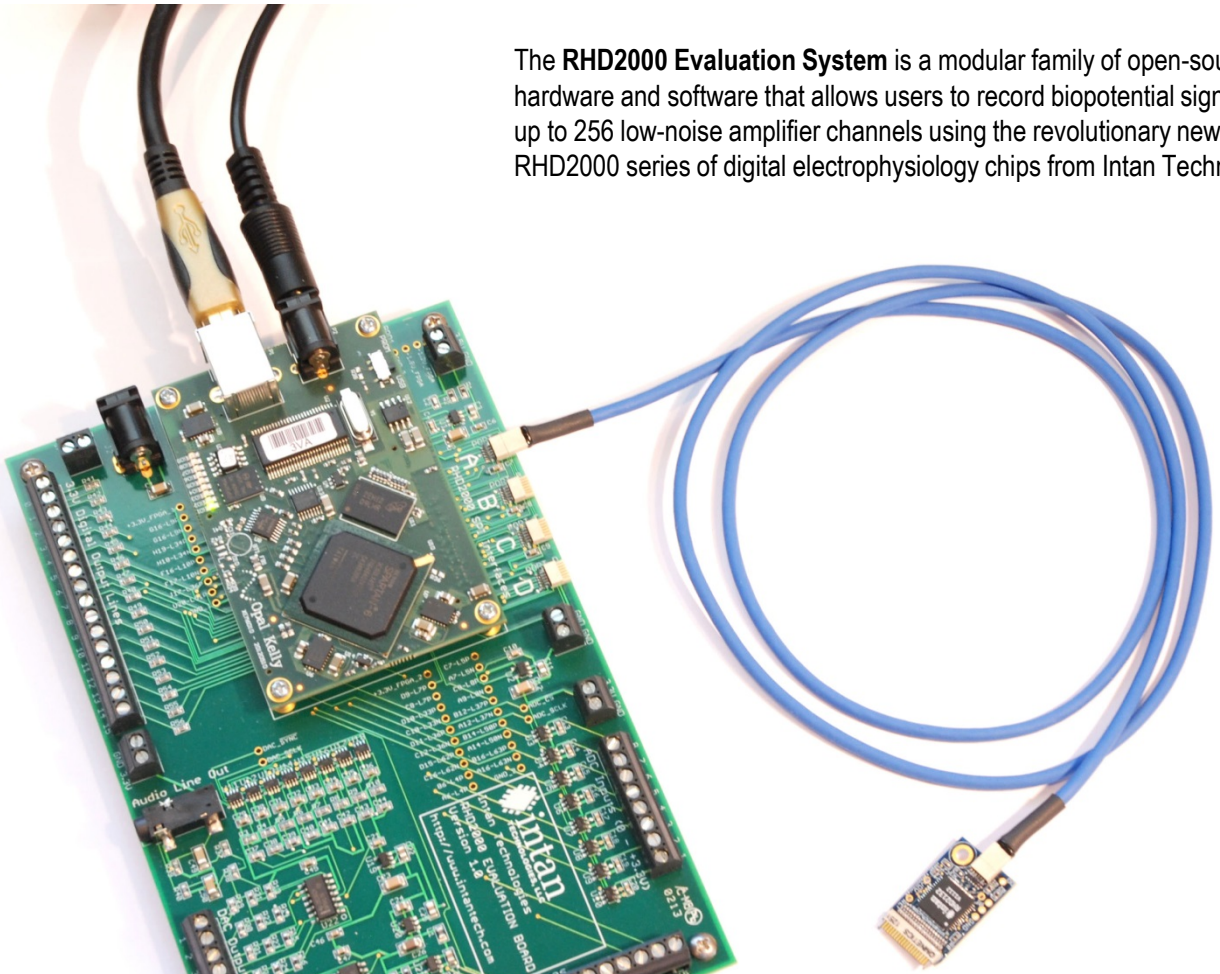
RHD2000 Evaluation System Catalog

20 May 2015



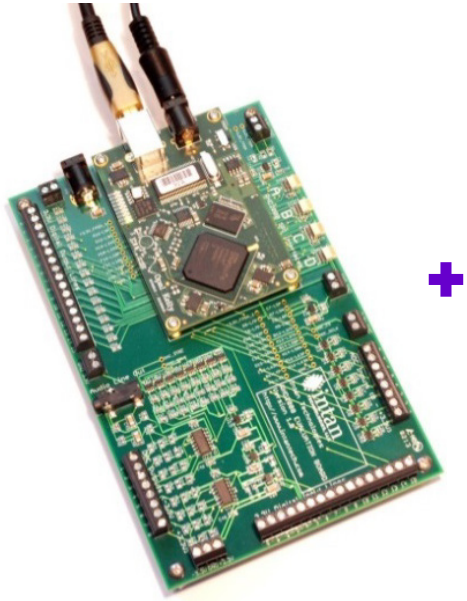
The **RHD2000 Evaluation System** is a modular family of open-source hardware and software that allows users to record biopotential signals from up to 256 low-noise amplifier channels using the revolutionary new RHD2000 series of digital electrophysiology chips from Intan Technologies.

For more information on the items listed in this catalog, visit **http://www.intantech.com/RHD2000_evaluation_system.html**.

For prices and order forms visit **http://www.intantech.com/pricing.html**.

Basic RHD2000 Evaluation System

The **RHD2000 USB interface board** connects to a host computer via a standard USB 2.0 cable. Small **amplifier boards** connect to this controller via thin, flexible all-digital **SPI interface cables**. Amplifier boards are available with unipolar electrode inputs and a common reference input (commonly used in neural recording applications) or with bipolar electrode inputs (commonly used in surface EMG or ECG applications). Some boards contain 3-axis accelerometers that may be used to monitor motion or orientation with respect to gravity.



RHD2000 USB interface board (#C3100)

Includes USB 2.0 cable and power source.

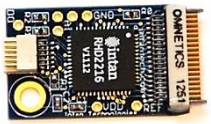
Each RHD2000 USB interface board supports up to four SPI interface cables.

RHD2000 3-ft (0.9 m) SPI interface cable (#C3203)
