EXAMPLE NAME: ADC_MEASUREMENT_ADV_EXAMPLE_XMC45

OVERVIEW: A PWM triggers starts an ADC measurement, where three values are converted after each other. The order is user defined. The result of the third measurement generates an interrupt. In the interrupt service request all results are read out and a LED is toggled.

DESCRIPTION:

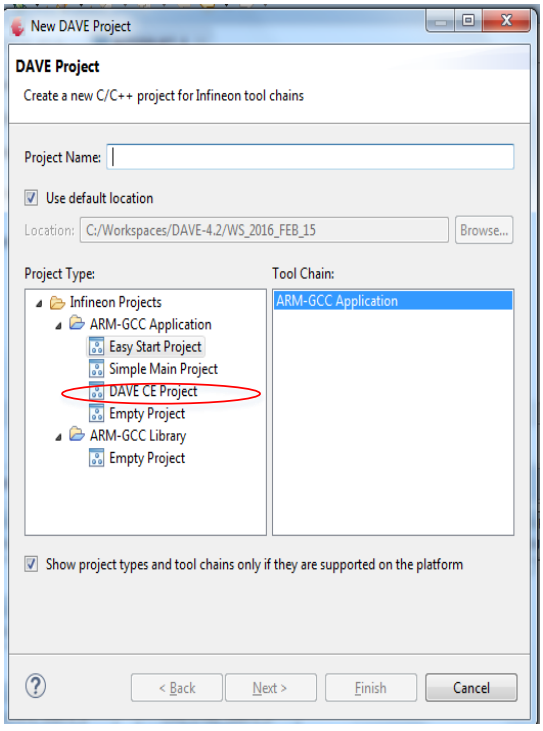
- PWM APP is used to generate a trigger with 1Hz
- ADC_MEASUREMENT_ADV APP is used to configure the ADC conversions.
- DIGITAL_IO APP is used to toggle an LED for debugging purpose.
- INTERRUPT APP is used to read out the ADC results and control the DIGITAL_IO APP.

REQUIRMENTS:

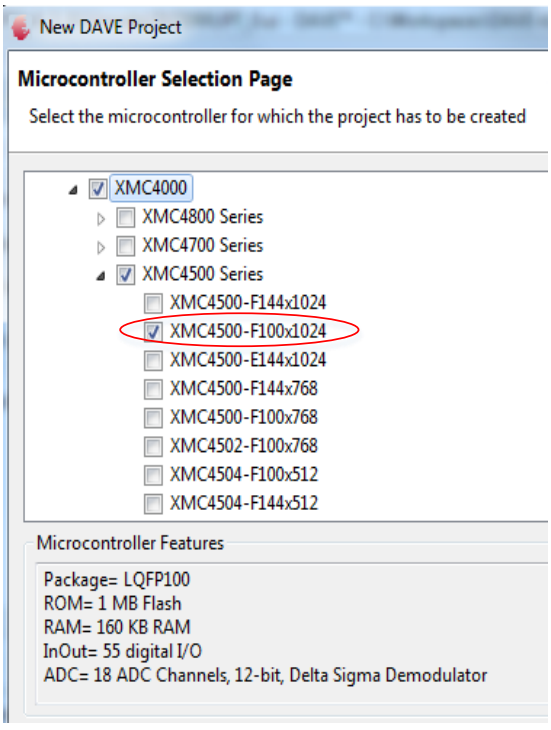
Boards Required: XMC4500 CPU Board (Order Nr: KIT_XMC45_EE1_002) DAVE

HOW TO CREATE THE PROJECT:

Enter Project Name
Select Project Type "DAVE CE Project"

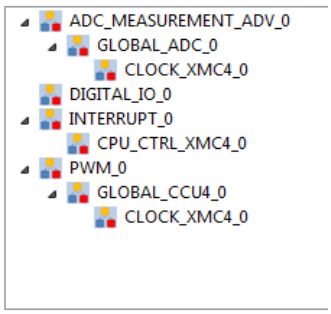


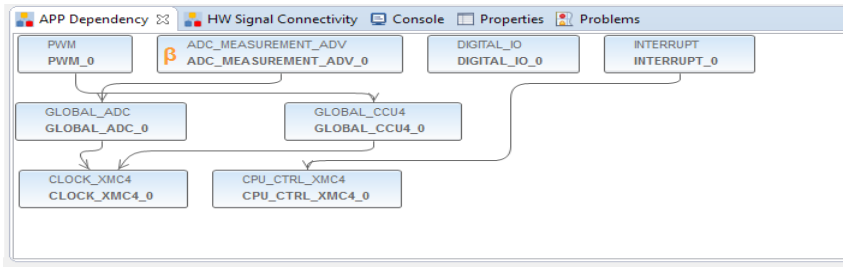
Select Microcontroller Info
XMC4500 Series XMC4500-F100X1024



