# W2100-System

## Technical Specifications

### General Characteristics
- **Operating temperature**: 10 °C to 50 °C
- **Storage temperature**: 0 °C to 70 °C
- **Relative humidity**: 10 % to 85 %, non-condensing

### Headstage
- **Dimensions (W x D x H)**
  - **W2100-HS4**: 13 x 13 x 5.5 mm (+ antenna)
  - **W2100-HS8**: 15.5 x 15.5 x 5 mm (+ antennae)
  - **W2100-HS16**: 15.5 x 15.5 x 5 mm (+ antennae)
  - **W2100-HS32**: 15.5 x 15.5 x 6.7 mm (+ antennae)
  - **W2100-HS8-ES2-0.5mA**: 15.5 x 15.5 x 5 mm (+ antennae)
  - **W2100-HS14-ES2-0.5mA**: 15.5 x 15.5 x 5 mm (+ antennae)
  - **W2100-HS4-opto**: 13 x 13 x 5.5 mm (+ antenna)
- **Weight**
  - **W2100-HS4**: approx. 1.9 g (+ battery)
  - **W2100-HS8**: approx. 2.8 g with single row connector (+ battery)
  - **W2100-HS16**: approx. 2.9 g (+ battery)
  - **W2100-HS32**: approx. 3.7 g (+ battery)
  - **W2100-HS8-ES2-0.5mA**: approx. 3.7 g (+ battery)
  - **W2100-HS14-ES2-0.5mA**: approx. 3.7 g (+ battery)
  - **W2100-HS4-opto**: approx. 1.9 g (+ battery)

### Integrated Amplifier
- **Gain**: 101
- **Bandwidth**: 1 Hz to 5 kHz (0.1 Hz on request)
- **Resolution**: 16 bit
- **Input voltage range**: + / - 12.4 mV
- **Distance for wireless link**: 5 m guaranteed (under normal circumstances)

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*Important: In MC_Rack software the scaling of the analog channels is not correct for a factor of 2, because the gain of the analog channels is not considered.*
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### Technical Specifications

#### Sampling rate in “Single Headstage Mode”

| W2100-HS4   | 40  | 25  |       |       |       |       |
| W2100-HS8   | 40  | 40  | 25    |       |       |       |
| W2100-HS16  | 40  | 40  | 25    | 25    |       |       |
| W2100-HS32  | 40  | 40  | 25    | 25    | 20    |       |
| W2100-HS8-ES2-0.5mA | 40  | 40  | 25    |       |       |       |
| W2100-HS14-ES2-0.5mA | 40  | 40  | 25    |       |       |       |
| W2100-HS4-opto | 10  | 10  |       |       |       |       |

#### Sampling rate in “Multi Headstage Mode”

| W2100-HS4   | 10  | 10  |       |       |       |       |
| W2100-HS8   | 10  | 10  | 10    |       |       |       |
| W2100-HS16  | 10  | 10  | 10    | 5     |       |       |
| W2100-HS32  | 10  | 10  | 10    | 5     | 2     |       |

#### Electrical Stimulation

- Output current:
  - W2100-HS8-ES2-0.5mA: -0.5 mA to +0.5 mA @ +/-10 V compliance voltage
  - W2100-HS14-ES2-0.5mA: -0.5 mA to +0.5 mA @ +/-10 V compliance voltage

- Rise time (10 - 66 %) current, 0 - 100 μA: 1.5 μs @ RL = 10 kΩ

#### Optical Stimulation

- LED Stimulation channels: 2
- LED driving current output: max. 1A @ max. 3.7 V compliance voltage

#### Receiver

- Dimensions (W x D x H): 250 mm x 83 mm x 25 mm w/o antennae
- Dimension of antenna: 110 mm x 10 mm (length x diameter)
- Frequency band: 2.4 GHz frequency band
- Impedance of antenna: 50 Ohm
- Analog Out only available in **W2100-RE-AO**: 68-pin MCS standard connector

#### Power supply unit (MPU 30)

- Input voltage: 90 – 264 VAC @ 47 – 63 Hz
- Output voltage: 11 – 13 V
- Max. power: 30 W
- Mark of conformity: CE, TÜV, cUL
- European standard: EN60601
**Interface Board „MCS-IFB 3.0 Multiboost“ and connectors**

- **Dimensions (W x D x H)** 250 x 83 x 25 mm
- **Weight** 300 g

**Front Panel**
- 4 Digital inputs: Lemo connector, EPL 00250 NTN
- 4 Digital outputs: Lemo connector, EPL 00250 NTN
- 2 Auxiliary channels (not in use): Lemo connector, EPL 00250 NTN

