VitalsBridge™

STEP 2: VITALSBRIDGE TO PATIENT MONITOR CONNECTION GUIDE

VITALSBRIDGE 300 200 AND 100

Basic Steps:

1. Connect power to the VitalsBridge
2. Turn the VitalsBridge on
3. Connect the VitalsBridge to your patient monitor using the cables included in the cable and sensor kit
   - o Possible Connections Include:
     - ▪ Pulse Oximetry (SPO$_2$) (All Models)
     - ▪ Non-invasive Blood Pressure (NIBP) (All Models)
     - ▪ Temperature (All Models)
     - ▪ ECG (VitalsBridge 200 and 300)
     - ▪ Invasive Blood Pressure (VitalsBridge 300)
     - ▪ Capnography (VitalsBridge 300)

Connecting Power to the VitalsBridge™

External Power

To power the VitalsBridge via wall power, simply connect the external power adapter and plug into any standard wall outlet.

⚠ *Warning*: Use only the included 9V power supply. Prior VitalsBridge models used a different voltage for their power supply. Using an incorrect power supply may damage the VitalsBridge and void the warranty.

Internal Battery

The VitalsBridge contains an internal, non-replaceable Lithium-Ion battery to allow for unplugged operation of the unit. When fully charged, this will allow for at least 1 hour of use (2 – 5 hours typical). To charge the battery, connect the external power supply. The power supply will charge a fully depleted battery in 6-12 hours. When the unit is switched on, the battery indicator on the top panel will flash when there is less than 15% of battery life remaining; if you need to continue using the VitalsBridge, connect the external power.

When plugged in and powered off, the VitalsBridge battery will be charged. When plugged in and powered on, the VitalsBridge battery will also be charged (at a slower rate).

Turning the VitalsBridge On

If you would like to turn on your monitor and VitalsBridge now, you may do so. The VitalsBridge is turned on by simply pressing the power button in the lower left corner of the top surface of the device.

If the Monitor and the VitalsBridge are turned on, as each connection is made it will be possible to check if each piece is connected and working properly.

Once powered on, the VitalsBridge takes approximately 30 seconds to initialize. The LED below the battery will flash as the VitalsBridge is initializing. (For additional information on the process of turning on the VitalsBridge as well as what the other LED lights mean, see page 23 under "Running the VitalsBridge.")

Establishing the VitalsBridge/Patient Monitor Connection

This section will describe how to connect the cables and tubing between the VitalsBridge and the vital signs patient monitor. The sensor and cable kit provided with the VitalsBridge is intended to be preconfigured with the vital signs monitor brand and model you plan to use. If more than one vital signs monitor will be used, refer to www.vitalsbridge.com for information on how to purchase additional sensor and cable kits.

Pulse Oximetry (SpO₂) (All Models)

▶ Video Link: https://tinyurl.com/VBSpO2instruction

In recently shipped cable kits, a small blue stripe should identify all pulse oximetry cables.

Pulse oximetry, or SpO$_2$, is used to determine the oxygen saturation of a patient's blood. It also will provide a pulse measurement. SpO$_2$ simulation by the VitalsBridge uses special circuitry in a custom SpO$_2$ adapter sensor/cable kit, which provides expected levels to simulate the SpO$_2$ probe according to the SpO$_2$ value set in the simulator's instructor

2

application. The custom SpO$_2$ adapter has labeled cable connections to both the VitalsBridge and the vital signs monitor. It is important to have the correct SpO$_2$ adapter for the brand of SpO$_2$ technology (e.g., Nellcor, Nellcor Oximax, Masimo, Philips, etc.).

There are currently two types of pulse oximetry adapters. Please follow the instructions for the adapter that came in your sensor and cable kit.

