Application Note

How to use the TOMBAK
As a signal synchronisation module

Multiboard Series

TOMBAK : Synchronization electronic board

How to use the TOMBAK in Pick Mode

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

1. Presentation

Synchronization signals is available on this module. A signal (internally generated or external) can be synchronized with an external reference signal connected to Pulse_In connector.
The output delay from input and the pulse width are software adjustable.

2. Timing Diagram

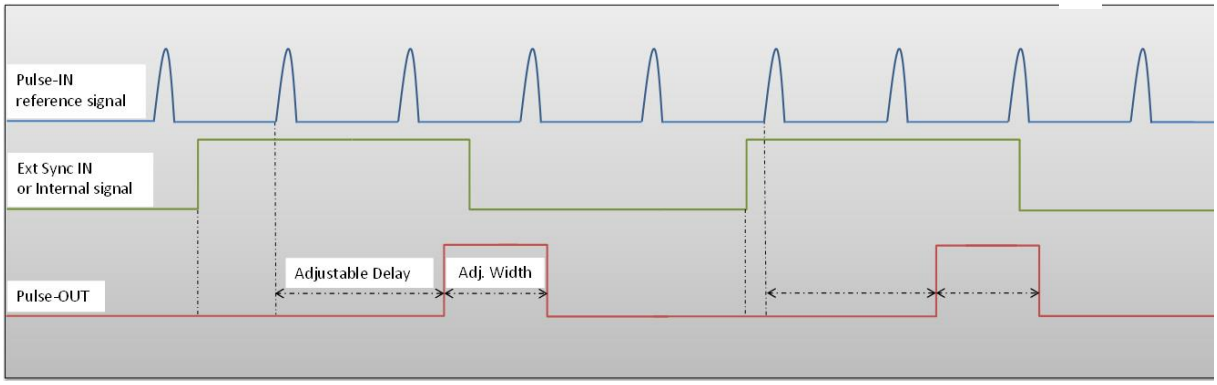


Figure 1 : External or internal signal synchronized with Pulse-In signal.

3. Synoptic

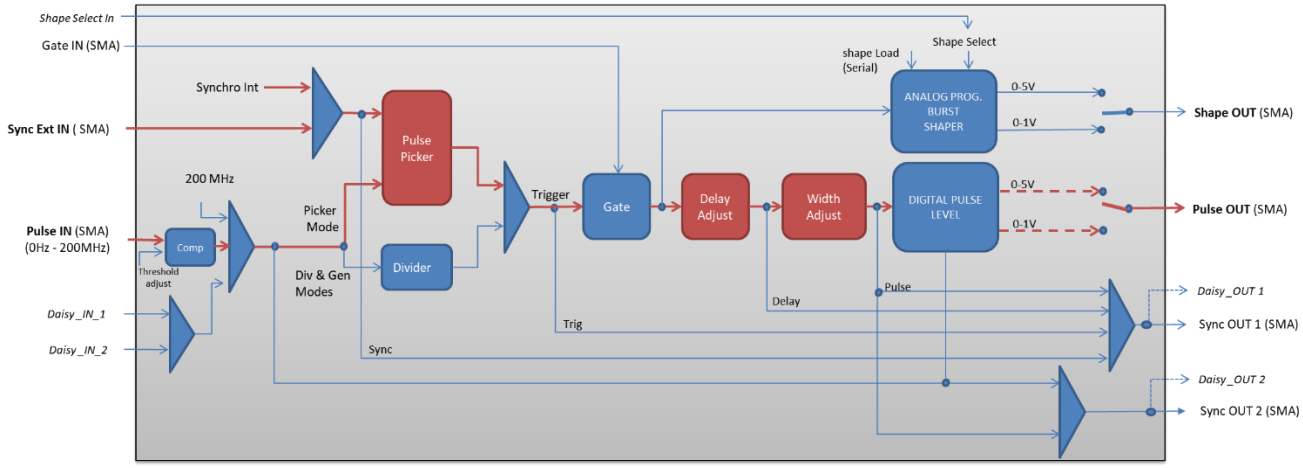
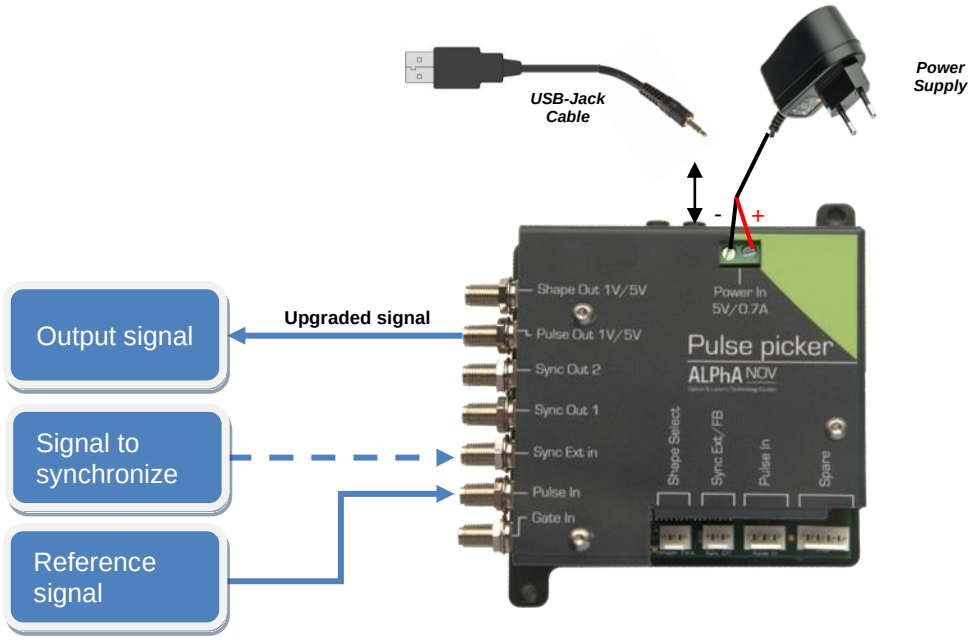


