



Up to 14 external device signals



Ethernet Port
(supports POE)

Serial port
(supports bluetooth
communications
interface)

Information
Lights -
Status/Network
Activity

Power
(optional)

graelDC

External Device Interface and Communications Module

The **Compumedics Grael® DC** module provides the interface of up to 14 external device signals which meet the input requirements and integrates that data with Compumedics digital amplifier systems, such as Grael® HD and Somté® PSG systems. The Grael® DC also has a serial port that supports a Bluetooth® communications device for use with the Somté® PSG (part no.7900-0049-01). The device is powered from a Power-over-Ethernet (PoE) source, either a Compumedics PoE Switch (part no.0400-0050-00) or a Compumedics PoE Mid-span Power Injector (part no.0400-0041-00).

Part Numbers

8028-0009-01	Grael® DC External Device Interface
7900-0049-01	SENA Parani SD1000 Bluetooth Adaptor
0400-0041-00	PowerDsine PD-3001/AC Single Port PoE Midspan device
0400-0050-00	8 Port 10/100Mbps Ethernet Switch with 4POE Port

KEY FEATURES

- 14 bi-polar, high-level, DC inputs ($\pm 1.5V$, 3V p-p) for signals from External devices
- Low frequency, high voltage signals, also referred to as DC signals, such as, SpO₂, CPAP, tCO₂, and pH, can be calibrated to known signals through the Compumedics application software
- Samples and digitizes these signals at 256Hz for each input when used with any Compumedics amplifier
- Supports PTP mode which allows sample rates up to 4096 Hz and data synchronisation < 2 μ s when used with the Grael V2
- 24-bit analog to digital (A-to-D) conversion of signal data
- User-selectable storage rates from 16 to 256 Hz per input (16 to 4096 Hz when used with a Grael V2)
- User-selectable software high pass and low pass be set to an appropriate range for each type of signal
- Amplification gain or signal sensitivity is set by the user to provide appropriate amplitudes for each signal
- Software pairing with a specific Compumedics digital amplifier, such as the Grael® HD-PSG or Somté® PSG System
- Communication with the application workstation is done through an Ethernet RJ-45 connector, using the 10/100Base-T protocol.
- Powered via Power-over-Ethernet (PoE) source, either a PoE Switch or a PoE midspan power injector or external power supply
- Bluetooth Communication with Somté® PSG System, if equipped with Bluetooth dongle.

SPECIFICATIONS

Inputs	14
Full Scale Range	± 1.5 volt
Maximum input	± 20 volts continuous
Gain Accuracy	$\pm 2\%$
Resolution	24 bits
Low pass filter (3db frequency)	256sps: 71Hz. 512sps: 143Hz. 1024sps: 284Hz. 2048sps: 580Hz. 4096sps: 1150Hz.
Sample rate	4096 Hz (256 Hz when used with legacy devices)
Power source	Any power over Ethernet network switch or mid-span power injector that complies with both 802.3af and IEC/EN 60601
Operating voltage	48 volts (poe) or 12 volts (external power supply)
Consumption	< 5 watts
Power Indicator	Status LED on rear panel

Dimensions

System Component	Size L x W x H	Weight
Grael® DC unit	178mm x 155mm x 55mm 7.00in x 6.102in x 2.1653in	550 grams 19.40 ounces

Communication

Protocol to Host PC	TCP/IP
Type	802.3/802.3u Ethernet with auto MDIX. Requires 802.3af compliant switch or midspan power injector.
Data Rate	10 or 100 Mbit/second
Connector	RJ45 (8 pin)
Cable	Unshielded twisted pair, up to 100m

Complies with IEC 60601-1 : 2012 & IEC 60601-1-2 : 2014 requirement

Transport and Storage Conditions

-10°C (+14F) to 50°C (+122F)
20-90% RH non-condensing

The Grael® DC Module Unit:

- can be operated continuously
- has no protection against ingress of water
- is not suitable for use in the presence of a flammable anaesthetic mixture with air
- is not suitable for use in the presence of a flammable anaesthetic mixture with oxygen or nitrous oxide

BLUETOOTH TO LAN COMMUNICATION

The Grael® DC is designed to support wireless communication with the Somté® PSG system using an optional Compumedics Bluetooth transceiver (7900-0040-01) attached to the serial port on the Grael® DC. Communication is established using a Bluetooth routine that supports secure device pairing.

Somté® PSG Bluetooth® Interface

Requires	Compumedics Bluetooth device
Type (SPP)	Class 1 Bluetooth v2.0 compliant, supporting serial port profile
Connector	9-pin D-sub
Transmit power	16 dBm
Frequency band	2.402 to 2.480 GHz
Range	Up to 20m
Supported protocol	Bluetooth serial port profile
Operating mode	Slave or endpoint mode (connectable device) accepting all connection requests (subject to security)
Security	User selectable PIN, 1 to 15 decimal digits. If used both authentication and encryption are enabled.