

# Nicolet LTM

## Long-Term System

### Specifications



#### General Specifications

##### Isolated Power Supply

115 or 230 VAC  $\pm$  10% input, 50 - 60 Hz  
595 VA primary; 500 VA secondary  
Output voltage = input voltage

##### Dimensions

Unibody cart approx. 47" H x 21" W x 30" D (119 x 53 x 76 cm)

**Weight** Unibody cart approx. 150 lbs. (68kg) (depending on model of printer)

##### Operating Environment (in use)

Temperature: 15.6 to 32.2° C, (60 to 90° F)  
Relative Humidity: 20-80%, non-condensing  
Altitude: 0-3km, (0-10,000 ft)

##### Non-Operating Environment (in storage)

Temperature: 17.7 to 55° C, (0 to 132° F)  
Relative Humidity: 10-90%, non-condensing  
Altitude: 0-12km, (0-40,000 ft)

#### Desktop Computer

**CPU** Intel® Pentium Core 2 duo 2.1 GHz technology with 2 GB RAM (min.)

**Operating System** Microsoft® Windows® XP Professional

**User Interface** Keyboard and mouse

**Hard Disk** 80 GB (min.)

**Digital Video System** 500 GB (min.) Total of 580 GB

**Graphics** Dual head, PCI-X

#### Storage Devices

DVD+RW Drive

CareFusion  
Middleton WI

[carefusion.com](http://carefusion.com)

#### Monitor/Display

19" LCD with Speakers (optional)

Pixel Resolution 1280 x 1024

24" wide aspect LCD (optional)

#### EEG Display

Sec/Page 2, 5, 10, 20, 30, 60, 120, 240, 300, 600, 1200

mm/Sec 6, 8, 10, 15, 30, 60, 120, 240

#### Amplifiers (Acquisition Only)

**C32, C64, C64OR, C64OR/SSU Amplifier**

Analog/Digital Converter 22 bit (16 stored)

ADC Resolution Voltage = 0.153  $\mu$ V

Channels (Inputs) 32/64 channels

DC Offset Tolerance  $\pm$  220 mV;  $\pm$  600 mV C64OR, C64OR/SSU

Maximum Input Range  $\pm$  5 mV

Bandwidth 0.16-500 Hz; 1.6-500 Hz C64OR, C64OR/SSU

Noise  $\leq$  2 $\mu$ V pk-pk @ 0.16 - 70Hz

Input Impedance  $>$ 100 M $\Omega$

CMRR at Patient Inputs  $>$  110 dB @ 0.16 - 70 Hz with active patient ground connected;

**NOTE:** *The following are under software control:*

**Anti-aliasing Filter Cut-off Frequencies** 33, 67, 134 and 268 Hz

**Amplifier Sample Rate**

128, 256, 512 and 1024 (Software sub-sampling for individual channels)

**Sensitivity**

10, 20, 30, 50, 70, 100, 150, 200, 300, 500, 700, 1000, 2000, 5000  $\mu$ V/cm

1, 2, 3, 5, 7, 10, 15, 20, 30, 50, 70, 100, 200, 500  $\mu$ V/mm

**High Filters** Off, 10, 15, 25, 30, 35, 40, 50, 60, 70, 100, 150, 200, 300, 500, 1000, 1500 Hz

**Low Filters** Off, 0.16, 0.3, 0.5, 1, 1.6, 2, 3, 5 Hz

0.2, 0.33, 0.5, 0.625, 1, 2, 3.3, 6.2 seconds

**Notch Filter** Off, 50/60 Hz

#### Bipolar Inputs (C32, C64, C64OR only)

**Number of Inputs** All odd channel inputs can be configured as Bipolar AC in pairs of two through software

**Maximum Input Range**  $\pm$ 5 mV AC

**Bandwidth** 0.16 - 500 Hz AC

**ADC Resolution** 0.153  $\mu$ V AC

#### v32 Amplifier

**Analog/Digital Converter** 16 bits

**ADC Resolution Voltage** = 0.153  $\mu$ V

**DC Offset Tolerance**  $\pm$  340 mV

**Channels (Inputs)** 32 EEG configurable as bipolar AC (24-32), 1 configurable as DC (32)

**Maximum Input Range**  $\pm$  5 mV

**Bandwidth** 0.053 - 500 Hz

**Noise**  $<$  1.5 $\mu$ V pk-pk @ 0.1 - 100 Hz

*v32 Amplifier continued on next page*

#### Nicolet Cortical Stimulator software (optional)

# Nicolet LTM

## Long-Term System

### Specifications

#### v32 Amplifier *(continued)*

**Input Impedance** > 100 M $\Omega$  (common mode)  
**CMRR at Patient Inputs** > 115 dB @ 50 – 60 Hz, with active patient ground connected  
**Channel Crosstalk** < -40 dB  
**Amplifier Sample Rate (under software control)** 125, 250, 500, 1000, 2000  
**Calibration** Square wave, 1, 5, 10, 20 sec period, 10, 50, 100, 1000  $\mu$ V amplitude  
**Input Bias Current** < 5 nA  
**Anti-Aliasing Filter Cut Off Frequency** 500 Hz  
**Differential Input Impedance** 40 M $\Omega$   
**Interface to Amplifier** Ethernet  
**Built-in Impedance and Display**  
**Headbox** Optional; no impedance display  
**Additional Ports**

