

Application Note How to use the TOMBAK as a voltage level converter (SYNC Mode)

Multiboard Series

TOMBAK : Synchronization electronic board





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How to use the TOMBAK as a Voltage Level Converter (SYNC Mode)

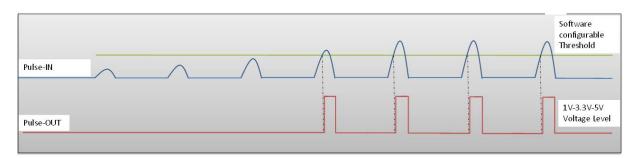
<u>Pre-requirement:</u> Before using the TOMBAK board, make sure you followed all the instructions mentioned in the Operating Manual

1. Presentation

The board can be used as a voltage level converter in every mode that used the Pulse_In signal as a reference signal. However, SYNC mode is a specific mode that gives extended performance to the voltage converter feature (higher frequency, lower jitter, <u>lower insertion delay</u>...).

An additional "Autofine delay" can be added which adds a 0-10ns delay while keeping a very short insertion delay and ultra-low Jitter.

2. Timing & voltage level Diagram



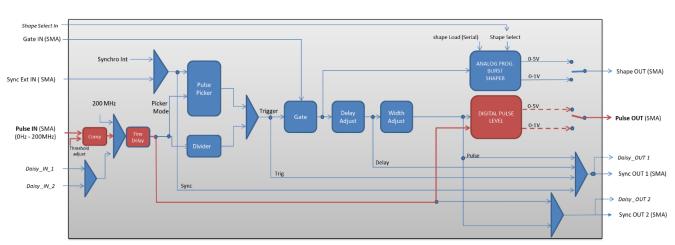


Figure 1 : Pulse In detection signal with software adjustable threshold

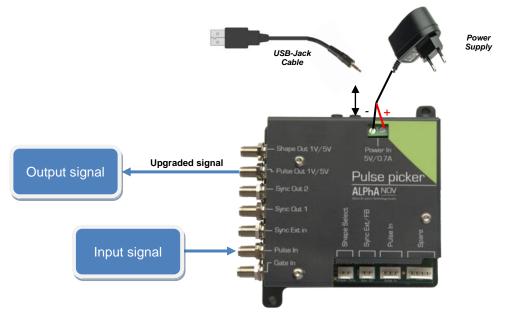
Figure 2 : Main firmware features used in Voltage Level Converter

3. Synoptic

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4. Cabling

- 1. Plug the USB-Jack cable in the "USB In" connector
- 2. Plug the signal you want to convert in the "Pulse In" SMA connector
- 3. The upgraded signal will output on the "Pulse Out" SMA connector
- 4. Finally, plug the power supply to the "*Power In*" connector to power on the board



5. Software configuration

Launch the ALPhANOV Control Software and click on *Connect* to start the TOMBAK hardware detection. The software automatically detects the TOMBAK board.



A window will appear for each TOMBAK connected to the computer.



The main configuration windows must be configured as follow :

PP 17E01 - Line 1 - Alphanov Control Software				
File Config Info				
Working Mode				
On Off On	Off On Off			
Board Shaper	Inverse			
High Pick Gen	Sync			
Advanced Mode				
Input Pulse				
2,00 V	100,0 kHz			
Threshold	Pulse Freq.			
1	Direct Daisy			
Division	Source			
Ouput Pulse				
Ouput Pulse	0 ns 🔿 0,00 ns 🔄			
Ouput Pulse	0 ns 🚽 0,00 ns 🜩 Auto Fine Delay 📑			
1,000 µs 📩 100,0 Width Delay				
1,000 µs 🔔 100,0 Width Delay Synchro Input	Auto Fine Delay			
1,000 µs 📩 100,0 Width Delay				
1,000 µs	Auto Fine Delay			
1,000 µs 💬 100,0 Width Delay Synchro Input Int ⊡t None Source Mode	Auto Fine Delay			
1,000 µs ↓ 100,0 Width Delay Synchro Input Int □st Source Mode 10,000 kHz ↓ Frequency Burst Size	Auto Fine Delay			
1,000 µs ↓ 100,0 Width Delay Synchro Input Int ➡t None Source Mode 10,000 kHz ↓ Frequency Burst Size Synchro Output	Auto Fine Delay			
1,000 µs 100,0 Width Delay Synchro Input Int Int Ext Source Mode 10,000 kHz 1 Frequency Burst Size Synchro Output Sync Sync Trig Delay	Gate Burst Soft Image: Soft Trigger Pulse ALPhA NOV			
1,000 µs ↓ 100,0 Width Delay Synchro Input Int ⊡t Source Mode 10,000 kHz ↓ Frequency Burst Size Synchro Output	Auto Fine Delay			

- Working Mode window :
 - Set the Board On
 - Set the **Shaper** button to **Off**
 - Set the **Inverse** button to **Off** unless you need to invert the output signal
 - Set Advanced Mode to Sync

Working Mode					
On	Off	On	Off	On	Off
Board		Shaper		Inverse	
High	Pick	Gen	Sync		
Advanced Mode					



- Input pulse window :
 - Configure the Threshold voltage so that the input pulse frequency is detected and the same as your pulse generator system
 - Set the **Division** factor to **1**
 - Set the input pulse **Source** to **Direct**

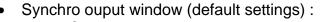
Input Pulse				
2,00 V		100,0 kHz		
Threshold		Pulse Freq.		
1		Direct	Daisy	
Division		Source		

- Output Pulse window :
 - Choose the output **delay value**
 - Choose the output **pulse width**
 - Auto Fine Delay may be let in auto mode (this generates an additional adjustable delay in the 0-10ns range)

Ouput Pulse

Synchro Input

- Synchro input windows (default settings) :
 - Source : not used in this mode
 - Gate Mode : None
 - Frequency : not used in this mode
 - Burst size : not used in this mode



 \circ Source : Pulse

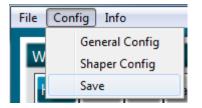


0.00 ns

to Fine Delay



Don't forget to save the settings by clicking on the "Save" button in the bar menu.





6. Main features

Input PulseIn voltage (software adjustable threshold)	30 mV – 3,3V
Input/output maximum frequency	150 MHz
Minimum insertion delay (fine delay deactivated) (see fig 2)	12 ns
Minimum insertion delay (0-10ns fine delay) (see fig 2)	15 ns
Output Voltage	1 / 3,3 / 5 Volts (hardware setup – see user manual for selecting it)

