Practical Polygraph: How to Perform a Field Functionality Check

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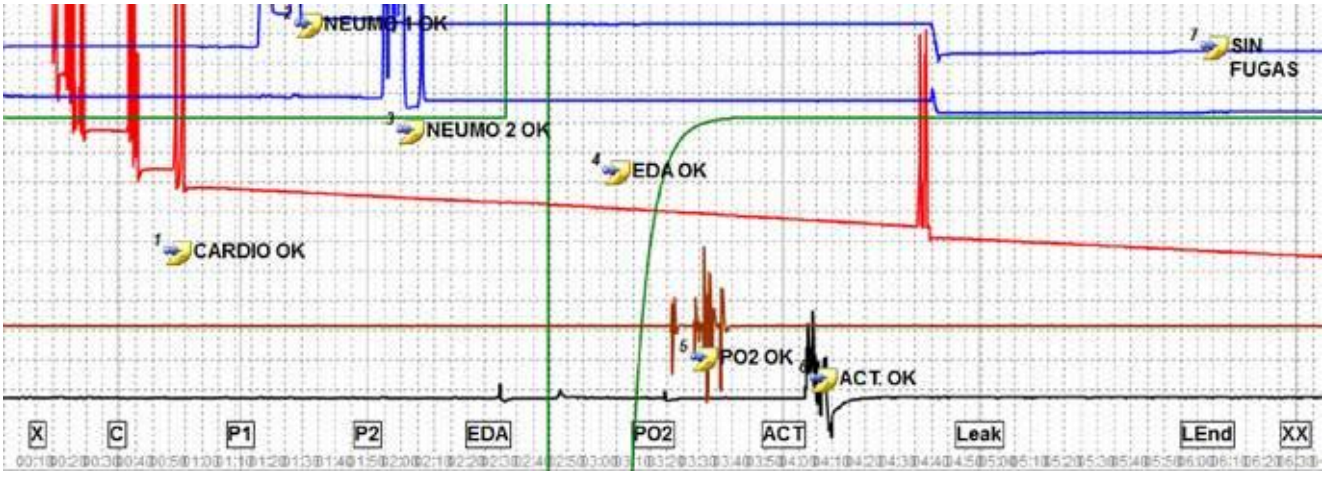
Most modern computerized polygraphs require no field calibration to function effectively. However, it may remain important, on some occasions, to verify that the recording sensors are in adequate functional condition and capable of capturing and recording information of normal interpretable quality. For this reason, hardware devices have remained commercially available to help examiners check for problems or verify the functionality of the polygraph instrument and polygraph sensors. In field settings, it is also possible to verify correct functionality or ascertain the presence of problems in field settings using simple procedures that do not involve an additional device.

There is no specification or requirement for periodically checking the functionality of computerized polygraph instruments. Functionality check procedures no known effect on the validity of a polygraph test. Problems or faults with polygraph recording sensors are likely to be observed and corrected immediately during an exam. For practical purposes, the acquaintance test will serve as a de-facto functionality check. There may, however, be times in which a field examiner may wish to conduct a Field Functionality Check to ascertain the functionality of a polygraph instrument and recording sensors – such as when a recording sensor problem is suspected or for some high-value polygraph cases.



The following is a simple procedure that can be executed for virtually any polygraph instrument in any field setting, without reliance on additional devices that may not be immediately available.

Preparation for the field functionality check:

1. Visually inspect all sensors for damage
2. Connect all sensors to the polygraph instrument and connect the instrument to the computer
3. Wrap the cardio cuff around a jar, water bottle or similar sturdy object (the cuff can also be inserted into a large coffee cup)
4. Ensure the computer date and time are correct
5. Launch and log into the polygraph software
6. Create a new polygraph exam identified with the instrument serial number. If subsequent functionality checks will not be recorded in the same exam then you can include the current date and your name in the exam name. (Some systems use arbitrary exam names).
7. If an examinee name is required use "Functionality Check." If an examinee date-of-birth is required use the current date one year earlier.
8. Initialize the data acquisition. (Some systems require that you initialize a new Series.)
9. Adjust the gain for all sensors to any value equal to or greater than 1.
10. Select the "Functionality Check" template

The Field Functionality Check question template should include the fol- lowing items

1. X Start the functionality check
2. C Cardio sensor check
3. TR Thoracic respiration sensor check
4. AR Abdominal respiration sensor check
5. EDA Electrodermal sensor check
6. VM Vasomotor sensor check
7. ACT Activity sensor check
8. Leak Start the one-minute leak-down check
9. LEnd End the one-minute leak-down check
10. XX End the functionality check

During the functionality check, simply press the space bar briefly for each item in the question template. It is not necessary to hold the space for the duration of each sensor check, nor is it necessary to press the space bar to enter an answer for each item. Wait for the question timer to expire before proceeding to each subsequent item in the question template.