RHD2000 6-ft (1.8 m) SPI interface cable (#C3206)
RHD2000 3-ft (0.9 m) Ultra Thin SPI interface cable (#C3213)
RHD2000 6-ft (1.8 m) Ultra Thin SPI interface cable (#C3216)

Multiple SPI cables may be daisy-chained to form longer cables up to 10 meters (33 feet) in length.

Both standard (blue) and ultra thin (violet) SPI cables are shown here.

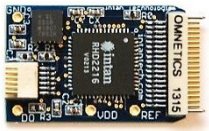
RHD2132 amplifier board with 32 unipolar inputs (#C3314)



RHD2216 amplifier board with 16 bipolar inputs (#C3313)

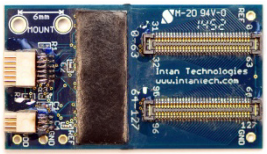
RHD2164 amplifier board with 64 unipolar inputs (#C3315)

RHD2132 amplifier / accelerometer board with 32 unipolar inputs and 3-axis accelerometer (#C3324)



RHD2216 amplifier / accelerometer board with 16 bipolar inputs and 3-axis accelerometer (#C3323)

RHD2132 16-channel amplifier board with 16 unipolar inputs (#C3334)



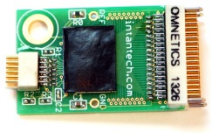
RHD2000 128-channel amplifier board with 128 unipolar inputs (#C3316)

For more information on these items, see the **RHD2000 evaluation system datasheet** at **www.intantech.com/downloads.html**.

RHD2000 Electrode Adapters

Amplifier Boards with 2x Omnetics A79025 36-pin Connectors

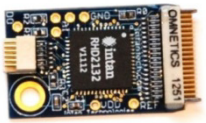
RHD2164 amplifier board with 64 unipolar inputs (#C3315)



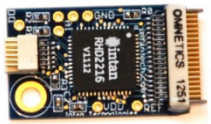
Direct connection to NeuroNexus H64LP electrode connectors with 2x Omnetics NPD-36 connectors with 4 guide posts each or two of the adapters shown below.

