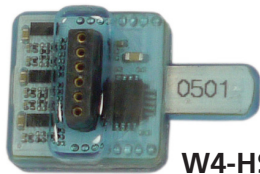


Wireless Headstages: Overview W4-HS, W8-HS, W16-HS, W32-HS

Technical Specifications of the Headstages

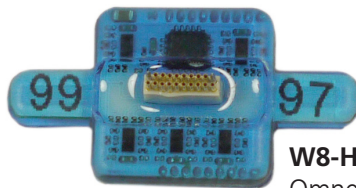
Important: Please handle the headstages with great care!
Do not touch the antennae, but the body of the headstages.



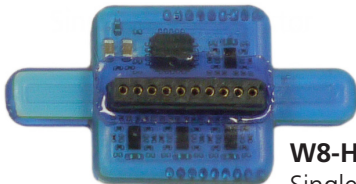
W4-HS

Technical Specifications

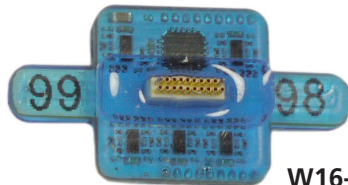
Number of recording channels	4, 8, 16 or 32
Weight (without battery)	W4 1.9 g W8 2.9 g W16 3.6 g W32 3.7 g
Dimensions (W x D x H)	W4 13 x 13 x 5 mm W8 16 x 16 x 5 mm W16 16 x 16 x 6.5 mm W32 16 x 16 x 7.5 mm
Distance for wireless link	5 m and more under normal conditions
Amplifier	
Gain	101
Bandwidth	1 Hz to 5 kHz (0.1 Hz on request)
Input impedance	1 GΩ 10 pF
Resolution	16 bit
Input voltage range	+/- 12.4 mV
Input noise	< 1.9 μV _{RMS}



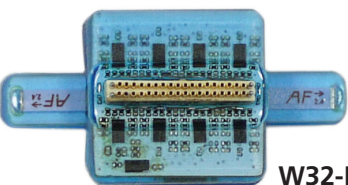
W8-HS with
Omnetics
Connector



W8-HS with
Single Row
Connector



W16-HS



W32-HS

Sampling Rate in kHz per Channel

Sampling rate (kHz / channel)		Number of selected channels				
		2	4	8	16	32
Type of head- stage	W4-HS	40	20			
	W8-HS	40	40	20		
	W16-HS	20	20	20	10	
	W32-HS	10	10	10	10	5

Software

Operating system	Windows ® 10, 8.1, 7 (64 bit)
Data acquisition and analysis software	Multi Channel Suite Version 1.5.1 and higher MC_Rack Version 4.6.2 and higher

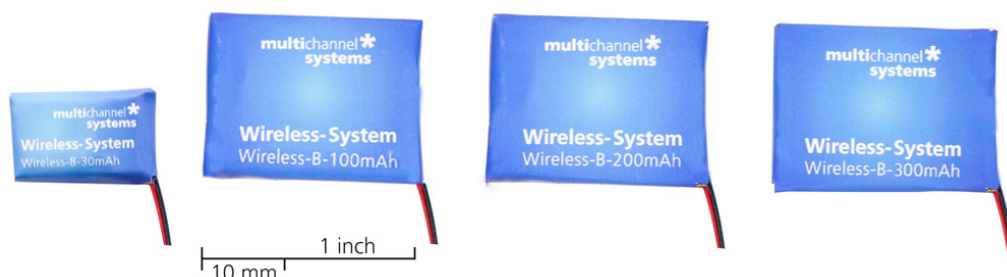
Wireless Headstages: Overview W4-HS, W8-HS, W16-HS, W32-HS

Technical Specifications of the Lithium Polymer Batteries



Batteries

Batteries do not belong in normal household waste and, thus, must always be disposed of within the framework of existing legislation.



Wireless-B-100mAh

Standard battery for the Wireless- System. Please connect the battery via cable to the headstage.



