



VIRTUAL CHANNELS

The user can create virtual channels thanks to the license D_VIRT_CHAN. These channels are one calculation result, which can be added to the « normal » channels during a measurement or a post-processing. Most of you know the useful arithmetic module, the aim of this tip is to show the interest of virtual channels for you.

1. PRESENTATION

The « virtual channels » can be useful during the measurement or after because:

- We can calculate one result, directly insert inside a measurement like "normal" channels
- It is possible to make some analysis difficult to make without these « virtual channels »
- We can create triggers, events ...
- Etc

We will give you in this tip 3 use cases, where the « virtual channels » are THE solution for users.

Use case n°1: particular analysis

We would like to measure a channel for which the DC part of the signal should be the track parameter and the AC part should be analyzed.

In the PAK software, the « tacking » channels are only defined as « magnitude » or « Tacho » channels. These types of channels don't allow us to analyze the AC part of the signal.

The idea is to create a virtual channel only with the AC part defined as « normal ». The steps are necessary:

1/ conversion of the "magnitude" channel to "normal" channel

2/ Application of HP FIR filter to remove the DC part of the signal

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Use case n°2: Multiple Trigger

The multiple trigger combines different conditions relative to existing channels. For instance, it can be used to Start measurement at certain noises for automotive or start measurement at dangerous levels during a monitoring.

The formula has 3 steps:

- 1/ Definition the starting events
- 2/ Creation of one trigger for each event
- 3/ Combination of all the triggers

Use case n°3: Event counter

The event counter can be used to do statistics, test bench control measurement support ...

For the settings, we need to:

- Define the interesting event
- Create pulse signal at each event
- Count the number of pulses



2. SETTINGS

During the measurement

In the measurement setup, we can define some virtual channels. To do this, some « empty » lines have to be available. If we are measureing with a 16 channels MKII, we can, for example, change in the « Global settings » the number « 1..16 » in « 1..20 ».

Measurement Setup - MKII_module_ICP									
<u>File Edit Tools Extras ?</u>									
🗋 🚅 🛃 Save and Close 📓 🐚 🏡 🔦									
Global Settings	1: Normal channels								
✓ 1 : Normal channels Channels 120	Device MKII								
Channels	Channel Configuration Channel Settings Meas. Positions Calibration								
Channels	Sampling Rate [Hz] 32768								
Channels	Polynom. Cal. Pre-Filters RPM Analyses								
5 : Channels	Polynom. Cal. FIR Filter Tors. Vibration								
Camera	Polynom. Cal. Par FIR Filter Par RPM Analyses Param								

Click on « Channel configuration », you can see the 4 « empty » lines, where we can select « Virtual channel ».

BAK (Channel	Config.			X
File	e Edit	Tools	?		
	Channe	Slot	Туре		•
2	2	1-1:1:2	ICP42 G2		_
3	3	1-1:1:3	ICP42 G2		
4	4	1-1:1:4	ICP42 G2		
5	5	1-1:2:1	ICP42 G2		
6	6	1-1:2:2	ICP42 G2		
7	7	1-1:2:3	ICP42 G2		
8	8	1-1:2:4	ICP42 G2		
9	9	1-1:3:1	ICP42 G2		
10	10	1-1:3:2	ICP42 G2		
11	11	1-1:3:3	ICP42 G2		Ξ
12	12	1-1:3:4	ICP42 G2		
13	13	1-1:4:1	ICT42 G2 Input		
14	14	1-1:4:2	ICT42 G2 Input		
15	15	1-1:4:3	ICT42 G2 Tacho		
16	16	1-1:4:4	ICT42 G2 Tacho		
17	17		-		
18	18		ICS42 G2		
19	19		ICT4acho		
20	20		ICT4acho		~
МК	II Devices	Read	MIC42X G2		
			WSB42 G2 =	ОК Арріу С	ancel
			WSB4ZX G2		_

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PAK

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17	17	-	Virtual channel
18	18	-	Virtual channel
19	19	-	Virtual channel
20	20	-	Virtual channel

In « Channel Settings », you active some of this lines and click on « Virtual channels » bottom.

Channel Settings									X	
	Eile	<u>E</u> dit	<u>T</u> ools <u>?</u>							
		On/Of	Channel	Position	Meas. Mode	Input	Couplin	Ground	Range	Sen 🔦
L.	9		9 [1-1:3:1 - ICP42 (CH9	Normal	Voltage	AC	Differential	10 V [20 dB]	None
ŀ	10		10 [1-1:3:2 - ICP42	CH10	Normal	Voltage	AC	Differential	10 V [20 dB]	None
Ŀ	11		11 [1-1:3:3 - ICP42	CH11	Normal	Voltage	AC	Differential	10 V [20 dB]	None
	12		12 [1-1:3:4 - ICP42	CH12	Normal	Voltage	AC	Differential	10 V [20 dB]	None
Ŀ	13		13 [1-1:4:1 - ICT42	CH13	Normal	Voltage	AC	Differential	10 V [20 dB]	None
	14		14 [1-1:4:2 - ICT42	CH14	Normal	Voltage	AC	Differential	10 V [20 dB]	None
Ŀ	15		15 [1-1:4:3 - ICT42	CH15	Tacho	Voltage	AC	Differential	60 V [36 dB]	
Ŀ	16		16 [1-1:4:4 - ICT42	CH16	Tacho	Voltage	AC	Differential	60 V [36 dB]	=
Ŀ	17	1	17 [Virtual channel]		Normal					
Ŀ	18	1	18 [Virtual channel]		Normal					
Ŀ	19	1	19 [Virtual channel]		Normal					
	20	1	20 [Virtual channel]		Normal					Ŧ
L	•			111						- P
	<u>P</u> rec	ondition	ing] <u>T</u> acho Param	eters <u>V</u> irtual cha	nnels	Manager	<u>R</u> ead TE	DS TEDS con	sistency check	
L	OK Cancel									