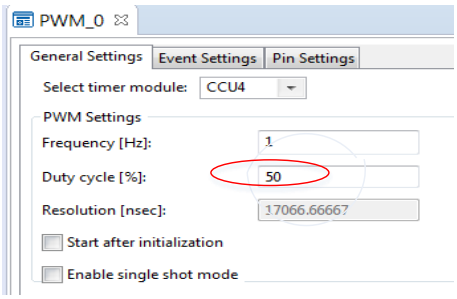
2. Use the "Add New App" in the toolbar to add 1 instance of ADC_MEASUREMENT APP. Configure the APP instances with the following configurations.

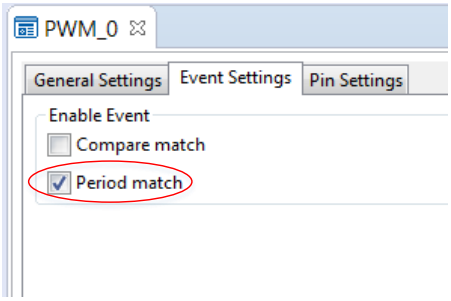
Views: App Dependency Tree and App Dependency



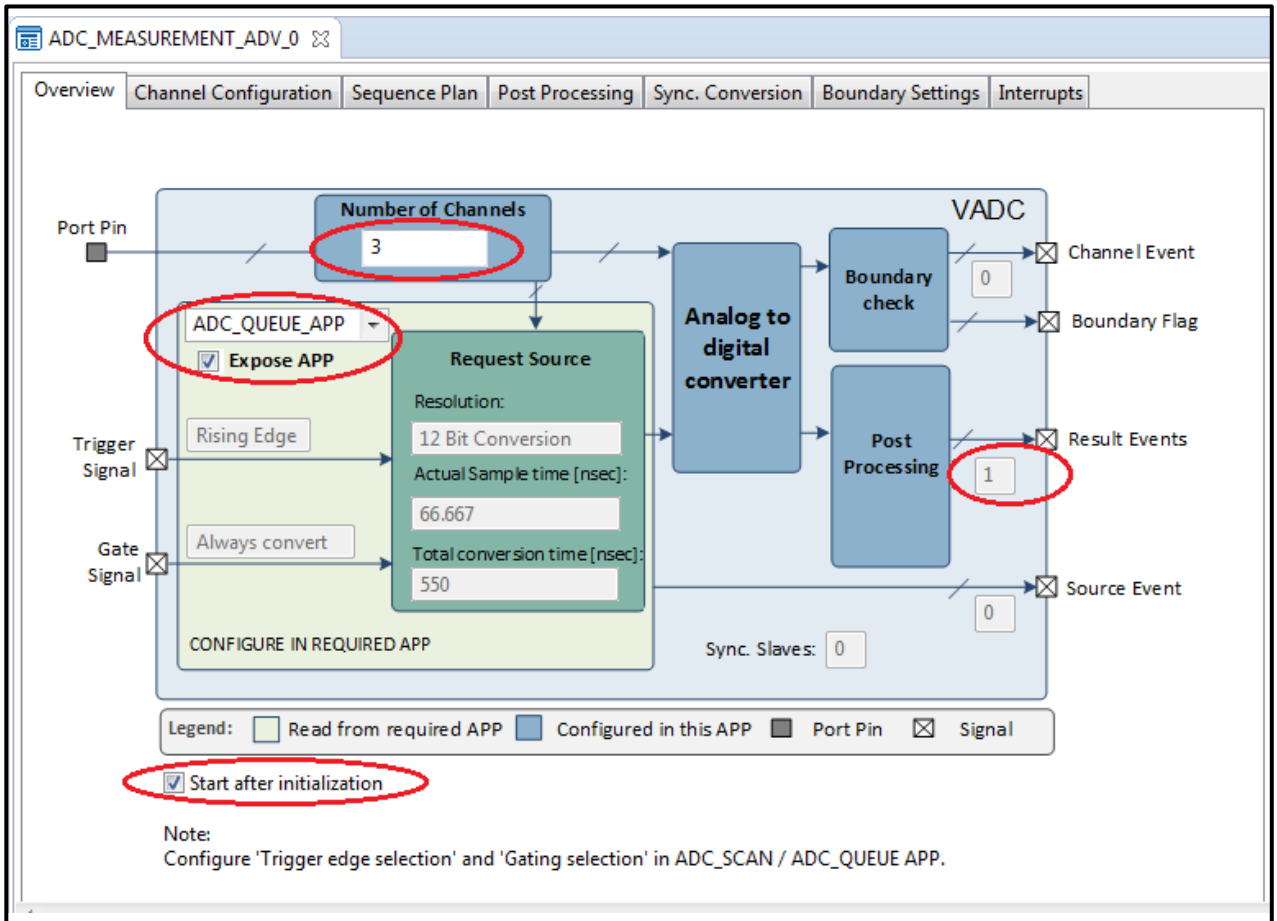


PWM_0:

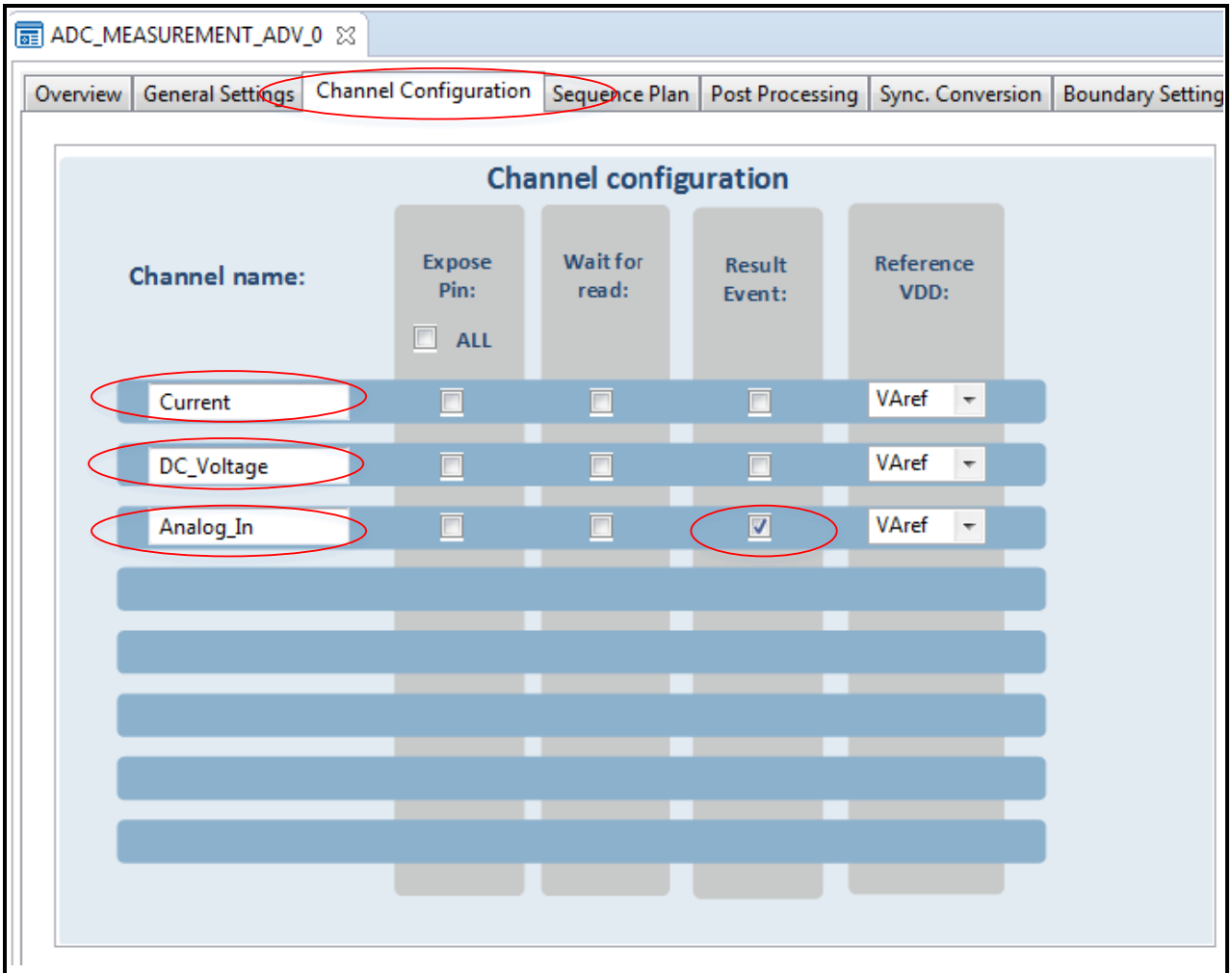




- ⇨ General Settings Tab: Set frequency to 1Hz
- ⇨ Event Tab: enable "Period match"
- ⇨ No further changes

