

Smiths Medical PM BCI[®] Capnocheck[®] Plus/Sleep

Sleep Lab Polysom Interface

A. PREPARATION

1. Identify Polysom being used:
 - a. Manufacturer
 - b. Specific model
2. Identify if the connection will be made at an auxiliary box, attenuator or amplifier
Identify the manufacturer and specific model and type of connection, e.g. 3.5mm Mini Phono, Safety Plug, BNC, etc.
3. Identify 3 channel or 4 channel monitoring needs:
 - a. 3 channel only (signal distance < 50 ft) requires BCI analog cable catalog no. 9014
 - b. 4 channel or signal distance up to 250 ft requires BCI analog cable catalog no. 9015
4. Capnocheck[®] Plus interfacing features:
 - a. 0 – 1 volts analog output
 - b. 9014 analog interface cable specifications:
 1. 25 pin female end to Capnocheck[®] Plus
 2. 3 – pigtails terminating in 3.5 mm mono signal, female phone jack
 3. Pin index:

Pin No.	Description
2	Serial data received in to Capnocheck [®] Plus
3	Serial data transmitted out from Capnocheck [®] Plus
4	Busy from pc/printer to Capnocheck [®] Plus Capnocheck [®] Plus
7	GROUND
21	Analog 1 (white)
23	Analog 2 (red)
24	Analog 3 (black)

- c. 9015 analog inter face cable specifications:
 1. The Capnocheck Plus must have CCAP software
 2. PIC adapter: 25 pin female end to Capnocheck[®] Plus w/ 25 pin male end to 9015 cable
 3. 4 – pigtails terminating in 3.5 mm mono signal, female phone jack
 4. Pin index:

Pin No.	Description
2	Serial data received in to Capnocheck [®] Plus
3	Serial data transmitted out from Capnocheck [®] Plus
4	Busy from pc/printer to Capnocheck [®] Plus Capnocheck [®] Plus
7	GROUND
21	Analog 1 (white)
23	Analog 2 (red)
24	Analog 3 (black)
19	Analog 4 (green)

NOTE: *May require an adapter to fit different manufacturers (Respironics & Sensor medic requires)*

5. Identify technical support for Polysom manufacturer
6. Identify Polysom cables needed to interface with the Capnocheck[®] Plus
Order one cable for each channel desired for recording
7. Customer to call Polysom manufacturer for montage set up and calibration procedure.

Capnocheck[®] Plus specifications for calibration:

Parameter	0 Volt	1 Volt
ETCO ₂ (%)	0	10
ETCO ₂ (mmHg)	0	100
Inspired CO ₂	0	100
Respiratory rate	0	150
SpO ₂	0	100
Heart rate	0	254

8. Identify date and time with customer for evaluation and or purchased set up to occur
 - a. Notify Polysom technical support for availability on that date
 - b. Notify BCI clinical support for availability on that date

B. INTERFACE SET UP:

1. Set up the Capnocheck[®] Plus menu:
Breath averaging: 4 bpm avg (adults) or breath by breath (peds/infants)
2. Identify parameters to be recorded and channels to be used
3. Interface the Capnocheck[®] Plus with the designated Polysom with the appropriate designated cables and adapters
4. Caution: The Polysom connection inlets may be specifically designated by parameter and may not be interchangeable
5. Capnocheck Plus: Channel 1=white, channel 2=red, channel=3 black, channel 4 channel=green

C. CALIBRATION *(Note: Montage should already be complete)*

1. Enter the Capnocheck[®] Plus/Sleep menu by pressing the MENU/ENTER key
2. Select ANALOG OUT
 - a. Set output type to internal for 3 channel monitoring without long distance signal requirement or external for 4 channel and/or long distance signal
 - b. Arrow to channel 1
 - i. Press ENTER to highlight channel 1 assignment
 - ii. Use the arrow key to change the channel 1 assignment to 0 volt
 - iii. Press ENTER to program the channel 1 assignment which initiates a 0 volt signal to the Polysom
 - iv. Observe that the Polysom has received a 0 volt signal from the Capnocheck[®] Plus/Sleep
NOTE: The Capnocheck Plus/Sleep puts out a signal slightly higher than 0 volts which may result in tweaking at the Polysom end to match
 - v. Press ENTER again to highlight the channel 1 assignment
 - vi. Use the arrow key to change the assignment to 1 volt
 - vii. Press the ENTER key to program the assignment and initiate a 1 volt signal to the Polysom
 - viii. Observe that a 1 volt signal has been sent to the Polysom
NOTE: Some polysom's 1-volt equivalent for CO₂ is 76, which may require some "tweaking" at the Polysom end to match
 - ix. Press enter again to highlight 1 volt and use arrow keys to label channel with the appropriate parameter
 - x. Press ENTER again to program and accept label
 - b. Repeat steps for channels 2 and 3
 - c. Channels may be all "0" volted, then all "1" volted and then labeled
If so desired
3. 4-channel menu set up
 - a. In the analog out menu select EXTERNAL for Output Type
 - b. Calibrate channels 1 and 2 as indicated above
 - c. Select [MORE] to access channels 3 and 4
 - d. Calibrate the same as 1 and 2

D. HELPFUL HINTS AND TROUBLESHOOTING

1. The Capnocheck[®] Plus is capable of sending a numeric EtCO₂ value to the Polysom but, the Polysom may not have the ability to display it on the screen.
2. When calibrating the Capnocheck Plus don't forget to ENTER twice to un-highlight the assignment, otherwise it will not be initiated.

3. Some Polysoms will show CO₂ data on the screen but do not incorporate the information in its report. Profox software* may be useful here.
4. When assigning channels in the Capnocheck[®] Plus the label “EtCO₂” will give a numeric value, the label CO₂ Waveform will give a CO₂ waveform.
5. When a channel is not being used it is necessary to change the label to 0 or 1 volt to prevent electrical interference from happening.
6. Respiratory effort/flow needs to be monitored during a sleep study; it can be measured via thermistor, pressure transducer or CO₂ waveform. Some sleep labs choose to measure it two different ways at a time.
7. The plethysmogram on the Capnocheck Plus is auto gained therefore, the height of the waveform is not reflective of perfusion; the shape is.
8. Please refer to the Polysom Operation Manual and technical support for montage set up and Polysom calibration procedures.

E. Polysom Manufacturers and Telephone Numbers

SensorMedics

800-231-2466
ext 8757

Respironics

800-345-6443 , Prompt 2

Bio-logic

847-949-5200, ext 253

Cadwell

800-245-3001

LaMont

888-452-6668

Nicolet

800-356-0007

Medgraphics

877-294-1346

Grass Telefactor

800-343-4039 ext 511

Compumedics

877-294-1346

Braebon

888-462-4841

Nihon Kohden

800-325-0283
prompt 3, then 3497

Sandman (NPB)

800-663-3336

Medcare (Rembrandt/Flaga)

888-662-7632

Stellate

888-742-1306 (US & Canada)

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* Profox Associates, Escondido, CA <http://www.profox.net/> or 760-432-9921