In the window, you can edit the calculation.

w Virtual channels		
<u>File Edit Tools ?</u>		
Channel	Arithmetic	
1 17 ;		
2 18;		
3 19;		
4 20 ;		
	OK Cancel	



Postprocess

In the "postprocess (Throughput)" window, open the menu extra/Options.

🔤 Postprocess (throughput) - Demo_post_process_virtual_channel							
File Edit	Tools E <u>x</u> tras ?						
🕴 🗋 💕 🛃 S	Save ar <u>O</u> ptions 🗳						
-Original Mea	surement			^			
Name of mea	asurement ExampleAudio/Pors	sche_raw [EX]					
From [s]	▼ To [s]		✓ Selection				
General							
Title	Porsche example measuremen	ıt					
Test Bench	•	Test no.					
Expert	Miller 🔻	Division	Power Train	=			
Customer	Customer A 🔻	Customer Div.	Chassis 🔹				
Descriptions							
PAKVehicle	Porsche 911	Env. (Condition Unbenannt				
Meas_Text	Unbenannt	Test	Cycle Unbenannt				
- Measuremen	t Settings						
Current Proje	ect Projet3		Measurement Setup Import				
Test Name	Postprocess		Graphic Definition	2			
Subtitle	PP_porsche_raw_virt_chan	inel	Page -				
				.			
Start Postpro	ocess						

In the last tab, we activate « Modify/add virtual channels ».

Priories Contractions	×
<u>File Edit Tools ?</u>	
Descriptions Online graphics Level/Slow display Display Positions Data Storage Meas. Sequence Other	
Postprocess: Load latest change in setup	^
Add digital bus channels	=
Modify/add virtual channels	
Postpr./Import: Use modifier	~
ОК Арріу	Cancel

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A new setting is displayed after the setup. You can enter a name and open it:

Measurement Settings									
Current Project	Projet3		Measurement Setup	Import					
Test Name	Postprocess	2	Virtual Channels	Demo_pp_virtual_channel	🚰				
Subtitle	PP_porsche_raw_virt_channel	2	Graphic Definition		2				
			Page	- •					

In this window, we can activate some « virtual channels », define the formula, the name , position, label... of this new channel.

💌 A	Additional Virtual Channels - Demo_pp_virtual_channel										
Eile	ile Edit Iools Extras 2										
	🗳 🕻	Save and Close 🔒 🗈 🖺 Sam	pling rate of virtual channel sampling gro	oup [Hz] 16384	•						
	Active	Sampling group	Arithmetic	Quantity	Position label	Direction	X position [m] Y position	m] Z position [m]	Meas.point description	Meas.point type	
1	1	1st sampling rate		Sound Pressure	Left	s	0	0	0 Left ear	LS	=
2	1	1st sampling rate		Sound Pressure	Right	S	0	0	0 Right ear	LS	
3		Virtual Channels									
4		Virtual Channels									
5		Virtual Channels									
6		Virtual Channels									
7		Virtual Channels									
8		Virtual Channels									
9		Virtual Channels									
10		Virtual Channels									
11		Virtual Channels									
12		Virtual Channele									
Po:	sition lis	st									

3. CALCULATION EXAMPLES

Cas n°1 : Analysis

Convert a Magnitude channel to "NORMAL"
CH1_Normal = (POS{ CH2_normal }*0+1)*POS{ CH1_magnitude }
AC FIR Filter
RESULT = HP_FIR(POS{ CH1_Normal },1,1025)

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Cas n°2: Multiple trigger

#Creation of 2 bandpass on 2 measured signals #absolute value of bandpass 100-300Hz for Mic_01 Mic1F1 = ABS(BP_FIR(POS{ Mic_01 },100,300,1025)) #absolute value of bandpass 1500-2500Hz for Mic_02 Mic2F2 = ABS(BP_FIR(POS{ Mic_02 },1500,25000,1025))

#Trigger for tachoedge if value for Mic1F1 is higher 2
T1 = TRIGGER(Mic1F1,2,2,RISING,0.1)
#Trigger for tachoedge if value for Mic2F2 is higher 2.5
T2 = TRIGGER(Mic2F2,2.5,2.5,RISING,0.1)

#Join pulses \rightarrow OR statement. One level exceeds or the other a pulse edge will be created for further use. RESULT = JOIN_PULSES(T1,T2)

Cas N°3 : Event counter

You can call us to set up a event counter. Below, you can see the steps in graphics for an example, where the event consists to have a detector value higher than 0.1 Pa.



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PREVIEW

In the next august issue of your PAK Tip: derived channels

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