Monitor Specific Adapter

The typical adapter is connected by using the gray cord included in the SpO$_2$ adapter kit provided to connect the adapter box to the VitalsBridge. The white cable protruding from the adapter box is then connected to the SpO$_2$ cable from the monitor being used to present the vitals signs.
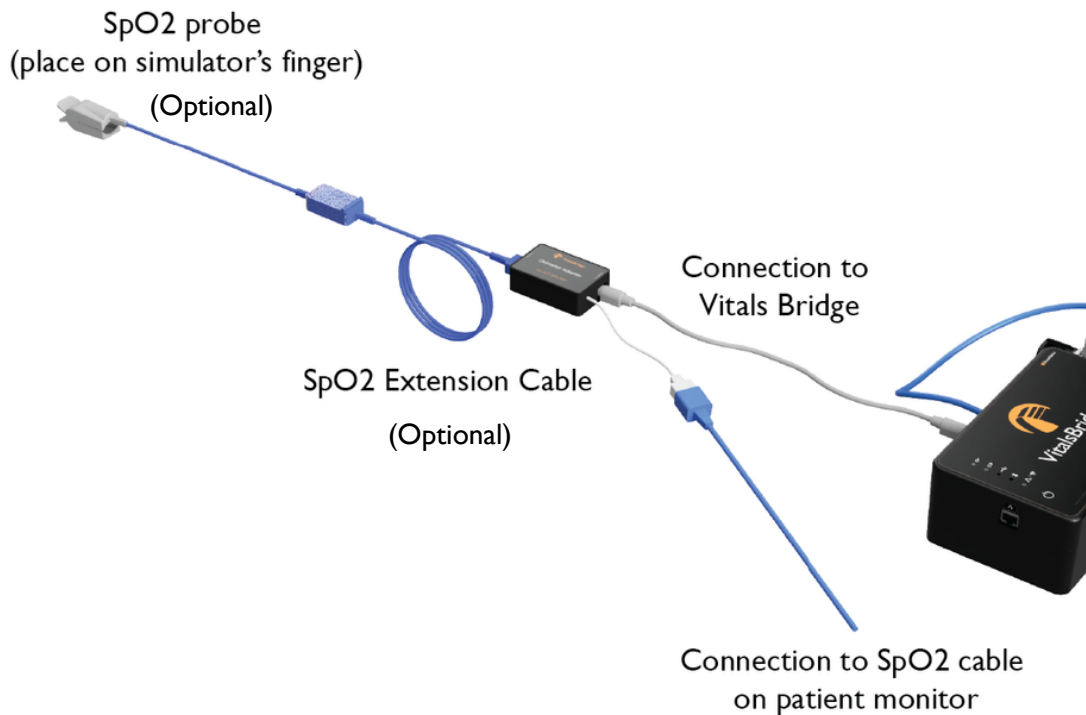

Universal Adapter

This adapter uses the non-disposable SpO$_2$ probe that is supplied with the patient monitor.

To attach, connect the adapter box to the VitalsBridge with the gray cable that came packaged with the adapter box. Then clip the SpO$_2$ probe (the one typically used with the monitor) into adapter box around the white plastic covered "finger" inside the adapter box. Make sure the probe is firmly and deeply secured around the "finger." There may be some resistance as you push the probe down (see figure below).