**Rear Panel**
- 1 16 Bit Digital In / Out: 68-pin MCS standard connector
- 1 8-Channel Analog In: 10-pin connector (2.54 mm grid), dual row standard IDC
- 2 Analog Inputs: Lemo connector, EPL 00250 NTN
- Signal input range for analog channels: ± 2500 mV
- Gain for analog channels: 2 *
- 1 Digital signal processor DSP port: 20-pin JTAG connector (1.27 / 2.54 mm grid), dual row
- 2 USB 3.0 ports: USB 3.0 super speed cable (type A - micro B)
- Power supply: MPU 30, PWR DC 0.85 x 2.75 mm
- Ground: Common jack 4 mm, banana plug
- 1 Audio output: Stereo jack 3.5 mm PRA.00.250.CTAC29

**Side Panel**
- 2 Interface board to headstage connectors: External power over serial ATA (eSATAp)

**Power Supply Unit (MPU 30)**
- Input voltage: 90 - 264 VAC @ 47 - 63 Hz
- Output voltage: 11 - 13 V
- Max. power: 30 W
- Mark of conformity: CE, TÜV, cUL
- European standard: EN60601

**Software**
- **Operating system**: Microsoft Windows 10, 8.1, Microsoft Windows 7 (32 or 64 bit), English and German version supported
- **Data acquisition and analysis software**
  - Multi Channel Experimenter: Version 1.5.1 and higher
  - Multi Channel Analyzer: Version 1.5.1 and higher
  - MC_Rack: Version 4.1.1 and higher
- **Data export software**
  - Multi Channel DataManager: Version 1.6.1 and higher, HDF5 (Matlab, Python, NEX (NeuroExplorer), CED (Spike), ASCII
  - MC_DataTool: Version 2.6.3 and higher, Axion binary file, ASCII, binary file
## W2100-System

### Technical Specifications

#### Storage Battery

<table>
<thead>
<tr>
<th>Storage battery</th>
<th>Lithium polymer, rechargeable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recording time of batteries in hours at maximal sampling rate on all available channels</td>
<td></td>
</tr>
<tr>
<td>W2100-HS4</td>
<td>W2100-HS8</td>
</tr>
<tr>
<td>W2100-HS16</td>
<td>W2100-HS32</td>
</tr>
<tr>
<td>30 mAh battery</td>
<td>0.8</td>
</tr>
<tr>
<td>100 mAh battery</td>
<td>2.5</td>
</tr>
<tr>
<td>200 mAh battery</td>
<td>5</td>
</tr>
<tr>
<td>300 mAh battery</td>
<td>7.5</td>
</tr>
<tr>
<td>0.6</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>6.1</td>
</tr>
<tr>
<td>0.4</td>
<td>1.3</td>
</tr>
<tr>
<td>2.5</td>
<td>3.8</td>
</tr>
<tr>
<td>0.4</td>
<td>1.2</td>
</tr>
<tr>
<td>2.3</td>
<td>3.5</td>
</tr>
</tbody>
</table>

#### Dimension of battery

<table>
<thead>
<tr>
<th>Battery Size</th>
<th>Dimensions (W x D x H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 mAh battery</td>
<td>17 x 11 x 3 mm</td>
</tr>
<tr>
<td>100 mAh battery</td>
<td>26 x 19.5 x 2.3 mm</td>
</tr>
<tr>
<td>200 mAh battery</td>
<td>26 x 20 x 4.5 mm</td>
</tr>
<tr>
<td>300 mAh battery</td>
<td>27.5 x 19.5 x 5 mm</td>
</tr>
</tbody>
</table>

#### Weight of battery

<table>
<thead>
<tr>
<th>Battery Size</th>
<th>Weight with cable: W2100-B-CA</th>
<th>Weight with battery board: W2100-B-BB</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 mAh battery</td>
<td>approx. 1.5 g</td>
<td>approx. 1.5 g</td>
</tr>
<tr>
<td>100 mAh battery</td>
<td>approx. 3.7 g</td>
<td>approx. 3.8 g</td>
</tr>
<tr>
<td>200 mAh battery</td>
<td>approx. 5.1 g</td>
<td>approx. 6.7 g</td>
</tr>
<tr>
<td>300 mAh battery</td>
<td>approx. 8.1 g</td>
<td>approx. 8.7 g</td>
</tr>
</tbody>
</table>

#### Recharging Device

<table>
<thead>
<tr>
<th>Dimensions (W x D x H)</th>
<th>Period of charging</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>55 mm x 20 mm x 10 mm</td>
<td>1 hour</td>
<td>USB powered</td>
</tr>
</tbody>
</table>

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