TECHNICAL FACT SHEET

NIM Eclipse® E4
Complexity Simplified

NIM Eclipse® NP
Neurophysiologist Supported System

Medtronic
Further, Together

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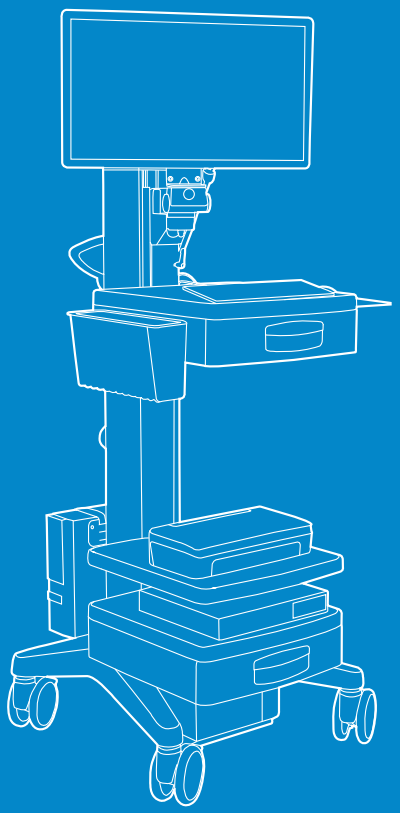
Complexity Simplified



NIM Eclipse® NP
Neurophysiologist Supported System

SYSTEM OVERVIEW

Real Multitasking
Simultaneous, acquisition, processing, display, saving, reviewing and electronic processing of data.

Real Multimodality Monitoring
with simultaneous continuous monitoring of EEG, MEP, SSEP, AEP and VEP, EMG and triggered EMG

Predefined Modalities and tests
EEG, RAW EMG, Trigger EMG, H-Reflex, MEP, D-Wave, Automatic Pedicle Screw, Automatic Nerve Root, Automatic Nerve Proximity, Train of Four (TOF), Upper SSEP, Lower SSEP, Other EP, BAER, VEP, Speech Mapping, Motor Mapping

Interleaving
Up to 16 stimulated modalities can be interleaved, incl. MEP.

Sets
Up to 8 Multimodality sets can be defined within a single test

User interface
Mouse with "notebook" pages and Windows style controls.

Data collection modes
Free running, averaged or triggered. All trace parameters (fi lter, amplifi er gain, artifact rejection, timebase, display scale, etc.) are fully user adjustable and independent.

Data presentation
Data are displayed in 4 window types: Traces, Stack, Spectral, Numerics. Windows may be split, resized and moved.

Vital signs
Import up to 16 physiological measures from an external physiological monitor using serial data link.

Display
Any data window can be viewed at any time.

Trace window
Displays continuous EEG and EMG, averaged EP, and triggered EMG. Up to 96 traces can be displayed.

Stack window
Displays EP, triggered EMG traces epochs stacked in time.

Spectral window
Displays up to 32 processed channels of EEG in CSA, DSA or CDSA formats.

Numeric window
Displays absolute or relative calculated values of measurements.

Video/Audio
Up to two Windows 7 conform sources can be recorded synchronized to neurological data.

Settings panel
Displays key test parameters, which can be quickly changed during the test.

Cursors
Absolute and differential in all EP and triggered EMG trace display windows.

Events
Alarm in case of adjustable 10-90 % drop of amplitude in MEP and EP

Saving data
Data can be saved manually or automatically as continuous EEG, free run EMG, triggered EMG, updated averaged EP, Screen snapshots.

Data review
Previously saved data can be reviewed while monitoring. Review data locally or remotely via network or Internet.

Remote Monitoring
Embedded functionality, Data transfer or Screen transfers with chat function File sharing (with and without server)

ASCII Export
available in Review Mode only EEG, EEG Spectra, EMG, trigEMG, EP, Stack Marker, with or without Patient Info

Test protocols
Standard test protocols are provided and can be modifi ed and saved by user.

Comments
Preset and free form text entry saved with time marks.

Quick reports
Automatically generated for every test.

Help
Context-sensitive Help function is available

Speaker output
Any selected EMG trace, raw EMG, modulated EMG tone, mixed raw/ modulated EMG Tone.