3
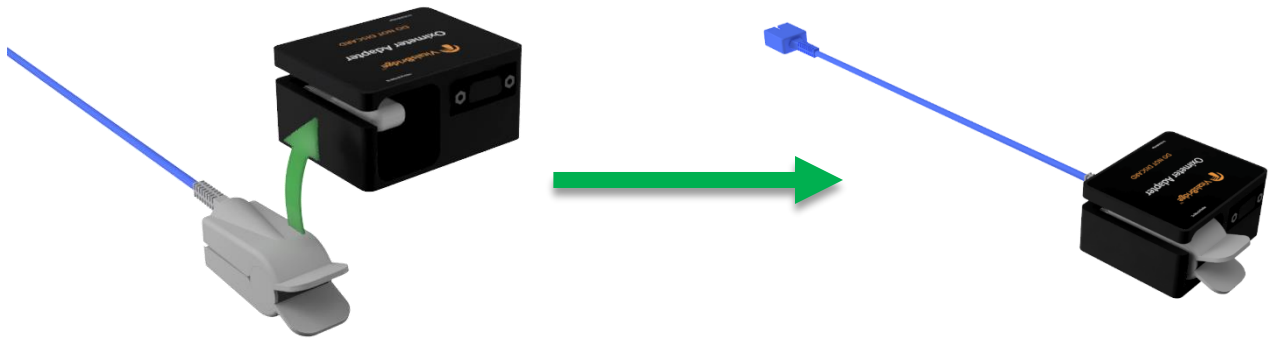
Mock Probe

A disposable SpO$_2$ probe is supplied with the adapter as well. This may be plugged into the adapter box and placed on a manikin's or standardized patient's finger; however, *this probe is not required for presenting a SpO$_2$ value on the patient vital signs monitor.* When plugged in, this additional SpO$_2$ probe will communicate with the VitalsBridge. While it does not provide a reading that is displayed on the monitor, if the probe is *not* attached to a finger/manakin/something else of the like *no* SpO$_2$ reading will be displayed on the monitor (simulating how a real SpO$_2$ probe will not give a reading if not on a finger)

An extension cable is also included with the mock probe to allow for further reach of the probe from the VitalsBridge.

If your monitor and VitalsBridge are on, an SpO$_2$ reading should appear on the monitor screen when connected correctly (Note: This reading will only appear if the mock SpO$_2$ probe is on a finger of some sort OR not connected).

Non-invasive Blood Pressure (NIBP) (All Models)

▶ Video Link: https://tinyurl.com/VBNIBPinstruction

The VitalsBridge is capable of simulating non-invasive blood pressure by mimicking the pulsing of an artery. The NIBP tubing from the patient monitor is connected to the VitalsBridge, and when the patient monitor initiates a NIBP reading, the VitalsBridge simulates an appropriate magnitude of pulsing.

The tubing connection from the patient monitor to the VitalsBridge may need configuration, depending on the style of connector used with the patient monitor's NIBP tubing. A tubing adapter and connectors have been included for appropriate fitting(s) to connect the luer fitting on the VitalsBridge with the patient monitor's NIBP tubing. If the NIBP tubing contains 2 connectors, a 2-tube to 1 tube adapter fitting has been provided.

4

Select the appropriate tube and lure fittings

Affix the tube and luer fittings to each other to provide an ending that can be attached to the monitor NIBP tubing
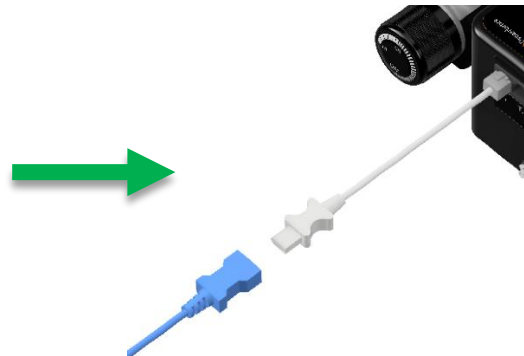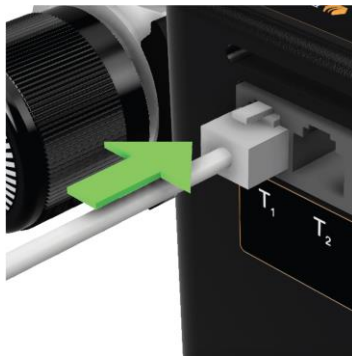
If your monitor and VitalsBridge are on, a blood pressure reading should appear on the monitor screen when a blood pressure cycle is run and everything is connected correctly.

Temperature (All Models)

▶ Video Link: https://tinyurl.com/VBTempinstruction

*In recently shipped cable kits, a small red stripe should identify all temperature cables.

The VitalsBridge simulates the output of YSI 400 compatible temperature transducers. The temperature cable is a short white cable that consists of a short RJ-11 connector on one end, which connects to the VitalsBridge. The other end of the cable is a transducer-style connector, which connects to the temperature patient monitor cable. Two temperature cables are supplied with the VitalsBridge.

If your monitor and VitalsBridge are on, a temperature reading should appear on the monitor screen when connected correctly.

Electrocardiogram (ECG) and Respiration (VB200 and VB300)

▶ Video Link: https://tinyurl.com/VBECGinstruction

5

The VitalsBridge 200 and 300 are supplied with connections for up to 5 ECG leads (RA, RL, V, LL, and LA). Using the ECG harness from the patient monitor, connect each lead (match the corresponding colors or labels on the leads to those on the VitalsBridge).   In addition to simulating ECG, a respiration by impedance signal is also produced by the VitalsBridge.

