

# Natus® Embla® SDx Amplifier

## Technical Specifications

### Amplifier Inputs

AC Channels .....	20 AC channels, 6 Sensor inputs
Referential Inputs.....	16 referential
Differential Inputs.....	4 Differential
Sensor Inputs.....	6 (Chest, Abdomen, Snore, Airflow, Pressure, Position)
DC Channels (patient side).....	2 non-isolated
DC Channels (computer side).....	6 isolated
Photic.....	No
Digital Trigger Input.....	N/A
Pulse Oximetry.....	SpO <sub>2</sub> , Pulse Rate, PPG, Plethysmogram, Pulse Quality
Event Button.....	2 (Breakout and Base)

### Digital Specifications

Input Impedance.....	Common Mode: $\geq 1G\Omega$ Differential Mode: $\geq 40 M\Omega // 280 pF \pm 20\%$
Input Noise.....	$\leq 2 \mu V_{pp}$ (0.1Hz – 70 Hz)
Common Mode Rejection Ratio.....	$\geq 106$ dB min
Sampling Rates.....	256, 512 Hz
Bandwidth.....	DC to 200 Hz (default HFF is 0.08 Hz)
Input Signal Range (AC).....	20 mVpp, $\pm 0.3$ 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

### 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.....	$< 2.5, < 5, < 10, < 25 k\Omega$
Channel Test Signal.....	Software Controllable 0.25, 0.5 and 1 Hz; 10 – 2000 $\mu V_{pp}$

### Amplifier Mechanical

Base Unit Size (HxWxD).....	29 x 26.5 x 5cm (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 kPa

#### 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)  $\pm 8$  kV contact (to the patient lead and expose metal),  $\pm 15$  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  $\pm 2$  kV power supply  $\pm 1$  kV  
IEC 61000-4-5:2014, Third Edition  
IEC 61000-4-5  $\pm 1$  kV Surge differential mode  $\pm 2$  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