Batteries

Dimensions in mm, Weight in g

	Length	Width	Height	Weight
30 mAh	17	11	3	1.5
100 mAh	26	19.5	2.3	3.1
200 mAh	26	20	4.5	4.6
300 mAh	27.5	19.5	5	6.8

Recording Time

of batteries in hours at maximal sampling rate on all available channels

	W4-HS	W8-HS	W16-HS	W32-HS
30 mAh	1.0	0.6	0.5	0.4
100 mAh	3.2	2.	1.7	1.3
200 mAh	6.4	4	3.4	2.6
300 mAh	11.2	6.8	5.9	3.9

Longterm Storage

of the Lithium Polymer Batteries

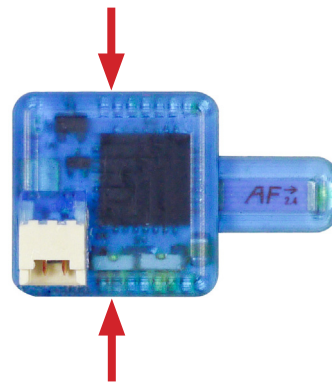
Important: Ideally store the batteries 70 % charged in a low humidity environment at 5 to 7 °C, for example in the fridge, but not in the freezer. Please check the charging state quarterly to prevent totally self-discharge, which can destroy the batteries.

W4-HS Headstage

4-Channel Wireless Headstage for Use with the Wireless-System

Applications

The W4 headstage is the ideal solution for spikes, LFP, EEG, ECG, EMG, and ECoG. Additional inputs to the interface board allow the synchronization of the data with external devices.



W4-HS top side:
Connector for the battery

Important: Please handle the headstage with great care!
Do not touch the antenna, but the body of the headstage.

Technical Specifications

Advantages

- Small-sized headstage with integrated A/D converter.
- The Wireless-System converts the recorded signals into digital data already on the headstage.
- The signal-to-noise ratio is excellent and most important, independent from the distance between sender and receiver.
- The signal amplitude is independent of the distance, too, and the data arrives safely and completely at the receiver for further analysis.

Number of recording channels
Weight (without battery)
Dimensions (W x D x H)
Distance for wireless link

4
+/- 2.2 g
13 x 13 x 5 mm
5 m and more under normal conditions

Amplifier

Gain
Bandwidth
Input impedance
Resolution
Input voltage range
Input noise

101
1 Hz to 5 kHz (0.1 Hz on request)
1 GΩ || 10 pF
16 bit
+/- 12.4 mV
< 1.9 μV_{RMS}

Sampling rate

4 channels simultaneously
2 channels simultaneously

20 kHz
40 kHz

Software

Operating system
Data acquisition and analysis software

Windows ® 10, 8.1, 7 (64 bit)
Multi Channel Suite
Version 1.5.1 and higher
MC_Rack Version 4.6.2 and higher

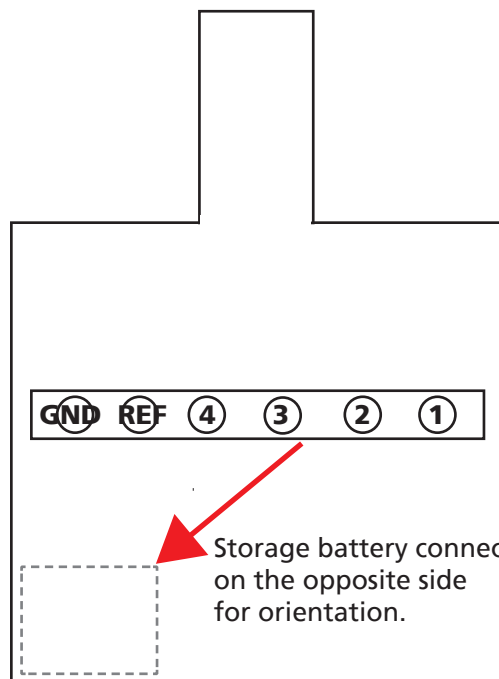
W4-HS Headstage

Layout



W4 Headstage with Single Row Connector

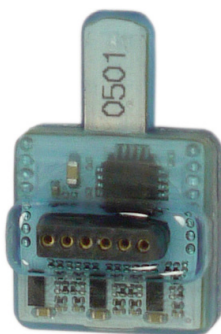
Diagram of the bottom side with pin layout. Please orientate the headstage as shown in the diagram.



Pin Layout of the single row precession socket (1.27 mm, round pins)

Wireless-B-100mAh

Standard battery for the W4-HS. Please connect the battery via cable to the headstage. The recording time with a 100 mAh battery at maximal sampling rate on all four channels is 3.2 hours.



W4-HS bottom side:

Connector for the electrode probe or for the ME/W-Signal generator.