Amplifier Boards with Omnetics A79025 36-pin Connector

RHD2132 amplifier board with 32 unipolar inputs (#C3314)

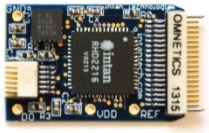


RHD2216 amplifier board with 16 bipolar inputs (#C3313)



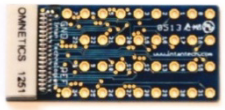
RHD2132 amplifier / accelerometer board with 32 unipolar inputs and 3-axis accelerometer (#C3324)

RHD2216 amplifier / accelerometer board with 16 bipolar inputs and 3-axis accelerometer (#C3323)

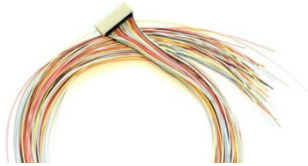


Direct connection to electrodes with Omnetics NPD-36 connectors with 4 guide posts such as NeuroNexus CM, OCM, and H32 chronic electrode connectors, Plexon CON/32m-V connector, or Blackrock CerePlex M connector.

or



or



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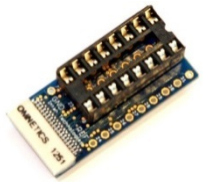


RHD2000 electrode adapter board with 36-pin connector (#C3410)

Wires may be soldered into holes, or 16-pin DIP socket (included) may be soldered onto board to connect to a NeuroNexus A, OA, or D16 acute electrode connector.

RHD2000 36-pin wire adapter for 36-pin connector (#C3420)

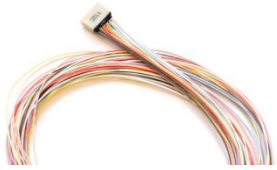
Amplifier Boards with Omnetics A79041 18-pin Connector

Direct connection to electrodes with Omnetics NPD-18 connectors with 2 guide posts such as NeuroNexus CM, OCM, and HC16 chronic electrode connectors.

RHD2132 16-channel amplifier board with 16 unipolar inputs (#C3334)

+

or



RHA/RHD2000 18-pin wire adapter for 16-channel amplifier board (#B7600)

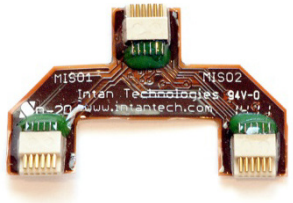
For more information on these items, see the **RHD2000 evaluation system datasheet** at **www.intantech.com/downloads.html**.

RHD2000 Dual Headstage Adapters

The **RHD2000 dual headstage adapter** allows two amplifier boards to share a single SPI interface cable.

(Cannot be used with the RHD2000 128-channel amplifier board.)

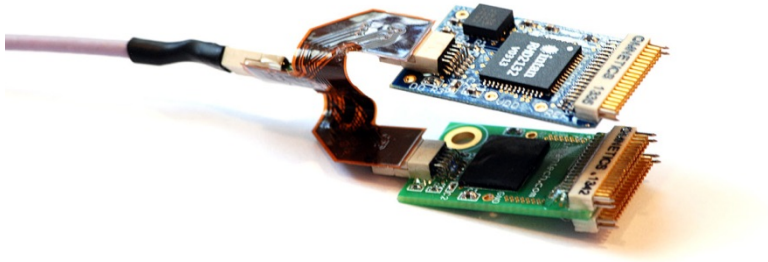
For more information, see the **RHD2000 dual interface adapter datasheet** at **www.intantech.com/downloads.html**



RHD2000 dual headstage adapter (#C3440)

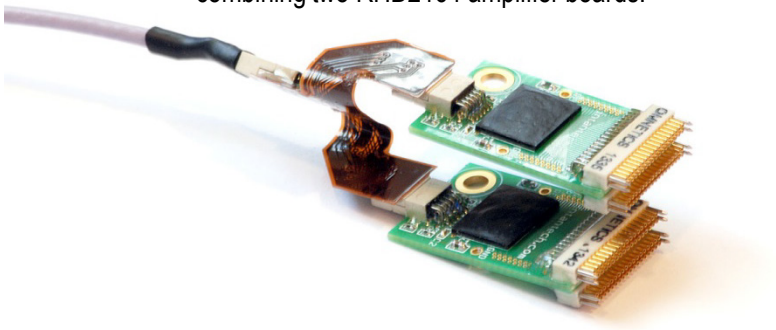
A 96-channel headstage with accelerometer created by combining an RHD2164 amplifier board with an RHD2132 amplifier/accelerometer board.

to **RHD2000 USB interface board** ←



A 128-channel headstage created by combining two RHD2164 amplifier boards.

