

## NONINVASIVE BLOOD PRESSURE CALIBRATION WITH ACQKNOWLEDGE AND THE NIBP100D-HD UNIT(HEMODYNAMIC VERSION)

This document refers specifically to the NIBP100D-HD system (This system cannot be shipped into the U.S.) If using the standard NIBP100D, please use the “Noninvasive Blood Pressure Calibration with AcqKnowledge and the NIBP100D Unit” guide included with the system.

The new NIBP100D-HD Hemodynamic system now has four different outputs:

- Raw Blood Pressure (BP)
- Mean Arterial Pressure (MAP)
- Cardiac Output (CO)
- Pulse Pressure Volume (PPV)

A new CBLNIBP100D-HD cable is included with every system. This cable connects one end to the right side of the NIBP100D-HD unit (“AUX”), and the other end to 4 x 3.5 mm male connectors, labeled BP, MAP, CO, and PPV.

These four signals will need to be connected to an HLT100C and 4 x INISO in order to provide isolated (electrically safe) inputs to the MP150 system.

**IMPORTANT:** When connecting this system to an A/D system, be aware that the outputs are NOT electrically isolated and will need to be isolated before going into the A/D system. This will keep the subject electrically safe. This is especially important when connecting electrically via ECG, EMG, EDA, EEG, etc. to the subject.

### Hardware Setup

Connect the CBLNIBP100D-HD cable as noted above to the HLT100C inputs. Channels 1, 2, 3, and 4 will be used as an example.

Turn on the NIBP100D-HD using the Power button on the lower front left panel. Press and hold for two full seconds to turn on. The device will go through a 30-second self-test, including an alarm test.

Next, verify that the device is outputting from 0 to +5 volts on the AUX port.

1. Press the Setup (wrench icon) button on the front panel (right).
2. Select “**Measurement**”, then “**Display Options**”, then check that the last option, “**Analog Out Reference**” is displaying “0 V to 5 V”.



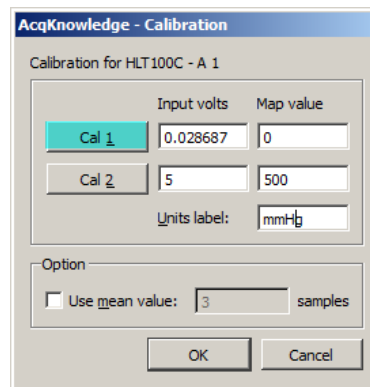
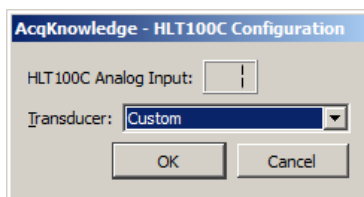
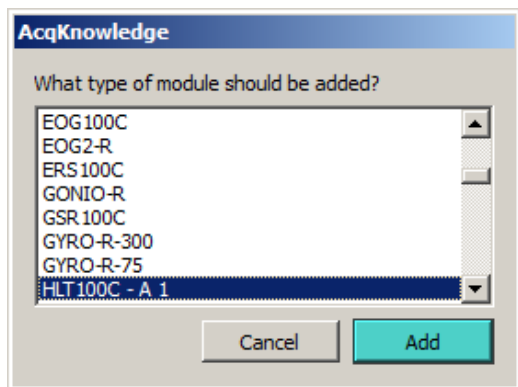
**If Analog Out Reference instead displays “-5 V to 5 V”:**

- Turn the dial to select this item, press the dial, then turn the dial one click to the left to change the display to “0 V to 5 V.”
- Push the dial to select this option.
- Using the dial again, select OK.
- Turn the dial to OK and select, then again turn the dial to OK and select again to get back to the main screen.

You are finished setting up the unit to output 0 to +5 volts.

### Setup Channel 1 (Raw BP)

1. Launch the AcqKnowledge software. In AcqKnowledge version 4.0 or newer, the software will prompt, “What type of module should be added?”
2. Select “**HLT100C- A1**” and select “**ADD.**”
3. Select “**Custom**” from the Transducer list and click OK. This opens a scaling dialog similar to the one on the lower right.



