



Signal Processing Units

User guide

July 2016

Rev 05

Worldwide technical support and product information:

www.toolsforsmartminds.com

TOOLS for SMART MINDS Corporate headquarter

Via Padania, 16 Castel Mella 25030 Brescia (Italy)

Copyright © 2014 TOOLS for SMART MINDS. All rights reserved.

SUMMARY

Overview	5
Requirements	5
Minimum hardware requirements	5
Minimum software requirements	5
Installation	6
Selecting a SPU	7
Direct (No processing)	Error! Bookmark not defined.
Useful links	10

OVERVIEW

iDaq supports installation of additional components to extend capabilities and features of iDaq itself. Thanks to these additional components, new types of acquisition devices, new signals processing features and other kinds of functionalities can be added to iDaq.

Signal Processing Units (SPU) is a component for iDaq that allows to manipulate raw signals acquired from a wide range of sensors and electronic devices, to get values in engineering units with specific scales.

This guide explains how to install and use the SPU component.

REQUIREMENTS

This section contains the list of requirements that users should know before using Signal Processing Units for iDaq.

MINIMUM HARDWARE REQUIREMENTS

Ensure that your computer fulfills the following hardware requirements:

- Dual core CPU or higher.
- 2 GB RAM (4 GB is strongly recommended).
- Display resolution 1024x768 or higher.
- Mouse or other pointing device.
- Network connection.

MINIMUM SOFTWARE REQUIREMENTS

Ensure that your computer fulfills the following software requirements:

- OS: Windows 7 or higher.
- iDaq 2015. You can download an evaluation copy of iDaq at the following site:
<http://www.idaq-datalogger.com>

INSTALLATION

To install Signal Processing Units (SPU) for iDaq, run iDaq and click on **Configuration ▶ Option ▶ Install**. Browse your files in File Explorer and select the component file (**SPU.zip**). Once SPU file is selected, iDaq will automatically install it. As shown in the following figure, if the installation process has been successfully completed, a new set of processing units will be added in the list of installed components. If the installation process has not been successfully completed, an error will appear.

Installed Components*	Version	File
Product Types		
Capabilities		
Channels		
Waveform Processing Units		
Decimation	1.0.0.19	C:\iDaq\Components\WPU_Decimation\T4SM_iDaq_WPU_Dec
Phonic Wheel	1.0.0.42	C:\iDaq\Components\WPU_PhonicWheel\T4SM_iDaq_WPU_Ph
Polynomial	2.0.1.66	C:\iDaq\Components\WPU\T4SM_iDaq_WPU.Mlibp
Probe	2.0.1.66	C:\iDaq\Components\WPU\T4SM_iDaq_WPU.Mlibp
Absolute Value	2.0.1.66	C:\iDaq\Components\WPU\T4SM_iDaq_WPU.Mlibp
Mean Value	2.0.1.66	C:\iDaq\Components\WPU\T4SM_iDaq_WPU.Mlibp
Negate Value	2.0.1.66	C:\iDaq\Components\WPU\T4SM_iDaq_WPU.Mlibp
RMS Value	2.0.1.66	C:\iDaq\Components\WPU\T4SM_iDaq_WPU.Mlibp
Filter	2.0.1.66	C:\iDaq\Components\WPU\T4SM_iDaq_WPU.Mlibp
1st Order Derivative	2.0.1.66	C:\iDaq\Components\WPU\T4SM_iDaq_WPU.Mlibp
Custom Code	1.0.0.27	C:\iDaq\Components\WPU_CustomCode\T4SM_iDaq_WPU_Cu

*Changes to marked options will take effect the next time you start iDaq.

FIGURE 1 - INSTALLING SIGNAL PROCESSING UNITS COMPONENT FOR IDAQ

Once installation is completed, you can start to process acquired signals with new Processing Units.

SELECTING A SPU

To select the right SPU associated to a channel, follow the steps indicated below.

Click on device icon to open its editor, a window similar to the one illustrated in next figure displays all settings of your device. Buttons with sensors icon at the right, allow to configure channels managed by your device. Multifunction boards have multiple capabilities: analog input, digital input, analog output, digital output, etc. other acquisition devices, such CompactDAQ modules, have fewer capabilities.