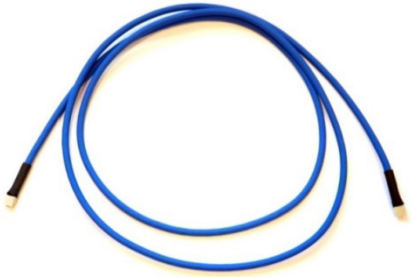
to **RHD2000 USB interface board** ←



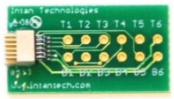
RHD2000 SPI Cable Adapters

The **RHD2000 SPI cable adapter board** provides a convenient way to access all 12 wires in an **RHD2000 SPI interface cable**. These boards may be used to develop interfaces between custom hardware under development and existing Intan products.

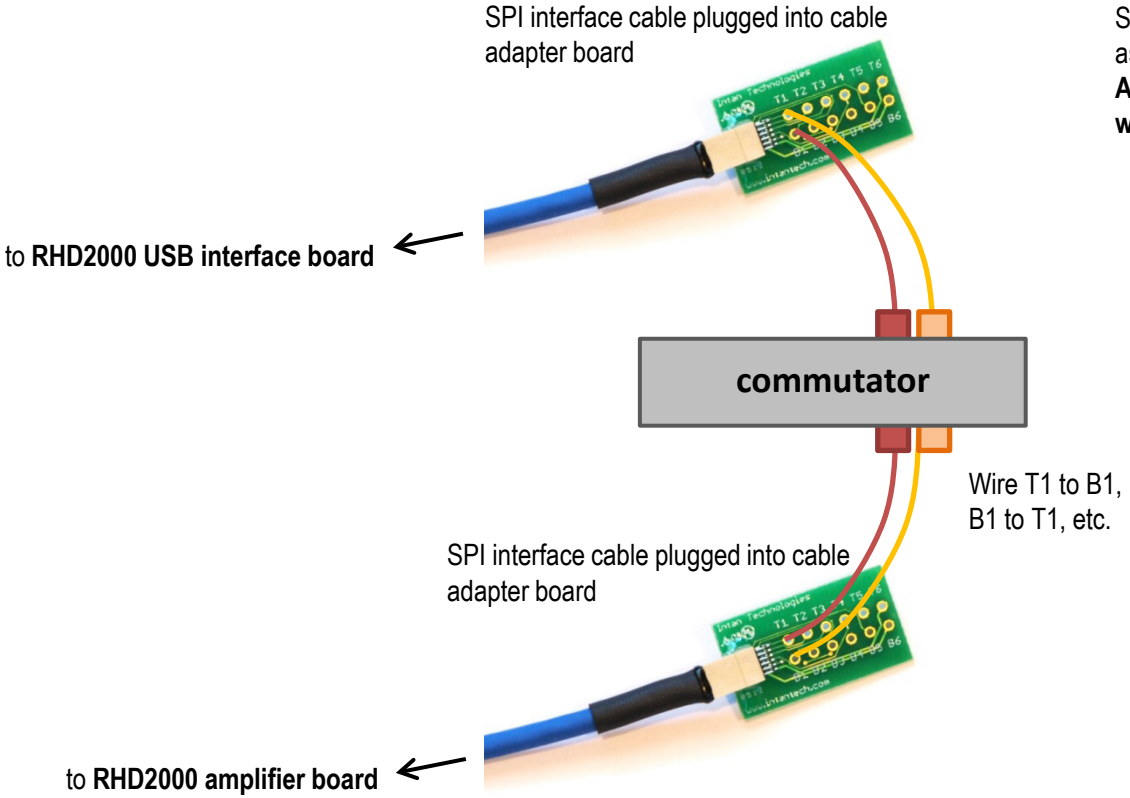
For more information, see the **RHD2000 SPI cable/connector specification** at **www.intantech.com/downloads.html**



RHD2000 SPI interface cable



RHD2000 SPI cable adapter board for custom SPI interface applications (#C3430)