Once connected, the patient monitor will be able to display the respiration rate and ECG information.

If your monitor and VitalsBridge are on, an ECG reading should appear on the monitor screen when connected correctly.

Invasive Blood Pressure (IBP) (VB300 only)

Video Link: https://tinyurl.com/VBIBPinstruction

In recently shipped cable kits, a small yellow stripe should identify all invasive blood pressure cables.

The VitalsBridge is able to simultaneously simulate up to 3 different invasive blood pressure waveforms. These include arterial blood pressure (ABP), central venous pressure (CVP), pulmonary artery pressure (PAP) or pulmonary capillary wedge pressure (PCWP). The VitalsBridge simulates the transducer output signal for each invasive blood pressure and utilizes an RJ-11 cable to connect from the VitalsBridge to the patient monitor's IBP cable. Note: contact Dynasthetics or www.vitalsbridge.com for assistance with purchasing a VitalsBridge-compatible invasive blood pressure monitoring cable (i.e., the cable that connects from the patient monitor to the VitalsBridge RJ-11 cable).

6

When using IBP, a connection to every waveform is not required for the VitalsBridge to function. Unused IBP ports on the VitalsBridge may be left unconnected.

If your monitor and VitalsBridge are on, an IBP reading should appear on the monitor screen when connected correctly.

Configuration of VitalsGas Source (VB300 only)

▶ Video Link Install: https://tinyurl.com/VBCO2install
▶ Video Link Uninstall: https://tinyurl.com/VBCO2uninstall

The VitalsGas, a regulated source of compressed CO_2, is required for capnography. A 16g threaded CO_2 cylinder may be used or compressed CO_2 from another external source may be available at your facility (wall source, a tank, etc). Consult your facility's engineering department regarding external CO_2 sources and the appropriate regulators and adapters for correct and safe connection.

Using the Portable VitalsGas Regulator: The portable VitalsGas regulator uses 16g threaded CO_2 disposable cylinders. The regulator may be detached by moving the regulator out of its bracket on the side of the VitalsBridge. The regulator's tubing has a luer lock fitting that will connect into the VitalsBridge, and regulator knob to control the flow of gas. The regulator should be turned to the off position when it is not connected to the VitalsBridge via the luer connection. Only turn the regulator on when a tight secure connection to the VitalsBridge has been verified.

⚠   *Caution:* The regulator should be kept horizontal to upright when the VitalsGas cylinder is attached. The cylinder is pressurized. Sudden release of pressure may cause injury. Turn regulator to **OFF** when not in use.

⚠ *Warning*: VitalsGas cartridges may become extremely cold when discharging.   Protect eyes and hands when installing and handling VitalsGas cartridges.

⚠ *Warning*: Mishandled VitalsGas cartridges may become projectiles.

Installing VitalsGas Cartridge:

1. If replacing a cartridge, temporarily remove the regulator from its bracket on the VitalsBridge instrumentation and remove the empty cartridge from the regulator by turning it counterclockwise. *(If this is the first time installing a cartridge, the regulator should already be separated from its bracket and there should be no cartridge attached to it, unlike the figure below.)*
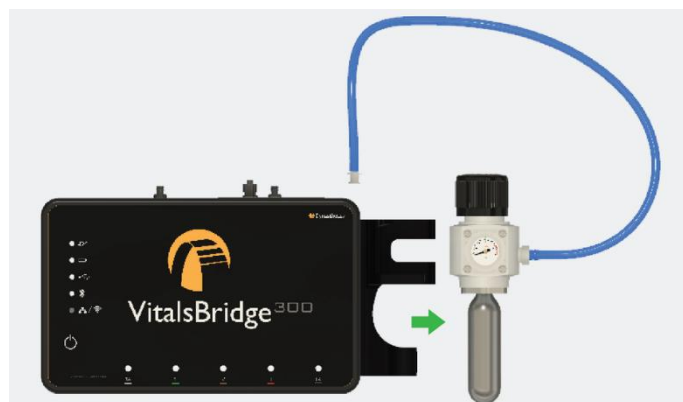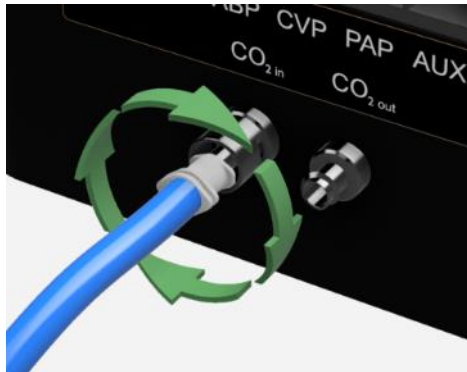