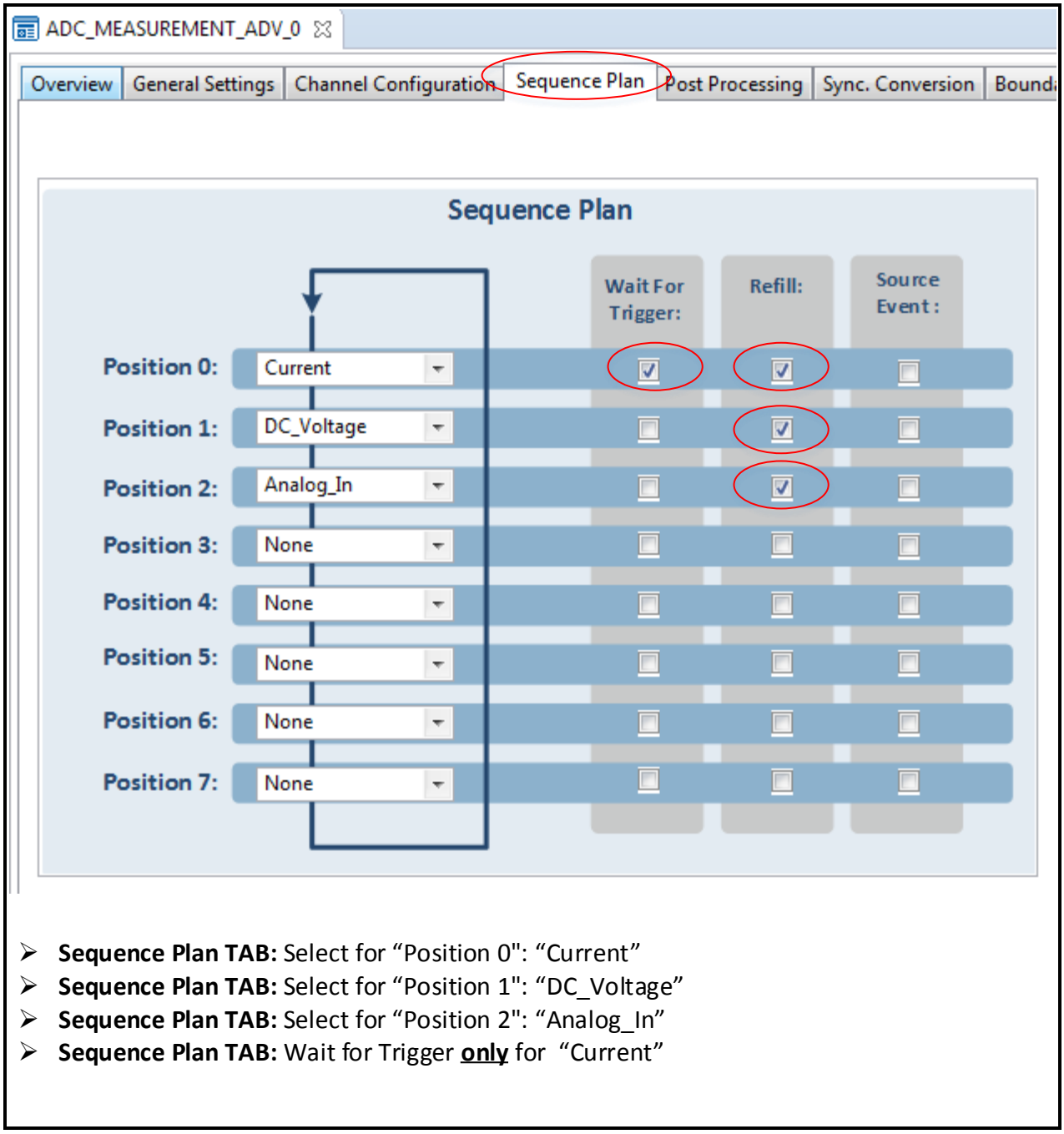


- **Overview Tab:** Set Number of Channels to 3
  ***Note*:** This will add 2 channels and call the solver
- **Overview Tab:** Set required APP from ADC_SCAN_APP to ADC_QUEUE_APP
- **Overview Tab:** Enable Insert channels at initialization
- **Overview Tab:** Note in orange: this will be configured in the next tab.