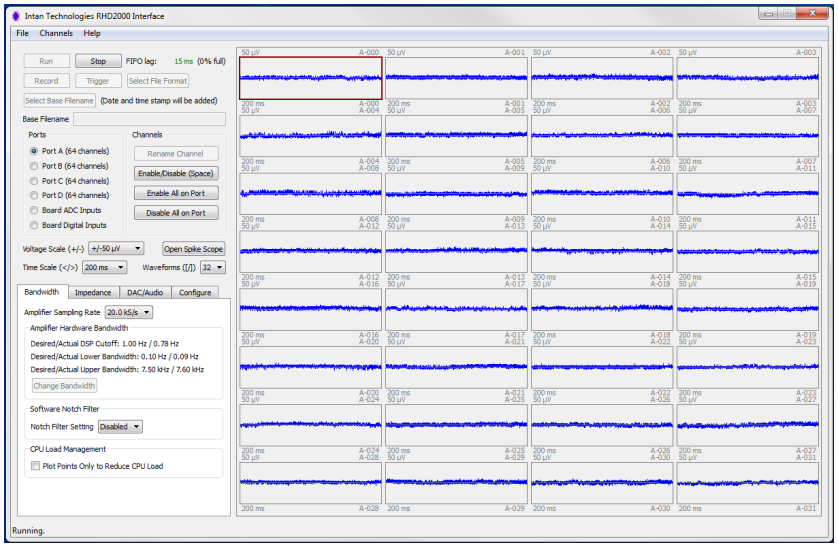


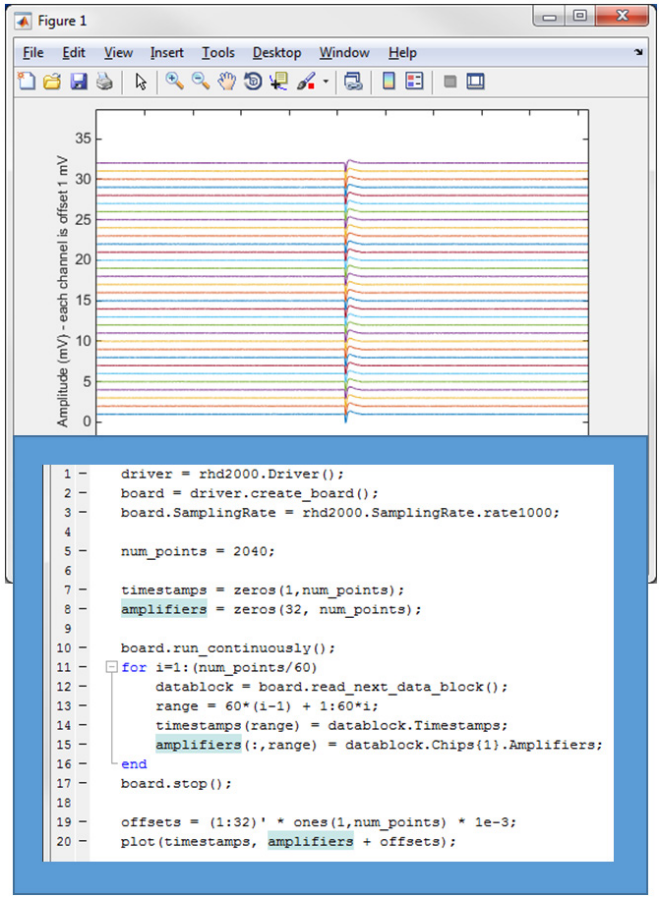
Two RHD2000 SPI cable adapter boards may be used to pass SPI interface signals through a custom connector or commutator, as shown here. For more information, see the **RHD2000 Application note: Adapting SPI cables to a commutator** at **www.intantech.com/downloads.html**.

RHD2000 Interface Software

Intan Technologies offers free, open-source interface software that allows users to acquire data from the RHD2000 Evaluation System.

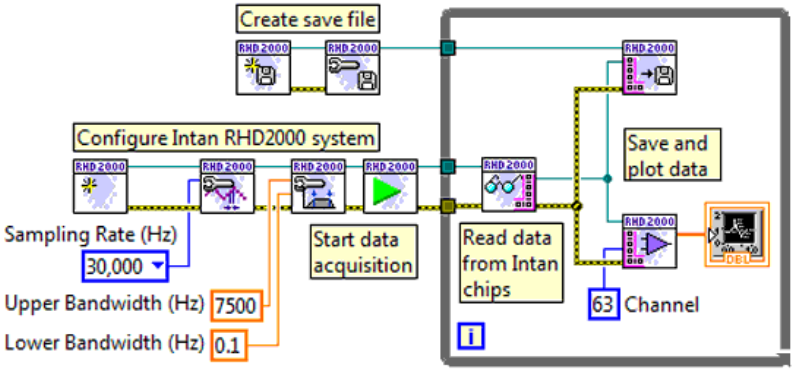
A compiled, executable version of this software for Windows, as well as the C++/Qt source code, is available at **www.intantech.com/downloads.html#software**.