2. Adjust the regulator knob to the "OFF" position by rotating it counterclockwise.

7

3. Attach the blue tubing to the blue luer lock ($CO_{2\ in}$) on the front of the VitalsBridge and verify a secure connection.

4. Orient the VitalsBridge so the threaded connection on the regulator can be seen. Hold the regulator in one hand, align the cartridge under the housing, and quickly turn it clockwise into the regulator. Do not stop until tight. Do not over tighten; the cartridge only needs to be hand-tight. It is normal for a small burst of gas to leak out during cartridge installation.

5. Replace the regulator back on the bracket that is attached to the VitalsBridge instrumentation.

6. SLOWLY turn the regulator knob clockwise until the pressure on the gauge reads 15-20 PSI. Do not set the regulator to a reading higher than 20 PSI.

⚠ *Caution:* Ensure VitalsGas has been fully released prior to disposing of the cartridge. This may be accomplished by: (i) turning the regulator to "OFF", (ii) detaching the female luer fitting from the blue luer lock ring on the VitalsBridge, (iii) *slowly* turning the regulator knob clockwise (towards "HI"), and (iv) allowing the remaining compressed gas to expel in a controlled manner. The cartridge may be very cold. Point the outlet of the cartridge away from yourself and others. Wear eye protection. **Ensure that the knob is turned to the off position before a new cartridge is installed.**

⚠ *Caution:* When not in use turn the regulator to the off position and disconnect the regulator tubing from the VitalsBridge.

⚠ *Caution*: VitalsGas cartridges may **NOT** be transported by air.

To verify this has been connected correctly, connect the capnography cable as directed below.

Capnography (Side-stream End Tidal CO$_2$, VB300 only)

The VitalsBridge is configured for simulating side-stream capnography. Capnography is the measurement of concentration of patients' exhaled CO$_2$. The VitalsBridge utilizes a compressed CO$_2$ source to provide a mixture composed of the correct amount of air and CO$_2$ to simulate the fraction of CO$_2$ exhaled over each breath by a patient. To use the capnography function, ensure that your patient monitor supports side-stream capnography measurement. If it does, connect its capnography line (a thin clear tube) to the luer fitting labeled "CO$_2$ out" on the VitalsBridge.

9

To side-stream CO_2 connection on vital signs monitor.
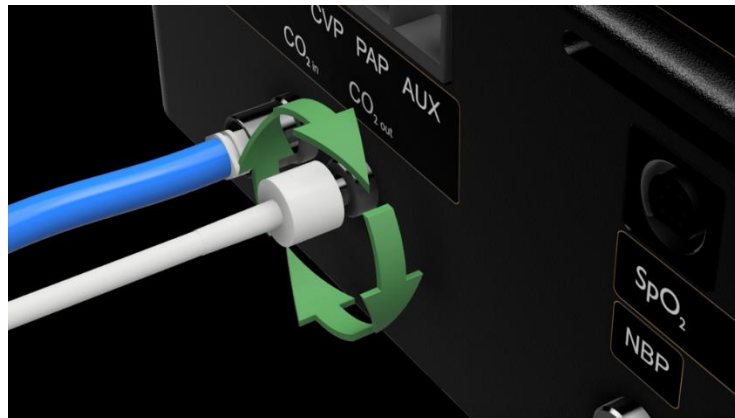
If your monitor and VitalsBridge are on, a CO_2 reading should appear on the monitor screen when your VitalsGas and capnography cable are connected correctly.

Support

For technical assistance, contact VitalsBridge customer support:

- support@vitalsbridge.com
- 1-435-200-3402
- 1-801-484-3820

10