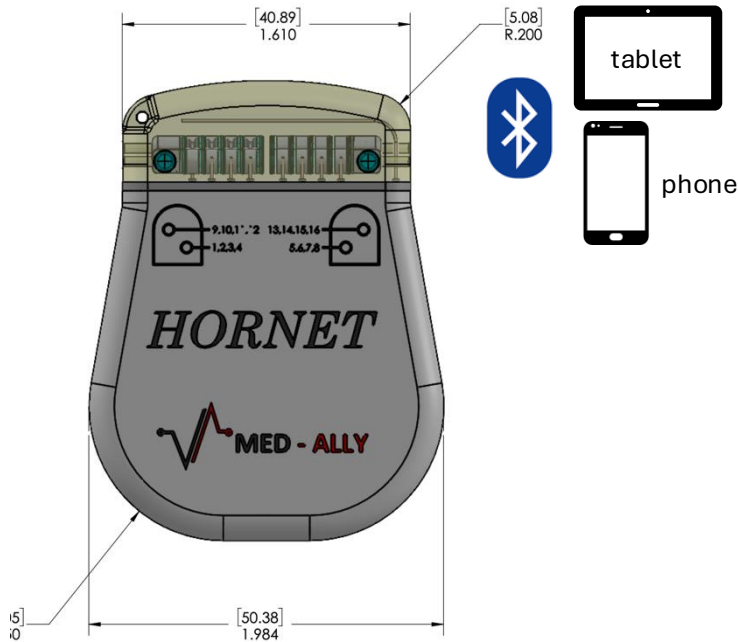




# The OpenNerve Implantable Pulse Generator (IPG)

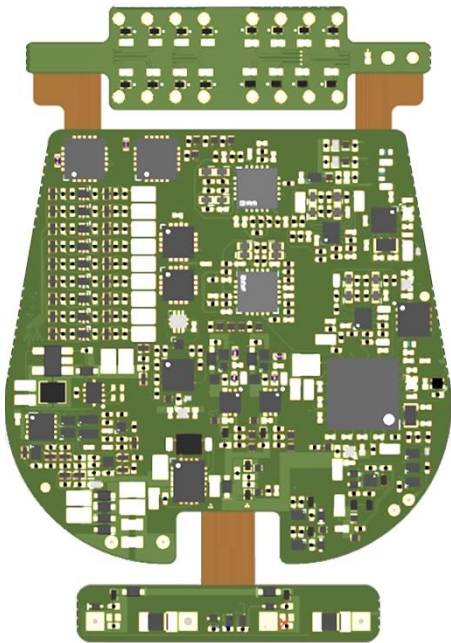
A flexible and powerful clinical-ready platform for bioelectronic medicine



- Four 4-contact or two 8-contact Bal-Seal connectors (16 total contacts)
- 8 stimulation and 8 sensing channels, configurable among the 4 header connectors
- Impedance measurement on all stimulation electrodes
- Bluetooth Low Energy (BLE) communication
- 2x rechargeable 400mAh Quallion QL0200I cells (primary cell option also available)

## Electrical Specifications

- Sequential bipolar stimulation: select any of 8 channels or IPG case as anode and cathode
- Max stimulation current of  $\pm 5\text{mA}$  at  $1.6\text{k}\Omega$  (typical for SNS) or  $\pm 4\text{mA}$  at  $2\text{k}\Omega$  (typical for cVNS)
- Analog front ends (AFEs) configurable in hardware for multiple biosignals



Stimulation Parameter	Minimum	Maximum	Step
Amplitude, mA	0.2	5	0.1
Pulse Width, $\mu\text{s}$	100	1000	50
Frequency, Hz	1	100	1
Output Limits, V	-8	8	
Ramp Up Duration, s	1	10	1
Ramp Down Duration, s	1	10	1
Train On Duration, s	10	300	10
Train Off Duration, s	0	300	10

AFE Specification	ECG HRV	ECG RR	stEMG	smEMG
High-pass filter, Hz	0.7	0.1	0.01	1
Low-pass filter, Hz	64	0.64	0.25	640
Amplitude min LSB, $\pm\mu\text{V}$	2.8	2.8	1.4	1.4
Amplitude max at 14bit, $\pm\text{mV}$	24	24	12	12
Gain for ADC $V_{\text{ref}} = \pm 3\text{V}$	125	125	250	250
ADC frequency, Hz	256	256	1	2560

ECG: electrocardiography, HRV: heart rate variability, RR: respiratory rate, stEMG: striated muscle electromyography, smEMG: smooth muscle electromyography

## Additional Features Available

- **I2C connectivity** in header for interfacing with digital sensors
- Unidirectional low-frequency AC **nerve block**
- **Neural recording** front end for compound action potentials

Learn More Here



<https://opennerve.org>