and a Processor Board. The Main Board contains signal acquisition and power management circuitry. The I-O Board contains data port connectors. The Processor Board runs both signal analysis software to generate the patient's physiological readings and user interface software to display the patient's readings and trend them over time. The IQvitals device contains an SD card to store the patient's readings and the device settings, while the Digital Vital Signs Device uses on-board flash memory.

GENERAL TROUBLESHOOTING NOTES

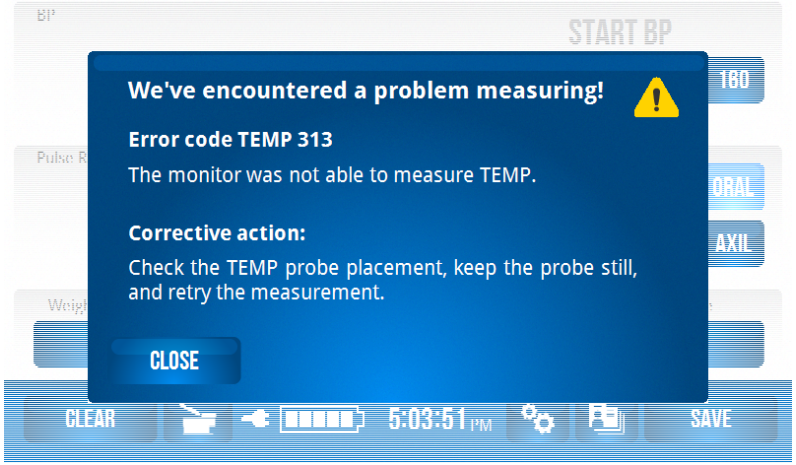
As a general rule, it is a good idea to power-cycle the device to see if a problem persists. The device has numerous self-checks that will continue to trigger if the issue persists.

It is often necessary to isolate a problem to a particular component–the device, the power supply, a patient sensor, etc. It is a good idea to swap in a "known-working" component to see where a problem lies.

Confirm that Midmark-approved SpO_2 sensors and temperature probe covers are being used.

ERROR CODES

The following table contains the error codes that may be encountered while operating the Digital Vital Signs Device or IQvitals® devices. All error codes will appear in separate boxes similar to the image below. See the Troubleshooting section of this Service Manual for each code's appropriate corrective action.



Code	Indication
NIBP 305	Artifact
NIBP 306	Hardware failure
NIBP 309	Overpressure
NIBP 310	Blocked line
NIBP 311	Open line
NIBP 312	Measurement time-out
NIBP 313	Cannot measure
NIBP 314	Weak signal
SpO_2 302	Unplugged
SpO_2 305	Artifact
SpO_2 306	Hardware failure
SpO_2 314	Weak signal
SpO_2 315	Probe fault
SpO_2 316	Check sensor

Code	Indication
TEMP 302	Unplugged
TEMP 304	Temp too high
TEMP 306	Hardware failure
TEMP 313	Cannot measure
TEMP 315	Probe fault
TEMP 330	Temp too low
BAT 325	Battery low
REC 327	Recorder door open
REC 328	Recorder paper out
REC 329	Recorder fault
Monitor	
MON 332	Monitor fault

POWER ISSUES

The Digital Vital Signs Device uses an external mains power supply. Each device contains a rechargeable lithium ion battery that is automatically recharged when the device is connected to mains.

The device's power switch is on the front of the device. When the device is on, the on/off switch is lit green.

The Battery Charging Light is also on the front of the device. It indicates the charging status:

- Solid green: device is on mains power and battery is charged
- Blinking green: device is on mains power and battery is charging
- Off: device is not on mains power and battery is not charging

The Digital Vital Signs Device will run on battery power for approximately 8 hours. The battery takes about 4 hours to recharge from a fully depleted state.

A "Battery Low" message will be reported when the battery is nearly depleted (approximately 40% remaining battery power). The device automatically shuts itself off when the battery is too low to function.

The battery should last for 2-3 years under normal use and can be replaced via a dedicated access door on the back of the device.

Caution
The device should only be used with the power supply and battery that are listed in the Operation Manual.

Issue/Error Code	Probable Cause	Check
Device won't start. Screen stays black, on/off switch does not illuminate.	No power to wall outlet.	Green LED on power supply is lit. Check wall outlet with a known-working power supply.
	Bad power supply.	Green LED on power supply is lit. Check wall outlet with a known-working power supply.
	Power supply not fully connected to device.	Power supply cable is firmly inserted into the power connector on the back of the device. Battery Charging Light on the front of the device is lit (green). See notes above or refer to the Operation Manual.
	Device is not powered on.	On/off button on the front of the device is lit (green).
	Battery is dead.	Reconnect device to mains power. Power cycle the device.

Issue/Error Code	Probable Cause	Check
Device won't start. *(continued)*	Internal problem.	• Replace I-O Board (likely), Power Switch which is part of the Front Bezel (possible) or Main Board (less likely).
Device won't start. Screen is white, Midmark start-up banner never displayed.	Internal problem.	• Power cycle the device. • Reseat display cable in connector on Processor Board. • If problem persists, replace Processor Board.
Device won't start. Screen is frozen at Midmark start-up banner or home screen.	Internal problem.	• Power cycle the device. • If problem persists, reseat or replace SD Card (IQvitals only) (more likely) or Processor Board (possible).
Device won't start. Midmark start-up banner is displayed and then the screen becomes white.	Internal problem.	• Power cycle the device. • If problem persists, reseat or replace SD Card (IQvitals only).
Device immediately powers off when disconnected from mains.	Battery is fully discharged.	• Charge battery by plugging device into mains power. Confirm that the battery charging light on the front of the device is blinking (charging). • If problem persists, replace Main Board (likely) or Battery (less likely).
Battery Gauge not full after sufficient charging time.	Battery at end of life.	• Replace Battery.
Battery Life shorter than usual.	Battery at end of life.	• Replace Battery.

COMMUNICATION ISSUES WITH IQMANAGER®

The Digital Vital Signs Device can connect to a personal computer (PC) or laptop via a USB or serial cable (IQvitals® only). This allows for the transfer of patient data between the device and IQmanager® software.

Issue/Error Code	Probable Cause	Check
USB disconnect or Error Code MON 0.	USB cable became detached from device or IQmanager PC.	• Check cable connection.
	Device is no longer powered on.	• Confirm that device is on mains. • Follow the power checks from earlier in this document.
	Cable problem.	• Test with a 2nd cable.
	Internal problem.	• Power cycle the device. • If problem persists, check for damaged connector on I-O Board. Replace I-O Board (most likely) or Main Board (possible).
Computer won't connect to the device.	USB or serial cable (IQvitals only) not attached to device or IQmanager PC.	• Check cable connection.
	Device is not powered on.	• Follow the power supply checks.
	Wrong communication set-up.	• Confirm that the communication set-up is correct on the IQmanager PC (USB or Serial Port (IQvitals only), correct Serial Port number).
	Cable problem.	• Test with a known-working cable.
	Internal problem.	• Power cycle the device. • If problem persists, check for damaged connector on I-O Board. Replace I-O Board (most likely) or Main Board (possible).

BLOOD PRESSURE (BP) MEASUREMENT ISSUES

It is always suggested that the cuff manufacturers' instructions for use or product insert be consulted.

For best practice techniques when obtaining a blood pressure measurement for a patient using the Digital Vital Signs Device refer to the Device Operation section of the device Operation Manual.

Periodic BP measurement accuracy check:

- The BP circuitry contains a calibration potentiometer that is set at the factory. This potentiometer will remain stable for the life of the product and is not field serviceable.
- An accuracy check of the BP pressure transducer and a leak test should be conducted annually. See Section B of this Service Manual.

Issue/Error Code	Probable Cause	Check
BP readings seem low or high.	Incorrect measurement technique.	• Refer to the Operation Manual for recommended measurement technique. • Retake measurement. • Test with a known-working device.
	Internal problem.	• Test with a known-working device. • Check accuracy of BP circuit. See Section B of this Service Manual.
Measurement taking too long.	Initial inflation pressure too low.	• Select the "BP Start" pressure button that is 30 mmHg above the patient's systolic value (to avoid double pumping).
	Patient motion.	• Ask patient to remain still. • Retake measurement.
	Arrhythmia or valvular defect.	• Measure on opposite arm.
NIBP 305 Artifact.	Too much patient movement.	• Ask patient to remain still. • Retake measurement.
	Patient's pulse signal has persistent variability due to arrhythmia or valvular problem.	• Apply the cuff to the opposite arm where variability may be reduced. • Retake measurement.

Issue/Error Code	Probable Cause	Check
NIBP 306 Hardware failure.	Internal problem.	• Power cycle the device. • If problem persists, connect device to Test Harness and power up. See Section B of this Service Manual. • If problem is persistent, it will occur when running the Test Harness. When Code 306 is reported as the NIBP parameters (either at start-up or after starting a measurement), check the NIBP status field for the fault description. • If NIBP status is "Pump/Transducer Failure," (1) the NIBP Manifold tubing may have become disconnected from the transducer or pump, (2) the Pump may not be starting, or (3) the transducer may be faulty. Inspect the NIBP Manifold and retest. If problem persists, listen for the sound of the Pump at measurement start (must power-cycle the device first). If Pump is not starting, replace Pump (most likely) or Main Board (possible). If Pump is starting, replace transducer which is part of the Main Board. • If NIBP status is "Pressure Not Releasing," check NIBP Manifold tubing for debris or replace (possible) or replace Valve Assembly (possible). • For all other NIBP status, replace Main Board.
NIBP 309 Overpressure.	Cuff pressure was too high.	• Instruct patient to remain still. • Retake measurement.
NIBP 310 Blocked line.	BP hose is constricted.	• Check the BP hose for damage or kinks. • Retake measurement.

Issue/Error Code	Probable Cause	Check
NIBP 311 Open line.	BP hose is not attached to device or cuff.	• Attach BP hose. • Retake measurement.
	Cuff may be worn or damaged.	• Test with a known-working cuff. • Retake measurement.
	Cuff is too loose.	• Check cuff for proper fit. • Retake measurement.
	Leak in device's internal pneumatic system.	• Perform Leak Test. See Section B of this Service Manual. • If device fails leak test with a small steady leak, check all connections on NIBP Manifold or replace. Retest. • If device fails leak test with a significant leak, check or replace Valve Assembly (most likely), or step-valve which is part of the Main Board (possible) or Pump (unlikely).
NIBP 312 Measurement time-out.	Measurement was taking too long to complete.	• Instruct patient to remain still. • Retake measurement.
NIBP 313 Cannot measure.	Inflation pressure was less than patient's systolic pressure.	• Retake measurement at higher inflation pressure.
	Device is auto-zeroing after power-up.	• Wait 10 seconds after powering on device or connecting to device. • Retake measurement.
	Patient's pulse signal is too small.	• Check that cuff is not too large for patient. • Check cuff for proper fit and placement. • Retake measurement.
NIBP 314 Weak signal.	Patient's pulse signal is too small.	• Check that cuff is not too large for patient. • Check cuff for proper fit and placement. • Retake measurement.

PULSE OXIMETRY (SpO_2) MEASUREMENT ISSUES

It is always suggested that the SpO_2 sensor manufacturers' instructions for use or product insert be consulted.

For best practice techniques when obtaining an SpO_2 measurement for a patient using the Digital Vital Signs Device refer to the "Device Operation" section of the device Operation Manual.

Periodic SpO_2 measurement accuracy check:

- The SpO_2 circuitry contains a calibration potentiometer that is set at the factory. This potentiometer will remain stable for the life of the product and is not field serviceable.
- An accuracy check of the SpO_2 circuitry should be conducted annually. See Section B of this Service Manual.

Issue/Error Code	Probable Cause	Check
Readings seem low or high.	Incorrect measurement technique.	• Refer to manufacturer's instructions for use. • Retake measurement. Wait for measurement value to stabilize. • Test with a known-working device.
	Sensor problem.	• Test with a known-working sensor.
	Internal problem.	• Test probe with a known-known device. • Perform a BP Calibration Check. See Section B of this Service Manual.
SpO_2 302 Unplugged.	The SpO_2 cable is disconnected from the device.	• Connect the SpO_2 cable to the device.
SpO_2 305 Artifact.	Too much patient movement.	• Ask patient to remain still.
SpO_2 306 Hardware failure.	Internal problem.	• Power cycle the device. • If problem persists, replace Main Board.
SpO_2 312 Measurement time-out.	Cannot measure. Incorrect sensor size or too much motion.	• Refer to manufacturer's instructions for use.
SpO_2 314 Weak signal.	Weak patient pulsations.	• Refer to manufacturer's instructions for use.

Issue/Error Code	Probable Cause	Check
SpO_2 315 Check sensor.	Faulty sensor.	• Detach and reattach sensor. Retest. • Test with a known-working sensor. If problem goes away, replace faulty sensor. If problem persists, replace Main Board.
SpO_2 316 Check sensor.	Cannot measure. The SpO_2 sensor is misaligned or came off the patient.	• Refer to manufacturer's instructions for use.
No response by device when SpO_2 sensor is applied to the patient.	Internal problem or faulty sensor.	• If no red light is coming from the sensor, detach and reattach sensor. Retest. • Test with a known-working sensor. If problem goes away, replace faulty sensor. If problem persists, replace Main Board.

TEMPERATURE MEASUREMENT ISSUES

It is always suggested that the temperature probe manufacturers' instructions for use be consulted.

For best practice techniques when obtaining a temperature measurement for a patient using the Digital Vital Signs Device, refer to the "Device Operation" section of the device Operation Manual.

Proper probe installation:

- Make sure the probe cord is threaded through the cord guide on the back of the device.
    - o Heavy strain on the probe can cause the probe wire to break inside the connector.

Periodic temperature accuracy checks:

- The temperature circuitry is self-calibrating.
- An accuracy check of the temperature circuitry should be conducted annually. See section B of this Service Manual.

Issue/Error Code	Probable Cause	Check
Readings seem low or high.	Incorrect measurement technique or probe placement.	• Refer to Operation Manual for proper probe placement. • Verify correct temperature measurement with a calibrated water bath. • Test with a known-working probe.
	Probe damaged.	• Test with a known-working probe. • Make sure the probe is threaded through the cord guide on the back of the device. • Check probe and cable for damage.
	Internal problem.	• Test with a known-working probe. • Perform Temperature Calibration Check. See Section B of this Service Manual.
No measurement started when probe is removed from the probe well.	Probe unplugged.	• Check that probe is firmly connected to the device. • Test with a known-working probe.
	Internal problem.	• Test with a known-working probe. • If problem persists, check connectors between I-O Board and Main Board for physical damage, and replace board(s) if needed (possible). Or replace probe well switch which is part of the Temp Assembly (less likely).
Temperature measurement starts even though the probe is in the probe well.	Internal problem.	• Reinsert probe into well, power cycle the device and retest. • If problem persists, replace probe well switch which is part of the Temp Assembly (most likely) or I-O Board (possible).
TEMP 302 Unplugged.	Probe unplugged.	• Check that probe is firmly connected to the device. • Test with a known-working probe.

Issue/Error Code	Probable Cause	Check
TEMP 304 Temp too high.	Temperature reading > 106 °F.	• Verify correct temperature measurement with a calibrated water bath.
TEMP 306 Hardware failure.	Internal problem.	• Power cycle the device. • If problem persists, replace Main Board.
TEMP 313 Cannot measure.	Probe is too warm at start of measurement process. (> 92 °F).	• Wait 10 seconds between measurements so probe can return to a valid starting temperature point.
	It is taking too long to get a stable temperature.	• Check for proper "oral" or "axillary" temp setting. • Hold probe steady and retake measurement. • Refer to the Operation Manual for proper probe placement. • Test with a known-working probe.
	Room is too cold (< 60 °F).	• Retake measurement in warmer environment.
	Room is too warm (> 92 °F).	• Retake measurement in cooler environment.
	Probe heating element not working.	• Retake measurement. • Test with a known-working probe. • If problem persists, replace Main Board.
TEMP 315 Probe fault.	Faulty probe.	• Power cycle the device and retake measurement. • Test with a known-working probe. • If problem persists, replace Main Board.
TEMP 330 Temp too low.	Temperature reading < 95 °F. Probe Problem.	• Verify correct temperature measurement with a calibrated water bath.

WEIGHT MEASUREMENT ISSUES

The Digital Vital Signs Device and IQvitals® Device can connect to either a Fairbanks® TeleWeigh™ digital floor scale or a Midmark 626 Barrier-Free® Examination Chair with Digital Scale. The Fairbanks scale can measure weight from 10 to 500 lb and receives its power from the Digital Vital Signs Device or IQvitals® device (no batteries required for the scale). The Midmark 626 exam chair with Digital Scale can measure weight from 30 to 600 lb.

Periodic weight measurement accuracy check:

- The Fairbanks scale is calibrated at the factory and should not need further calibration.
- The Fairbanks scale is self-zeroing.
- An accuracy check of the Fairbanks scale should be conducted annually. See Section B of this Service Manual.
- For service instructions for the Midmark 626 Barrier Free® Power Examination Chair with Digital Scale, contact Midmark customer support or visit midmark.com.

Issue/Error Code	Probable Cause	Check
No reported weight (Fairbanks Scale).	Scale cable not attached to device.	• Check scale cable connection. • If connected, scale should power on and show weight in its local display.
	Fairbanks scale feature not enabled (device is configured to communicate with Midmark 626 with Digital Scale instead).	• Confirm that the "Chair" feature is disabled via the Service Settings menu.
	Weight is above scale capacity.	• Ask patient to stand in the middle of the scale. • Is patient more than 500 lb?
	Weight is below scale capacity.	• Is patient less than 10 lb?
	Internal problem.	• Check scale cable connection. • If connected, scale should power on and show weight in its local display. • Test with a known-working scale and/or device to isolate problem. If problem is device-related, replace I-O Board (more likely) or Main Board (less likely).

Fairbanks and Teleweigh are trademarks of Fairbanks Scales, Inc.

Issue/Error Code	Probable Cause	Check
No reported weight (Midmark 626 Exam Chair with Digital Scale).	Scale cable not attached to device.	• Check scale cable connection.
	Midmark 626 with Digital Scale feature not enabled (device is configured to communicate with Fairbanks® scale instead).	• Confirm that the "Chair Scale" feature is enabled via the Settings menu. • Refer to the Operation Manual for Settings information.
	"Out of Range" weight is reported.	• Is patient less than 30 or greater than 600 lb?
	Internal problem.	• Check scale cable connection. • Test with a known-working scale or different device to isolate problem. • If problem is device-related, replace I-O Board (more likely) or Main Board (less likely).

PRINTING ISSUES

An optional, external thermal printer purchased from Midmark can be used with the Digital Vital Signs Device touchscreen device. The thermal printer technology heats the paper to create the image, rather than employing an ink cartridge, and receives its power directly from the Digital Vital Signs Device device.

Periodic thermal printer accuracy check:

- The thermal printer does not need calibration.
- A periodic functional check is warranted. See section B of this Service Manual.

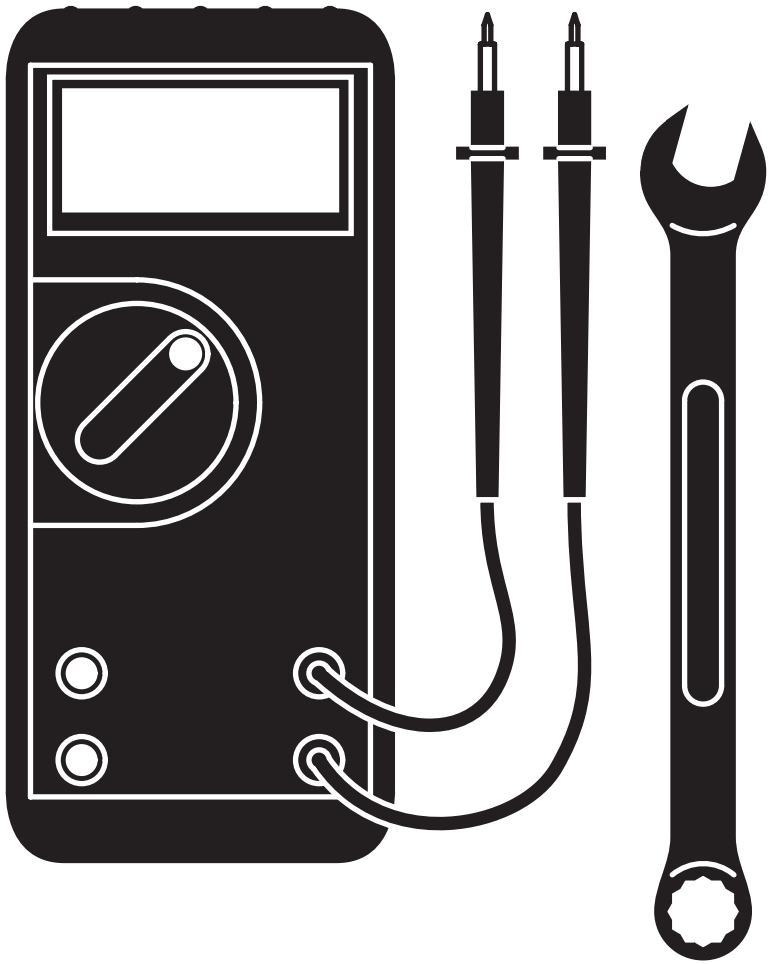
Problem	Probable Cause	Check
Thermal Printer Not Printing.	Printer not connected to device.	• Check printer cable connection.
	Printer out of paper.	• Check printer paper.
	Printer door open.	• Check that printer door is fully closed.
	Internal problem.	• Test with a known-working printer or different device to isolate problem. If problem is device-related, replace Processor Board (possible), SD Card (possible) (IQvitals only), I-O Board (unlikely) or Main Board (unlikely).

TOUCHSCREEN USER INTERFACE ISSUES

Issue/Error Code	Probable Cause	Check
No Touch Response.	Touchscreen out of calibration or not working.	• Power cycle the device. • If problem persists, re-calibrate touch panel. See Section B of this Service Manual. • If touch screen cannot be re-calibrated (e.g., no response to touch), reseat touch panel cable in connector on Main Board. Recalibrate. • If problem persists, replace touch panel which is part of the Display (likely), touch panel cable connector which is part of the Main Board (possible) or Processor Board (possible).
Display image is corrupted (not steady, missing colors, vertical lines on image).	Internal problem.	• Power cycle the device. • If problem persists, reseat display cable in connector on Processor Board. • If problem persists, replace Processor Board (possible) or Display (less likely).
Display is dark even though device is running (power switch is illuminated, audio feedback is heard when temperature probe is removed from the well).	Internal problem.	• Power cycle the device. • If problem persists, reseat backlight cable in connector on Main Board. • If problem persists, replace Display (more likely) or Main Board (possible).
Can't delete patient readings from memory or change device settings. (Pop-up message appears.)	SD card problem (IQvitals only).	• Power cycle the device. • If problem persists, reseat or replace SD Card (more likely) or replace Processor Board (possible).
Poor sound quality.	Internal problem.	• Replace speaker which is part of the Rear Cover (possible) or Processor Board (less likely).
Time-of-Day on device is incorrect after power cycle.	Internal problem.	• If problem persists, replace Processor Board (more likely) or coin cell battery which is part of the Main Board (possible).
MON 332 Monitor fault.	Internal problem.	• Power cycle the device. • If problem persists, replace Main Board (possible) or Processor Board (possible).

Service Tools + Calibration Checks

SECTION B



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USB SERVICE TOOLS KIT

OVERVIEW

The IQvitals® USB Service Tools Kit (P/N 181-6763) Includes the following tools:
However it is configured to automatically run the IQvitals service program tool (below). Just connect it to the USB port of the IQvitals device, power-on the unit, and the program will run, allowing you to check the accuracy of the unit:

- **IQvitals Service Program** (compatible with Digital Vital Signs Device)—runs on the touchscreen device from a USB drive, providing the ability to conduct accuracy and safety service-level functions
- **IQvitals Touch Panel Calibration Program** (compatible with Digital Vital Signs Device)—runs on the touchscreen device from the USB drive, providing the ability to calibrate the touchscreen

Note: USB connection only operates on personal computers running Windows® XP or Windows® 10.