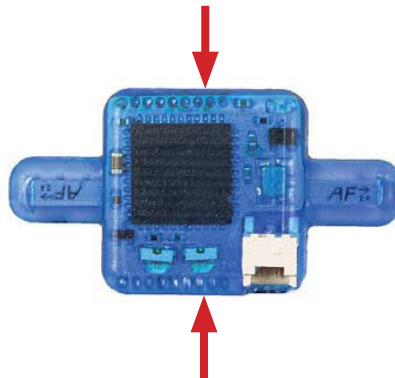
Connector for W4 Headstage with single row precession socket (1.27 mm, round pin).

The connector mates with a standard single row 1.27 mm pin connector such as: preci-dip 850-10-006-10-001101

Channel 1
Channel 2
Channel 3
Channel 4
REF (Reference)
GND (Ground)

W8-HS Headstage

8-Channel Wireless Headstage for Use with the Wireless-System



W8-HS top side:
Connector for the battery

Applications

The W8 headstage is the ideal solution for spikes, LFP, EEG, ECG, EMG, and ECoG. Additional inputs to the interface board allow the synchronization of the data with external devices.

Important: Please handle the headstage with great care!
Do not touch the antennae, but the body of the headstage.

Advantages

- Small-sized headstage with integrated A/D converter.
- The Wireless-System converts the recorded signals into digital data already on the headstage.
- The signal-to-noise ratio is excellent and most important, independent from the distance between sender and receiver.
- The signal amplitude is independent of the distance, too, and the data arrives safely and completely at the receiver for further analysis.

Technical Specifications

Number of recording channels	8
Weight (without battery)	+/- 2.9 g
Dimensions (W x D x H)	16 x 16 x 5 mm
Distance for wireless link	5 m and more under normal conditions
Amplifier	
Gain	101
Bandwidth	1 Hz to 5 kHz (0.1 Hz on request)
Input impedance	1 GΩ 10 pF
Resolution	16 bit
Input voltage range	+/- 12.4 mV
Input noise	< 1.9 μV _{RMS}
Sampling rate	
8 channels simultaneously	20 kHz
4 channels simultaneously	40 kHz
2 channels simultaneously	40 kHz
Software	
Operating system	Windows ® 10, 8.1, 7 (64 bit)
Data acquisition and analysis software	Multi Channel Suite Version 1.5.1 and higher MC_Rack Version 4.6.2 and higher

W8-HS Headstage

Layout for the W8-HS Headstage with Single Row Connector

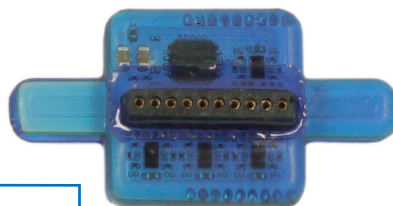
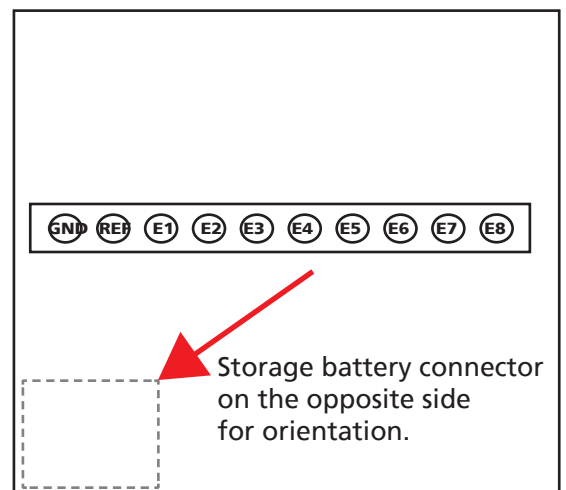


Wireless-B-100mAh

Standard battery for the W8-HS. Please connect the battery via cable to the headstage. The recording time with a 100 mAh battery at maximal sampling rate on all eight channels is 2 hours.

W8 Headstage with Single Row Connector

Diagram of the bottom side with pin layout. Please orientate the headstage as shown in the diagram.



W8-HS bottom side:
Connector for the electrode probe or for the ME/W-Signal generator.

Connector for W8 Headstage with single row precession socket (1.27 mm, round pin).