DIGITAL PREAMPLIFIER MODULE

Number	1 or 2 modules
Channels	32 (16 channels per preamplifier module)
Active inputs	64 (32 inputs per preamplifier module)
Leads	Auto switched
Indicators	LEDs indicate active electrode inputs
Auto recovery	0.5 sec recovery to baseline after overload
Full Scale:	±10 V to ±25 mV
Noise	20 nV ÖHz, < 2.0 mV p-p (0.2 – 200 Hz)
CMRR	> 100 dB @ 60 Hz
Impedance	> 1000 Mega Ohm on every channel
DC input	± 0.75 V
Bandwidth	1 Hz – 4 KHz
A/D converter	20KHz/channel, 16 bit
External digital interface port	Isolated, RS232, 5V, 155Kb
Interfaces to Nonin Xpod pulse oximetry Interface	Embedded
Proprietary external digital interface port	Isolated, RS232, 5V, 155Kb
Isolation	Optical
Safety	Meets or exceeds IEC60601-1
Environmental	Splash proof
Dimensions	Size: 5.5 X 8.8 X 1.5 inch, 14 x 22.4 x 4 cm
Weight	1.5 lb, 0.68 kg

PULSE OXIMETER MODULE

Oximeter device	Nonin Xpod Patient Cable Oximeter Rev 2 1 or 2 Oximeters per System
Population	Adult, pediatric and neonatal
Anatomical sites	Fingers and toes
Oxygen saturation range	0 to 100%
Pulse rate range	18 to 321 pulses per minute
Measurement wavelengths	
Red	660 Nanometers @ 3mw nominal
Infrared	910 Nanometer @ 3mw nomin
Power	Isolated, supplied by Digital Preamplifier Module
Dimensions	Size: 2.1 x 0.8 x 0.6 in ,Cable length: 6 ft
Weight	75 g

EVOKED POTENTIAL MONITORING

Channels	max 32 per set max 96 in one test
Modes	BAEP, AEP, SSEP,SEP, VEP, MEP
Averaging	Grand and linear or exponentially weighted moving averaging
Low pass filter	50 – 4000 Hz; 12 or 24 dB/oct
High pass filter	1 – 500 Hz; 6 or 12 dB/oct
Averaging filter	Zero phase bandpass or 3,5,7,9, 15, 25 pt smoothing filters
Notch filter	50 or 60 Hz
Sweeps	1 – 10000
Sweep length	1 – 5,000 msec
Timebase	0.1 – 500 msec/div, 10 divisions
Points/sweep	10 – 1000 based on Sweep Length
Artifact rej	0 – 100% of Full Scale, 0-20 msec delay
Stimulus delay	max ± 0.5 of the defined sweep length
Trace display	Current sweep, building average, last average, odd/even averages, up to 3 replications and baselines per trace
Markers	Up to 8 per trace

EEG MONITORING

Collection	Continuous, free running
Channels	max 32 per set, max 128 per program
Sampling Rate	250 samples/sec
Timebase	5,10,15,30 or 60 mm/sec and 0.2, 0.5, 1.0, 2.0 sec/div
Artifact rejection	0 – 100% full scale
Low pass filter	10 – 80 Hz; 12 or 24 dB/oct
High pass filter	1 – 20 Hz; 6 or 12 dB/oct
Notch filter	50 or 60 Hz
Processing	Absolute and relative power, rms voltage, mean and peak frequency, asymmetry and coherence in 8 user defined bands, burst suppression index, spectral edge frequency FFT epoch averaging: 1 – 30 epochs; moving averaged; 2 sec epochs

EMG MONITORING

Collection	Continuous, free running and signal and/or stimulus triggered
Channels	32 per set, max 128 per program
Traces	Free run EMG: Up to 64
Triggered EMG	Up to 64
EMG timebase	0.2, 0.5, 1.0, 2.0, 5.0 sec/div, 10 divisions
Sweep length	1 – 5,000 msec
Low pass filter	50 – 4,000 Hz; 12 or 24 dB/oct
High pass filter	1.0 – 500 Hz; 6 or 12 dB/oct
Notch filter	50 or 60 Hz
Pre-Stim delay	± 0.5 sweep length
Audio output	Selectable; any or all EMG channels
Signal trigger tones	Group High/low tone signals highest amplitude response from two groups
Trace	Unique frequency tone identifies highest amplitude signal trigger trace
Muting	Automatic muting of electrocautery noise using Mute Probe or dedicated Mute Trace