Note: Version 1.0 will not work with a unit built after 9/2018 (Serial #IFDD or Later) 2.0 will work with any unit.

ONE-TIME INSTALLATIONS

- Saving IQvitals Test Harness Folders

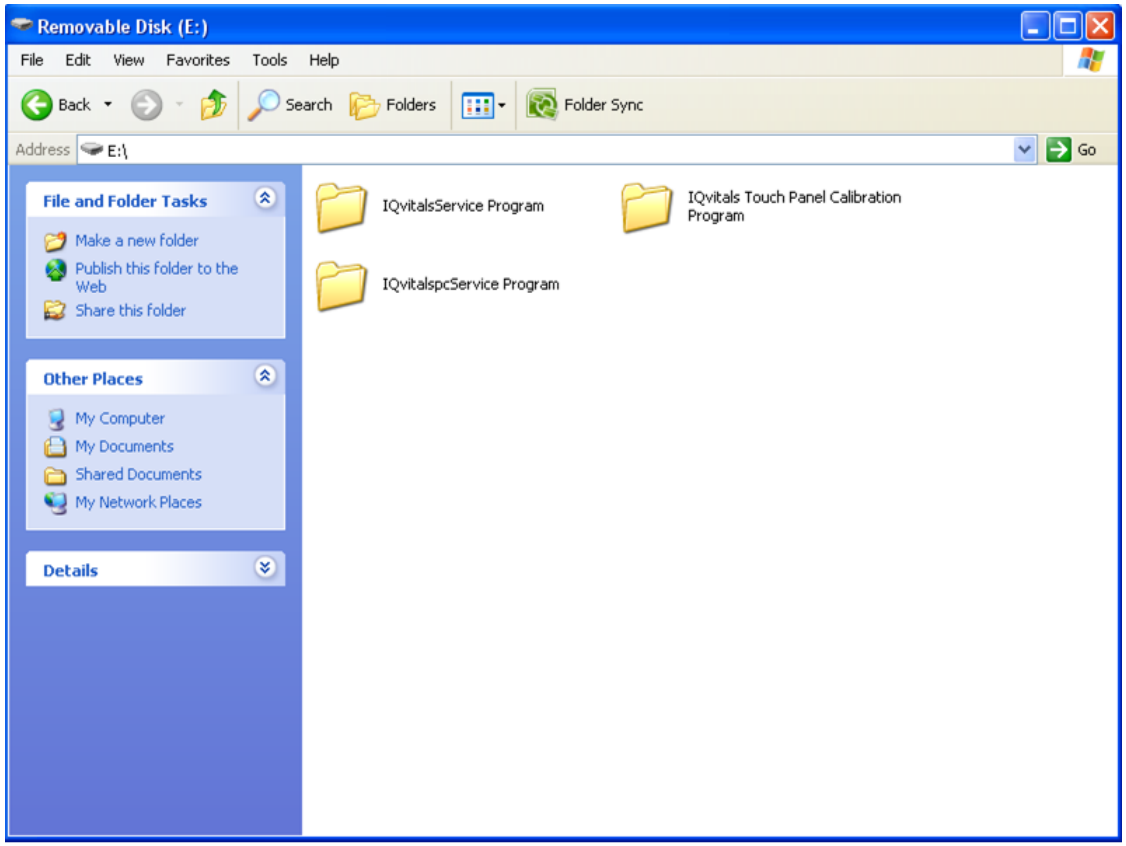
INSTALL USB SERVICE TOOLS KIT:

INSTALL: USB SERVICE KIT

Step 1: Connect USB Service Tools Kit (part # 181-6763) to your Windows® XP or Windows® 7 or 10 computer.

INSTALL: USB SERVICE KIT

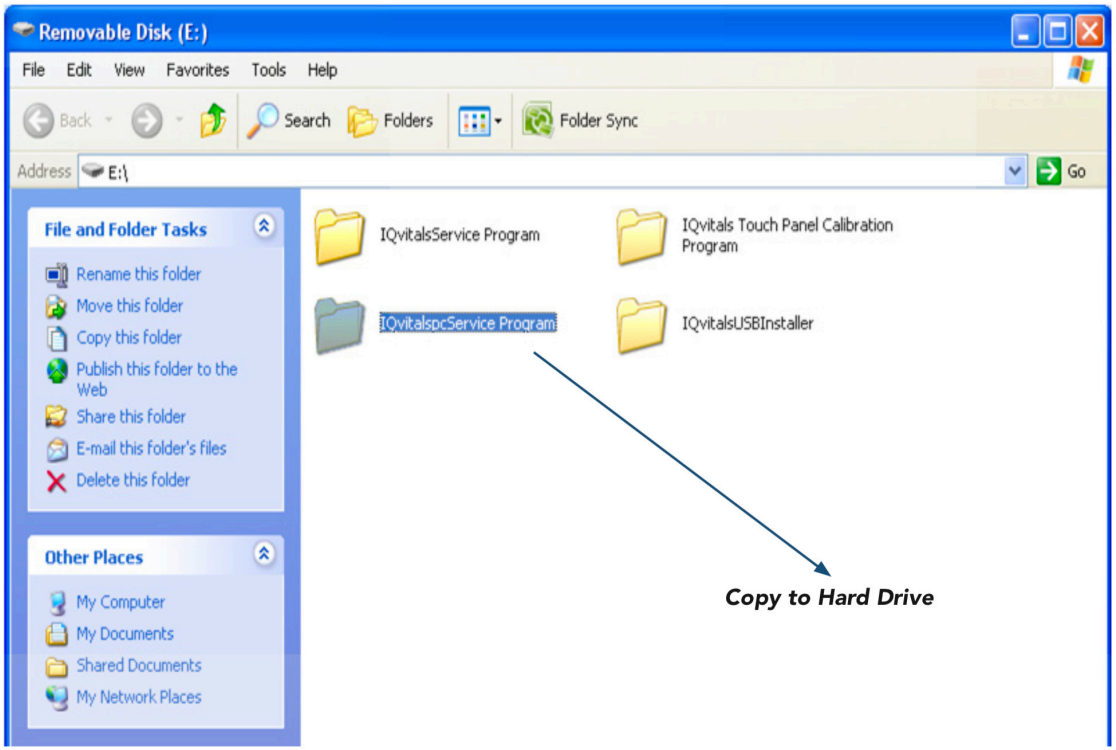
Step 2: Using Windows Internet Explorer®, view the contents of the USB stick (see picture displaying contents of USB).



INSTALL SERVICE TEST PROGRAM

INSTALL: IQvitalspcService Test Program

Step 1: Copy the IQvitalspcService Program Folder ontto the computer's hard drive.



INSTALL SERVICE TEST PROGRAM

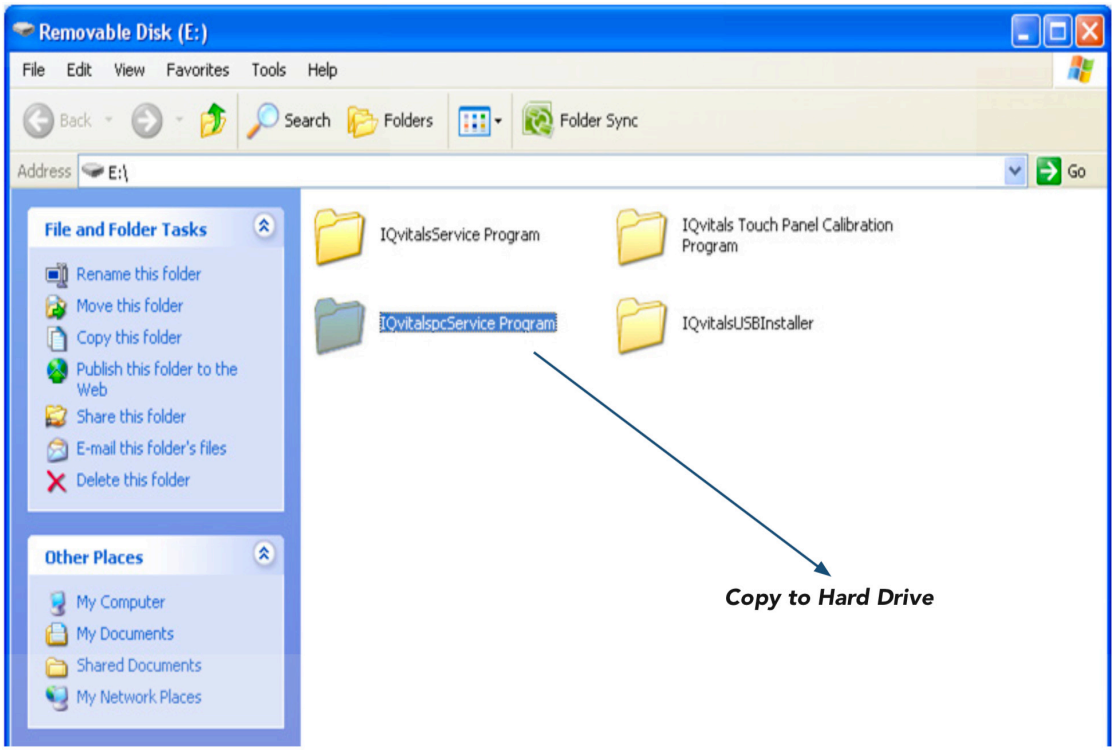
INSTALL: IQvitalspcService Program

Step 2: After the folder is copied to the hard drive:

- Open the IQvitalspcService Program (the copy on the computer)
- Select the IQvitalspcService Program.exe,
- Create a shorcut on thte desktop

Note:

To start the IQvitalspcService Program, luanch IQvitalspcService Program.exe from the desktop. This will start the Test Program (see Test Program View).

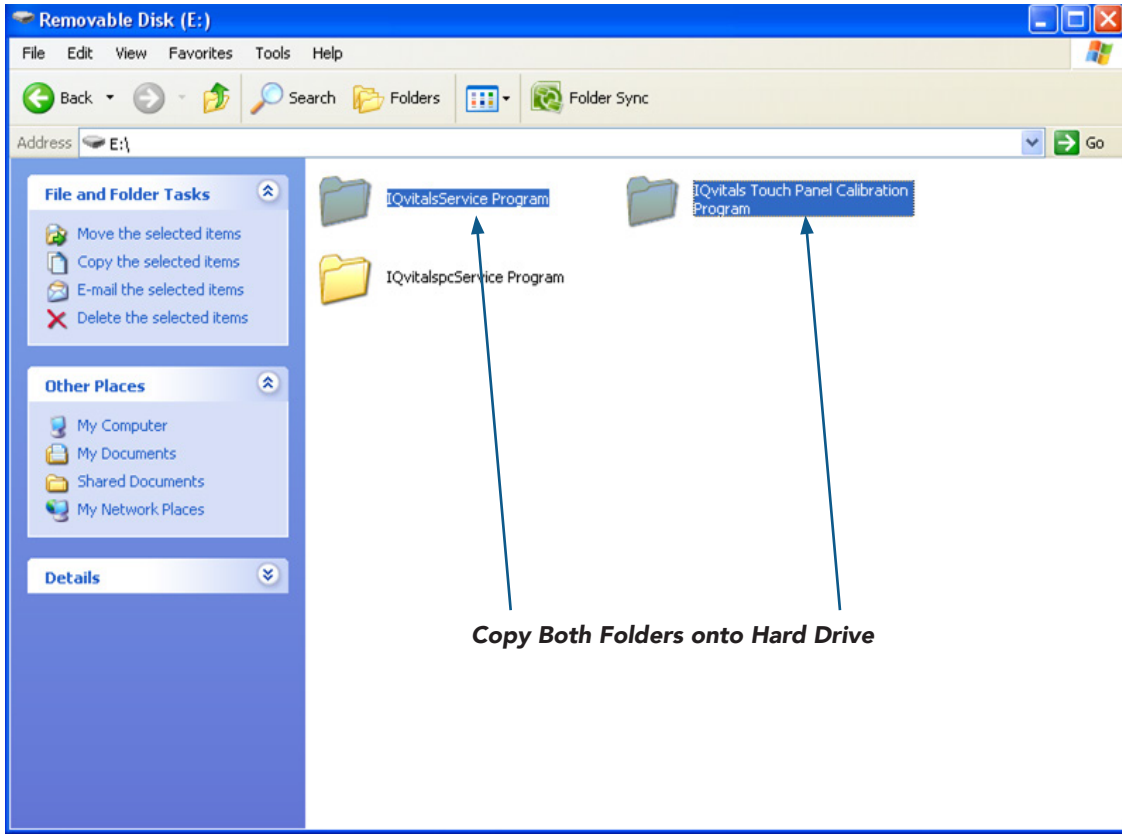


INSTALL SERVICE TEST PROGRAM: (CONTINUED)

INSTALL: Service Test Program

Step 3:

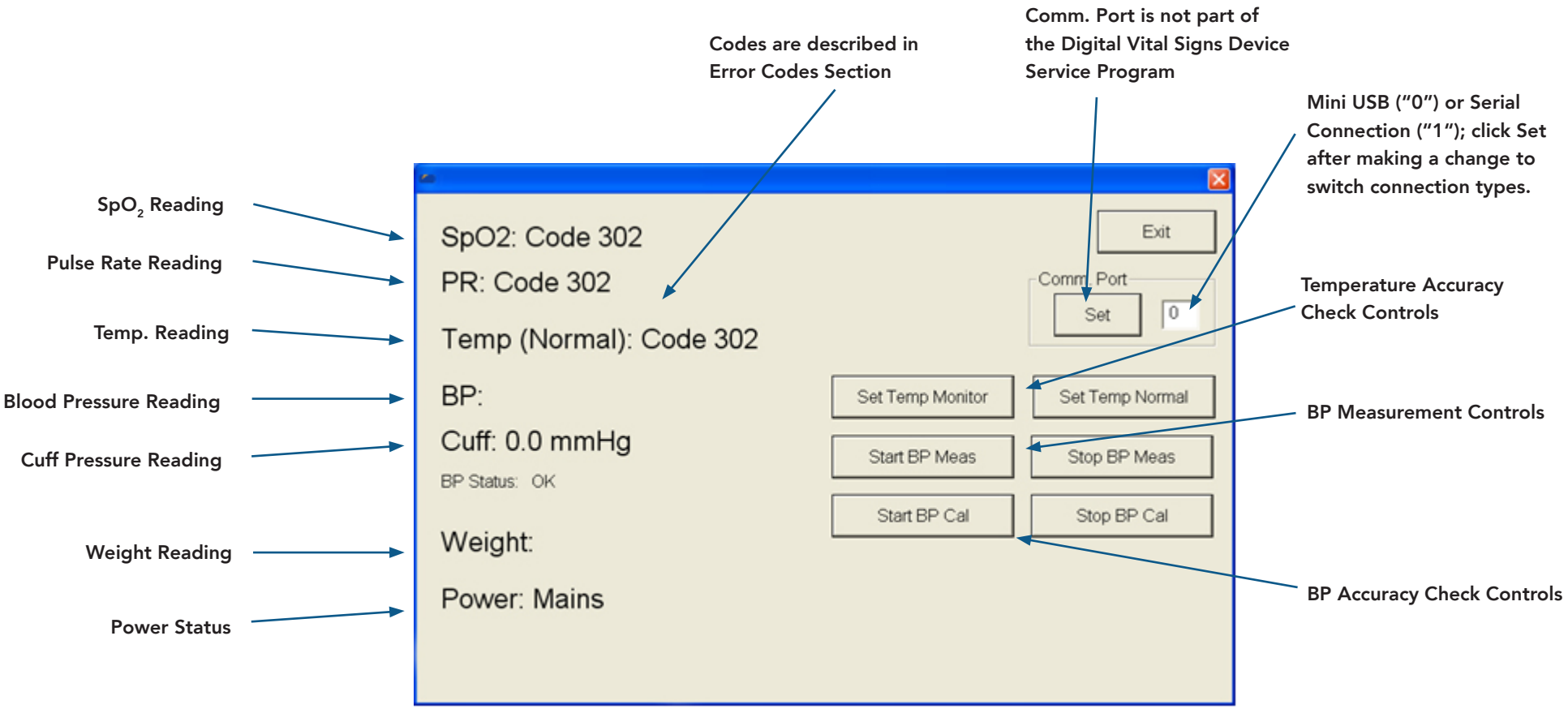
- Copy the IQvitals® Service Program and Touch Panel Calibration Program onto the computer's hard drive.
- The USB drive will be re-used to run these test programs on the device.



SERVICE TEST PROGRAM VIEW

IQvitals® Service Program

Runs on touchscreen device



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USB SERVICE TEST PROGRAM OR

TOUCH PANEL CALIBRATION PROGRAM CONFIGURATION

SERVICE TEST PROGRAM OR TOUCH PANEL CALIBRATION PROGRAM CONFIGURATION

Step 1: To run the IQvitals® programs on the touchscreen device:

- Copy the program's folder contents from the PC hard drive to the Startup folder in the USB drive's root directory. This process applies for both the IQvitals Service and IQvitals Touch Panel Calibration programs.

Step 2: Once the desired program is loaded into the Startup folder:

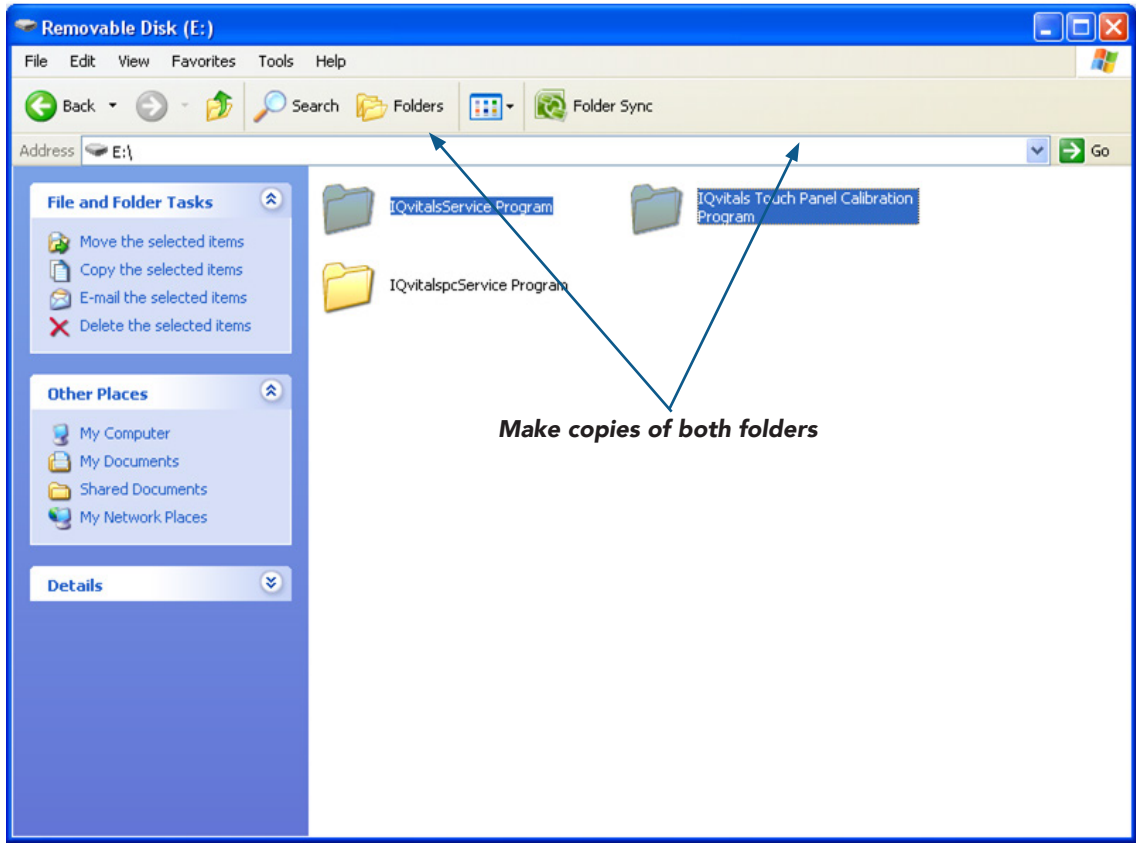
- Plug the USB drive into the touchscreen device
- Power the unit on.
- The device will boot up and display the configured test program automatically.

Note

The USB drive can only be configured to run one program at a time. Be sure to delete the Startup folder contents using the drive to run a new program.

Note

When the device touchscreen is connected to a USB drive with a Startup folder, it will run the executable files within that folder instead of the software in the device.



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FUNCTIONAL VERIFICATION CHECKS + CALIBRATION CHECKS

Functional Verification Checks

Perform a functional verification check annually or after repairing a device.

Digital Vital Signs Device Function	Procedure
Mechanical Integrity	Check for cracks, abrasive edges and other signs of damage.
Power Supply LED	Verify that the green "power" LED is illuminated on the Digital Vital Signs Device Power Supply when the power supply is plugged into AC power.
Battery Charging LED	Verify that the green "battery charging" LED is illuminated on the Digital Vital Signs Device power supply when the power supply is plugged into AC power.
On/Off LED	Verify that the green "On/Off" LED is illuminated on the back of the Digital Vital Signs Device device when the unit is on.
Battery	Verify that the device continues to run after it has been disconnected from mains and that the battery gas gauge displays the correct charge level.
Touchscreen	Verify that the screen is responsive to touch.
Speaker	Verify that the speaker sounds when the SpO_2 finger clip is attached to your finger and is sensed by the device.
SpO_2	Verify the accuracy of the SpO_2 parameter with the SpO_2 simulator at 96% SpO_2.
NIBP	Verify the BP accuracy against the simulator at a BP of 120/80.
Thermometer	Verify the temperature accuracy with a calibrated water bath at or near 98.6°F.
Scale	Verify the scale accuracy against calibrated weights.

CALIBRATION CHECKS

Perform safety and calibration checks annually.

Blood Pressure (BP) Calibration Check

BP Checks Include:

- BP Accuracy
- Cuff Pressure Accuracy
- Leak Rate
- Overpressure Detection

Note: The BP circuitry contains a factory-set calibration potentiometer. This will remain stable for the life of the product and is not field serviceable.

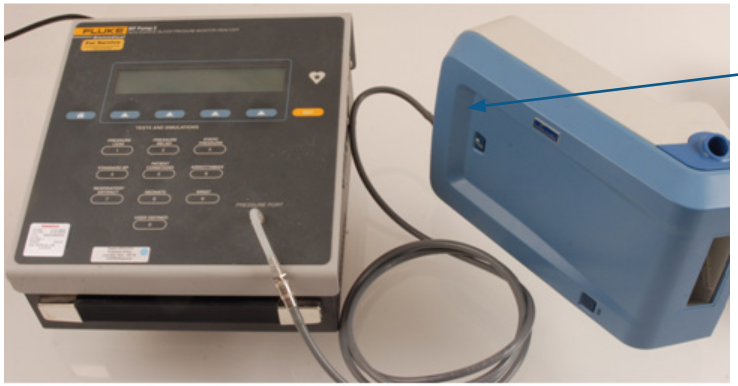
Tools Needed:

- BP Simulator (Fluke Biomedical "BP Pump 2" or equivalent)
- IQvitals® Service Test Program (depending on the device model number)
- BP Hose

Test Set-up:

Note: Each procedure requires the correct Test Program to be installed. For installation instructions, see section USB Service Tools Kit.

- Connect the device to simulator using a BP hose (see picture).
- For touchscreen device, run the IQvitals Service Test Program.