FIGURE 2 DEVICE EDITOR WINDOW.

Click on "Sensor Configuration" button at the right of the feature (highlighted button in previous image) that manages your device channels to display the channel editor window. Channel editor windows may have different functionalities according to the type of capability you have selected. in the following figure, you see Channel Editor Window for Analog Input acquisition of DAQ-mx devices.

Name	Units	Actual value	Physical Resource	Sensor Type
✓ ai0	Volt	-7.714	Dev2/ai0	Voltage Input
✓ ai1	Volt	-7.107	Dev2/ai1	Voltage Input
✓ ai2	Volt	-6.197	Dev2/ai2	Voltage Input
✓ ai3	Volt	-5.440	Dev2/ai3	Voltage Input
✓ ai4	Volt	-5.148	Dev2/ai4	Voltage Input
✓ ai5	Volt	-3.988	Dev2/ai5	Voltage Input
✓ ai6	Volt	-3.145	Dev2/ai6	Voltage Input
✓ ai7	Volt	-2.448	Dev2/ai7	Voltage Input
✓ ai8	Volt	-1.795	Dev2/ai8	Voltage Input
✓ ai9	Volt	-0.884	Dev2/ai9	Voltage Input
✓ ai10	Volt	-0.034	Dev2/ai10	Voltage Input
✓ ai11	Volt	0.728	Dev2/ai11	Voltage Input
✓ ai12	Volt	1.712	Dev2/ai12	Voltage Input
✓ ai13	Volt	2.475	Dev2/ai13	Voltage Input
✓ ai14	Volt	3.124	Dev2/ai14	Voltage Input
✓ ai15	Volt	4.102	Dev2/ai15	Voltage Input

FIGURE 3 CHANNEL EDITOR WINDOW.

Select the channel you want to edit clicking on its row and then press "Channel Settings" button, highlighted in figure above. you can also double click on channel row, to open its basic settings. Channel settings Window is different for every sensor type: thermocouple sensors and accelerometers sensors have their own specific Setting window. In the next image you see the settings window for voltage input signals.

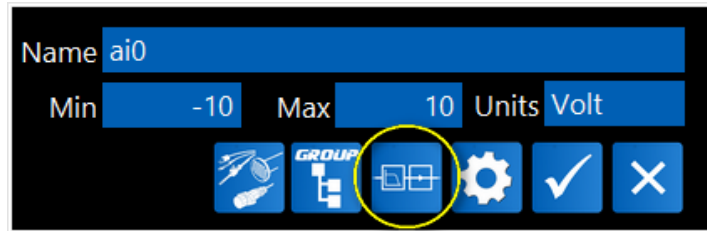


FIGURE 4 CHANNEL SETTINGS WINDOW.

In Channel settings window you can edit channel name, units of measurements and signal range, to edit the SPU associated to selected channel, click on the most left button, highlighted in previous figure.