STIMULATION GENERAL

Modes	Repetitive, non-repetitive, single sequence
Interleaving	Up to 16 stimuli
Trigger source	Internal, external.
Ext trigger	TTL compatible voltage level.
Trigger edge	Rise, fall.
Presentation	Continuous, paused (when averaging is halted)
Stimulus rate	0.01 – 100 stim/sec
Train rate	1 – 500/1000 Hz
Train count	2 – 200
Stim interval	Fixed, random
Randomness	0 to 30 %.
Elec stim. extender dimensions Size	5 X 5 X 1.3 in, 12.7 x 12.7 x 3.3 cm
Weight	0.4 lb, 0.181 kg
Safety	Meets or exceeds IEC60601-1

ELECTRICAL HIGH LEVEL

Output sites	8 sites/extender. Up to 2 stim extenders/system.
Stimulus mode	Single, train, pair, unilateral, bilateral
Stimulus type	Constant current or voltage
Polarity	Normal, inverse, biphasic
Pulse Duration	0.025 – 1.0 msec
High Intensity	0 – 20 mA in 0.1 mA steps, 400 V max;
	21 – 100mA in 1mA steps, 400V max
	0 – 20V in 0.1V steps into 4K Ohm load
	21 – 400 V in 1 V steps into 4K Ohm load
Monitoring	On-screen display of patient current

ELECTRICAL SLOW CHARGE MEP

Output sites	2 sites/extender.
Stimulus mode	Single, train, sequential train, with or without peripheral facilitation
Train Rate	100 – 500Hz
Train Count	2 – 9 monophasic, 2 – 7 biphasic
Stimulus type	Constant voltage
Polarity	Normal, inverse, biphasic
Pulse Duration	0.100 – 0.500 msec
Intensity	0 – 600 V in 1 V steps into 4K Ohm load. 175mA max.
Monitoring	On-screen display of patient current
Safety	Non-repetitive or repetitive stimulation
	Safety limits for stimulation parameters
	Auto shutdown when parameters exceed safe limits.
	Minimum time to re-stimulate 0.5 second, 2 Hz max, 1 Hz default

ELECTRICAL FAST CHARGE MEP

System can support up to 2 Extender / Stimulation boxes	
Output sites	2 sites/extender.
Stimulus mode	Single, train, double train, sequential train, with or without peripheral facilitation
Train Rate	100 – 1000Hz
Train Count	1 - 10 monophasic, 2 – 8 biphasic
Double Train Sum	
Count	2 - 10 monophasic, 2 – 8 biphasic
Double Train Interval	4 - 200 msec
Stimulus type	Constant voltage
Polarity	Normal, inverse, biphasic
Pulse Duration	0.030 – 0.075 msec Rectangular pulse
Intensity	0 – 1000 V in 1 V steps 1000 mA max.
Monitoring	On-screen display of patient current
Safety	Non-repetitive or repetitive stimulation
	Safety limits for stimulation parameters
	Auto shutdown when parameters exceed safe limits.
	Minimum time to re-stimulate 0.5 second, 2 Hz max, 1 Hz default

PEDICLE SCREW INTEGRITY

Output Sites	8 sites/extender. Up to 2 stim extenders/ system.
Modes	Automatic and Manual
Stimulus mode	Single
Stimulus type	Constant current
Polarity	Normal, biphasic
Pulse Duration	0.025 - 0.50 ms, 200 µs default
Rate	0.1 – 100 Stim/sec; Default = 5 Stim/sec
Manual Mode Intensity	0 – 100mA, 400 V max
Manual Mode Intensity Step	0.1 mA: 0 – 20 mA 1 mA: 21 – 100 mA
Automatic Stimulation Intensity	Start: 3 – 10 mA End: 10 – 60 mA
Automatic Response Criteria	Start Time: 0 – 20 ms End Time: 10 - Sweep Length ms Response Threshold: 0 – 20000 µV
Response Replications	3
Pass Fail Criteria	Fail if Below: Start – Pass mA
Pass if Above	Fail – End mA
Monitoring	On-screen display of patient current
Indicators	Tone, voice
Results	Auto saved comments with spinal level, intensity and results (Pass/Fail/No Decision)