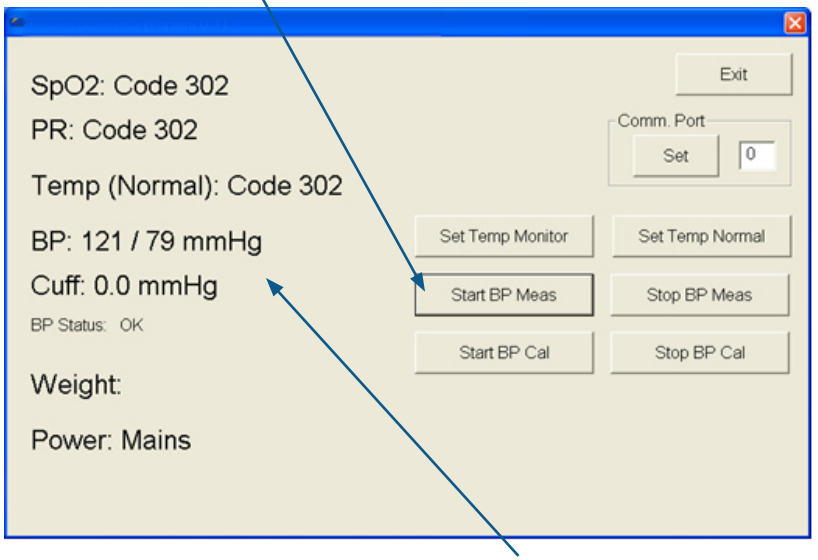
Note: ***Touchscreen device connects to the BP Simulator in same way***

BP CALIBRATION CHECK PROCEDURE:

- Set BP Simulator to 120/80 mmHg. Refer to the usage instructions provided with the BP simulator used for this procedure.
- Click **Start BP Meas** and wait for measurement to complete. The Test Program should report a BP result within ±5 mmHg of the simulator setting (see picture).
- If it is determined the device is out of tolerance, replace Main Board.

Note: *All testing assumes properly functional and calibrated test equipment. The device has been tested with the Fluke Biomedical BP Pump2 simulator. BP simulator behavior can vary from manufacturer to manufacturer.*

Click Start BP Meas.



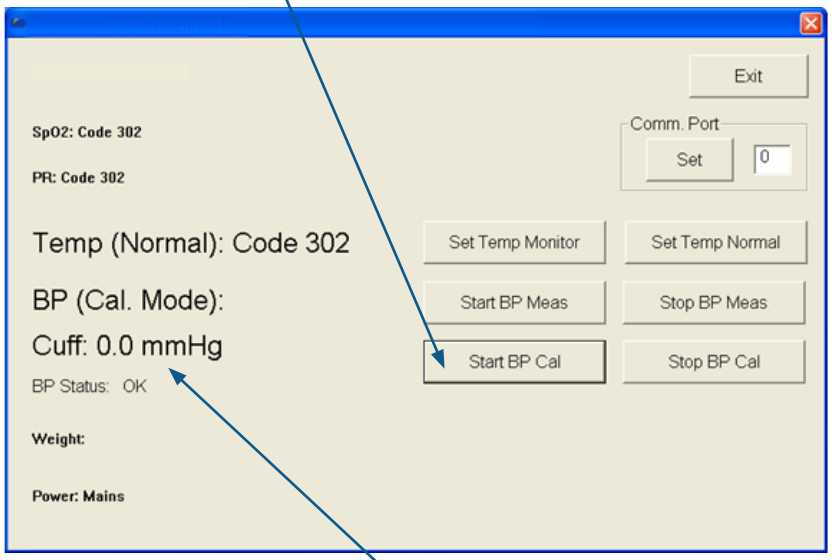
Ensure reading is within specifications.

CUFF PRESSURE CALIBRATION CHECK:

- Click **Start BP Cal.**
- Set the BP Simulator to Pressure Gauge mode and inflate it to 200 mmHg. If the simulator does not have a built-in pump, then use a hand-bulb and a calibrated manometer to inflate it to 200 mmHg.
- Wait for pressure to reach 200 mmHg, then observe the pressure values on the BP simulator and Test Program.
- Ensure that they differ by no more than ±5 mmHg.
- If it is determined the device is out of tolerance, replace Main Board.
- Click **Stop BP Cal** when finished.

Note: *All testing assumes properly functional and calibrated test equipment. The device has been tested with the Fluke Biomedical BP Pump2 simulator. BP simulator behavior can vary from manufacturer to manufacturer.*

Before starting the BP simulator, click Start BP Cal.



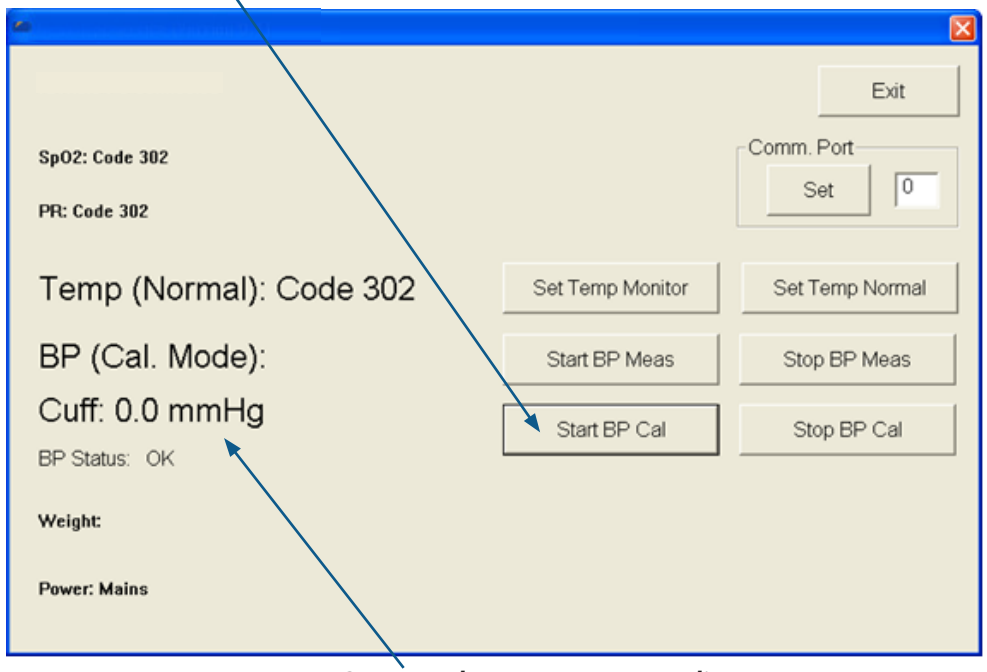
Compare the Test Program reading to the BP simulator once the simulator reaches 200 mmHg

LEAK RATE CALIBRATION CHECK:

- Click **Start BP Cal.**
- Set the BP Simulator to Pressure Gauge mode and inflate it to 200 mmHg. If the simulator does not have a built-in pump, then use a hand-bulb and calibrated manometer to inflate it to 200 mmHg.
- Allow pressure to reach 200 mmHg and wait 30 seconds for the pressure to stabilize.
- Watch the pressure value for a full minute and ensure that the device pressure reading does not drop by more than 5 mmHg (see picture).
- If the leak rate is out of tolerance, confirm that the test fixture is not the source of the leak. Check all connections on the NIBP Manifold and retest. If leak rate is still out of tolerance, check or replace: Valve Assembly (most likely), NIBP Manifold (possible), step-valve which is part of the Main Board (possible) or Pump (unlikely).
- Click **Stop BP Cal** when finished.

Note: *All testing assumes properly functional and calibrated test equipment. The device has been tested with the Fluke Biomedical BP Pump2 simulator. BP simulator behavior can vary from manufacturer to manufacturer.*

Before starting the BP simulator, click Start BP Cal.



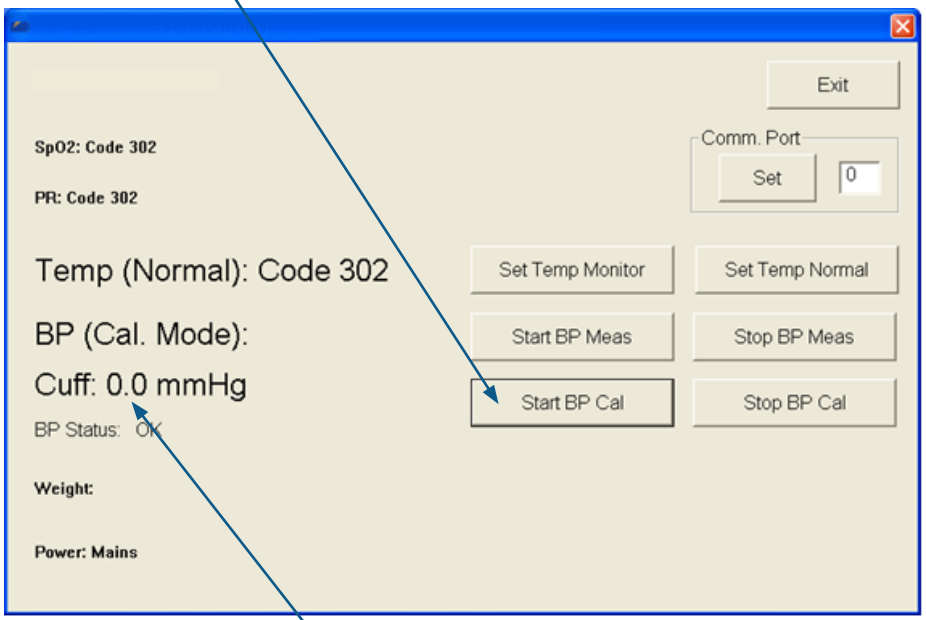
Compare the Test Program reading to the BP simulator for one minute once the simulator reaches 200 mmHg.

OVERPRESSURE DETECTION CALIBRATION CHECK:

- Click **Start BP Cal.**
- Set the BP Simulator to Pressure Gauge mode and inflate it to 200 mmHg.
- Wait 10 seconds for the pressure to stabilize. If the simulator does not have a built-in pump, then use a hand-bulb and calibrated manometer to inflate it to 200 mmHg.
- Change the simulator setting, or use a hand-bulb to inflate to 300 mmHg, and verify that the device releases pressure before reaching 300 mmHg.
- If pressure is not released before 300 mmHg, check the accuracy of the test fixture. If this is OK, replace Main Board.
- Click **Stop BP Cal** when finished.

Note: *All testing assumes properly functional and calibrated test equipment. The device has been tested with the Fluke Biomedical BP Pump2 simulator. BP simulator behavior can vary from manufacturer to manufacturer.*

Before starting the BP simulator, click Start BP Cal.



Make sure that the valve releases (pressure drops to zero) before pressure reaches 300 mmHg.

SpO_2 CALIBRATION CHECK

SpO_2 Checks Include:

- SpO_2 Accuracy

Note: *The SpO_2 circuitry contains a factory-set calibration potentiometer. This will remain stable for the life of the product and is not field serviceable.*

Tools Needed:

- SpO_2 Simulator (Fluke Biomedical "Index 2" or similar)
- IQvitals® Service Test Program (depending on the device model number)
- SpO_2 Finger sensor

Test Set-up:

Note: This procedure requires the Test Program to be installed. For installation instructions, see section USB Service Tools Kit.

- Connect the device to the simulator using an SpO_2 finger sensor (see picture).
- Ensure that the SpO_2 simulator is set to Nellcor™ mode.
- Set the SpO_2 simulator to 96% SpO_2 and 75 PR.
- For a touchscreen device, run the IQvitals Service Test Program.

Note: ***The touchscreen device connects to the SpO_2 simulator in same way.***

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Nellcor is a trademark of Covidien AG.

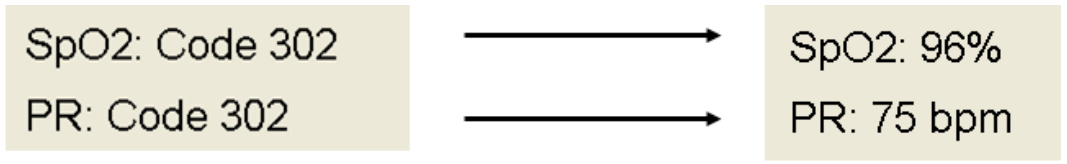
SPO_2 CALIBRATION CHECK PROCEDURE:

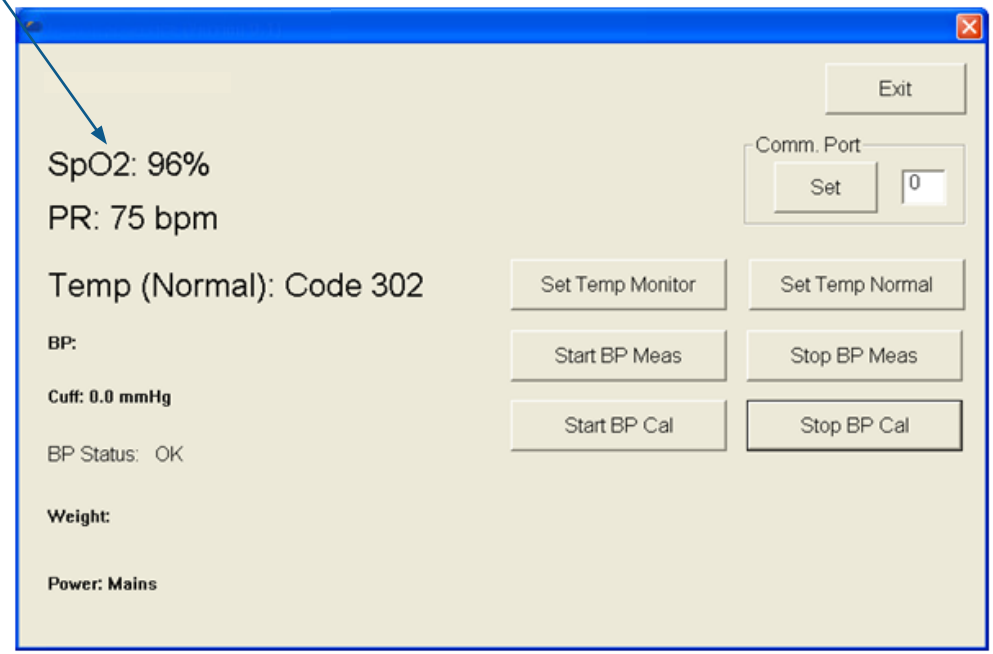
- Make sure that the SpO_2 and BP codes in the Test Program display change from Code 302 to a numeric reading when connected (see pictures).
- Compare the SpO_2 and PR readings in the Test Program to the 96% SpO_2 and 75 PR on the SpO_2 simulator display. There should be a difference of no greater than ±2% for the SpO_2 parameter and ±5 bpm for PR parameter.
- If the readings are out of tolerance, there may be a difference between the SpO_2 simulator and the processing of the SpO_2 signal.
- Confirm that the SpO_2 sensor is properly aligned on the SpO_2 simulator's "finger."
- If it is determined the SpO_2 measurements are out of tolerance, replace Main Board.

Note: *All testing assumes properly functional and calibrated test equipment. The device has been tested with the Fluke Biomedical "Index 2" simulator. SpO_2 simulator behavior can vary from manufacturer to manufacturer.*

Ensure that readings are within specifications.

Display Changes to Numerical Value





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TEMPERATURE CALIBRATION CHECK

Temperature Checks Include:

- Temperature Accuracy

Note: *The Temperature circuitry self-calibrates using internal, high-precision reference resistors. The device will report a "TEMP 306" error code if the circuitry is out of tolerance.*

Tools Needed:

- Calibrated Water Bath
- Digital Vital Signs Device Service Test Program (depending on the device model number)
- Temperature Probe

Test Set-up:

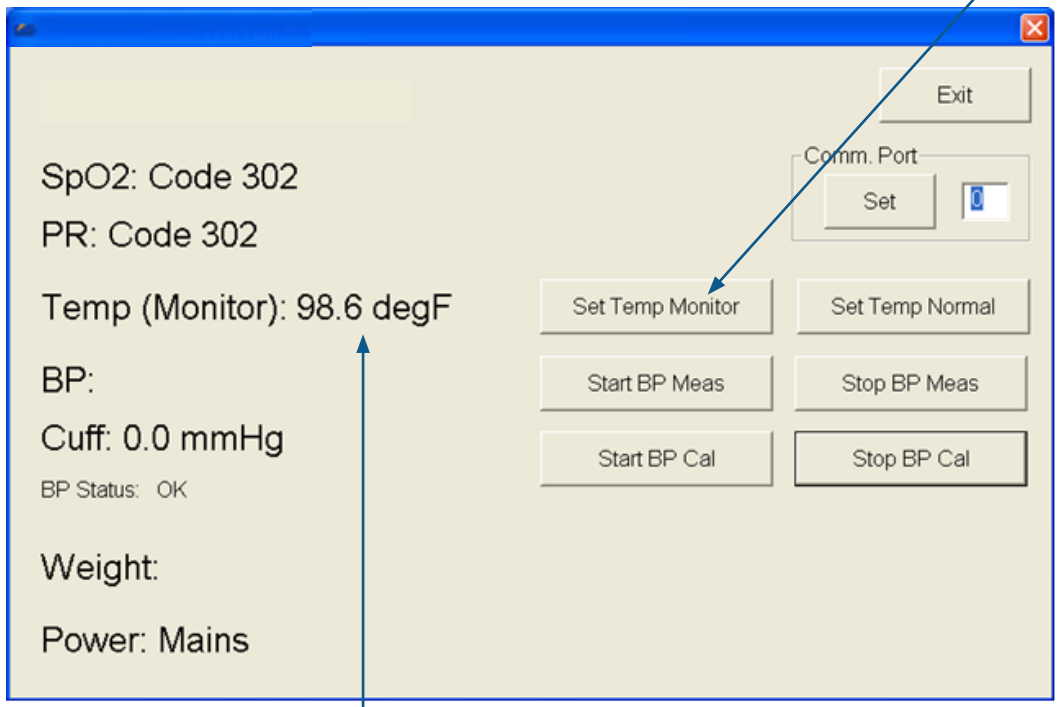
Note: *This procedure requires the Test Program to be installed. For installation instructions, see section Digital Vital Signs Device.*

- Connect the temperature probe to the device.
- Prepare a Calibrated Water Bath at approximately 98.6°F.
- For a touchscreen device, run the IQvitals® Service Test Program.

TEMPERATURE CALIBRATION CHECK PROCEDURE:

- Click **Set Temp Monitor** on the Test Program (see picture) to directly read the temperature of the probe tip.
- Place the temperature probe into water bath and check that the Test Program temperature is within ±0.3°F of the water bath.
- If temperature is out of tolerance check the accuracy of the test fixture. If this is OK, replace the probe (most likely), I-O Board (possible), or Main Board (possible).

Before placing the Temperature Probe into the Calibrated Water Bath, click Set Temp Monitor.



Ensure that the temperature reading is within specifications.

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WEIGHT CALIBRATION CHECK

This procedure is for the Fairbanks® TeleWeigh™ digital floor scale, which is calibrated at the factory and should not need further calibration.

For service instructions for the Midmark 626 Barrier-Free® Power Examination Chair with Digital Scale, contact Midmark customer support or visit midmark.com.

Weigh Checks Include:

- Weight Accuracy

Tools Needed:

- 4 Calibrated 50 lb Weights
- Digital Vital Signs Device Service Test Program (depending on unit model)

Test Set-up:

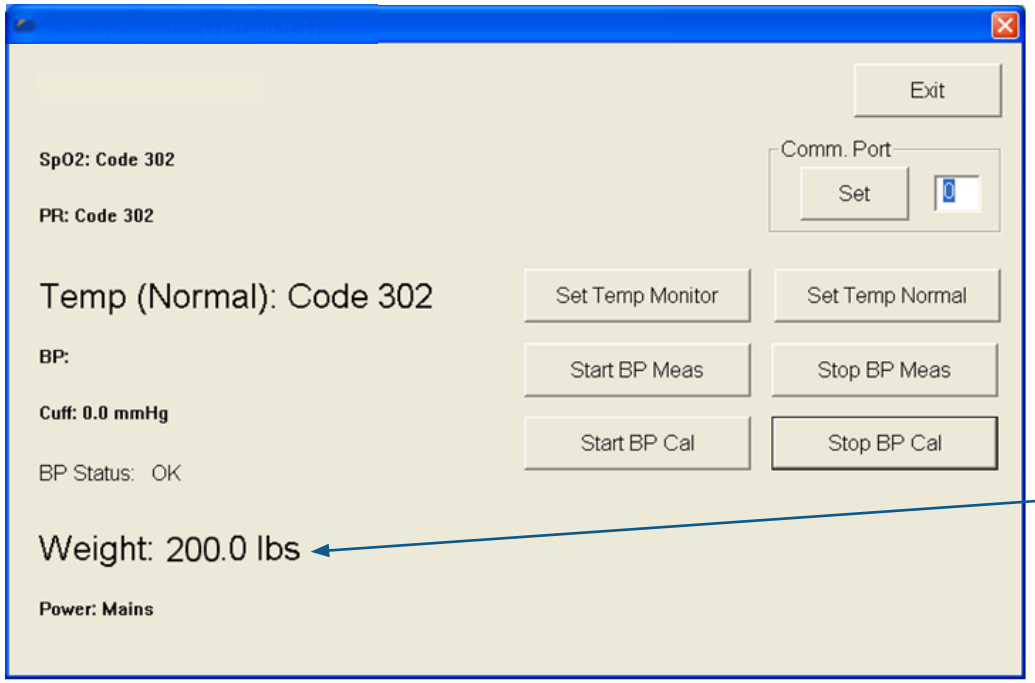
Note: *This procedure requires the Test Program to be installed. For installation instructions, see section Digital Vital Signs Device.*

- Connect the scale to the device.
- For a touchscreen device, run the IQvitals® Service Test Program.

 [Revised: 02/2021]

WEIGHT CALIBRATION CHECK PROCEDURE:

- Place weights on the scale to check the calibrated weight against the reported weight in the program display.
- Check weight at 50, 100 and 200 lb.
- Ensure that the reported weight is within ±1 lb of the calibrated weight.
- If scale is out of range, contact Midmark Support Services at 1.800.624.8950, option 2, for further information.



Ensure that the reported weight is within specifications.

TOUCHSCREEN CALIBRATION

The Touch Panel Calibration Program runs on the touchscreen device from a USB drive. It allows you to calibrate the touch panel. In normal use, the touch panel does not need recalibrating. However, touch panel calibration is required after the replacement of the display or processor board.

Tools Needed:

- Stylus
- Touch Panel Calibration Program

Touch Panel Calibration Procedure:

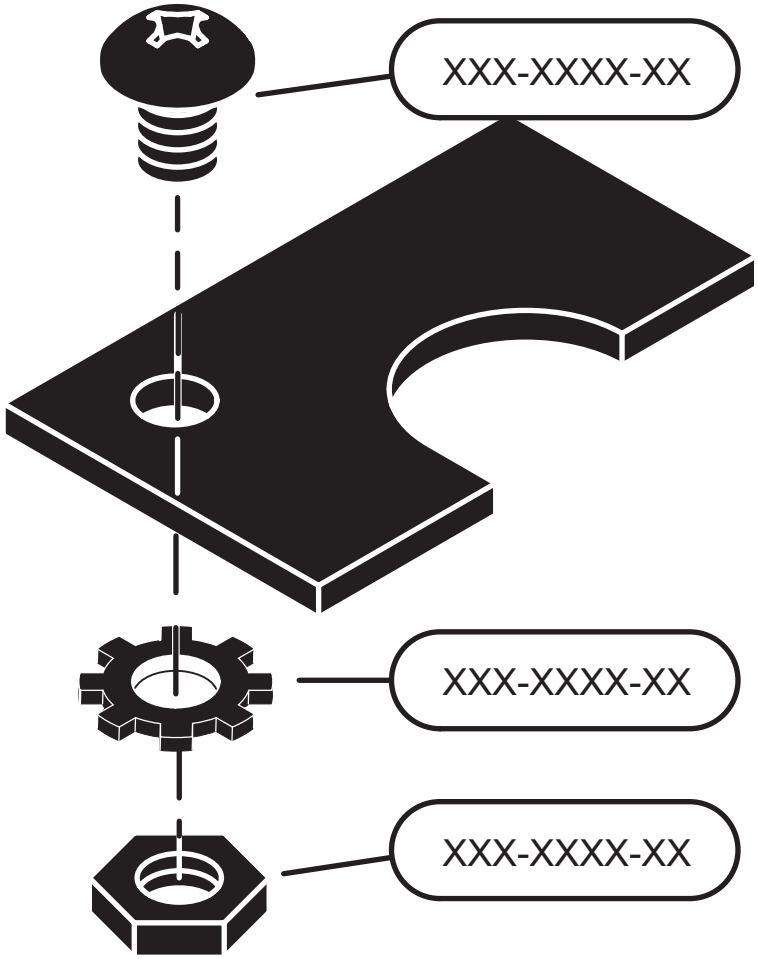
Note: *This procedure requires the Touch Panel Calibration Program to be installed. For installation instructions, see section USB Service Test Program or Touch Panel Calibration Program Configuration.*

- Connect the USB drive (with the Touch Panel Calibration Program) to the device.
- Run Device; the Touch Panel Calibration Program will automatically start.
- Follow the Touch Panel Calibration screen instructions using a stylus.
- If the touch panel calibration is successful, a second window will open. This will allow you to save the touch panel calibration constants and complete the calibration.