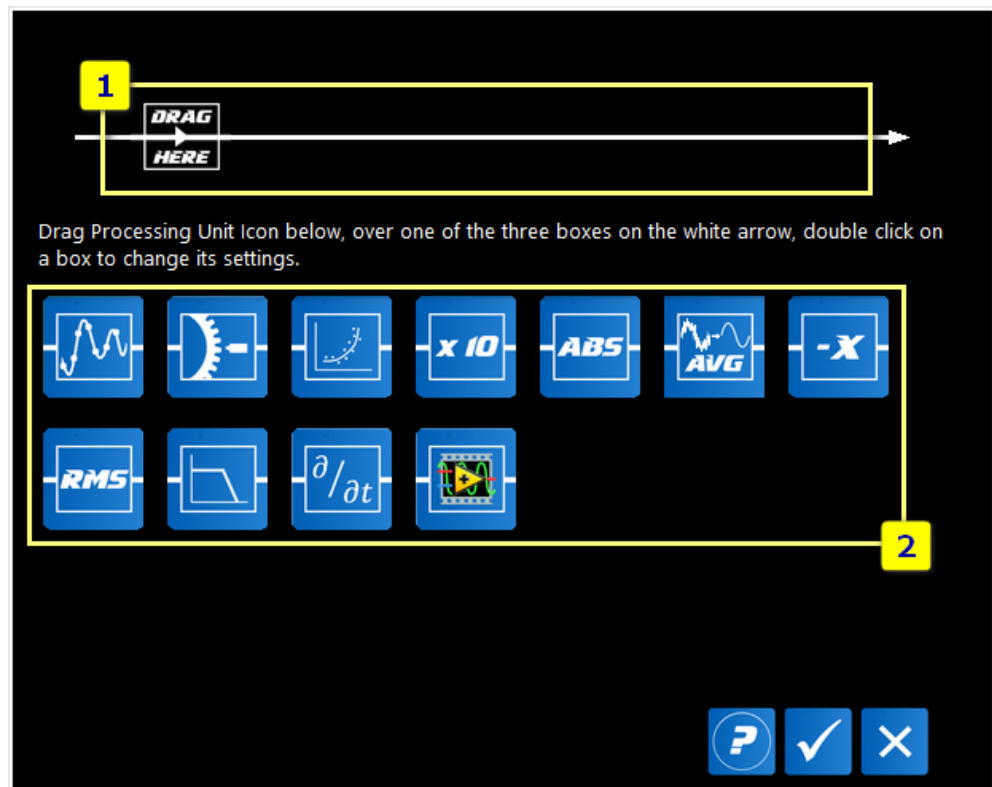


FIGURE 5 SPU EDITOR WINDOW.

In SPU Editor window, there are two main sections:

1. A processing chain. At the beginning, this item is empty except for the *Drag Here icon*.
2. A grid with all available SPUs to be placed on the processing chain. A channel can be configured with a minimum of zero SPUs up to five SPUs.

Select the SPU you want to use, left click on its icon and drag it over the icon *Drag Here* in the upper part of the window. During icon dragging, icon changes color to red, as indicated in the figure below.

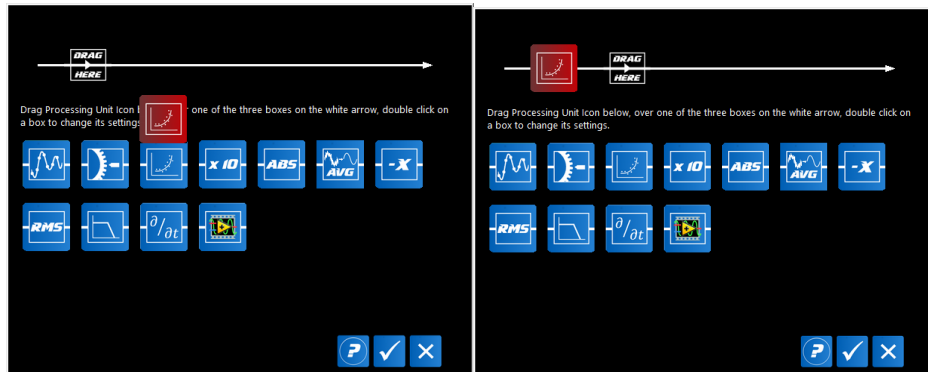


FIGURE 6 ADDITIONAL PROCESSING WINDOW

Some SPUs have to be configured, so when you release the SPU icon over the processing item, its settings window is displayed automatically. You can edit a SPU multiple time with a left click on the processing item icon. To delete an SPU from the processing chain, right-click on the icon, then click on the *Trash button*.

To open a SPU User Manual, right click over each SPU icon in section 2 of SPU Editor Window.

USEFUL LINKS

iDaq product page: <http://www.idaq-datalogger.com/idaq.php>

Signal Processing Units for iDaq product page: http://www.idaq-datalogger.com/addons_in.php?id=14

iDaq ADD-ON Store <http://www.idaq-datalogger.com/addons.php>

Support: <http://www.idaq-datalogger.com/support.php>