- Isolated SpO<sub>2</sub> with X-Pod
- Photic output
- Isolated patient event button

**Channel Hardware Gain** 410  
**Deblock** Yes  
**Auxiliary Inputs**  
1 Hi-level, non-isolated input for connection of external devices (e.g. CO<sub>2</sub> monitors, etc.)  
**Analog/Digital Converter** 16 bits  
**Maximum Input Range**  $\pm$  2.5V  
**ADC Resolution** 76.3  $\mu$ V  
**Bandwidth** DC – 500 Hz

#### v44 Amplifier

**System Configurations**  
Sleep, EEG, ICU monitoring and LTM  
OR and non-OR applications  
Cart mount and wall mount options  
**Analog/Digital Converter** 16 bits  
**ADC Resolution Voltage** = 0.153  $\mu$ V  
**DC Offset Tolerance**  $\pm$  900 mV  
**Channels (Inputs)** 32 EEG (9 configurable as bipolar 24-32 AC)  
12 non-isolated DC inputs ( $\pm$  5V, BW = 100Hz)  
**Maximum Input Range**  $\pm$  5 mV  
**Bandwidth** 0.053 - 500 Hz  
**Noise** < 1.5 $\mu$ V pk-pk @ 0.1 - 100 Hz (except channels 31, 32 and OR channels < 2 $\mu$ V p-p @ 0.1 - 100 Hz)  
**Input Impedance** > 100 M $\Omega$  (common mode)  
**CMRR at Patient Inputs** > 115 dB @ 50 – 60 Hz, with active patient ground connected (except channels 31, 32 and OR channels > 100 dB @ 50-60 Hz with active patient ground connected)  
**Channel Crosstalk** < -40 dB  
**Amplifier Sample Rate (under software control)**  
125, 250, 500, 1000, 2000  
**Calibration** Square wave, 1, 5, 10, 20 sec period, 10, 50, 100, 1000  $\mu$ V amplitude  
**Input Bias Current** < 5 nA

**Anti-Aliasing Filter Cut Off Frequency** 500 Hz

**Differential Input Impedance** 40 M $\Omega$

**Interface to Amplifier** Ethernet

**Channel Hardware Gain** 410

**Deblock** Yes

**Integrated SpO<sub>2</sub>**

**Channels (DC Inputs)** 12 non-isolated

- Analog/Digital Converter 16 bits

- Maximum Input Range  $\pm$  5V

- ADC Resolution 153  $\mu$ V

- Bandwidth DC – 120 Hz

**Additional Ports**

- RS232 Serial Ports (2)

- Auxiliary I/O

- Panasonic Camera Control port on amplifier

- Isolated SpO<sub>2</sub>

- Isolated patient event button

- Microphone input

- C64/C128 interface

- Synchronized video input

- Picture-in-picture input (optional)

- Yolk input

- Photic output

- Calibration output

**Headboxes**

v44 requires one of the following:

- Clinical headbox with built in impedance and display

- Clinical headbox with head cap adapter and built in impedance and display

- OR headbox

#### Printout

HP DeskJet Printer (Black, White, and Color)

#### Network

10/100/1000 Mb Ethernet (standard)

#### Quality System

Manufactured, designed, developed and marketed by CareFusion under ISO 13485

#### Compliance/Regulatory Standards

Designed, tested, manufactured and certified to meet the following domestic (USA), Canadian, European and International Standards:

**UL 60601-1** Medical Electrical Safety Standard (USA)

**CAN/CSA-C22.2 no. 601.1-M90** Medical Electrical Safety Standard (Canada)

**EN/IEC 60601-1** Medical Electrical Safety of Medical Equipment (International and Europe)

**IEC 60601-2-26** Particular safety of electroencephalographs equipment

**EN 60601-1-2** Collateral safety standard for EMC

**European Community (CE Mark)**

Medical Device Directive (MDD) product

**Patient Isolation** Type B and BF

Specifications, design options and terms quoted are subject to change without notice  
Advanced Technology Patent Pending

CareFusion  
Middleton WI

[carefusion.com](http://carefusion.com)