Note: *The touch panel calibration sequence will automatically restart if calibration is not successful.*

Purchasing Guide + Parts List

Section C



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ORDERING SERVICE PARTS

When placing a service parts order please have the following information available:

- Device model number and serial number of the device to be serviced
- Part numbers and quantities of service parts to be ordered
- Payment information

For payment details and placing an order contact Midmark Support:

eMail: *techsupport@midmark.com*

Phone: 1.844.856.1230

Hours: 5:00 am to 5:00 pm PST

PURCHASING GUIDE

The following chart identifies all available service kits for the Digital Vital Signs Device and IQvitals devices.

		Device Model Number			
Part #	Service Kit Name	1-100-1610 (Kit # 4-000-0500 Rev C) IQvitals® Device Touchscreen	1-100-1615 (Kit # 4-000-0510 Rev C) IQvitals Device Touchscreen w/ SpO_2	1-100-1630 (Kit #4-000-0500 Rev D) Digital Vital Signs Device	1-100-1635 (Kit #4-000-0510 Rev D) Digital Vital Signs Device with SpO_2
181-6110	IQvitals NIBP Pump	•	•		
181-6111	DVSD NIBP Pump			•	•
181-6120	IQvitals Valve Assembly	•	•		
181-6121	DVSD Valve Assembly			•	•
181-6130	IQvitals NIBP Manifold	•	•	•	•
183-6700	IQvitals Main Board w/ SpO_2		•		
183-6701	IQvitals Main Board - no SpO_2	•			
183-6704	DVSD Main Board			•	•
183-6712	IQvitals I-O Board	•	•		
183-6713	DVSD I-O Board			•	•
183-6720	IQvitals Processor Board	•	•		
183-6721	DVSD Processor Board			•	•
181-6740	IQvitals Temp Assembly	•	•		
181-6770	DVSD Temp Assembly			•	•
181-6741	IQvitals Battery Door	•	•		
181-6771	DVSD Battery Door			•	•
181-6742	IQvitals Rear Cover	•	•		
181-6772	DVSD Rear Cover			•	•
181-6744	IQvitals Front Bezel	•	•		

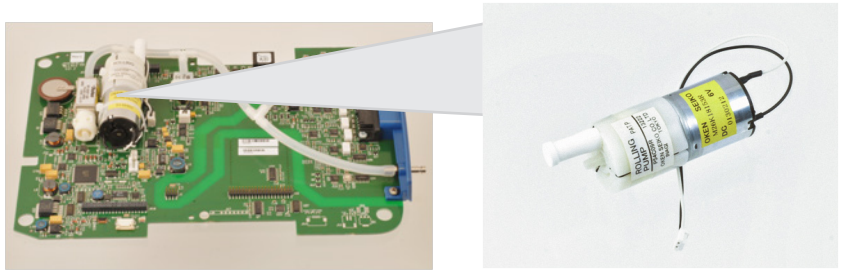
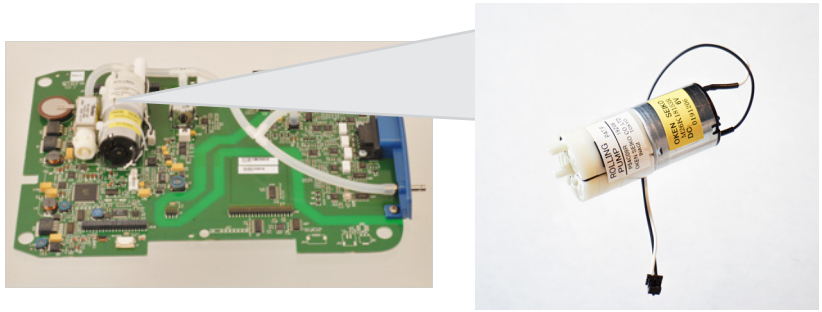
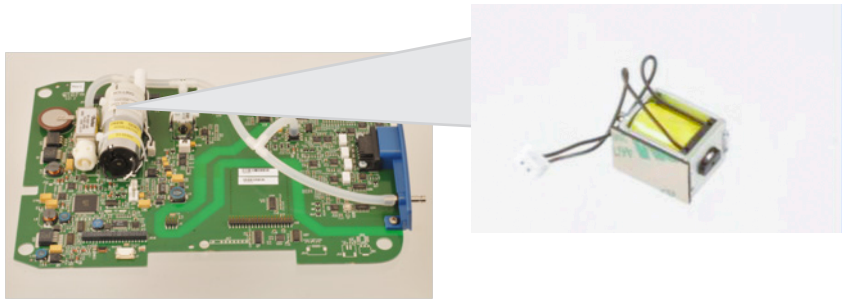
[Revised: 02/2021]

PURCHASING GUIDE

The following chart identifies all available service kits for the Digital Vital Signs Device and IQvitals devices.

		Device Model Number			
Part #	Service Kit Name	1-100-1610 (Kit # 4-000-0500 Rev C) IQvitals® Device Touchscreen	1-100-1615 (Kit # 4-000-0510 Rev C) IQvitals Device Touchscreen w/ SpO_2	1-100-1630 (Kit #4-000-0500 Rev D) Digital Vital Signs Device	1-100-1635 (Kit #4-000-0510 Rev D) Digital Vital Signs Device with SpO_2
181-6744	IQvitals Front Bezel	•	•		
181-6750	IQvitals	•	•		
181-6751	IQvitals Display Brackets	•	•		
181-6752	IQvitals Replacement Display	•	•		
181-6775	DVSD Replacement Display			•	•
181-6761	IQvitals SD Card Assembly	•	•		
181-6746	IQvitals Input Panel w/ SpO_2		•		
181-6747	IQvitals Input Panel - no SpO_2	•			
181-6773	DVSD Input Panel w/ SpO_2				•
181-6774	DVSD Input Panel - no SpO_2			•	
181-6762	Digital Vital Signs Device Battery Board	•	•	•	•
181-6763	Digital Vital Signs Device USB Service Tools Kit	•	•	•	•

PARTS LIST

Service Kit Name + Number	Service Kit Components	Information
181-6110 IQvitals® NIBP Pump Service Kit		***Note:*** This service kit is compatible with IQvitals units only.
181-6111 Digital Vital Signs Device NIBP Pump Service Kit		***Note:*** This service kit is compatible with Digital Vital Signs Device units only.
181-6120 IQvitals NIBP Manifold Service Kit		***Note:*** This service kit is compatible with IQvitals units only.

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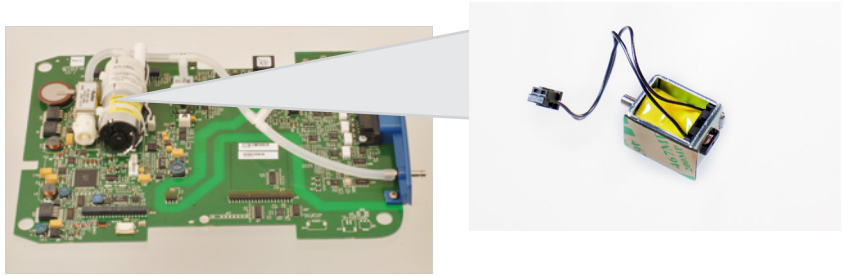
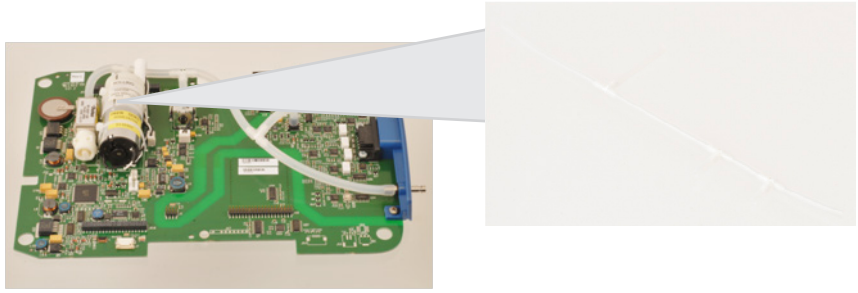
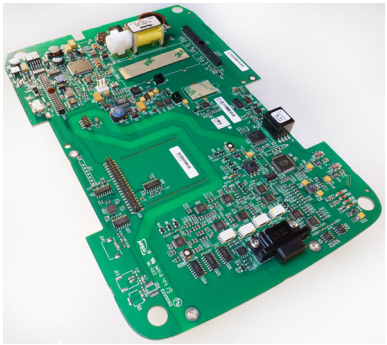
Service Kit Name + Number	Service Kit Components	Information
181-6121 Digital Vital Signs Device Valve Assembly Service Kit		***Note:*** This service kit is compatible with Digital Vital Signs Device units only.
181-6130 IQvitals® NIBP Manifold Service Kit		***Note:*** This service kit is compatible with all Digital Vital Signs Device and IQvitals units.
183-6700 IQvitals Main Board w/ SpO_2 Service Kit		***Note:*** This service kit is compatible with IQvitals units only.

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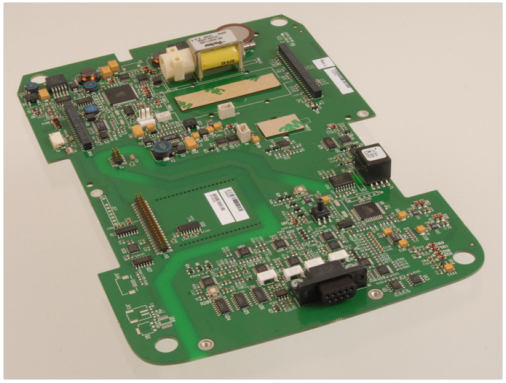
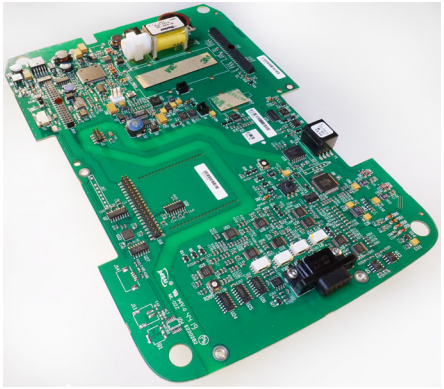
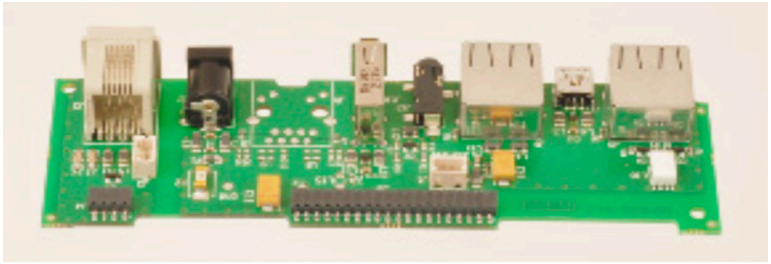
Service Kit Number + Name	Service Kit Components	Information
183-6701 IQvitals® Main Board – no SpO_2 Service Kit		***Note:*** This service kit is compatible with IQvitals units only.

Service Kit Number + Name	Service Kit Components	Information
183-6704 Digital Vital Signs Device Main Board Service Kit		***Note:*** This service kit is compatible with Digital Vital Signs Device units only.
183-6712 IQvitals® I-O Board Service Kit	 	***Note:*** This service kit is compatible with IQvitals units only.

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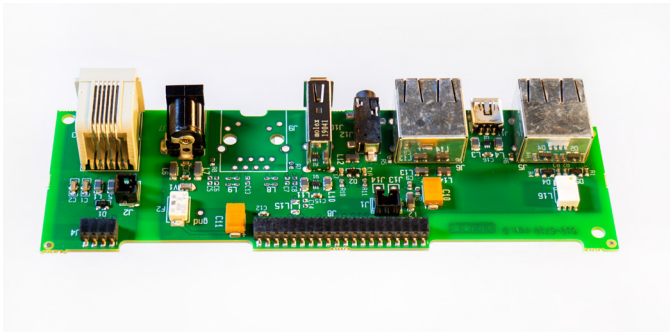
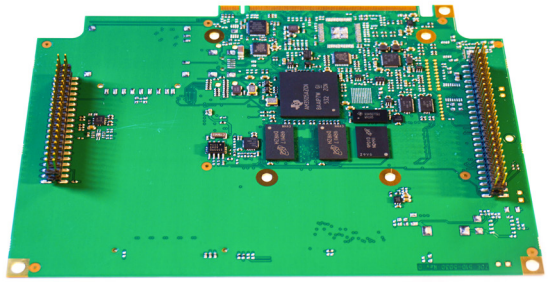
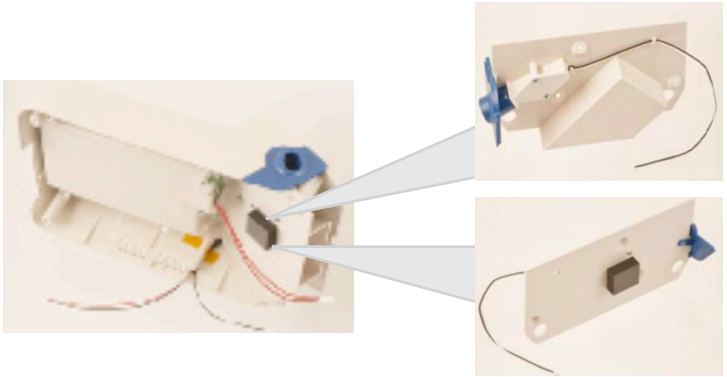
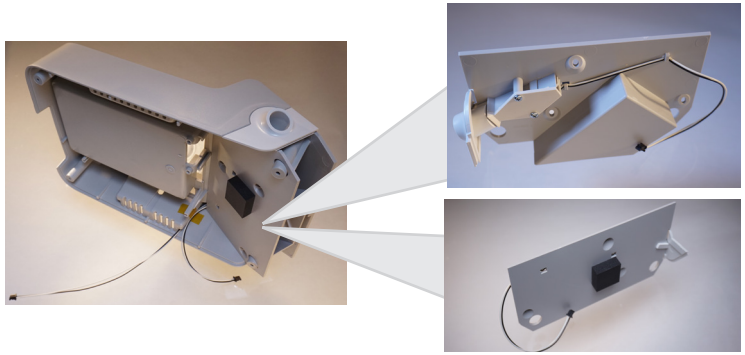
Service Kit Number + Name	Service Kit Components	Information
183-6713 Digital Vital Signs Device I-O Board Service Kit		***Note:*** This service kit is compatible with Digital Vital Signs Device units only.
181-6720 IQvitals® Processor Board Service Kit		***Note:*** This service kit is no longer available. If the unit contains this processor board, the unit needs to be sent in to the factory for an upgrade.
183-6721 Digital Vital Signs Device Processor Board Service Kit		***Note:*** This service kit is compatible with all Digital Vital Signs Device and newer IQvitals units. If the unit contains this processor board, use this service kit for repair.

Service Kit Number + Name	Service Kit Components	Information
181-6740 IQvitals® Temp Assembly Service Kit		***Note:*** This service kit is compatible with IQvitals units only.
181-6770 Digital Vital Signs Device Temp Assembly Service Kit		***Note:*** This service kit is compatible with Digital Vital Signs Device units only.
181-6741 IQvitals Battery Door Service Kit		***Note:*** This service kit is compatible with IQvitals units only.

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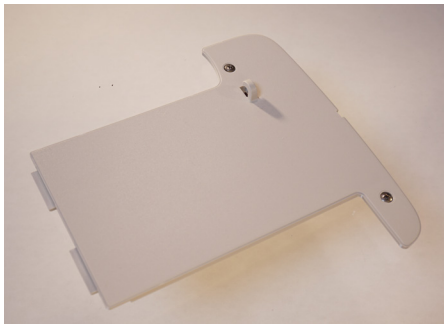
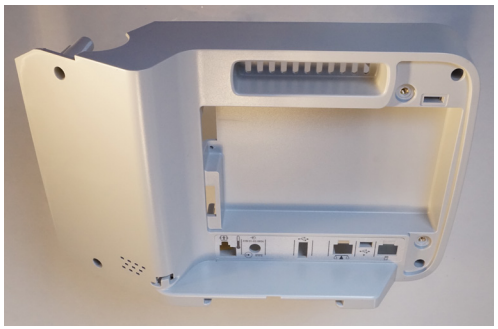
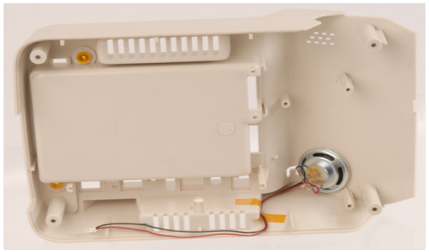
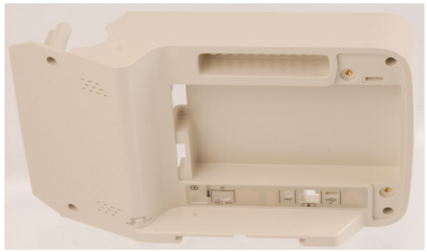
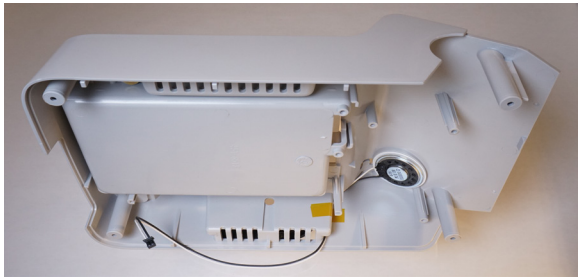
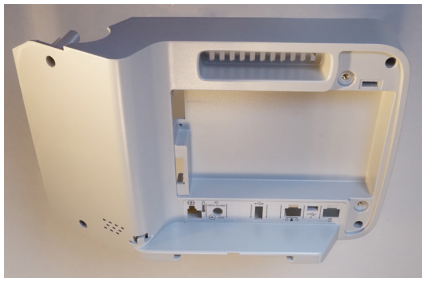
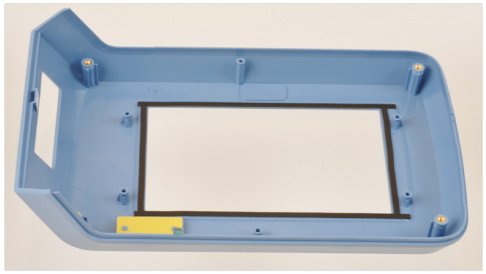
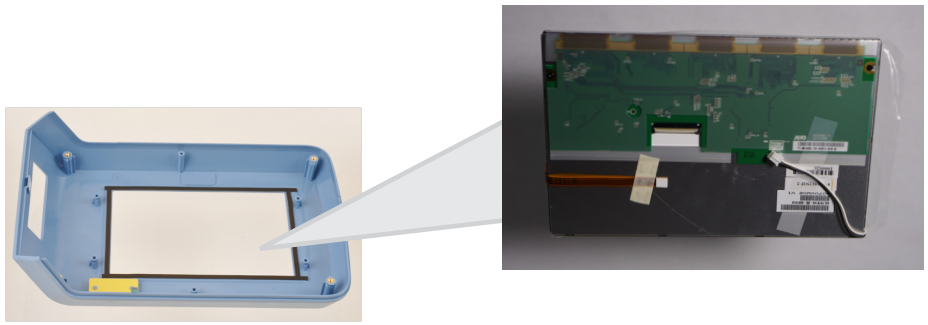
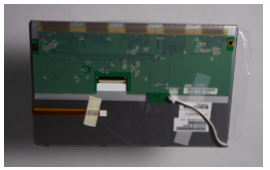
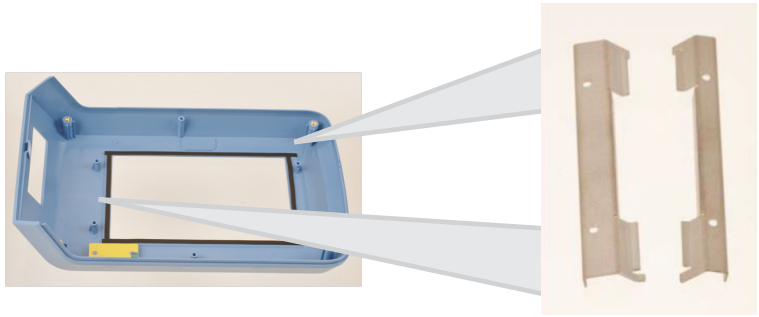
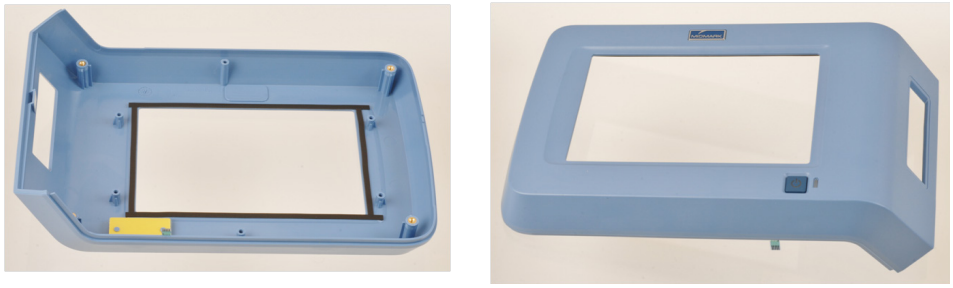
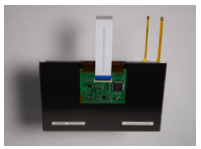
Service Kit Number + Name	Service Kit Components	Information
181-6771 Digital Vital Signs Device Battery Door Service Kit	 	***Note:*** This service kit is compatible with Digital Vital Signs Device units only.
181-6742 IQvitals® Rear Cover Service Kit	  	***Note:*** This service kit is compatible with IQvitals units only.
181-6772 Digital Vital Signs Device Rear Cover Service Kit	 	***Note:*** This service kit is compatible with Digital Vital Signs Device units only.

Service Kit Number + Name	Service Kit Components	Information
181-6744 IQvitals® Front Bezel Service Kit	 	***Note:*** This service kit is compatible with IQvitals units only. This service kit is only compatible for units with the display panel below.

Service Kit Number + Name	Service Kit Components	Information
181-6750 IQvitals® Display Service Kit		***Note:*** This service kit is compatible with IQvitals units only. This service kit is only compatible for units with the display panel below. 
181-6751 IQvitals Display Brackets Service Kit		***Note:*** This service kit is no longer available.
181-6752 IQvitals Replacement Display		***Note:*** This service kit is compatible with IQvitals units only. This service kit is only compatible for units with one of the display panels below.  

