

# Natus<sup>®</sup> Brain Monitor Amplifier

## Technical Specifications

### Amplifier Inputs

AC Channels .....	64 AC channels, 6 Sensor inputs
Referential Inputs.....	40 referential + 24 programmable (from differential to ref)
Differential Inputs .....	Programmable up to 12
Sensor Inputs .....	6 (Chest, Abdomen, Snore, Airflow, Pressure, Position)
DC Channels (patient side).....	4 non-isolated
DC Channels (computer side).....	12 isolated
Photic.....	Yes
Digital Trigger Input .....	8-bit TTL
Pulse Oximetry .....	SpO <sub>2</sub> , Pulse Rate, PPG, Plethysmogram, Pulse Quality
Event Button .....	2 (Breakout and Base)
Headcap Input.....	25 Pin Connector

### Analog Specifications

Input Impedance .....	Common Mode: ≥1 GΩ
	Differential Mode: ≥40 MΩ // 280 pF +/- 20%
Input Noise .....	<2 μVpp (0.1Hz – 70 Hz)
Common Mode Rejection Ratio .....	≥106 dB min
Bandwidth .....	DC to 1600 Hz (default HFF is 0.08 Hz)
Input Signal Range (AC).....	20 mVpp, +/-0.3 VDC
Dedicated Sensor Inputs .....	Chest, Abdomen, Thermistor, Pressure Cannula, Position, Snore
Derived Traces .....	XSum, XFlow, XVolume, Phase, RMI, RespRate, Flow_DR, Snore_DR, Elevation, Activity, Position

### Digital Specifications

Sampling Rates .....	256, 512, 1024, 2048, 4096 Hz
Sampling resolution .....	24 bits
Sampling Quantization.....	305nV
Storage Resolution.....	16 bits

### PC Interface

Network.....	Gigabit Ethernet, DHCP
Direct .....	USB 2.0 Hi-Speed, Ethernet

### Modes of Operation

Base Unit Fuse Type and Rating .....	Type T, 1.6 A / 250 V
Power.....	80 VA
Input .....	100 – 230 V, 50/60 Hz
Impedance Check.....	<2.5, <5, <10, <25 kΩ
Channel Test Signal .....	Software Controllable
	0.25, 0.5 and 1 Hz; 10 – 2000 μVpp

### Amplifier Mechanical

Base Unit Size (HxWxD) .....	29 x 26.5 x 5 cm (11.4 x 10.4 x 2 in)
Base Unit Weight .....	2300 g (5.1 lb)
Breakout Box Size (HxWxD) .....	19 x 11.4 x 3.2 cm (7.5 x 4.5 x 1.25 in)
Breakout Box Weight .....	460 g (1 lb)
Base to Breakout Cable Length.....	5 m (15 ft) included, 10 m (30 ft) max (optional)



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### Environmental Conditions for Use

#### Operating Environmental Limits

Temperature Range.....	10° – 30° C (50° – 86° F)
Relative Humidity Range .....	30% – 75%
Atmospheric Pressure Range .....	700 - 1060 hPa

#### Transport and Storage

Temperature Range.....	-25° – 60° C (-13° – 140° F)
Relative Humidity Range .....	10% – 95%
Atmospheric Pressure Range .....	500 – 1060 hPa

### Regulatory Compliance

#### Safety

- IEC 60601-1:2012 - General Safety Third Edition
- CAN / CSA-C22.2 No. 60601-1: 08(R2013) +C2:2011
- IEC 60601-1-6:2010 – Usability Third Edition
- IEC 62366:2007, Edition 1.0
- IEC 60601-2-26:2012 – Electroencephalographs Third Edition
- IEC60601-2-61:2011 - Pulse Oximeters
- EN ISO 80601-2-61:2011, Edition 1

#### EMC

- IEC 60601-1-2:2014 – EMC Fourth Edition
- IEC 61000-3-2:2014, Fourth Edition
- IEC 61000-3-2 Harmonic emissions – Class A
- IEC 61000-3-3:2013, Third Edition Voltage Fluctuations/ Flicker emissions
- CISPR11, Edition 5.0 A1:2010 RF emissions – Group 1, Class A
- IEC 61000-4-2:2008, Second Edition
- IEC 61000-4-2 Electrostatic Discharge (ESD) ±8 kV contact (to the patient lead and expose metal), ±15 kV air
- IEC 61000-4-3 Third Edition with A1:2007+A2:2010
- IEC 61000-4-3, 3 Vrms, 80 MHz to 2.7 GHz
- IEC 61000-4-4:2012, Third Edition, fast transient/burst ±2 kV power supply ±1 kV
- IEC 61000-4-5:2014, Third Edition
- IEC 61000-4-5 ±1 kV Surge differential mode ±2 kV common mode
- IEC 61000-4-6 Second Edition with A1:2004 + A2:2006
- IEC 61000-4-6, 150 kHz to 80 MHz
- IEC 61000-4-8:2009, Second Edition
- IEC 61000-4-8, Power frequency (50/60 Hz) magnetic field, 30 A/m