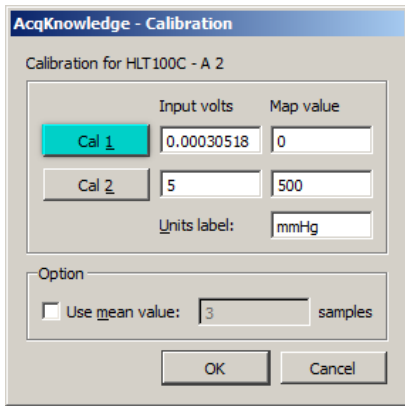
4. Click on the “Cal 1” button in the upper left to read in a precise voltage from the NIBP100D-HD on the BP channel (A1).
5. Enter the remaining Input and Map values as shown in the above scaling dialog.

If the NIBP100D-HD is powered on and not displaying any readings (sitting idle), then it will always output 0 volts across all four output channels (BP, MAP, CO, and PPV). This is the opportunity to properly ZERO the outputs coming into the HLT100C and MP150 system.

**If already recording data with BP values are showing on the display of the NIBP100D-HD:** The zeroing feature can also be turned on by using the dial selecting the lower right “quadrant” of the NIBP100D-HD display click to select it). At the bottom of the list, you can see “IBP: Zeroing Active”. You can then toggle this zero volts output condition in order to do your calibration.

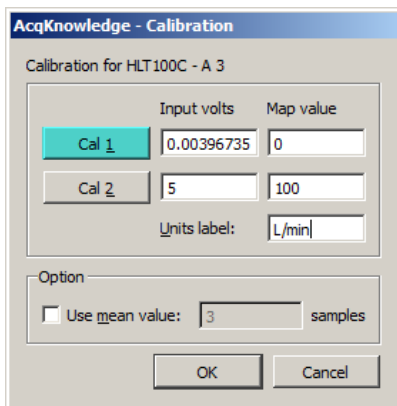
**Setup Channel 2 (MAP)**

1. Select “**Add New Module...**” from the *AcqKnowledge* Set Up Data Acquisition Screen.
2. Select “**HLT100C – A2**” then select “**Add**”, then select “**Custom**” from the Transducer list.
3. Click “**Cal 1**” to read in zero volts from the NIBP100D-HD.
4. Enter the remaining Input and Map scaling parameters as shown below and click OK.



**Setup Channel 3 (CO)**

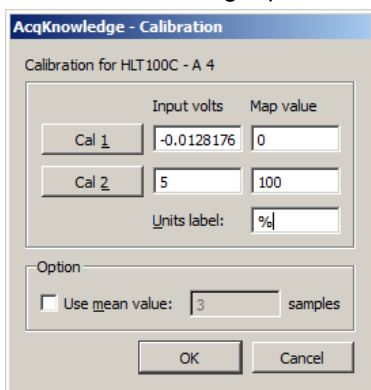
1. Select “**Add New Module...**” from the *AcqKnowledge* Set Up Data Acquisition Screen.
2. Select “**HLT100C – A3**” then select “**Add**”, then select “**Custom**” from the Transducer list.
3. Click “**Cal 1**” to read in zero volts from the NIBP100D-HD.
4. Enter the remaining Input and Map scaling parameters as shown below and click OK.



**Setup Channel 4 (PPV)**

5. Select “**Add New Module...**” from the *AcqKnowledge* Set Up Data Acquisition Screen.
6. Select “**HLT100C – A4**” then select “**Add**”, then select “**Custom**” from the Transducer list.
7. Click “**Cal 1**” to read in zero volts from the NIBP100D-HD.

Enter the remaining Input and Map scaling parameters as shown below and click OK.



After all four channels are set up, enter the channel information to the “Label” field:

Module	Label				Transducers
HLT100C - A 1	Raw BP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Custom
HLT100C - A 2	Mean AP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Custom
HLT100C - A 3	Cardiac Output		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Custom
HLT100C - A 4	Pulse Pressure Volume		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Custom

The recommended sampling rate is 100 s/s. Be sure not to lower your master sampling rate if you are also recording higher frequency signals such as ECG, EMG, etc.