NERVE PROXIMITY

Output Sites	8 sites/extender. Up to 2 stim extenders/ system.
Modes	Automatic
Stimulus mode	Single Internal, external.
Stimulus type	Constant current
Polarity	Normal
Pulse Duration	0.050 – 0.300 ms
Rate	0.1 – 100 Stim/sec; Default = 5 Stim/sec
Intensity	Max 3 – 20 mA
Response Criteria Start Time	0 – 20 ms
End Time	10 - Sweep Length ms
Response Threshold	5 – 200 µV
Monitoring	On-screen display of patient current

ELECTRICAL LOW LEVEL

Output site	site/extender. Up to 2 stim extenders/ system.
Stimulus mode	Single, train
Stimulus type	Constant current or voltage
Polarity	Normal, inverse, biphasic
Duration	0.025 – 0.5 msec
Intensity	Low level: 0 – 4.0 mA/V in 0.01 mA/V steps, 40 V max
Monitoring	On-screen display of patient current

AUDIO

Stimulus Mode	Left, right or binaural. Single or train.
Stimulus Rate	0.01 – 100 per second.
Type	Tone burst, click.
Polarity	Rarefaction, condensation, alternating.
Intensity	0 to 134 dB SPL Tone burst, 134 dB SPL Click
Steps	1 dB
Click duration	50 to 1000 msec in 50 msec steps.
Tone freq.	0.250 to 8 KHz.
Plateau	0 – 1600 cycles
Onset ramp	0 – 320 cycles
Tone envelope	Rectangular, Linear, Hanning, Hamming, Blackman, Blackman-Harris
Calibration	SPL or nHL
Masking Noise	Broadband white noise.
Noise Intensity	0 to 125 dB SPL absolute or relative to stimulus intensity.
Transducers	ER-3A insert or TDH 39 earphones.
Earphone delay	0.95 msec, adjustable

VISUAL

Stimulus Mode	Left, right or binocular. Single or train.
Flash duration	1-10 msec
Rel intensity	0-100 %
Pk luminous int	3 X 5500 mcd
Wavelength	White light

EXTERNAL STIMULUS TRIGGER OUTPUT

Output sites	2
Stimulus mode:	Single, train, unilateral or bilateral
Duration	100 µsec
Output	TTL compatible

MAIN UNIT CONTROLLER ECLC

Width	39.0
Heigth	8.0
Depth	26.0
Weigth	4kg
Power	100W max
Fuses	2x T2.5A250V Type 2

POWER TRANSFORMER (DESKTOP VERSION ONLY)

	inch	cm
Width	7.6	19.3
Height	4.6	11.7
Depth	5.6	14.2
Weight	3kg	
Power capacity	300 VA	
Power	230 VAC	

LAPTOP DELL LATITUDE 15 6000 SERIES

	4th gen Intel® Core™ i5-4310M Processor (2.7 GHz, 3M cache)
	4GB (1x4GB) 1600MHz DDR3L Memory
	15.6inch HD (1366x768) Anti-Glare LED
	6-cell (60Wh) Lithium Ion battery with ExpressCharge™
Width	379.00 mm (14.92 inches)
Height	33.4mm (1.31 inches)
Depth	250.50 mm (9.86 inches)
Starting weight	5.64lbs / 2.56kg

DESKTOP DELL OPTIPLEX 9020 SMALL FORM FACTOR

	inch	cm
Width	3.65	9.3
Heigth	11.42	29.0
Depth	12.28	31.2
Weight	3.265 kg	
Power	240 W	

FLATSCREEN DELL P2412H, 24INCH, VESA MOUNTED

	cm
Width	56.8
Heigth	37
Depth	18
Weigth	4 kg
Screen Preset Display Area	531.36mm x 298.89mm (24" H x V)
Power	21 W typical 50 W max