Figure 2 : Main firmware features used in synchronization mode

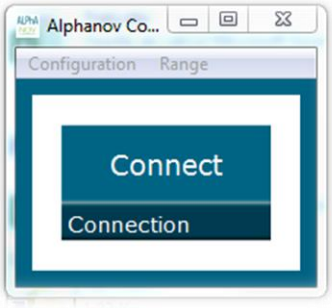
4. Cabling

1. Plug the USB-Jack cable in the "*USB In"* connector
2. Plug the signal to synchronize in the "*Sync Ext in"* SMA connector. (only for external signal synchronization). If signal to synchronize is internally generated, no signal needed on "*Sync Ext in".*
3. Plug the reference signal (i.e. the signal on which "Sync Ext In" signal or "internal signal" will be synchronized with) in the "*Pulse In"* SMA connector
4. The synchronized signal will output on the "*Pulse Out*" SMA connector
5. Finally, plug the power supply to the "*Power In*" connector to power on the board



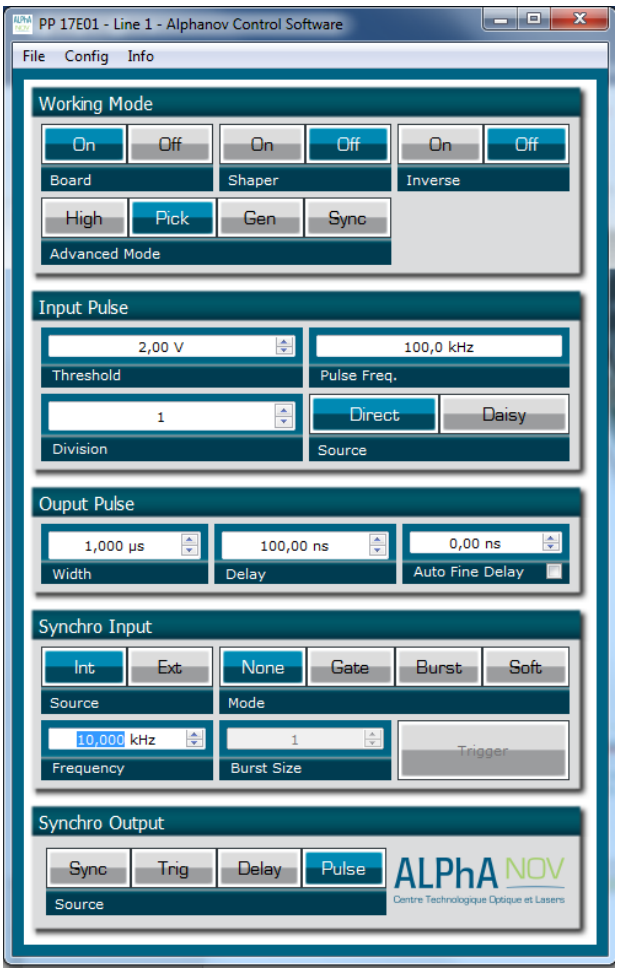
5. Software configuration

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

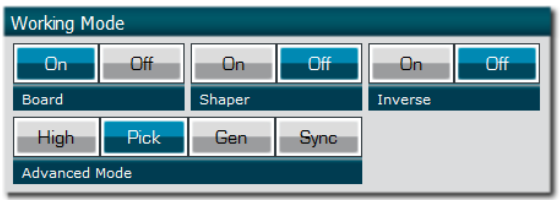


A window will appear for each TOMBAK connected to the computer.

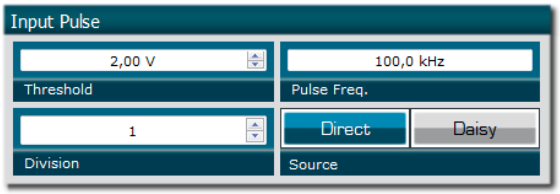
The main configuration windows must be configured as follow :



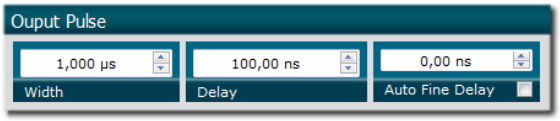
- Working Mode window :
  - Set the **Board** On
  - Set the **Shaper** button to **Off**
  - Set the **Inverse** button to **Off** unless you need to invert the output signal
  - Set **Advanced Mode** to **Pick**



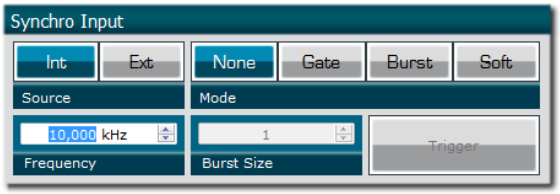
- Input pulse window :
  - Configure the **Threshold** voltage so that the input **pulse frequency** is detected and the same as your pulse generator system
