Fast Facts

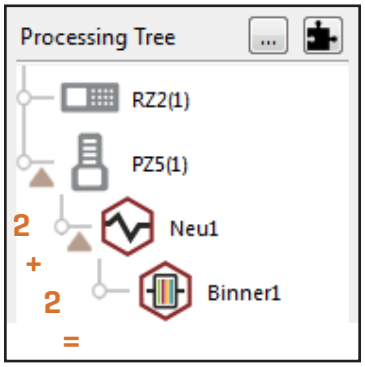
Input/Output Delays

WITH Synapse

There are two types of delays Synapse users should be aware of: gizmo delays and fixed sample delays associated with the I/O of their hardware devices. When synchronized processing is required, Synapse users can synchronize outputs or inputs using User Gizmos and delay components provided in RPvdsEx. *See User Gizmos in the Synapse Manual and Delay Functions in the Component Reference section of the RPvdsEx Manual for more information.*

Gizmo Delays

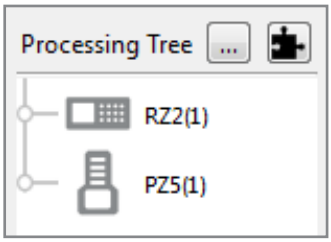
Each branch in the Synapse Processing Tree represents a signal flow or processing path. Each link in a branch adds exactly two samples of delay to that path. The path pictured to the right, from the PZ5 to the Binner, will have a four sample delay. You'll need to be aware of these small delays for experiments with complex processing paths that include many gizmos, custom user gizmos, or where timing is critical.



Gizmo Connections 2 samples

4 sample gizmo delays

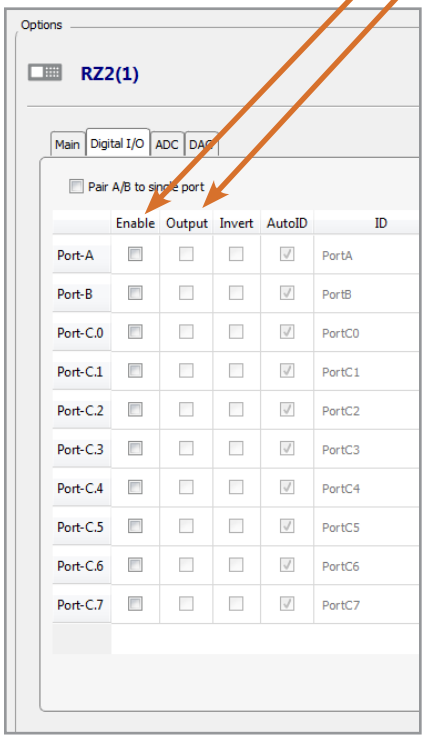
Hardware Delays



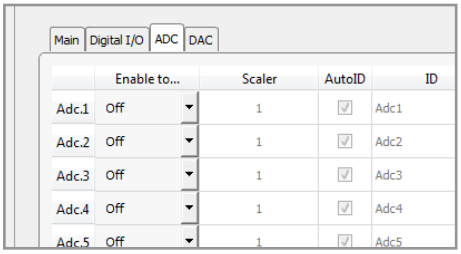
In Synapse, I/O for your processor is configured in the hardware HAL. These settings are displayed and arranged on Tabs in the Options area when the device is selected in the Processing Tree.

Digital Input 2 samples

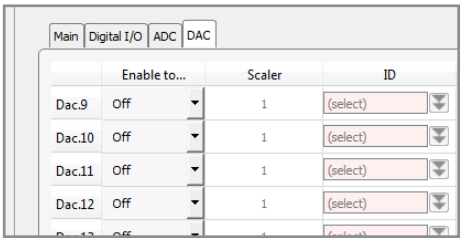
Digital Output 3 samples



ADC and DAC delays are specific to the type of analog-to-digital and digital-to-analog converters used in the device. **See the table on page two for hardware specific delays.*



ADC Delays Device Specific*



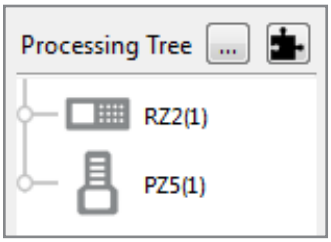
DAC Delays Device Specific*

DAC and ADC Processor Delays

The table below lists devices along with their associated DAC and ADC delays.