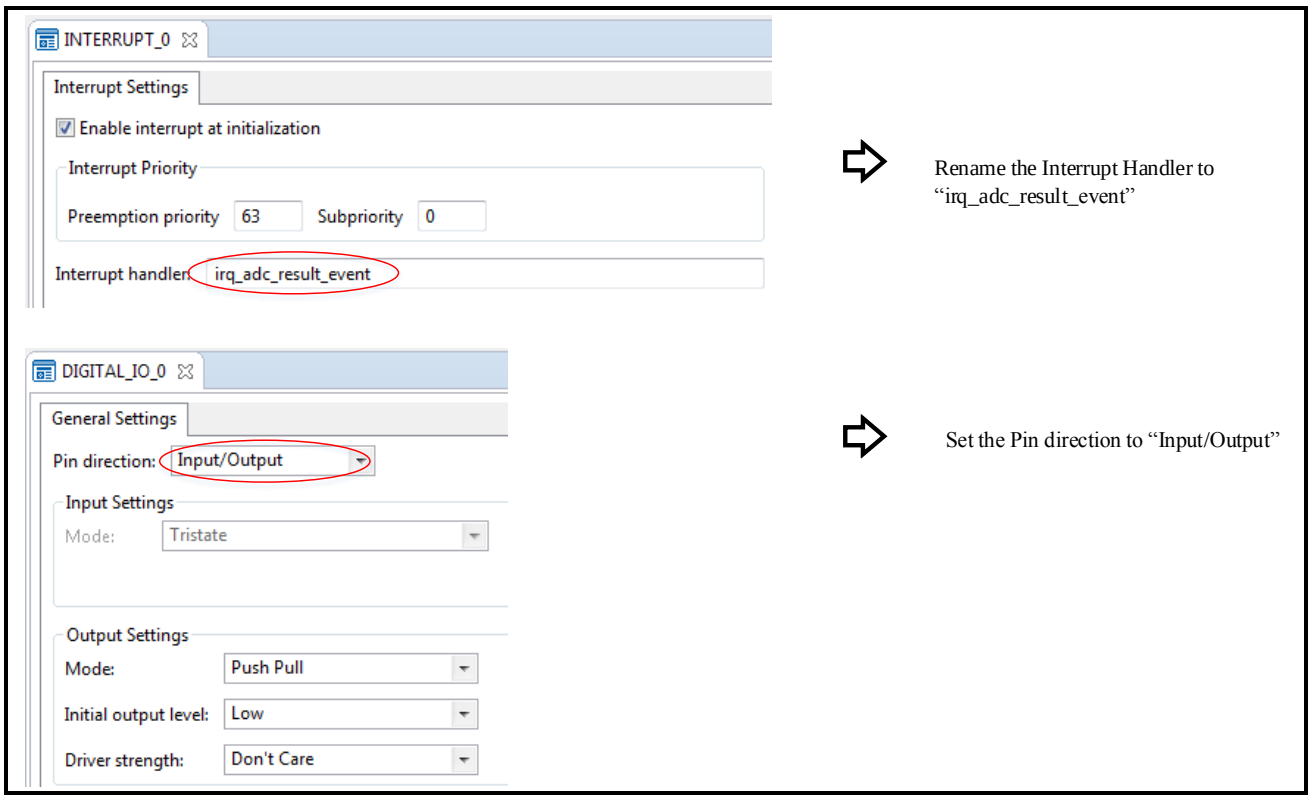
- **Channel Configuration TAB:** Rename “Channel_A” to “Current”
- **Channel Configuration TAB:** Rename “Channel_B” to “DC_Voltage”
- **Channel Configuration TAB:** Rename “Channel_C” to “Analog_In”
- **Channel Configuration TAB:** Enable result event of “Analog_In”

  Note: This will change the Result event information in the overview TAB.