  - Set the **Division** factor to **1**
  - Set the input pulse **Source** to **Direct**

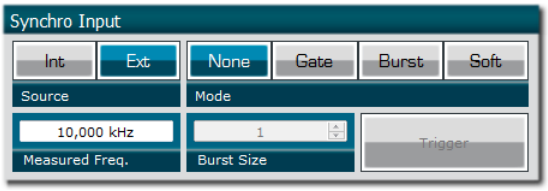


- Output Pulse window :
  - Choose the output **delay value**
  - Choose the output **pulse width**
  - **Auto Fine Delay** may be let in auto mode

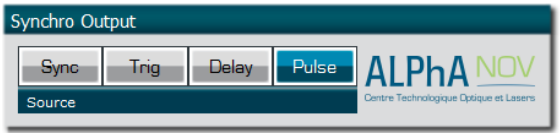


- Synchro input windows :
  - Source :
    - ⇨ Set **Int** to synchronize an internal generated signal with Pulse-In signal.
    - ⇨ Set **Ext** to synchronize an external signal (connected to Ext-In connector) with Pulse-In signal.
  - Mode : None
  - Frequency :
    - ⇨ If internal source is selected, set the output signal **Frequency** you need to synchronize.
    - ⇨ If external source is selected, **Frequency** shows the input Ext-In signal frequency
  - Burst size : not used in this mode

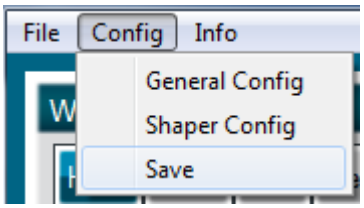




- Synchro ouput window (default settings) :
  - Source : Pulse



Don’t forget to save the settings by clicking on the “Save” button in the bar menu.



6. Main features

Adjustable pulse width ▪ resolution (for pulse width [5ns – 510ns]) ▪ resolution (for pulse width [511ns – 2^62ns])	[5ns – >>1000s] 2ns 5ns
Adjustable pulse delay ▪ resolution	[70ns – >>1000s] 10ps
Input Ext-In Voltage ▪ Logic Low ▪ Logic High	 [0-0.8V] [1.7-3.3V]
Input PulseIn voltage	30 mV – 3,3V
Input maximum frequency	200 MHz
Output Voltage	1 / 3,3 / 5 Volts (hardware setup)
Output maximum frequency	20 MHz