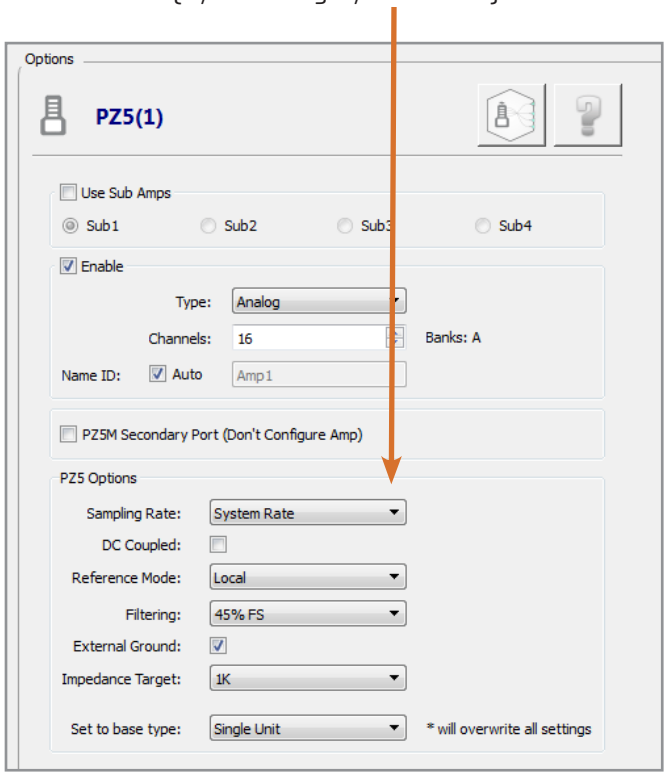
Device	SD DAC	SD ADC	PCM DAC	PCM ADC
RZ2, RZ5, RZ5D, RZ5P, IZ2	NA	NA	**4 samples**	**3 samples**
RZ6	31 samples	66 samples	NA	NA
RX5, RX7, MS16	NA	NA	**4 samples**	NA
RX6	**43 samples**	**70 samples**	NA	NA
RX8	**23 samples**	**47 samples**	**4 samples**	**3 samples**
RP2.1	**65 samples**	**30 samples**	NA	NA
RA16BA	**21 samples**	NA	NA	NA

ADC Amplifier Delays



Amplifier Delay Varies

Amplifier delays depend on a variety of factors including: the type on ADC converters, sampling rate, and system architecture. The amplifier's configuration options are displayed when the device is selected in the Processing Tree. The PZ5 HAL (pictured below) can be used to set an amplifier sampling rate or to follow the sampling rate of the RZ processor it is connected to (by selecting System Rate).



The tables below lists amplifiers along with their associated ADC delays.

PZ5 Hybrid ADC Delays

Dependent on PZ5 and RZ processor sample rates.

PZ5 rate	(RZ at 25 kHz) samples	(RZ at 12 kHz) samples
25 kHz	**22**	x
12 kHz	**40**	**23**
6 kHz	**76**	**42**
3 kHz	**141**	**79**
1.5 kHz	**270**	**152**
750 Hz	**543**	**295**

Medusa ADC Delays

RA4PA and RA16PA:	NA
RA16SD:	**20 Samples**

PZ2 and PZ3 Delays

Dependent on RZ processor sample rate.

Rate	Samples
6 kHz	**16**
12 kHz	**17**
25 kHz	**20**
50 kHz	**26**

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