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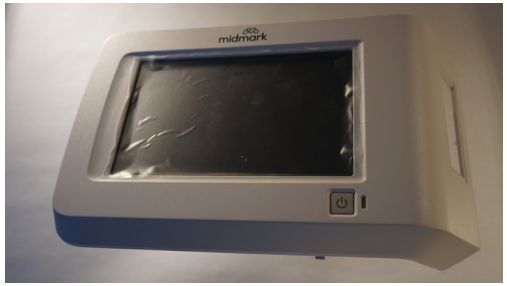
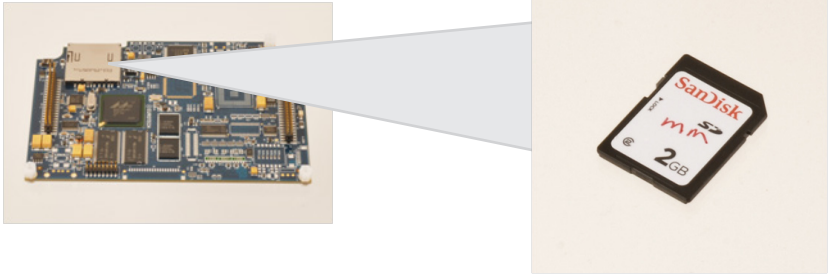
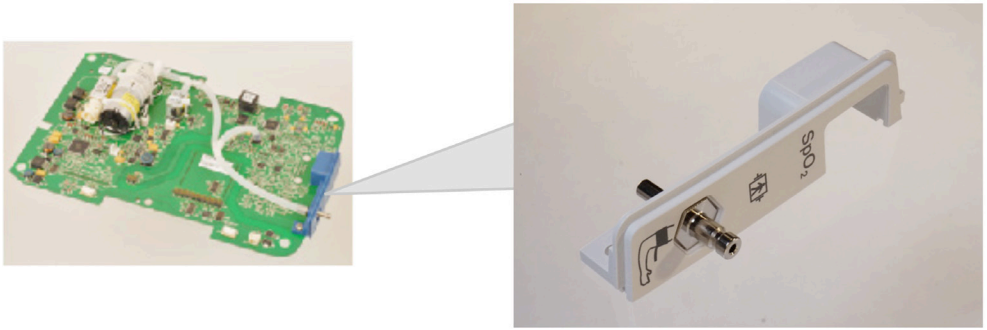
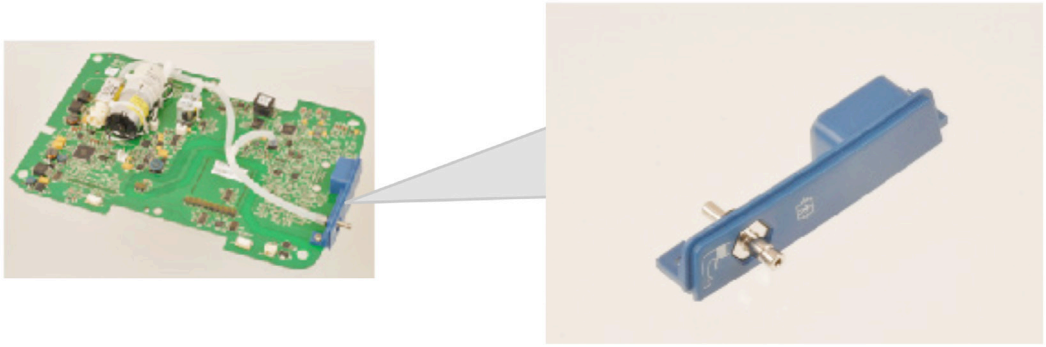
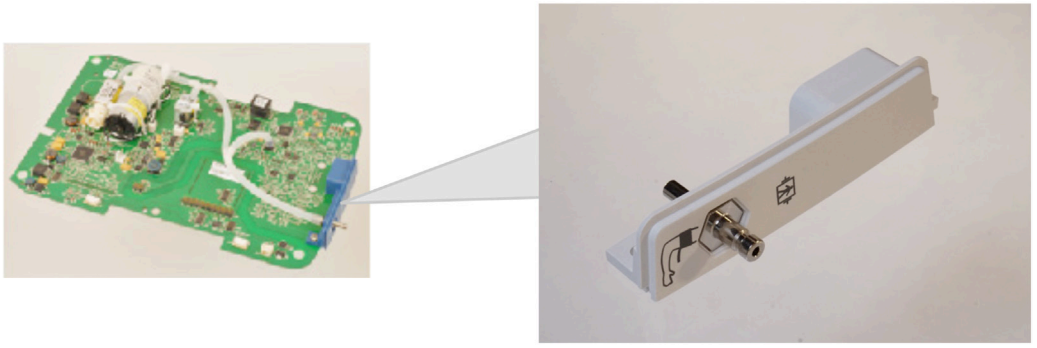
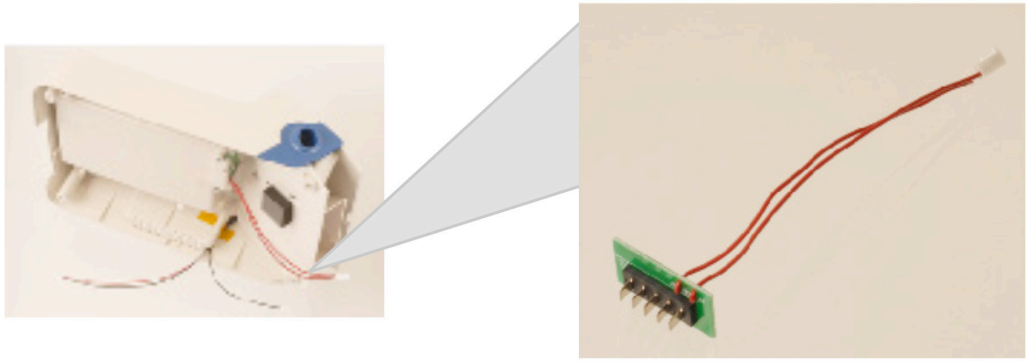
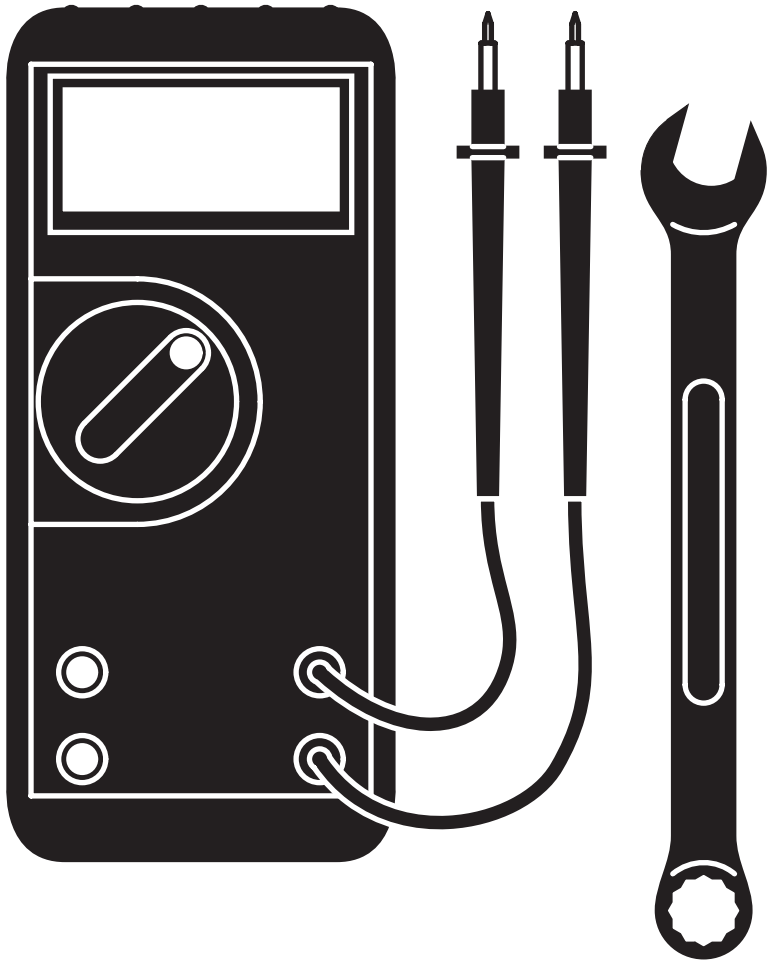
Service Kit Number + Name	Service Kit Components	Information
181-6775 DSVD Replacement Display Service Kit	 	***Note:*** This service kit is compatible with Digital Vital Signs Device units only.
181-6761 IQvitals SD Card Assembly		***Note:*** This service kit is compatible with IQvitals units only.
181-6746 IQvitals Input Panel w/ SpO_2 Service Kit	 	***Note:*** This service kit is compatible with IQvitals units only.

Service Kit Number + Name	Service Kit Components	Information
181-6773 Digital Vital Signs Device Input Panel - no SpO_2 Service Kit		***Note:*** This service kit is compatible with Digital Vital Signs Device units only.
181-6747 IQvitals® Input Panel – no SpO_2 Service Kit		***Note:*** This service kit is compatible with IQvitals units only.
181-6774 Digital Vital Signs Device Input Panel w/ SpO_2 Service Kit		***Note:*** This service kit is compatible with Digital Vital Signs Device units only.

Service Kit Number + Name	Service Kit Components	Information
181-6762 IQvitals® Battery Board Service Kit		***Note:*** This service kit is compatible with Digital Vital Signs Device and IQvitals units.
181-6763 Digital Vital Signs Device and IQvitals USB Service Tools Kit		***Note:*** This service kit is compatible with Digital Vital Signs Device and IQvitals units.

Service Part Replacement

SECTION D



DISASSEMBLY AND REASSEMBLY OF DIGITAL VITAL SIGNS DEVICE AND IQVITALS®

The following steps will guide you through the removal and replacement of components for the following device model numbers:

1-100-1610 - IQvitals

1-100-1615 - IQvitals with SpO_2

1-100-1630 - Digital Vital Signs Device

1-100-1635 - Digital Vital Signs Device with SpO_2

Tools Needed:

The following tools may be needed to conduct the steps outlined in this section:

- Phillips-head screwdriver
- Needle-nose tweezers
- Pen knife
- Pliers
- Wire cutters
- Replacement parts for the device

DISASSEMBLY

DISASSEMBLY

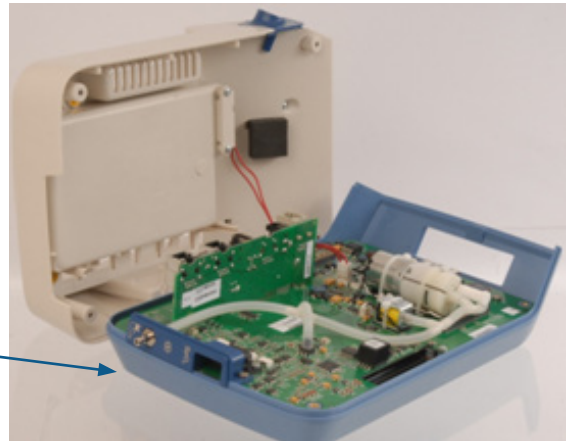
STEP 1: Remove the two screws to remove the battery door from the rear of unit to expose all four screw holes.

DISASSEMBLY

Step 2: Remove the battery and all four screws. Gently pull apart the front and rear covers.

DISASSEMBLY

Step 3: The two halves will still be connected by several cables plugged into the I-O board and mainboard (as shown).



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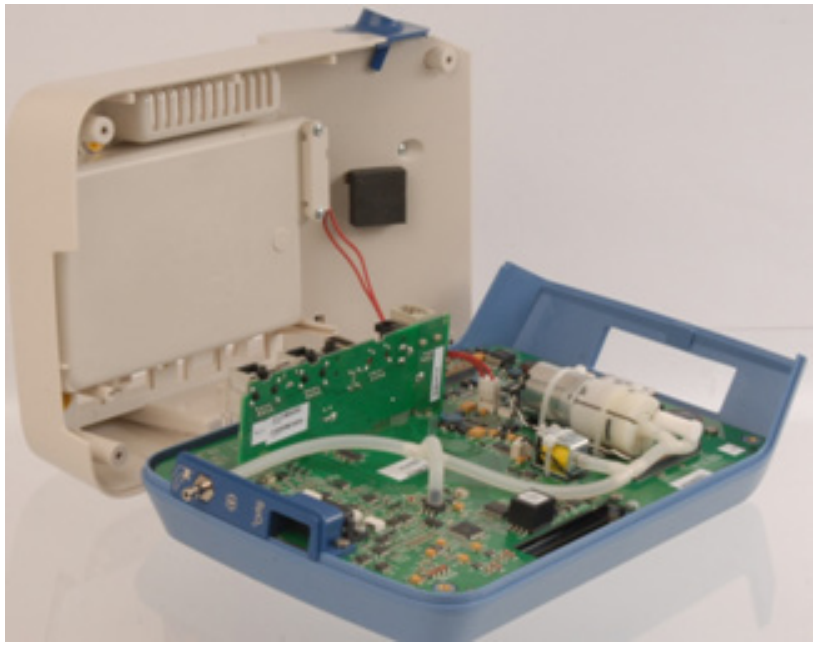
DISASSEMBLY (CONTINUED)

DISASSEMBLY

Step 4: To separate the main board and rear cover: Disconnect the battery cable from the main board.



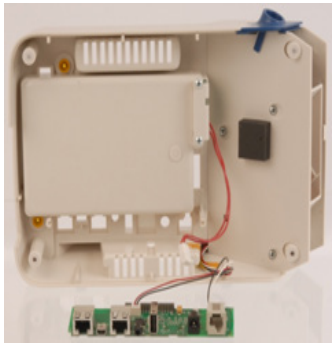
DISASSEMBLY

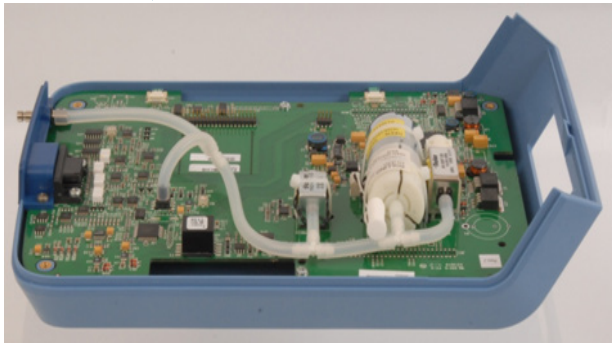
Step 5: Set aside the connected rear cover and I-O board.

DISASSEMBLY

Step 6: Detach the I-O board from the main board by pulling up firmly and carefully.

End Result





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DISASSEMBLY - REMOVING THE MAIN BOARD

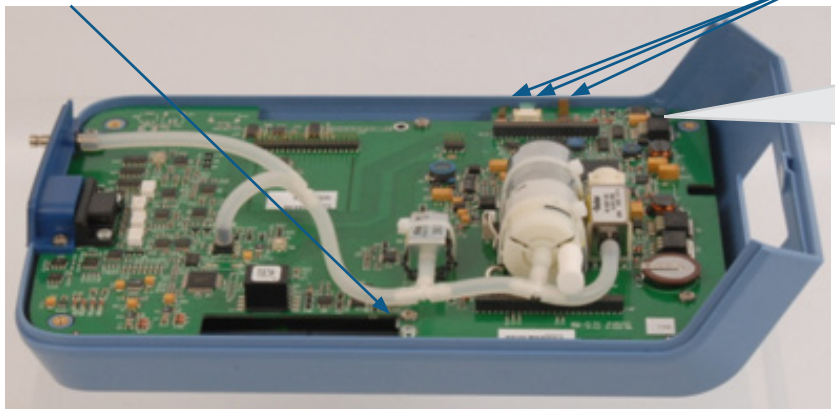
DISASSEMBLY - REMOVING THE MAIN BOARD

Step 1: To detach the main board from the front bezel:

- Disconnect the power cable, touch panel cable and backlight cable, connecting the screen and the main board.

Unplug Cables

Single Screw



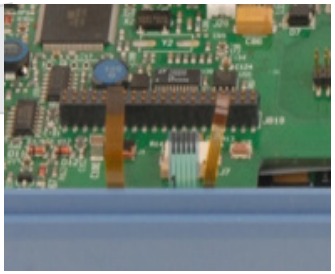
DISASSEMBLY - REMOVING THE MAIN BOARD

Step 2:

A) Remove the single screw keeping the main board on the front bezel:

B) Disconnect the power cable, touch panel cable and backlight cable, connecting the screen and the main board.

Disconnected



Pictures show underside of main board.

DISASSEMBLY - REMOVING THE MAIN BOARD

Step 3:

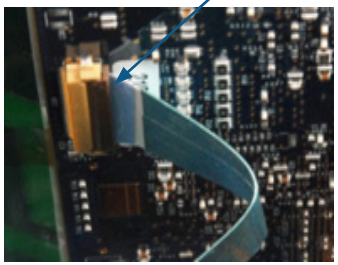
A) Tilt the main board up from the bezel:

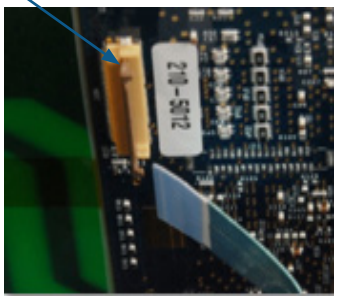
B) Open the cable door that connects the display cable to the processor board.

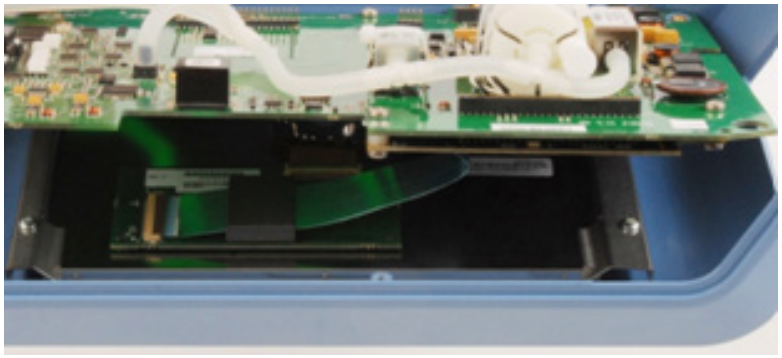
C) Separate the main board and processor board.

D) Close the cable door on the processor board to avoid damage.

Unclip cable door.







REASSEMBLY

Locate the kit being installed in Specific Part Replacement in Section D of this Service Manual and follow the instructions before continuing Reassembly.

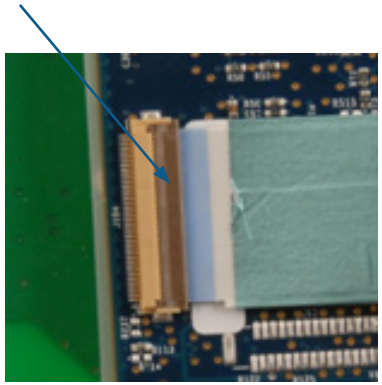
REASSEMBLY

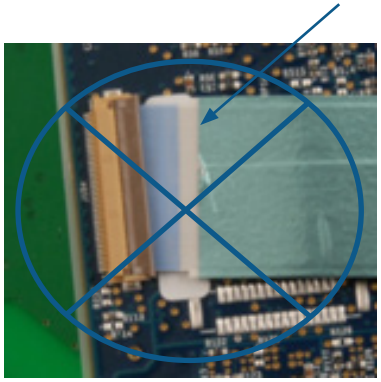
Step 1: To secure the main board back on front bezel:

- Connect the display cable from the screen assembly to the processor board (see alignment pictures).

Note

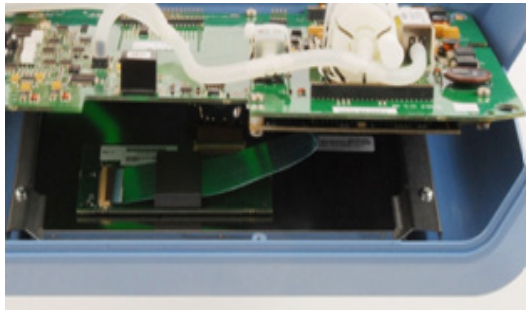
Secure the display cable by sliding it into the connector. Ensure a solid connection by making sure the cable sits in the door straight and not angled (both shown). If door does not easily snap closed, reposition the display cable. DO NOT FORCE!





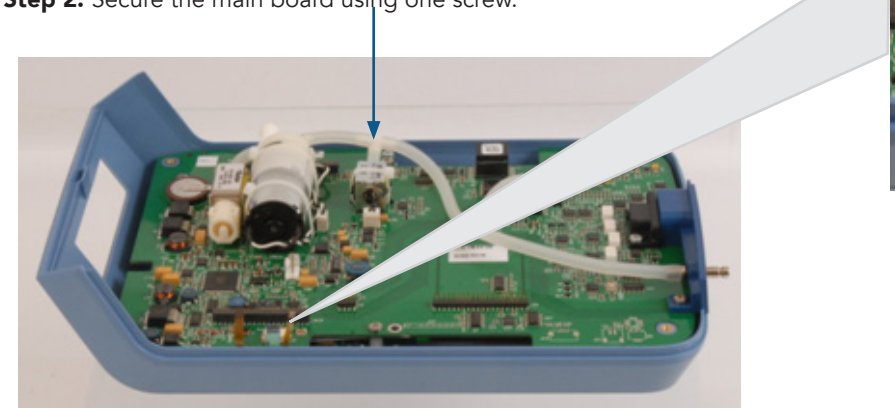
Note

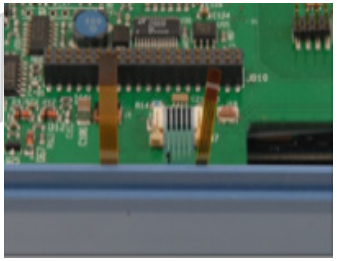
Be sure that the power cable, touch panel cable and the back-light cable are not caught underneath the main board as it is laid flat on the bezel.



REASSEMBLY

Step 2: Secure the main board using one screw.





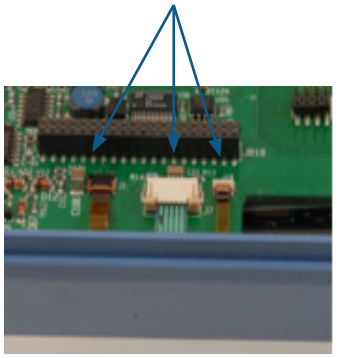
REASSEMBLY

Step 3: Position cables as shown here before screwing main board to front bezel.

REASSEMBLY

Step 4: After the screw has been put in:

- Reconnect the power cable, touch panel cable and backlight cable.



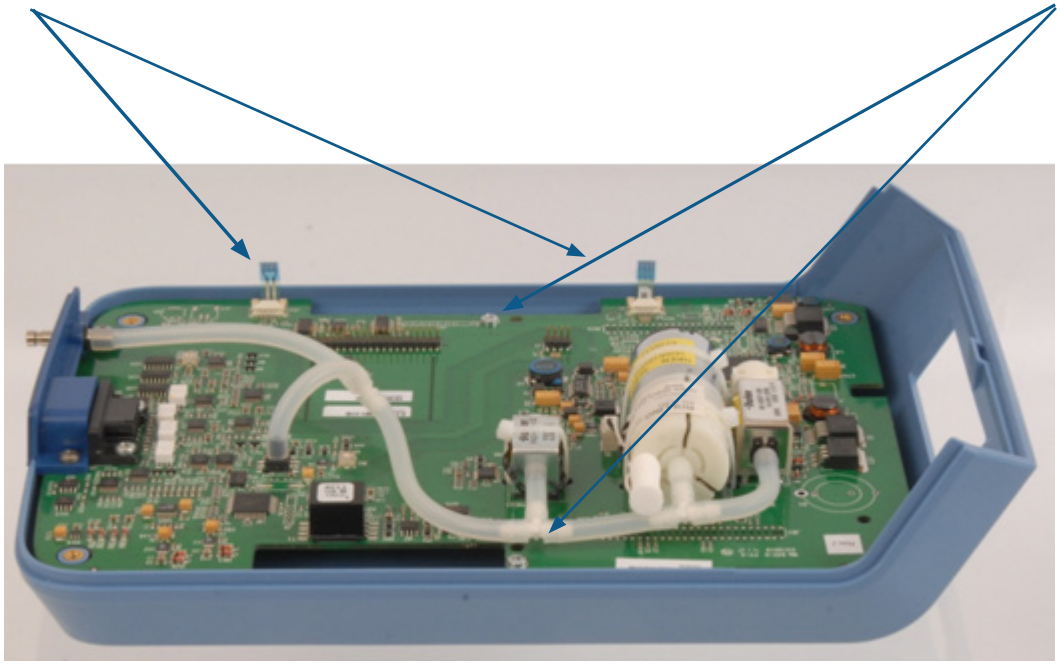
TP204 Rev. C

REASSEMBLY - REPLACING THE MAIN BOARD

Locate the kit being installed in Specific Part Replacement and follow instructions before continuing Reassembly.

REASSEMBLY - REPLACING THE MAIN BOARD

Step 1: Position cables as shown here before screwing the main board to the front bezel depending on the unit.



REASSEMBLY - REPLACING THE MAIN BOARD

Step 2: Secure the main board in the front bezel using two screws depending on the unit.