Enter a comment or annotation for each sensor to indicate whether the sensor passes the sensor check (i.e. OK) or indicate if a sensor fault is observed. It may also be possible to enter notes into the exam, instead of adding comments or annotations to the chart data, to document correct functionality for each sensor.

After ensuring that the polygraph instrument is connected and initialized (i.e., acquired data are displayed on- screen), the procedure for the functionality check is as follows:

- Inflate the cuff to around 100 mmHg and squeeze it several times. Adjust the cuff pressure to 65 mmHg and pinch the clamp.

- Start the recording of the chart data.

- X. Start the functionality check

  Tap the space bar to start functionality check, then wait a few seconds before proceeding.

- C. Cardio Sensor Check.

  Tap the space-bar to check cardiograph response. Squeeze or press the cuff causing about 2mmHg increase in pressure, then hold for 5 to 10 seconds and release. You should see a deflection in the tracing. Enter an “OK” annotation or comment to indicate the cardio sensor is functioning as expected.

- TR. Thoracic Respiration Sensor Check.

  Tap the space-bar to check thoracic respiration transducer. Stimulate the respiration chest assembly by stretching it about

¼ inch or ½ cm, then hold for 5 to 10 seconds and release. (This can be accomplished by holding one end of the sensor firmly on a desk or table with the bead- ed-chain extended over the edge, and then stretching the sensor by the length of one or two beads.) The tracing should rise, hold, then return. Enter an "OK" annotation or comment to indicate the thoracic respiration sensor is functioning as expect- ed.

- AR. Abdominal Respiration Sensor Check.Tap the space-bar to check abdominal respiration transducer. Stimulate the respiration chest assembly by stretching it about ¼ inch or ½ cm, then hold for 5 to 10 seconds and release. (This can be accomplished by holding one end of the sensor firmly on a desk or table with the bead- ed-chain extended over the edge, and then stretching the sensor by the length of one or two beads.) The tracing should rise, hold, then return. Enter an "OK" annotation or comment to indicate the abdominal respiration sensor is functioning as expected.

- EDA. Electrodermal Sensor Check.

  Tap the space-bar to check EDA sensor response. Touch the unattached EDA leads together, then release or separate them. This should cause signal to deflect sharply. Enter an "OK"annotation or comment to indicate the electrodermal sensor is functioning as expected.

- PO2. Vasomotor Sensor Check.

  Tap the space-bar to check vasomotor sensor response. Pinch open the vasomotor sensor and point the open end towards a window or light source for a few seconds, then point the sensor away from the light source. The signal should deflect noticeably and then stabilize or return. Enter an "OK" annotation or comment to indicate the vasomotor sensor is functioning as expected.

- ACT. Activity Sensor Check.

  Tap the space-bar to check seat activity sensor response. With the seat activity sensor on a firm surface, lightly tap or press down on the activity sensor with your hand for a few seconds. You should see a deflection in the tracing, and the tracing

should stabilize when the activity/stimulation has ended. Enter an "OK" annotation or comment to indicate the activity sensor is functioning as expected.

- Leak. One-minute leak-down Check.

  Tap the space-bar to start the one-minute leak-down check. First ensure that the cardio cuff is inflated to 65mmHg and attached to a stable object such as a jar, water bottle or coffee cup. Then attach the abdominal and thoracic respiration sensor to an empty chair. Tap space bar to initiate the one-minute leak-down check. Leave all components connected, and record data for one minute from Leak to Lend.

- LEnd. End of One-minute Leak- down Check.

  Tap the space bar to end leak- down check. The cardio and respiration sensor data should not move more than 1 or 2 chart di- visions during the one-minute leak-down check. Movement of more than 2 chart divisions during the one-minute period (approximately the time for two polygraph questions) may indicate a sensor fault. Enter an "OK" annotation or comment to indicate if the instrument and sensors have passed the one-minute leak-down check.

- XX. End Functionality Check.

  Tap space bar to indicate the end of the functionality check. Enter a final "OK" comment or annotation to indicate that the instrument and all recording sensors have passed the functionality check procedure.

- Stop the chart recording and save the functionality check as documentation or evidence that the instrument and recording sensors are functioning as expected.

The functionality check procedure can be conducted whenever a fault is suspected for any recording sensor. This procedure can also be used whenever it is useful to verify that the instrument and recording sensors are functioning as intended, such as before or after any high value polygraph test where the functionality of the instrument may be questioned, or when an instrument or sensor has been replaced or serviced. There is no requirement or recommendation for periodic or scheduled functionality checks. It is also possible to verify during an acquaintance test, with a live subject, that each of the polygraph

recording sensors is functioning correctly. All competent field practitioners should be familiar with the procedures to as- certain system or sensor faults, or to verify the correct functionality of the polygraph and recording sensors.