The connector mates with a standard single row 1.27 mm pin connector such as: preci-dip 850-10-006-10-001101

Pin Layout of the single row precession socket (1.27 mm, round pins)

GND	Ground
REF	Reference
E1	Channel 1
E2	Channel 2
E3	Channel 3
E4	Channel 4
E5	Channel 5
E6	Channel 6
E7	Channel 7
E8	Channel 8

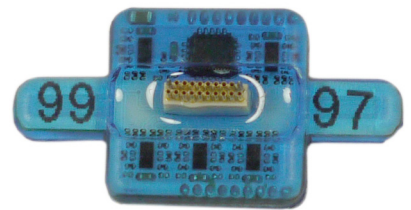
W8-HS Headstage

Layout for the W8-HS Headstage with Omnetics Connector

Connector for W8 Headstage with Omnetics Connector.

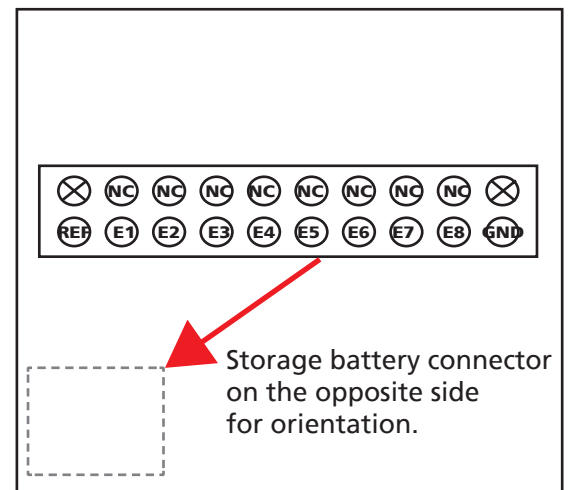
The Omnetics connector mates with standard pin connector such as:
Through-Hole:
A79038-001 (NPD-18-DD-GS)
Horizontal Surface Mount:
A79040-001 (NPD-18-AA-GS)
Vertical Surface Mount:
A79042-001 (NPD-18-VV-GS)
Cable (18.0" 34 AWG lead-wire):
A79044-001 (NPD-18-WD-18.0-C-GS)

W8-HS bottom side:
Connector for the electrode probe or for the ME/W-Signal generator.



W8 Headstage with Omnetics Connector

Diagram of the bottom side with pin layout. Please orientate the headstage as shown in the diagram.



Wireless-B-100mAh

Standard battery for the W8-HS. Please connect the battery via cable to the headstage. The recording time with a 100 mAh battery at maximal sampling rate on all eight channels is 2 hours.



Pin Layout of the single row precession socket (1.27 mm, round pins)

NC	Guide post	REF	Reference
NC	not connected	E1	Channel 1
NC	not connected	E2	Channel 2
NC	not connected	E3	Channel 3
NC	not connected	E4	Channel 4
NC	not connected	E5	Channel 5
NC	not connected	E6	Channel 6
NC	not connected	E7	Channel 7
NC	not connected	E8	Channel 8
NC	Guide post	GND	Ground

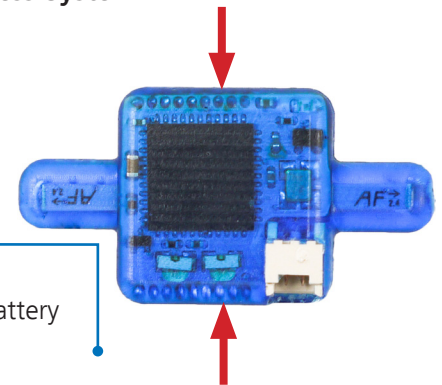
W16-HS Headstage

16-Channel Wireless Headstage for Use with the Wireless-System

Applications

The W16 headstage is the ideal solution for spikes, LFP, EEG, ECG, EMG, and ECoG. Additional inputs to the interface board allow the synchronization of the data with external devices.

W16-HS top side:
Connector for the battery



Important: Please handle the headstage with great care!
Do not touch the antennae, but the body of the headstage.