Note

Be sure that the power cable and pump switch cable are not caught underneath the main board as it is screwed down.

REASSEMBLY - REPLACING THE MAIN BOARD (CONTINUED)

REASSEMBLY - REPLACING THE MAIN BOARD

Step 4: Plug the battery cable into the main board.

REASSEMBLY - REPLACING THE MAIN BOARD

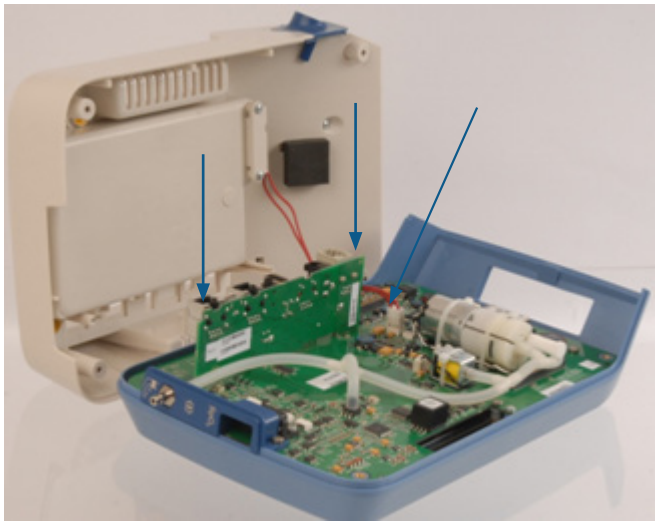
Step 5: Reattach the I-O board to the main board, taking great care to line up the pins correctly.

REASSEMBLY - REPLACING THE MAIN BOARD

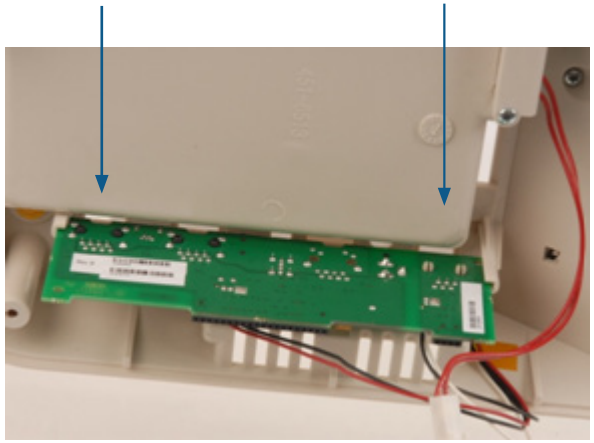
Step 6: Assemble the two halves together by sliding both ends of the I-O board into their corresponding plastic grooves in the rear cover.

Note

Be careful not to pinch any wires between the two halves (see photo).



The I-O board is disconnected from the main board to show orientation in plastic grooves.



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REASSEMBLY - REPLACING THE BACK PANEL

REASSEMBLY - REPLACING THE BACK PANEL

Step 1: Plug the battery cable into the main board.

REASSEMBLY - REPLACING THE BACK PANEL

Step 2: Reattach the I-O board to the main board.

Note

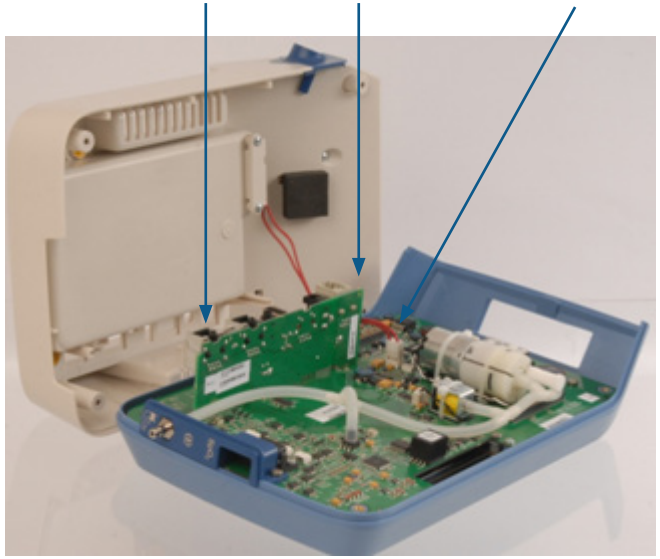
Be sure to line up the pins correctly.

REASSEMBLY - REPLACING THE BACK PANEL

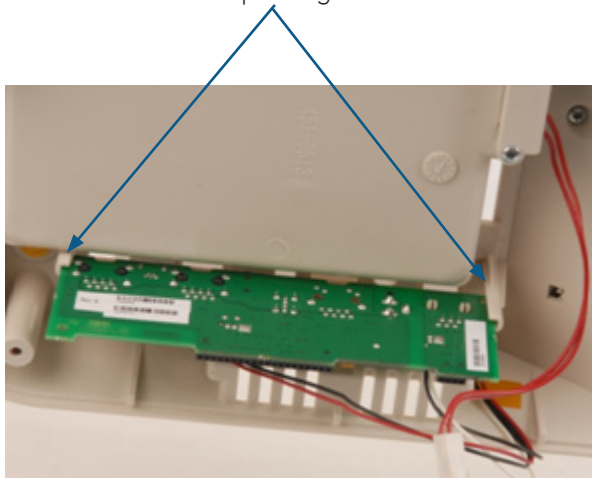
Step 3: Assemble the two halves together by sliding both ends of the I-O board into their corresponding plastic grooves in the rear cover.

Note

Be careful not to pinch any wires between the two halves.



The I-O board is disconnected from the main board to show orientation in plastic grooves.



TP204 Rev. C

REASSEMBLY - REPLACING THE BATTERY DOOR

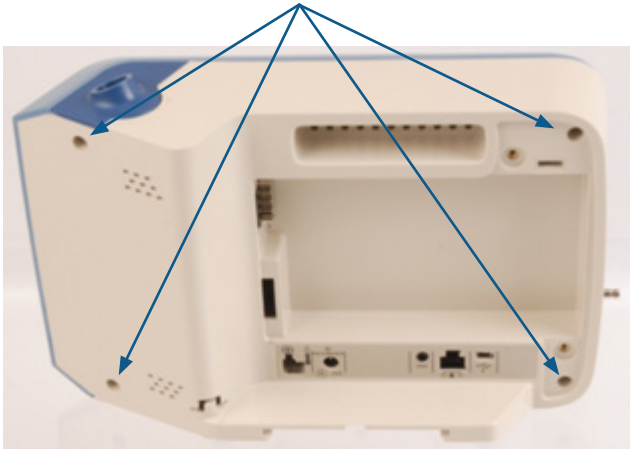
REASSEMBLY - REPLACING THE BATTERY DOOR

Step 1: Close the unit by replacing:

(A) all four screws

(B) the battery

(C) the battery door (two screws)



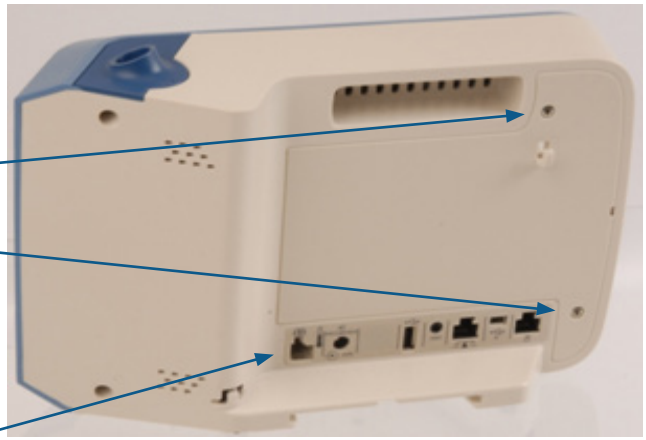
SPECIFIC PART INSTALLATION

BATTERY DOOR SERVICE KIT –

PART #181-6741 + #181-6771

INSTALL: BATTERY DOOR SERVICE KIT

Step 1: Remove the two screws on the back of the unit.



Note

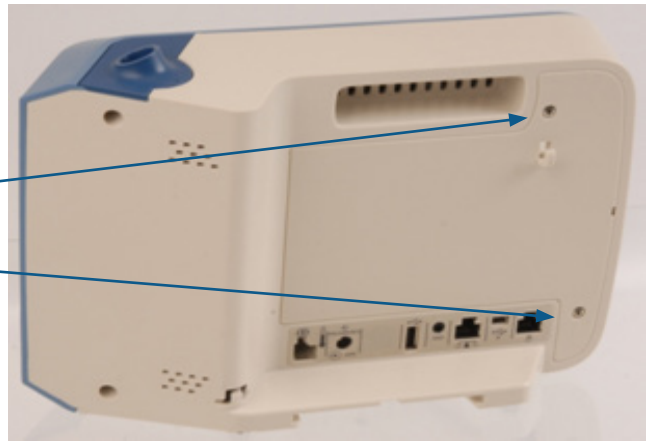
The number of inputs vary depending on the unit model number.

INSTALL: BATTERY DOOR SERVICE KIT

Step 2: Remove the old battery door and replace it with the new one.

INSTALL: BATTERY DOOR SERVICE KIT

Step 3: Install the new battery by inserting the two screws.



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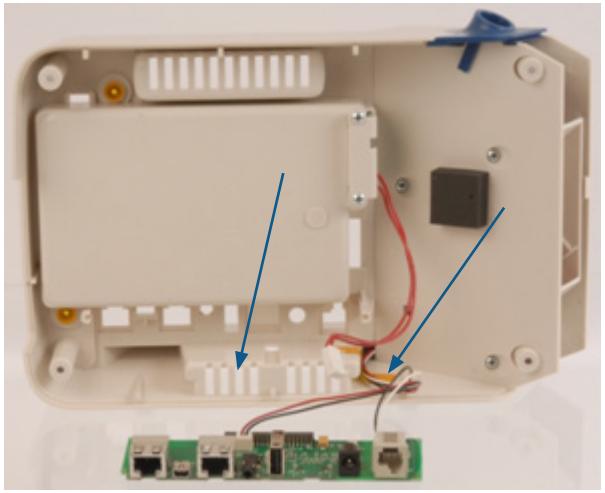
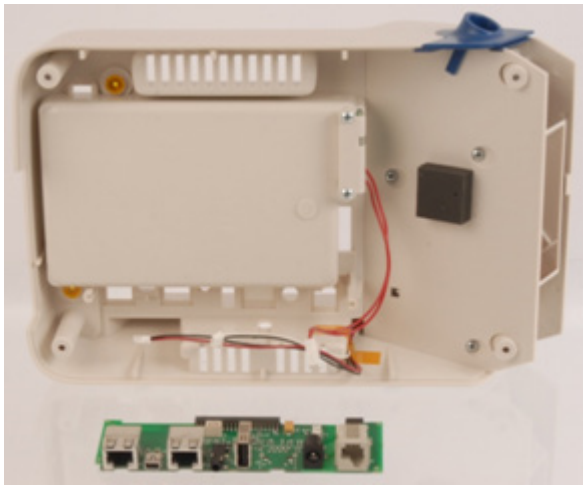
TEMP ASSEMBLY SERVICE KIT - PART #181-6740 + #181-6770

INSTALL: TEMP ASSEMBLY SERVICE KIT

Step 1: Disconnect temperature and speaker cables from I-O board.



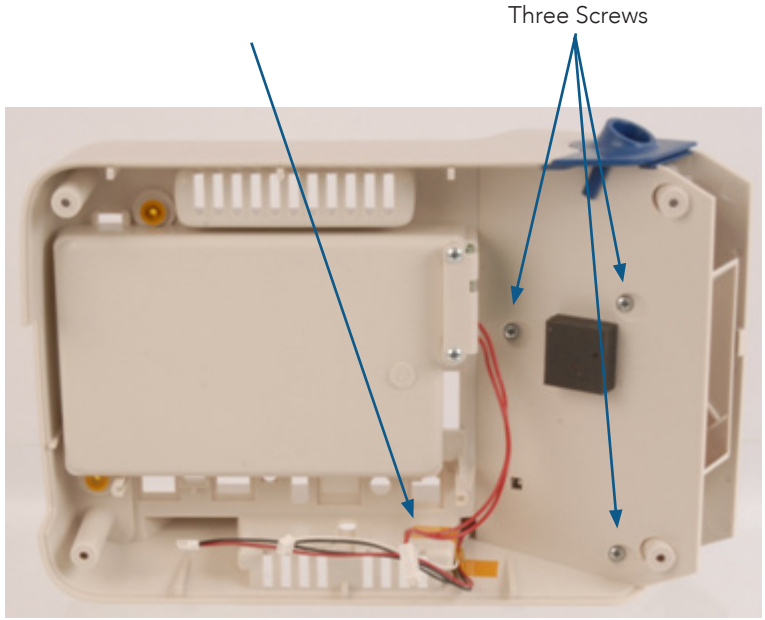


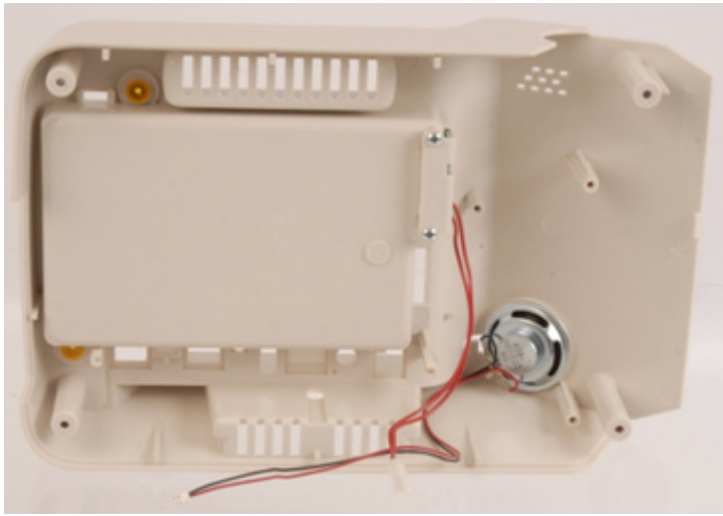
INSTALL: TEMP ASSEMBLY SERVICE KIT

Step 2: Detach the temp assembly by removing the three screws that hold it to the rear cover.

INSTALL: TEMP ASSEMBLY SERVICE KIT

Step 3: Peel off the Kapton tape that secures the speaker and temperature cables.

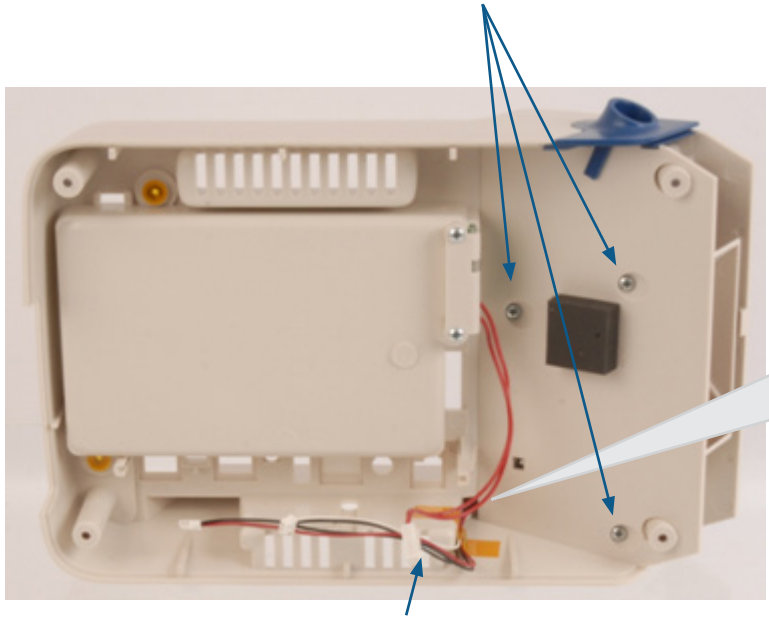




TP204 Rev. C

INSTALL: TEMP ASSEMBLY SERVICE KIT

Step 4: Attach the new temp assembly using the three screws.

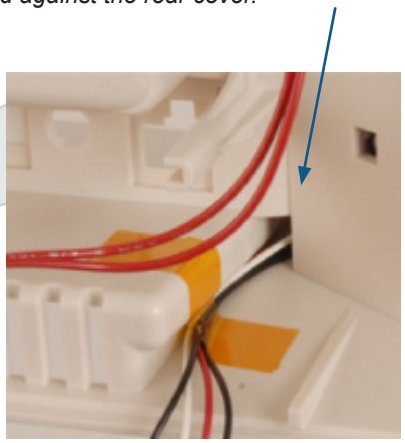


INSTALL: TEMP ASSEMBLY SERVICE KIT

Step 5: Pass the speaker and temperature cables through the opening at the bottom corner.

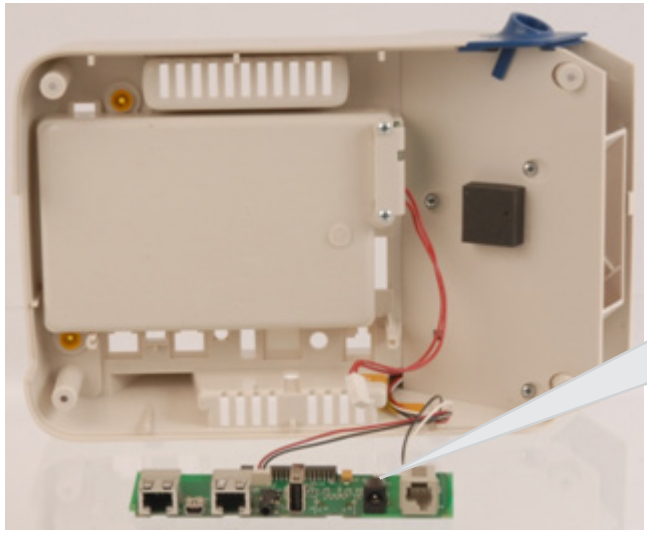
Note

Be sure both the speaker and temperature cables are not pinched against the rear cover.



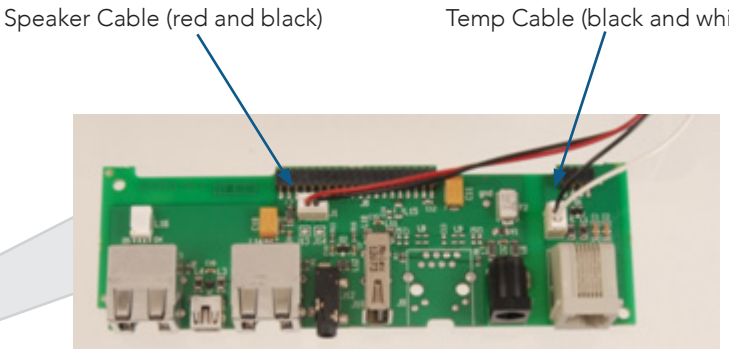
INSTALL: TEMP ASSEMBLY SERVICE KIT

Step 6: Tape down the two cables using a piece of Kapton tape.



INSTALL: TEMP ASSEMBLY SERVICE KIT

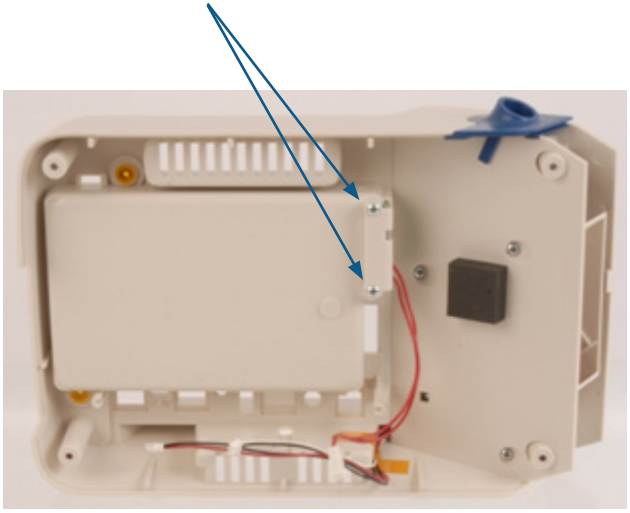
Step 7: Attach the speaker and temperature cables to the I-O board.



BATTERY BOARD SERVICE KIT - PART #181-6762

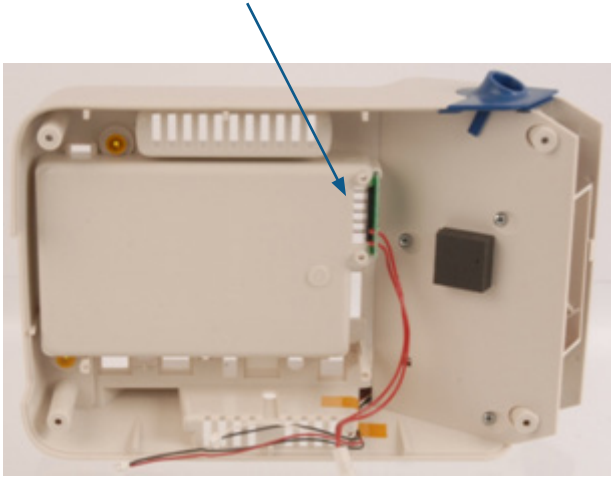
INSTALL: BATTERY BOARD SERVICE KIT

Step 1: Remove the two screws that hold the battery board and plastic bracket in place.



INSTALL: BATTERY BOARD SERVICE KIT

Step 2: Remove the old battery board and put in the new battery board. Secure the new board with the bracket and screws.



I-O BOARD SERVICE KIT - PART # 183-6712 + #183-6713

INSTALL: I-O BOARD SERVICE KIT

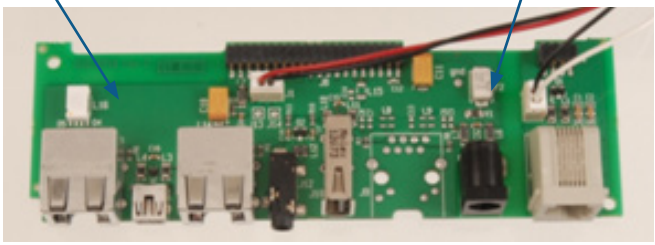
Step 1: Unplug the speaker and temperature cables from the current I-O board.

INSTALL: I-O BOARD SERVICE KIT

Step 2: Plug the speaker and temperature cables into the new I-O board.

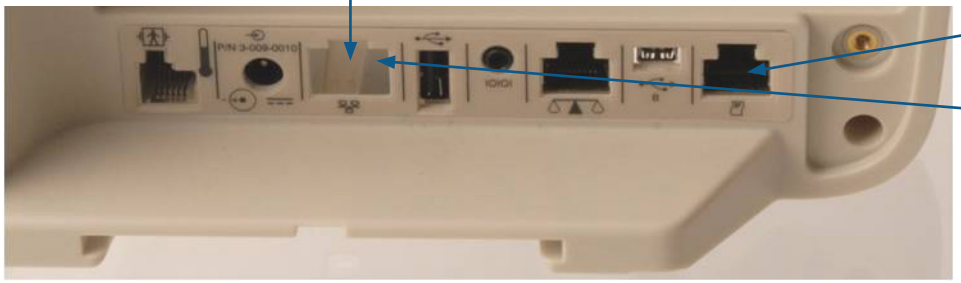
Speaker Cable (red and black)

Temp Cable (black and white)



Note

The rear sticker will need to be replaced if extra port is exposed (see photo below).



Swap old sticker for new one.