PRINTER HP OFFICEJET 100 - MOBILE BLUETOOTH PRINTER

	cm
Width	34.8
Heigth	8.4
Depth	17.5
Weigth	2.5 kg
Power	40 W max 24 W typical

COMPONENTS NIM ECLIPSE SD

ECLC	NIM Eclipse® Controller
CUSB100	USB Controller Jumper cable
MDP201	Mute detector probe
MSM100	Mouse
DAQ916	Digital Preamplifier 1 or 2
CDAQ916	Digital Preamplifier Cable 1 or 2
EEX901	Stimulator Extender 1 or 2
CEEX20	Cable for Stimulator Extender (20 ft)
CEEX98	Cable for Stimulator Extender (8 ft) 32ch only
ITP916	Impedance Test Plug
OPM660	8 Channel Patient Module (SD as option)
Choice of one of the following Laptops for Portable System:	
CCPUE4	Notebook Computer English
NCCPUE4-FR	Notebook Computer French
NCCPUE4-IT	Notebook Computer Italian
NCCPUE4-ES	Notebook Computer Spanish
NCCPUE4-DE	Notebook Computer German
CNCPS100*	Notebook Computer Jumper Cable (Dell) & Jumper cable Printer
Or the following components for a Desktop System:	
NWCPUE4	Desktop Computer English
NWCPUE4-FR	Desktop Computer French
NWCPUE4-IT	Desktop Computer Italian
NWCPUE4-DE	Desktop Computer German
NWCPUE4-ES	Desktop Computer Spanish
MON19	Flat Screen 24" LCD Monitor
CPJ203	P216/226 AC Jumper Cable 3 ft x 3
CPJ206	P216/226 AC Jumper Cable 6 ft x 1
Choice of one of the following Desktop Power Controllers:	
P226	Desktop Power Controller 220V
Choice of one of the following Powercords:	
1895825	Hospital Grade Power Cord (10 ft) European
1895824	Hospital Grade Power Cord (10 ft) Hong Kong/UK
Optional Extras:	
TC32	Portable Rolling Transporter case
MCLT16	Laptop Mobile Cart
MCNW16	Desktop Mobile Cart
MCFLEX21	European Monitor Cart
POC180	Eclipse Pulse Oximeter Module
AE102	Insert Earphones
VG202	LED Goggles
CVC200	Video capture adapter
PP500	Portable printer w/Bluetooth
CNCPS100*	Notebook Computer Jumper Cable (Dell) & Jumper cable Printer
Choice of one of the following Printer Powercords:	
CPP500UK	Printer Power Cable – UK
CPP500EU	Printer Power Cable – European

SERVICE & TRAINING

Product Order Number	Description:
SERVICEH6-MCT10	Service agreement NIM Eclipse Silver
SERVICEH6-MCT9	Service agreement NIM Eclipse Gold
SERVICEH6-MCT1	Service agreement NIM Eclipse planned care + add on
WARRANTYH6-NIMECP	Warranty extention NIM Eclipse
SERVICEH6-NED	Service agreement NIM Eclipse Diamond
SERVICEH6-NEDP	Service agreement NIM Eclipse Diamond plus
SERVICEH6-ESPECL1	Exchange support program NIM Eclipse
SERVICEH6-ESPPECL1	Exchange support program plus NIM Eclipse
SERVICEH6-LOANIMEC	Loaner NIM Eclipse (per incident, complete unit)
SERVICEH6-LAB	Repair and standard part replacement NIM Eclipse
SERVICEH6-LABEX	Exchange per incident NIM Eclipse
SERVICEH6-LABEXACC	Exchange per incident accessories NIM Eclipse
SERVICEH6-SUN	Software update NIM Eclipse
SERVICEH6-PMNIMEC	Planned maintenance NIM Eclipse (per planned maintenance)/ scheduled calibrations (per day)/ regulatory test protocols (per day)
SERVICEH6-SCN	Service case support / training NIM Eclipse (per day)
SERVICEH6-TCR-ECLP	Remote case support NIM Eclipse via telephone/vpn (per hour)
SERVICEH6-ECLPACK	Training package NIM Eclipse during installation
SERVICEH6-TRWO	Training workshop NIM Eclipse per person

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