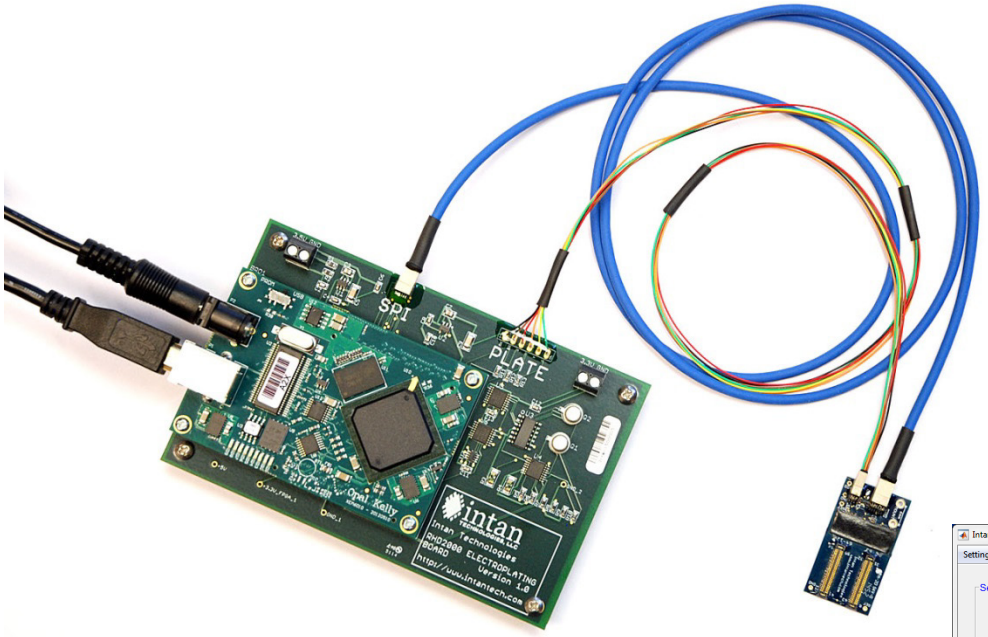


The **RHD2000 MATLAB Toolbox** (#S2120) is available for users who wish to integrate the RHD2000 Evaluation System directly with MATLAB. For more information on the MATLAB toolbox, see **www.intantech.com/RHD2000_matlab_toolbox.html**.

The **RHD2000 LabVIEW Library** (#S2100) allows users to control the RHD2000 Evaluation System directly from LabVIEW. For more information on the LabVIEW library, see **www.intantech.com/RHD2000_labview_library.html**.

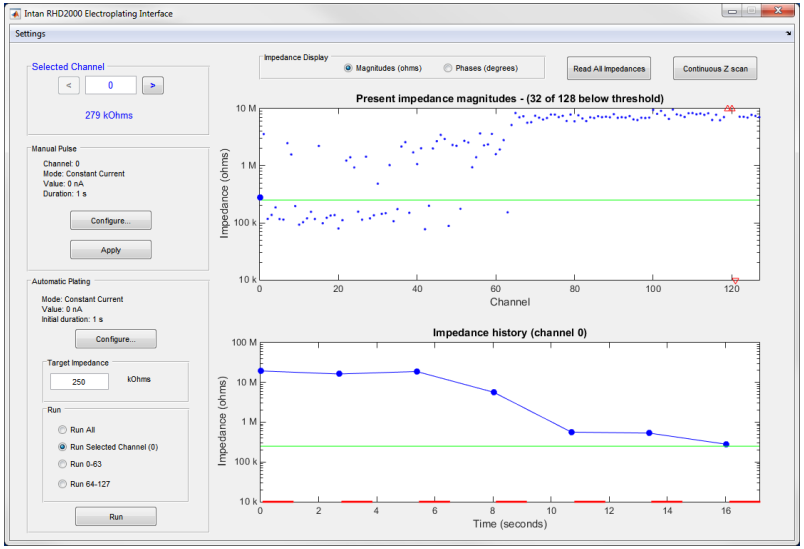


RHD2000 Electroplating Board



The **RHD2000 electroplating board** (#C3180) works with the 128-channel amplifier board. Together, these modules support automated electroplating of microelectrode arrays.