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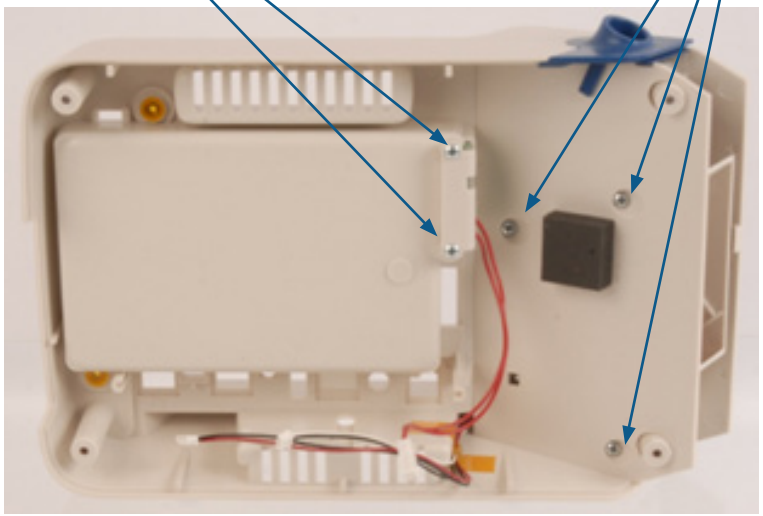
REAR COVER SERVICE KIT - PART # 181-6742 + #181-6772

INSTALL: REAR COVER SERVICE KIT

Step 1: Remove battery board (two screws) from the current rear cover.

INSTALL: REAR COVER SERVICE KIT

Step 2: Remove temp assembly (three screws) from the current rear cover.



INSTALL: REAR COVER SERVICE KIT

Step 3: Install all screws in new rear cover.

INSTALL: REAR COVER SERVICE KIT

Step 4:

(A) Carefully remove the outer sticker (found on the bottom of the rear cover) with a pen knife or similar tool.

(B) Remove the Serial Number and Part Number stickers and put them on the new rear cover in the same orientation.

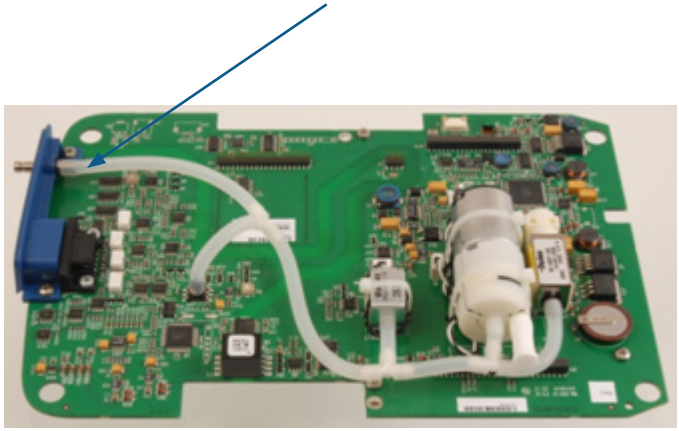
(C) Position the new rear sticker on the new rear cover (the Serial Number and Part Number should be visible through the outer sticker window).

Note: *Depending on the unit, there may be one sticker instead of multiple stickers.*

INPUT PANEL W/ SpO_2 SERVICE KIT - PART # 181-6746 + # 181-6773, AND INPUT PANEL - NO SpO_2 SERVICE KIT - PART #181-6747 + #181-6774

INSTALL: INPUT PANEL SERVICE KIT

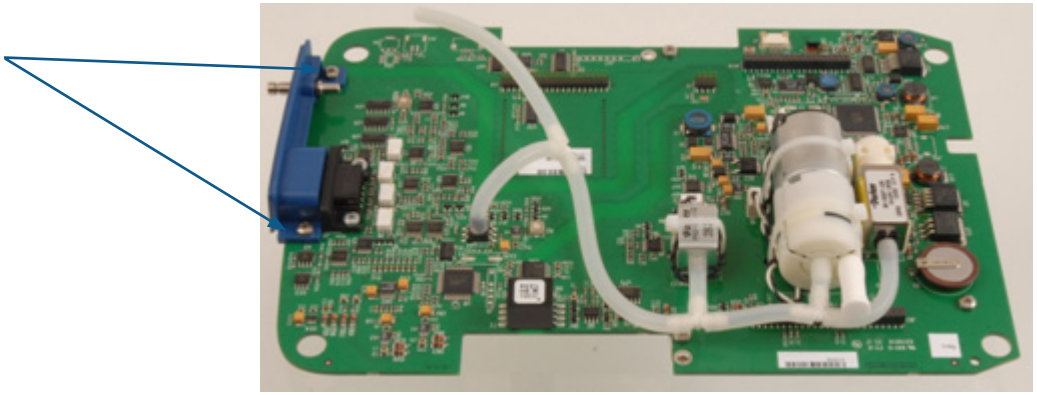
Step 1: Disconnect the manifold from the input panel.



Then, install the new input panel by replacing the screws and reconnecting the manifold.

INSTALL: INPUT PANEL SERVICE KIT

Step 2: Remove the two screws holding the input panel in place.



INSTALL: INPUT PANEL SERVICE KIT

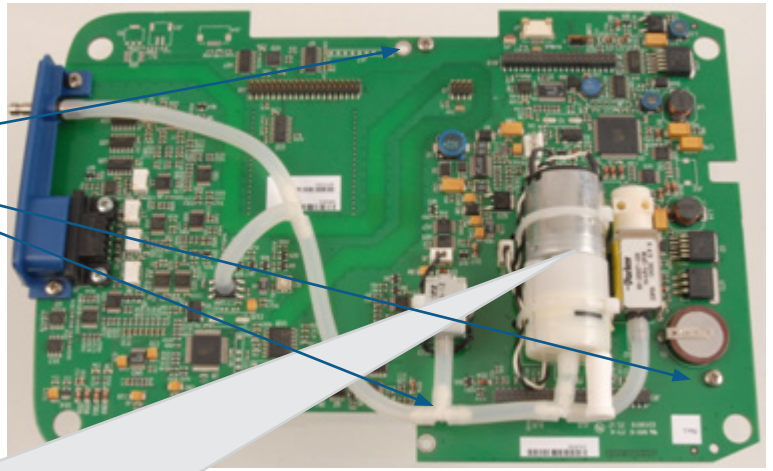
Step 3: Install the new input panel by replacing the screws and reconnecting the manifold.

TP204 Rev. C

NIBP PUMP SERVICE KIT - PART # 181-6110 + # 181-6111

INSTALL: NIBP PUMP SERVICE KIT

Step 1: Detach the processor board from the main board by removing all three screws and gently pulling the two boards apart.

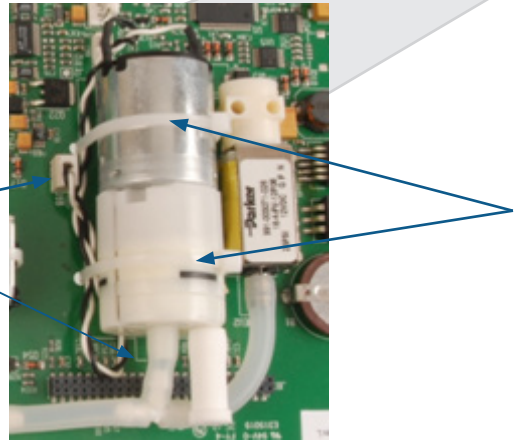


Note

The screw is beneath the manifold.

INSTALL: NIBP PUMP SERVICE KIT

Step 2: Unplug the manifold and pump wires.



INSTALL: NIBP PUMP SERVICE KIT

Step 3: Cut and discard the two tie straps holding the NIBP pump.

INSTALL: NIBP PUMP SERVICE KIT

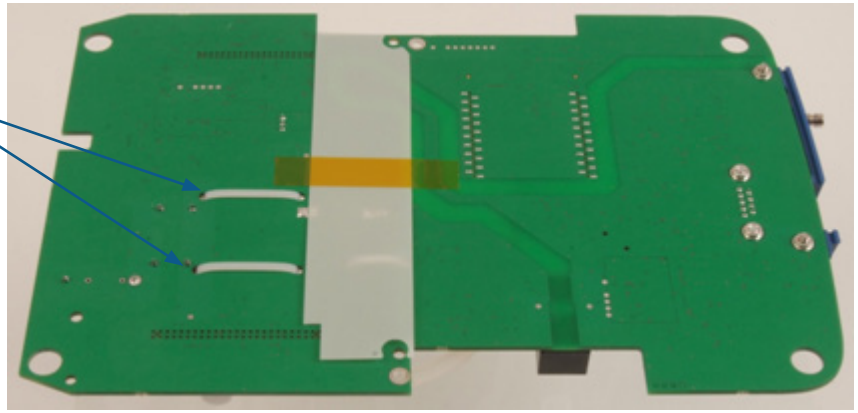
Step 4: Pull firmly on the pump to remove it from the adhesive stabilizer pad and the main board.

INSTALL: NIBP PUMP SERVICE KIT

Step 5: Remove the adhesive stabilizer pad from beneath the pump.

INSTALL: NIBP PUMP SERVICE KIT

Step 6: Place the new stabilizer pad in place and insert two new tie wraps.

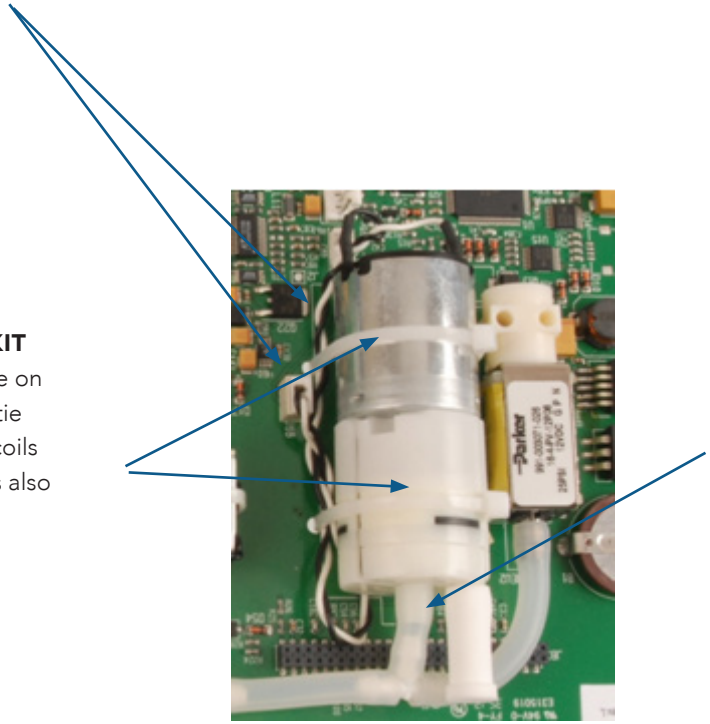


Note

Be sure to press tie wraps against the bottom of the main board while tightening them.

INSTALL: NIBP PUMP SERVICE KIT

Step 7: Plug pump into connector and twist several times to wrap the two pump wires together.



INSTALL: NIBP PUMP SERVICE KIT

Step 8: Center pump over the outline on the board and secure it with tie wraps. Be sure that the wire coils back next to the pump and is also secured by the tie wraps.

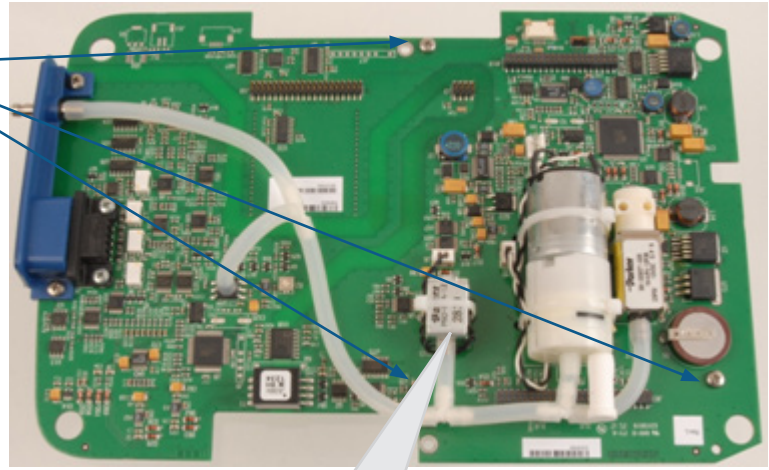
INSTALL: NIBP PUMP SERVICE KIT

Step 9: Reconnect the manifold to the pump and reattach the processor board to the main board using the three screws and being careful to line up the pins exactly.

TP204 Rev. C

VALVE ASSEMBLY SERVICE KIT -

PART # 181-6120 + # 181-6121



INSTALL: VALVE ASSEMBLY SERVICE KIT

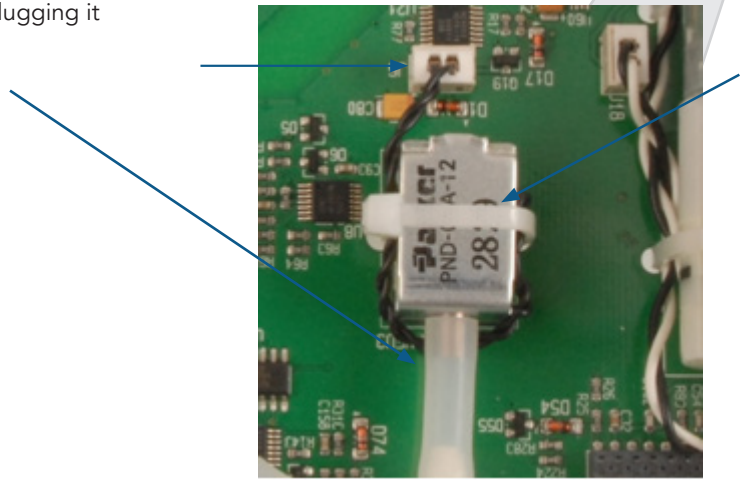
Step 1: Detach the processor board from the main board by removing all three screws and gently pulling the two boards apart.

Note

The screw is beneath the manifold.

INSTALL: VALVE ASSEMBLY SERVICE KIT

Step 2: Remove the valve from the main board by unplugging it from the board and manifold.



INSTALL: VALVE ASSEMBLY SERVICE KIT

Step 3: Cut and discard the tie wrap holding the valve.

INSTALL: VALVE ASSEMBLY SERVICE KIT

Step 4: Pull firmly on the valve to remove it from the adhesive pad and main board.

INSTALL: VALVE ASSEMBLY SERVICE KIT

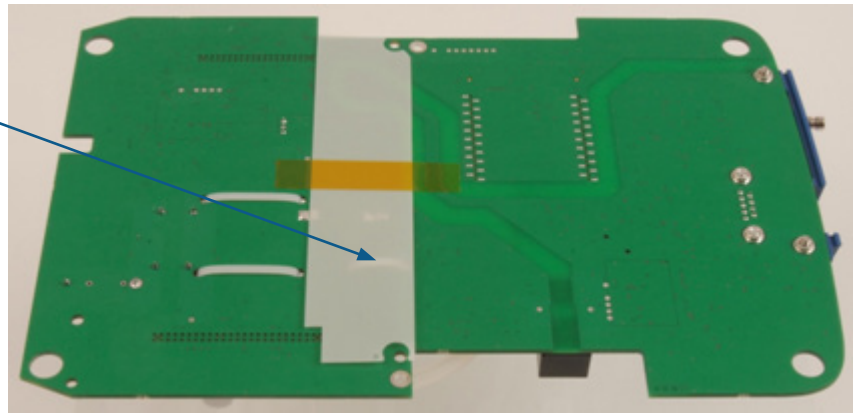
Step 5: Remove the adhesive pad from beneath the valve if it remains on the board.

INSTALL: VALVE ASSEMBLY SERVICE KIT

Step 6: Insert one new tie wrap.

Note

Press tie wrap against the main board while tightening to avoid having extra slack.

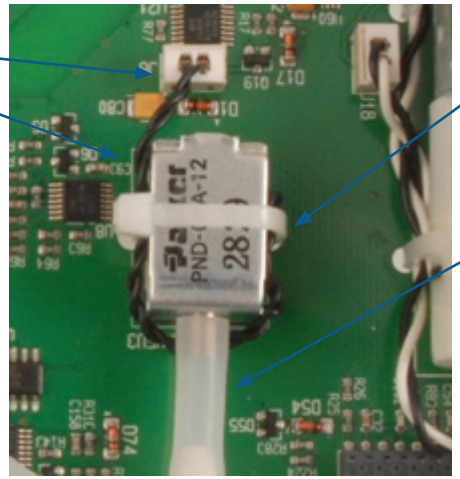


INSTALL: VALVE ASSEMBLY SERVICE KIT

Step 7: Plug the valve into the connector and twist several times to wrap the two wires securely together.

INSTALL: VALVE ASSEMBLY SERVICE KIT

Step 8: Loop the twisted wires once around the front of the valve while attaching it to the main board by means of the adhesive pad on the underside of the valve.



Note

Ensure that the valve is centered over the outline on the board.

INSTALL: VALVE ASSEMBLY SERVICE KIT

Step 9: Secure the valve with the tie wrap.

INSTALL: VALVE ASSEMBLY SERVICE KIT

Step 10: Reconnect the manifold.

Note

Be sure to press the tie wrap against the bottom of the main board while tightening.

INSTALL: VALVE ASSEMBLY SERVICE KIT

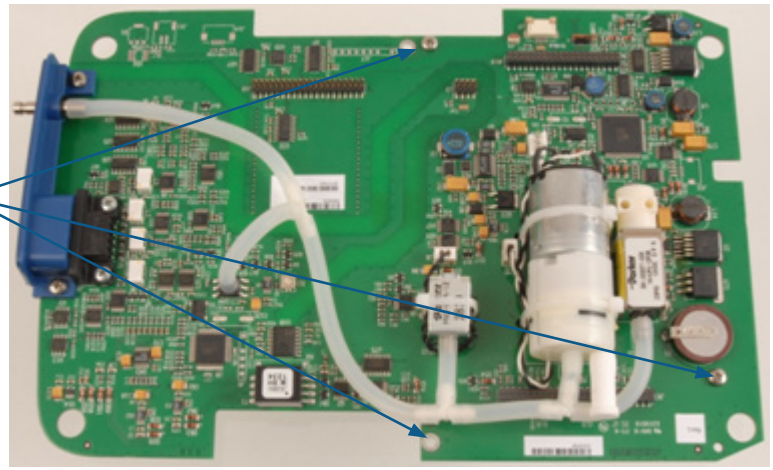
Step 11: Reattach the processor board to the main board using the three screws.

Note

Be careful to line up the pins exactly.

Note

The screw is beneath the manifold.



TP204 Rev. C

NIBP MANIFOLD SERVICE KIT - PART # 181-6130

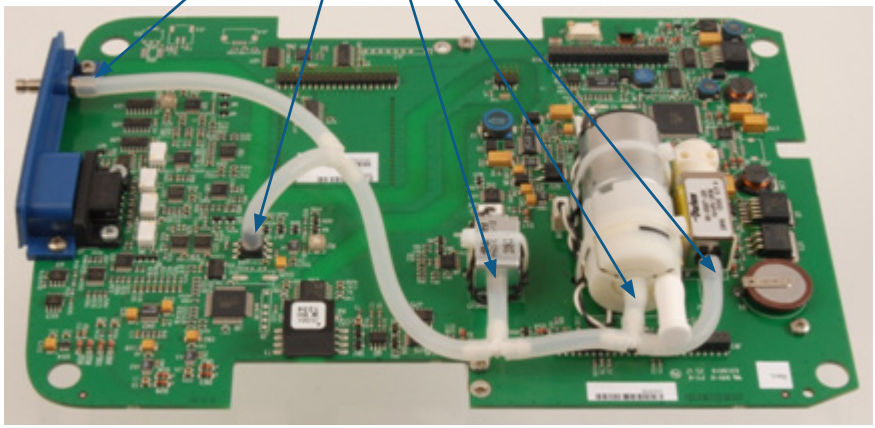
INSTALL: NIBP MANIFOLD SERVICE KIT

Step 1: Remove the NIBP manifold by unplugging it from all connections.

INSTALL: NIBP MANIFOLD SERVICE KIT

Step 2: Attach the new NIBP manifold by connecting it to both valves, the pump, the main board and the SpO_2 panel.

Step 1 and Step 2

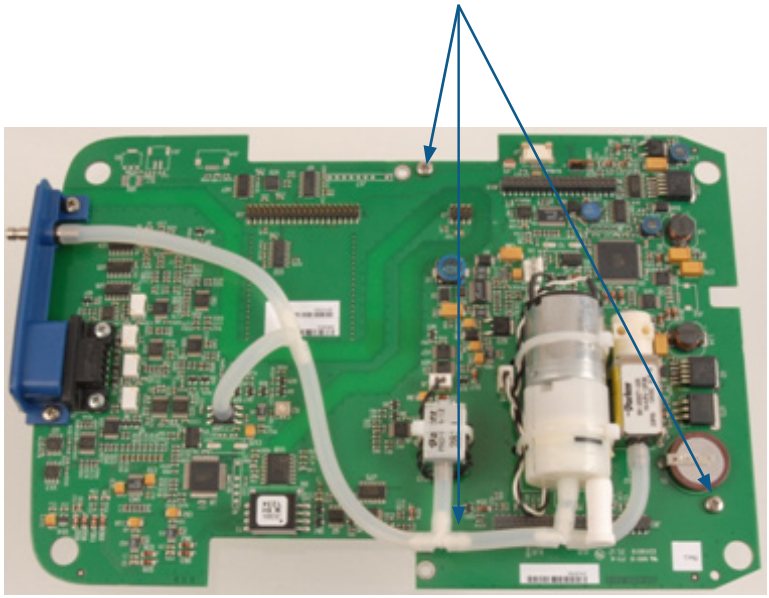


TP204 Rev. C

MAIN BOARD W/ SpO_2 SERVICE KIT - PART # 183-6700 + #183-6704 AND MAIN BOARD - NO SpO_2 SERVICE KIT - PART #186-6701 + # 183-6705

INSTALL: MAIN BOARD SERVICE KIT

Step 1: Detach the processor board from the current main board by removing all three screws.

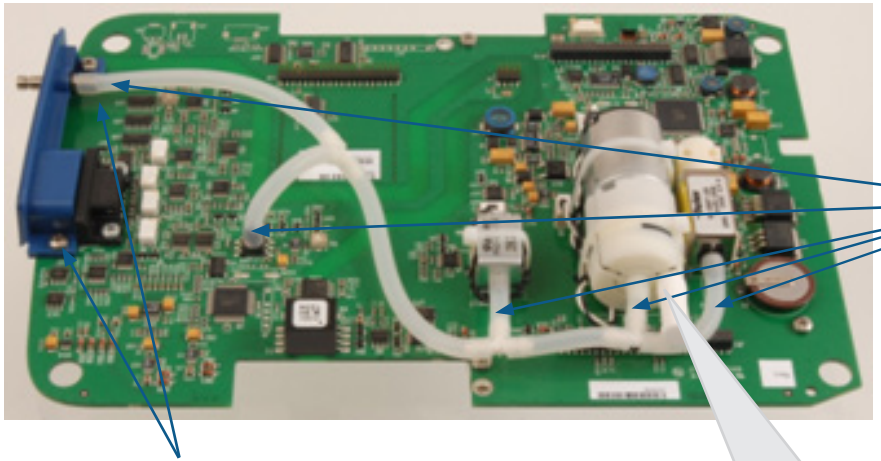


Note

The screw is beneath the manifold.

INSTALL: MAIN BOARD SERVICE KIT

Step 2: Gently pull the two boards apart.



INSTALL: MAIN BOARD SERVICE KIT

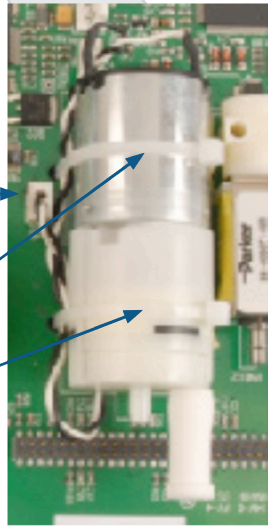
Step 3: Disconnect the manifold from all its connections and set it aside.

INSTALL: MAIN BOARD SERVICE KIT

Step 4: Remove the input panel and install it on the new main board by unscrewing the two screws, removing the input panel, and screwing the input panel onto the new main board.

INSTALL: MAIN BOARD SERVICE KIT

Step 5: Remove the NIBP pump from the main board by first unplugging the pump wire.



INSTALL: MAIN BOARD SERVICE KIT

Step 6: Cut and discard the two tie wraps that hold the NIBP pump.