Technical Specifications

Number of recording channels	16
Weight (without battery)	+/- 3.6 g
Dimensions (W x D x H)	16 x 16 x 6.5 mm
Distance for wireless link	5 m and more under normal conditions
Amplifier	
Gain	101
Bandwidth	1 Hz to 5 kHz (0.1 Hz on request)
Input impedance	1 GΩ 10 pF
Resolution	16 bit
Input voltage range	+/- 12.4 mV
Input noise	< 1.9 μV _{RMS}
Sampling rate	
16 channels simultaneously	10 kHz
8 channels simultaneously	20 kHz
4 channels simultaneously	20 kHz
2 channels simultaneously	20 kHz

Software

Operating system	Windows ® 10, 8.1, 7 (64 bit)
Data acquisition and analysis software	Multi Channel Suite Version 1.5.1 and higher MC_Rack Version 4.6.2 and higher

Advantages

- Small-sized headstage with integrated A/D converter.
- The Wireless-System converts the recorded signals into digital data already on the headstage.
- The signal-to-noise ratio is excellent and most important, independent from the distance between sender and receiver.
- The signal amplitude is independent of the distance, too, and the data arrives safely and completely at the receiver for further analysis.

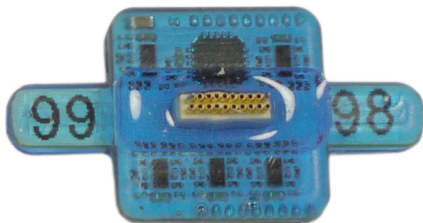
W16-HS Headstage

Layout



Wireless-B-100mAh

Standard battery for the W16-HS. Please connect the battery via cable to the headstage. The recording time with a 100 mAh battery at maximal sampling rate on all sixteen channels is 1.7 hours.



W16-HS bottom side:

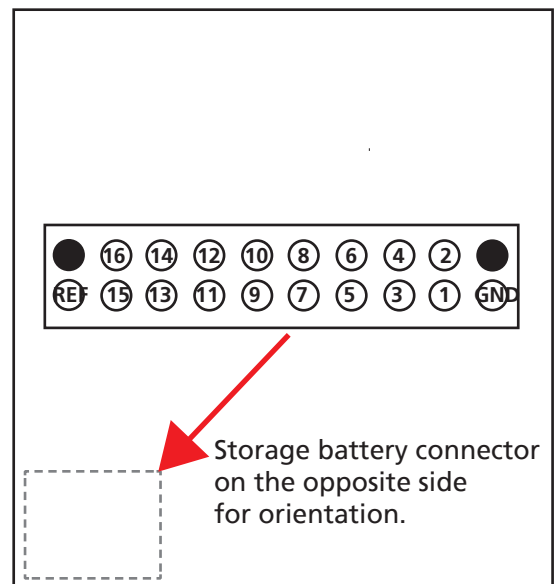
Connector for the electrode probe or for the ME/W-Signal generator.

Connector for W16 Headstage with Omnetics Connector

The Omnetics connector A79039-001 (NSD-18-DD-GS) mates with standard pin connector such as:
Through-Hole:
A79038-001 (NPD-18-DD-GS)
Horizontal Surface Mount:
A79040-001 (NPD-18-AA-GS)
Vertical Surface Mount:
A79042-001 (NPD-18-VV-GS)
Cable (18.0" 34 AWG lead-wire):
A79044-001 (NPD-18-WD-18.0-C-GS)

W16 Headstage with Omnetics Connector

Diagram of the bottom side with pin layout. Please orientate the headstage as shown in the diagram.



Pin Layout of the Omnetics Connector
A79039-001 (NSD-18-DD-GS)

GND (Ground)	Guide Post
Channel 1	Channel 2
Channel 3	Channel 4
Channel 5	Channel 6
Channel 7	Channel 8
Channel 9	Channel 10
Channel 11	Channel 12
Channel 13	Channel 14
Channel 15	Channel 16
REF (Reference)	Guide Post

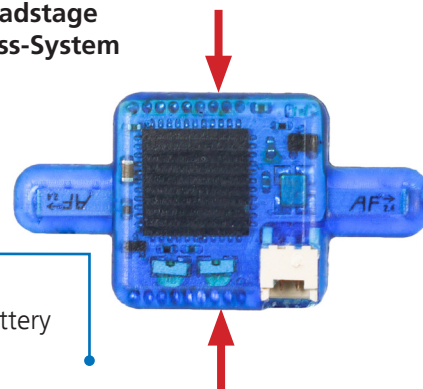
W32-HS Headstage

32-Channel Wireless Headstage for Use with the Wireless-System

Applications

The W32 headstage is the ideal solution for spikes, LFP, EEG, ECG, EMG, and ECoG. Additional inputs to the interface board allow the synchronization of the data with external devices.

W32-HS top side:
Connector for the battery



Important: Please handle the headstage with great care!
Do not touch the antennae, but the body of the headstage.