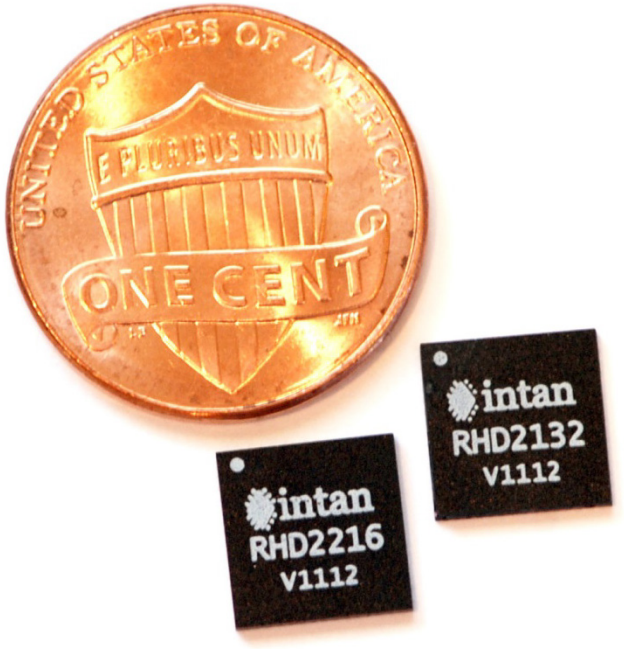
Includes USB 2.0 cable and power source.

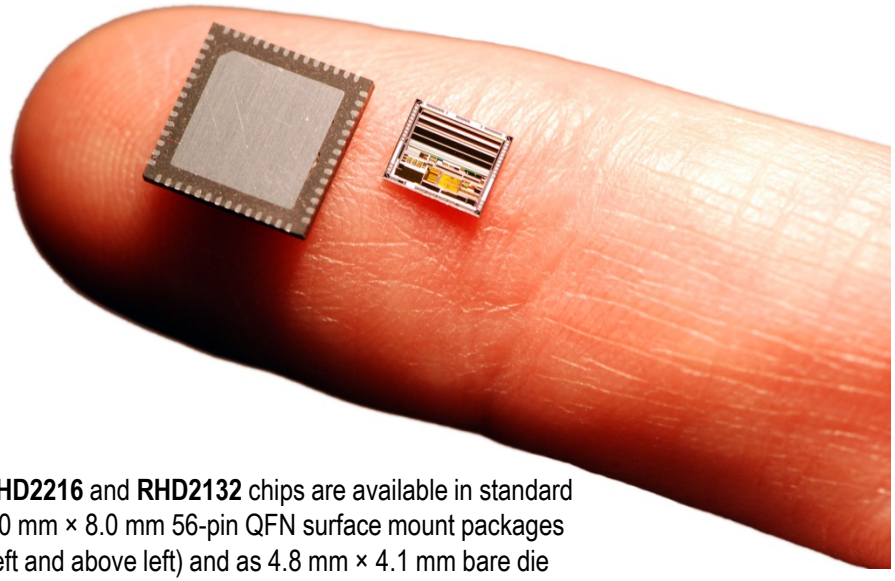


The electroplating MATLAB GUI requires the **RHD2000 MATLAB Toolbox** (#S2120) for operation.

For more information on these items, see **www.intantech.com/RHD2000_electroplating_board.html**.

RHD2000 Digital Electrophysiology Chips





RHD2216 and **RHD2132** chips are available in standard 8.0 mm × 8.0 mm 56-pin QFN surface mount packages (left and above left) and as 4.8 mm × 4.1 mm bare die (above right). **RHD2164** chips are available as 7.3 mm × 4.2 mm bare die only.

RHD2216 digital electrophysiology chip with 16 × 2 bipolar (differential) inputs
in QFN surface-mount package (#D8213)
as bare die (#P8003)

RHD2132 digital electrophysiology chip with 32 unipolar inputs and common reference input
in QFN surface-mount package (#D8214)
as bare die (#P8004)

RHD2164 digital electrophysiology chip with 64 unipolar inputs and common reference input
as bare die only (#P8005)

For more information on these items, see the **RHD2000 series digital electrophysiology interface chip datasheet** at **www.intantech.com/downloads.html**.