INSTALL: MAIN BOARD SERVICE KIT

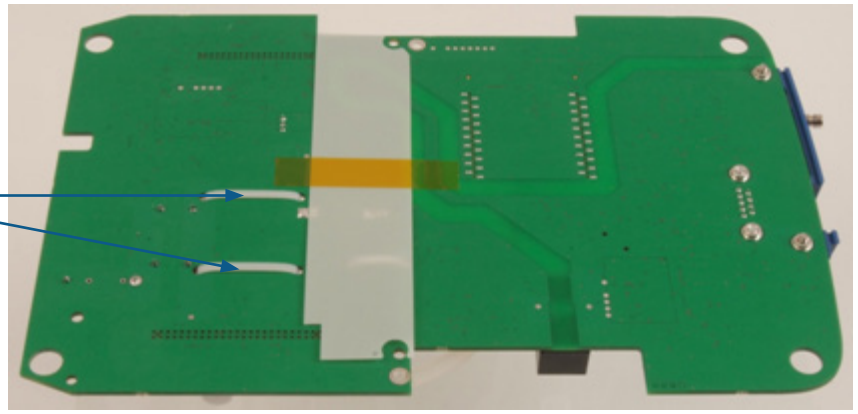
Step 7: Pull firmly on the pump to remove it from the adhesive stabilizer pad and main board.

INSTALL: MAIN BOARD SERVICE KIT

Step 8: Remove the adhesive stabilizer pad from the bottom of the pump.

INSTALL: MAIN BOARD SERVICE KIT

Step 9: Install the NIBP pump on the new main board by first inserting two new tie wraps.

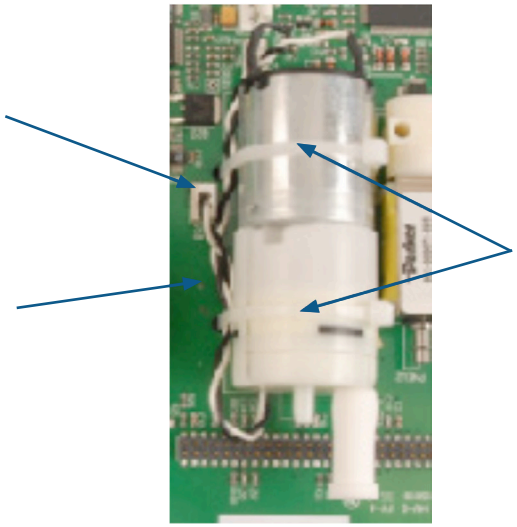


Note

Press the tie wraps against the bottom of the main board while tightening to avoid having extra slack.

INSTALL: MAIN BOARD SERVICE KIT

Step 10: Plug the pump into the connector.



INSTALL: MAIN BOARD SERVICE KIT

Step 11: Twist several times to wrap the two pump wires together.

INSTALL: MAIN BOARD SERVICE KIT

Step 12: Center the pump over the outline on the new board. Remove the paper from the stabilizer pad.

INSTALL: MAIN BOARD SERVICE KIT

Step 13: Secure the pump with tie wraps.

Note:

Ensure that the wire coils back next to the pump and is also secured by the tie wraps.

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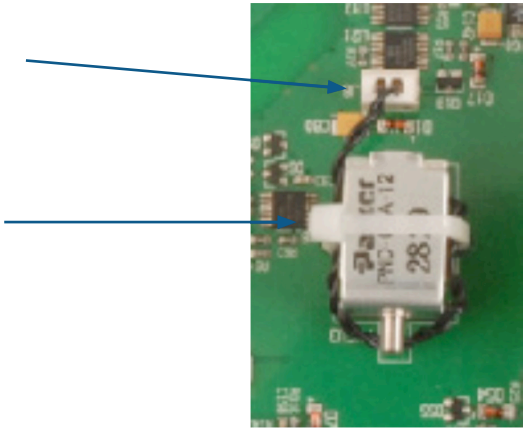
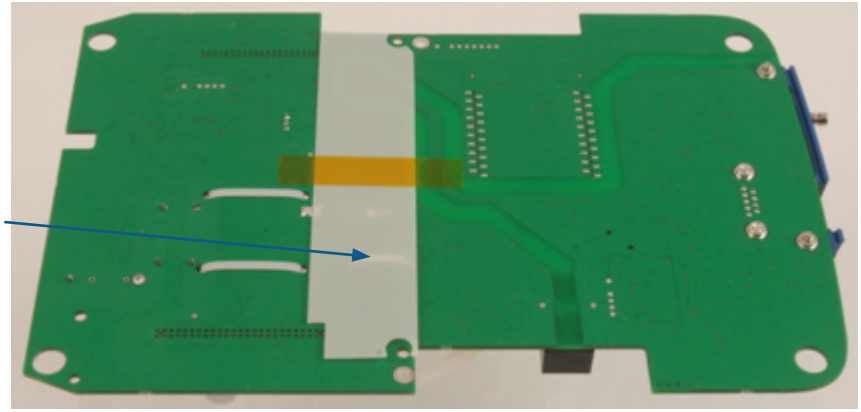
INSTALL: MAIN BOARD SERVICE KIT
Step 14: To move the valve from the current main board to the new main board, unplug it from the old board.



INSTALL: MAIN BOARD SERVICE KIT
Step 15: Cut and discard the tie wrap that holds it.

INSTALL: MAIN BOARD SERVICE KIT
Step 16: Pull firmly on the valve.

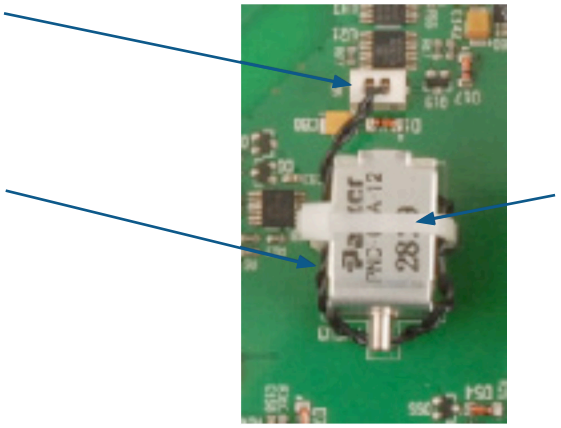
INSTALL: MAIN BOARD SERVICE KIT
Step 17: Remove the adhesive pad from the bottom of the new valve.



INSTALL: MAIN BOARD SERVICE KIT
Step 18: Insert one new tie wrap into the new main board.

Note:
Press the tie wrap against the bottom of the main board while tightening to avoid having extra slack.

INSTALL: MAIN BOARD SERVICE KIT
Step 19: Plug the valve into the connector.



INSTALL: MAIN BOARD SERVICE KIT
Step 20: Twist several times to wrap the two wires securely together.

INSTALL: MAIN BOARD SERVICE KIT
Step 21: Loop the twisted wires once around the front of the valve while attaching it to the main board by means of the adhesive pad on the new main board.

INSTALL: MAIN BOARD SERVICE KIT
Step 22: Secure valve and wire with the tie wrap.

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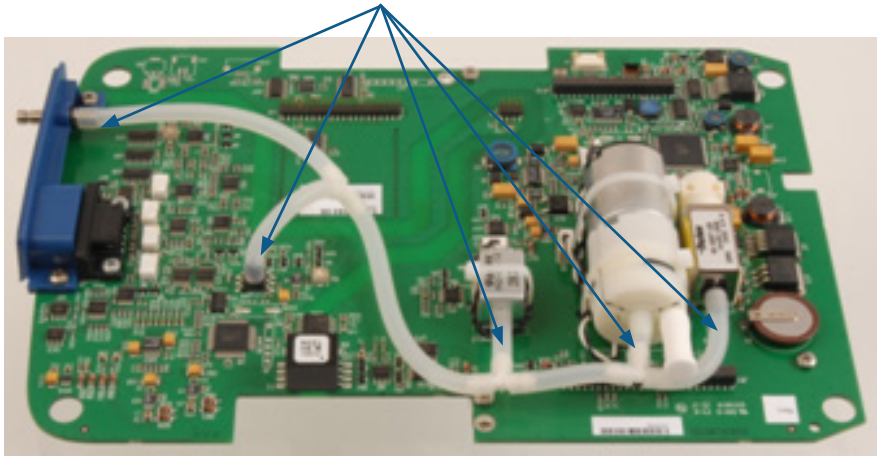
INSTALL: MAIN BOARD SERVICE KIT

Step 23: Attach the NIBP manifold by connecting it to both valves, the pump, the main board and the input panel.

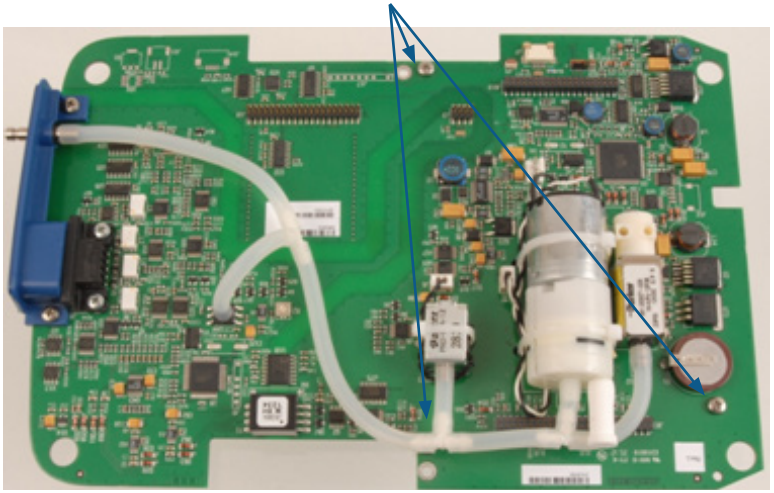


INSTALL: MAIN BOARD SERVICE KIT

Step 24: Attach the processor board to the new main board using the three screws.

Note:

Be careful to line up pins exactly.



Note:

The screw is beneath the manifold.

PROCESSOR BOARD SERVICE KIT - PART # 183-6720 + # 183-6721

INSTALL: PROCESSOR BOARD SERVICE KIT

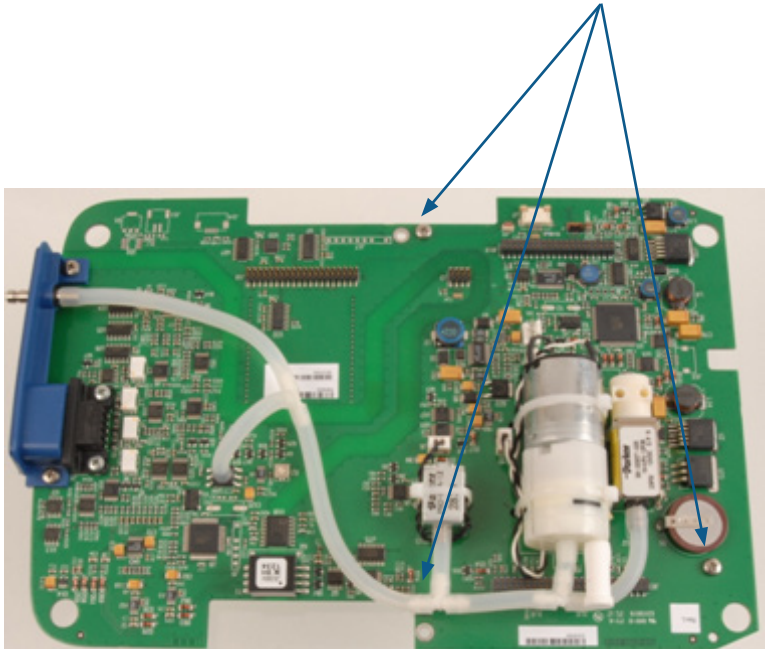
Step 1: Detach the processor board from the main board by removing all three screws and pulling the two boards gently apart.

INSTALL: MAIN BOARD SERVICE KIT

Step 2: Attach the new processor board to the main board using the three screws.

Note:

Be careful to line up pins exactly.



Note:

The screw is beneath the manifold.

Note:

Touch panel calibration is required after the replacement of processor board. Refer to the Touch Panel Calibration section of this Service Manual.

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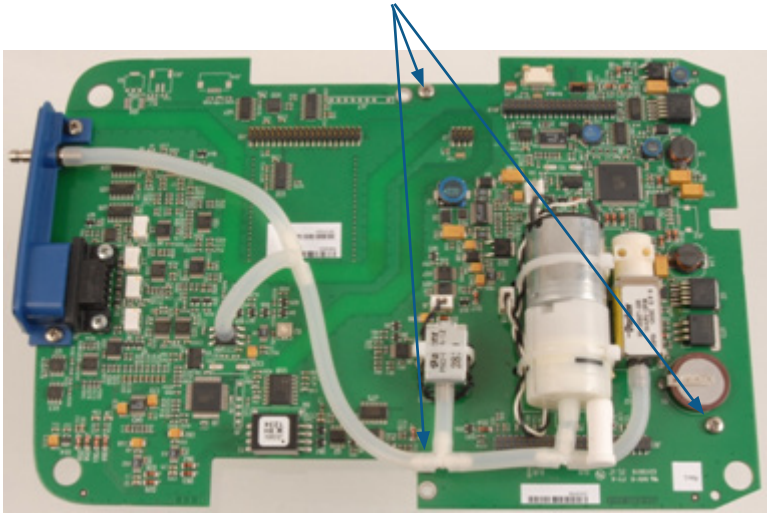
IQVITALS SD CARD ASSEMBLY - PART # 181-6761

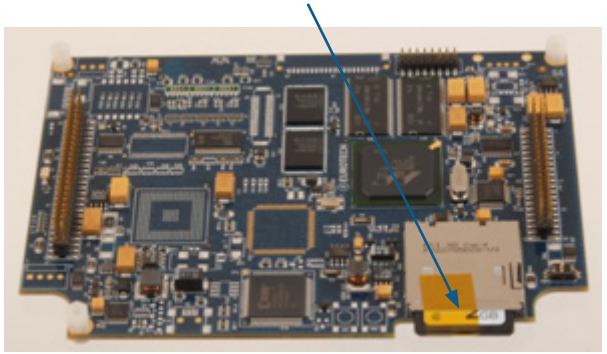
INSTALL: SD CARD ASSEMBLY

Step 1: To replace the SD card, detach the processor board from the main board by removing all three screws and gently pulling the two boards apart.



INSTALL: SD CARD ASSEMBLY

Step 2: Remove the Kapton tape and old SD card from the SD reader slot on the processor board.



INSTALL: SD CARD ASSEMBLY

Step 3: Replace the SD card and reattach the processor board to the main board using the three screws.

Note:

Be careful to line up pins exactly.

BRACKETS SERVICE KIT - PART # 181-6751

INSTALL: DISPLAY BRACKETS SERVICE KIT

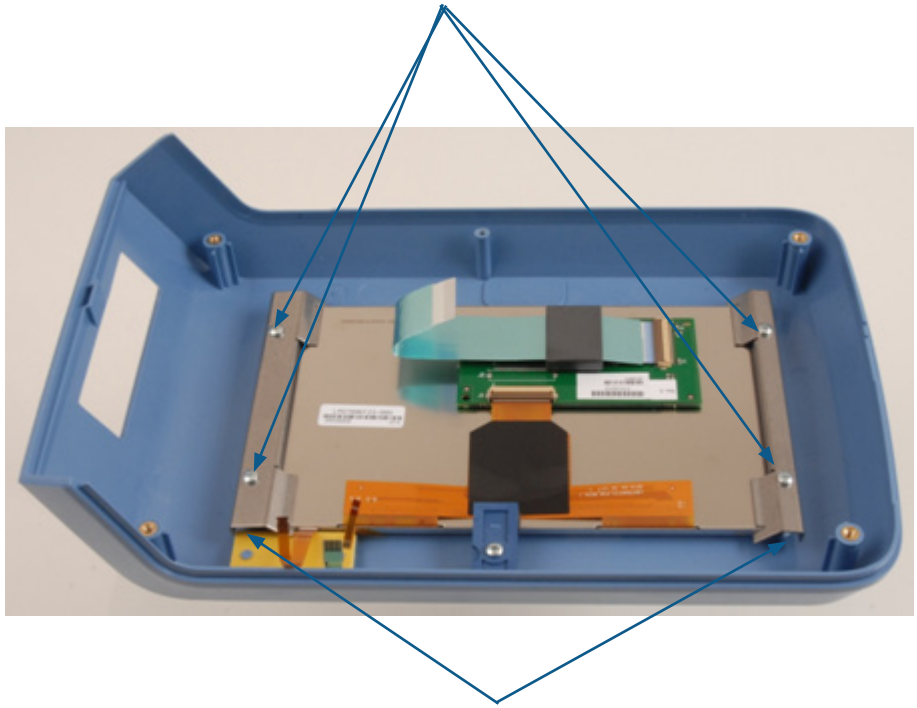
Step 1: To replace the display brackets, remove the two metal brackets (two screws each).

INSTALL: DISPLAY BRACKETS SERVICE KIT

Step 2: To install the new brackets, position the wider bracket above the switch panel and the thinner bracket on the opposite side.

INSTALL: DISPLAY BRACKETS SERVICE KIT

Step 3: Start each of the four screws to make sure that the screen is positioned properly before tightening each screw.



Note:

Do not over tighten screws, but make sure that the brackets do not move after installation.

Note:

When replacing the brackets, make sure that the wider bracket is on the left (above the switch panel) and the thinner bracket is on the right.

DISPLAY SERVICE KIT - PART # 181-6750

INSTALL: DISPLAY SERVICE KIT

Step 1: To replace the display, remove the screw that secures the blue display retainer tab in place.

Step 2: Unscrew both metal brackets (two screws each), and remove them.

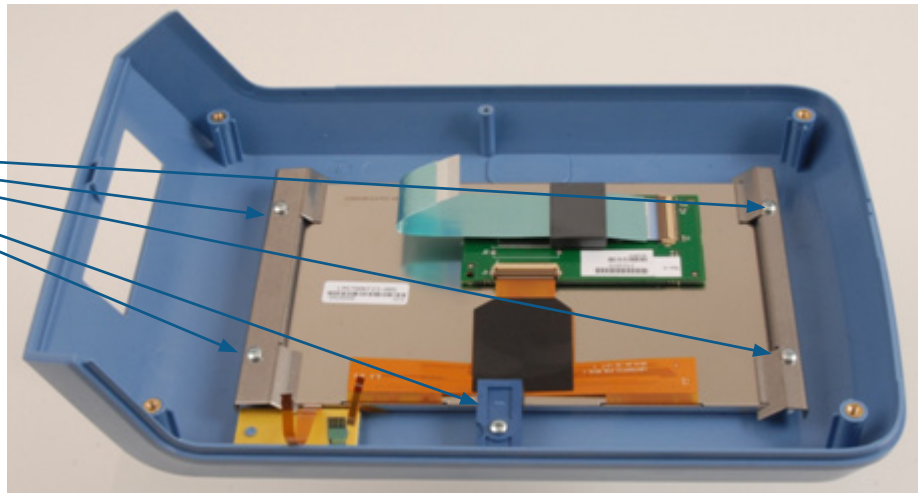
Step 3: Remove the current display.

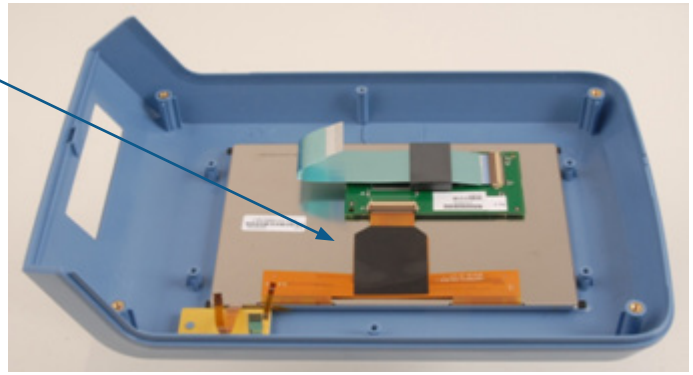
Step 4: Position the new display in its place.

Step 5: Secure the two metal brackets and display retainer tab the way they were removed.

Note:

Touch panel calibration is required after the replacement of processor board. Refer to the Touch Panel Calibration section of this Service Manual.





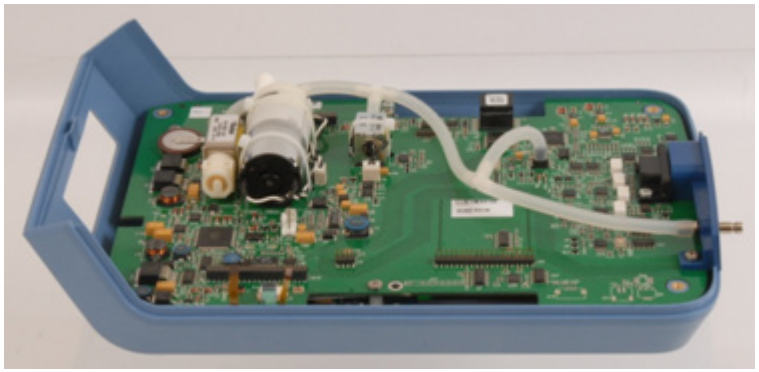
REPLACEMENT DISPLAY SERVICE KIT - PART # 181-6752 + # 181-6775

INSTALL: REPLACEMENT DISPLAY SERVICE KIT

Step 1: Connect the new front bezel (and screen) to the main board.

Note:

Touch panel calibration is required after the replacement of processor board. Refer to the Touch Panel Calibration section of this Service Manual.



FRONT BEZEL SERVICE KIT - PART # 181-6744

INSTALL: FRONT BEZEL SERVICE KIT

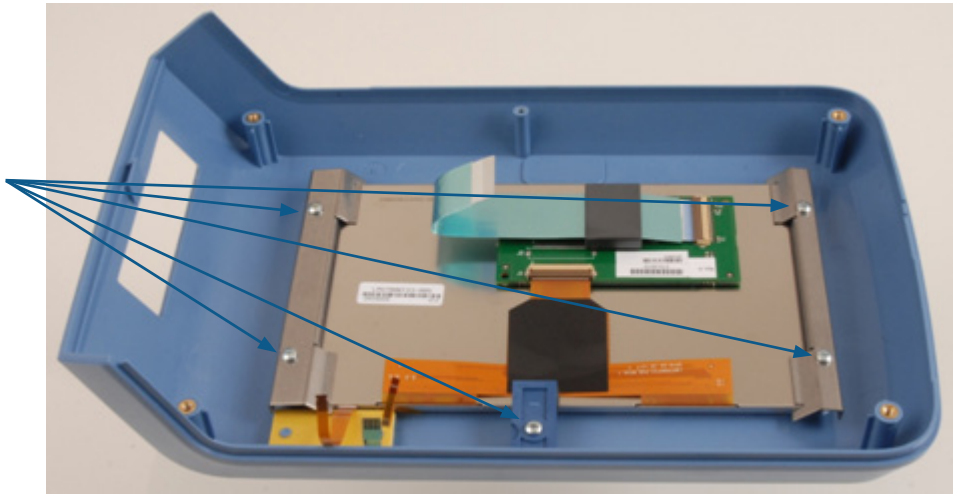
Step 1: To replace the front bezel, remove the screw that secures the blue display retainer tab in place.

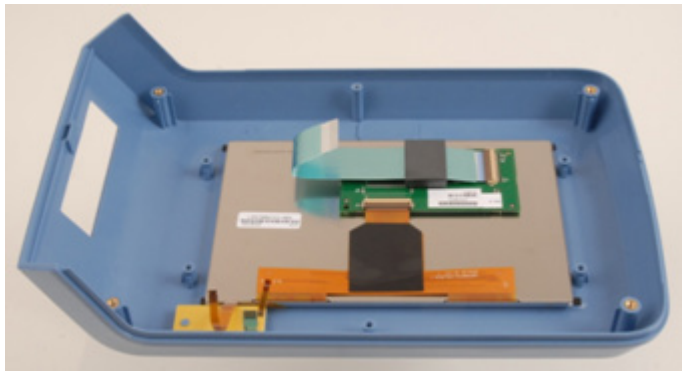
Step 2: Unscrew both metal brackets (two screws each) and remove them.

Step 3: Remove the display.

Step 4: Position the display in the new front bezel.

Step 5: Secure the two metal brackets and display retainer tab the way they were removed.





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