Technical Specifications

Number of recording channels	32
Weight (without battery)	+/- 3.7 g
Dimensions (W x D x H)	16 x 16 x 7.5 mm
Distance for wireless link	5 m and more under normal conditions
Amplifier	
Gain	101
Bandwidth	1 Hz to 5 kHz (0.1 Hz on request)
Input impedance	1 GΩ 10 pF
Resolution	16 bit
Input voltage range	+/- 12.4 mV
Input noise	< 1.9 μV _{RMS}
Sampling rate	
32 channels simultaneously	5 kHz
16 channels simultaneously	10 kHz
8 channels simultaneously	10 kHz
4 channels simultaneously	10 kHz
2 channels simultaneously	10 kHz
Software	
Operating system	Windows ® 10, 8.1, 7 (64 bit)
Data acquisition and analysis software	Multi Channel Suite Version 1.5.1 and higher MC_Rack Version 4.6.2 and higher

Advantages

- Small-sized headstage with integrated A/D converter.
- The Wireless-System converts the recorded signals into digital data already on the headstage.
- The signal-to-noise ratio is excellent and most important, independent from the distance between sender and receiver.
- The signal amplitude is independent of the distance, too, and the data arrives safely and completely at the receiver for further analysis.

W32-HS Headstage

Layout

Wireless-B-100mAh

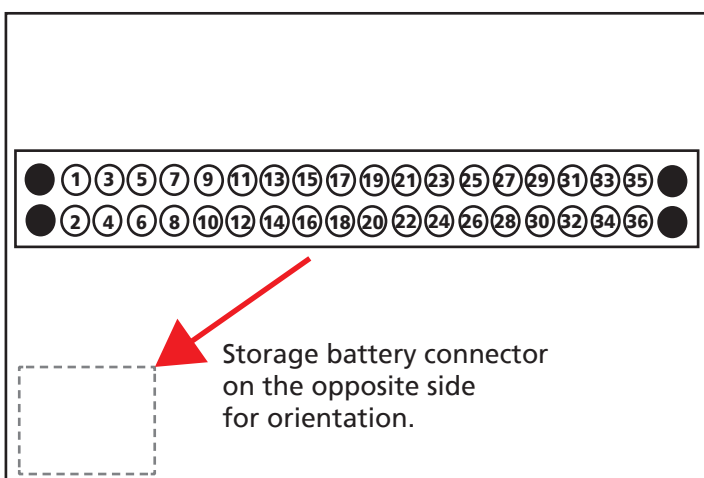
Standard battery for the W32-HS. Please connect the battery via cable to the headstage. The recording time with a 100 mAh battery at maximal sampling rate on all thirty-two channels is 1.3 hours.

W32-HS bottom side:

Connector for the electrode probe or for the ME/W-Signal generator.

W16 Headstage with Omnetics Connector

Diagram of the bottom side with pin layout. Please orientate the headstage as shown in the diagram.



Connector for W32 Headstage with Omnetics Connector

A79023-001 (NSD-36-DD-GS female, 4 guide posts mates with standard pin connector such as:
Straight Thru-Hole:
A79022-001
Horizontal Surface Mount:
A79024-001
Vertical Surface Mount:
A79026-001
Cable (18.0" 34 AWG lead-wire):
A79028-001

Pin Layout of the Omnetics Connector

Pin 1	GND (Ground)	Pin 13	Channel 11	Pin 25	Channel 23
Pin 2	REF (Reference)	Pin 14	Channel 12	Pin 26	Channel 24
Pin 3	Channel 1	Pin 15	Channel 13	Pin 27	Channel 25
Pin 4	Channel 2	Pin 16	Channel 14	Pin 28	Channel 26
Pin 5	Channel 3	Pin 17	Channel 15	Pin 29	Channel 27
Pin 6	Channel 4	Pin 18	Channel 16	Pin 30	Channel 28
Pin 7	Channel 5	Pin 19	Channel 17	Pin 31	Channel 29
Pin 8	Channel 6	Pin 20	Channel 18	Pin 32	Channel 30
Pin 9	Channel 7	Pin 21	Channel 19	Pin 33	Channel 31
Pin 10	Channel 8	Pin 22	Channel 20	Pin 34	Channel 32
Pin 11	Channel 9	Pin 23	Channel 21	Pin 35	GND (Ground)
Pin 12	Channel 10	Pin 24	Channel 22	Pin 36	GND (Ground)