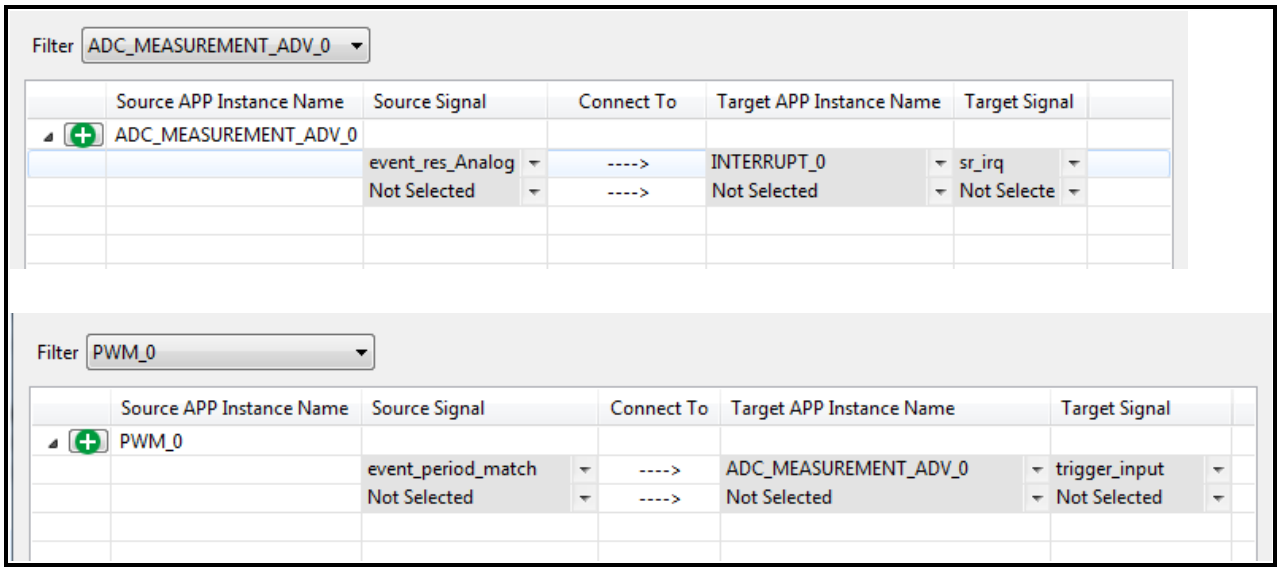


- **Sequence Plan TAB:** Select for “Position 0": “Current”
- **Sequence Plan TAB:** Select for “Position 1": “DC_Voltage”
- **Sequence Plan TAB:** Select for “Position 2": “Analog_In”
- **Sequence Plan TAB:** Wait for Trigger **only** for “Current”

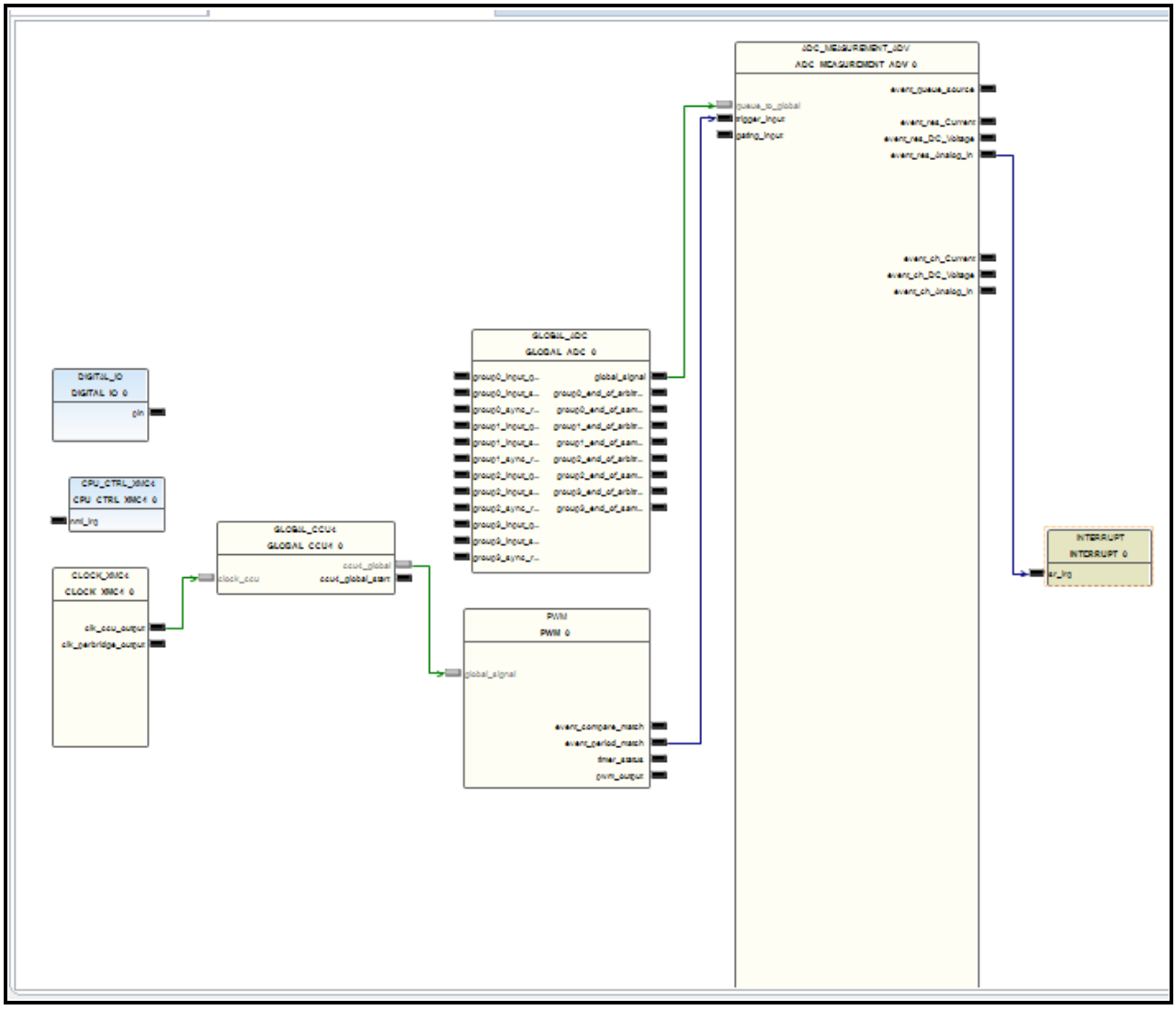
INTERRUPT and DIGITAL_IO APP Configurations:



3. Use the "Hardware Signal Connections" found at the bottom right of the APP UI window, to configure the signal connections.



HW Signal Connectivity:



4. Use the "Manual Pin Allocator" found in the toolbar, configure the output pins for the PWM.

APP Instance Name	APP Pin Name	Pin Number (Port)
ADC_MEASUREMENT_ADV_0		
	Analog_In Pin	#31 (P14.0)
	Current Pin	#30 (P14.1)
	DC_Voltage Pin	#29 (P14.2)
DIGITAL_IO_0		
	pin	#79 (P1.0)
PWM_0		
	PWM Output Pin	#7 (P3.0)

5. Generate the code for configurations made and change main.c accordingly.
6. Build and download to the microcontroller.

HOW TO TEST:
Download and run the demo in the uC.

OBSERVATIONS:

- The LED 2 (P1.0) is toggles after each measurement sequence.
- The PWM triggers with 1Hz the ADC, the ADC starts a measurement sequence with three conversions. The order of the conversions is defined in the sequence plan.
- If refill is selected for the channel it will be filled again in the queue.
- The sequence continues until a channel request a "wait for trigger". In this example the channel "Current" in Position 0 requests a "wait for trigger".
- With the next trigger of the PWM App the "Current" channel is converted and the sequence continues.

HINTS WHEN MIGRATING EXAMPLE TO OTHER DEVICES IN THE SAME XMC FAMILY:

The ADC_MEASUREMENT_ADV APP is not available on XMC1100