

# Multiplexer

*1 to 128 ultrasound channels*



# Multiplexer 1 to 128

## with ultrasound device single channel

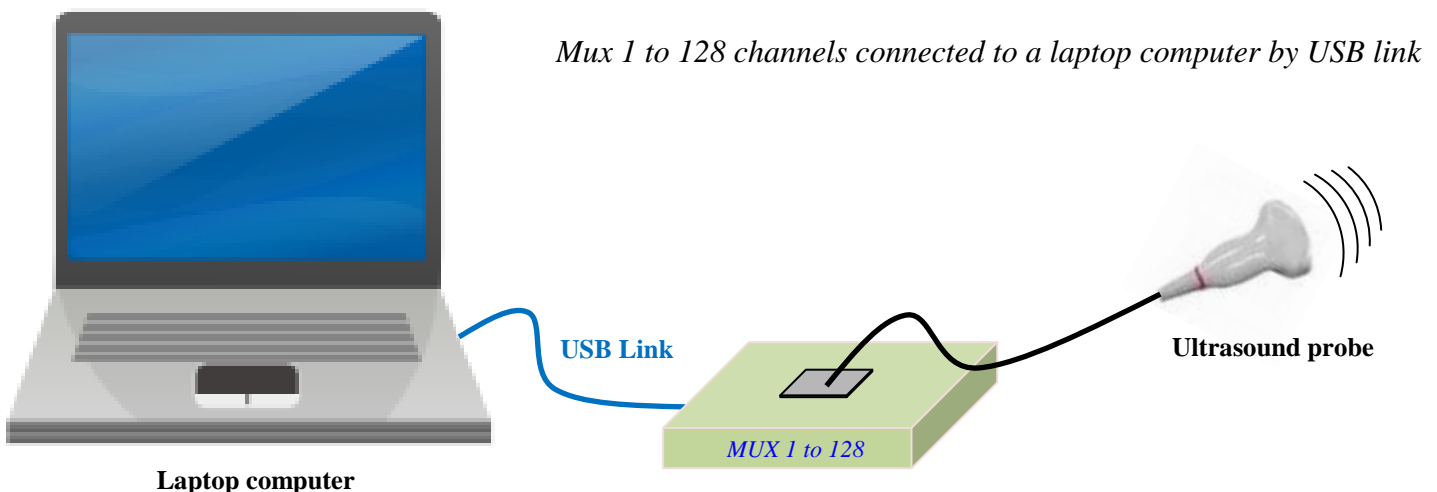
### Features

- USB2 High Speed connection
- - 6 dB bandwidth : 450 KHz to 26 MHz
- High voltage transmitting pulses
- 50  $\Omega$  load drive
- Digitizer 12 bits at 80 MSPS
- Programmable gain : -20 to 60 dB
- DAC curve
- Isolation : 60 dB
- Number of channels : 128
- Noise (for 60 dB) : 200  $\mu$ V
- Windows XP / Vista / Seven

### Applications

- NDT metal flaw detection
- Research and university

### Typical Application



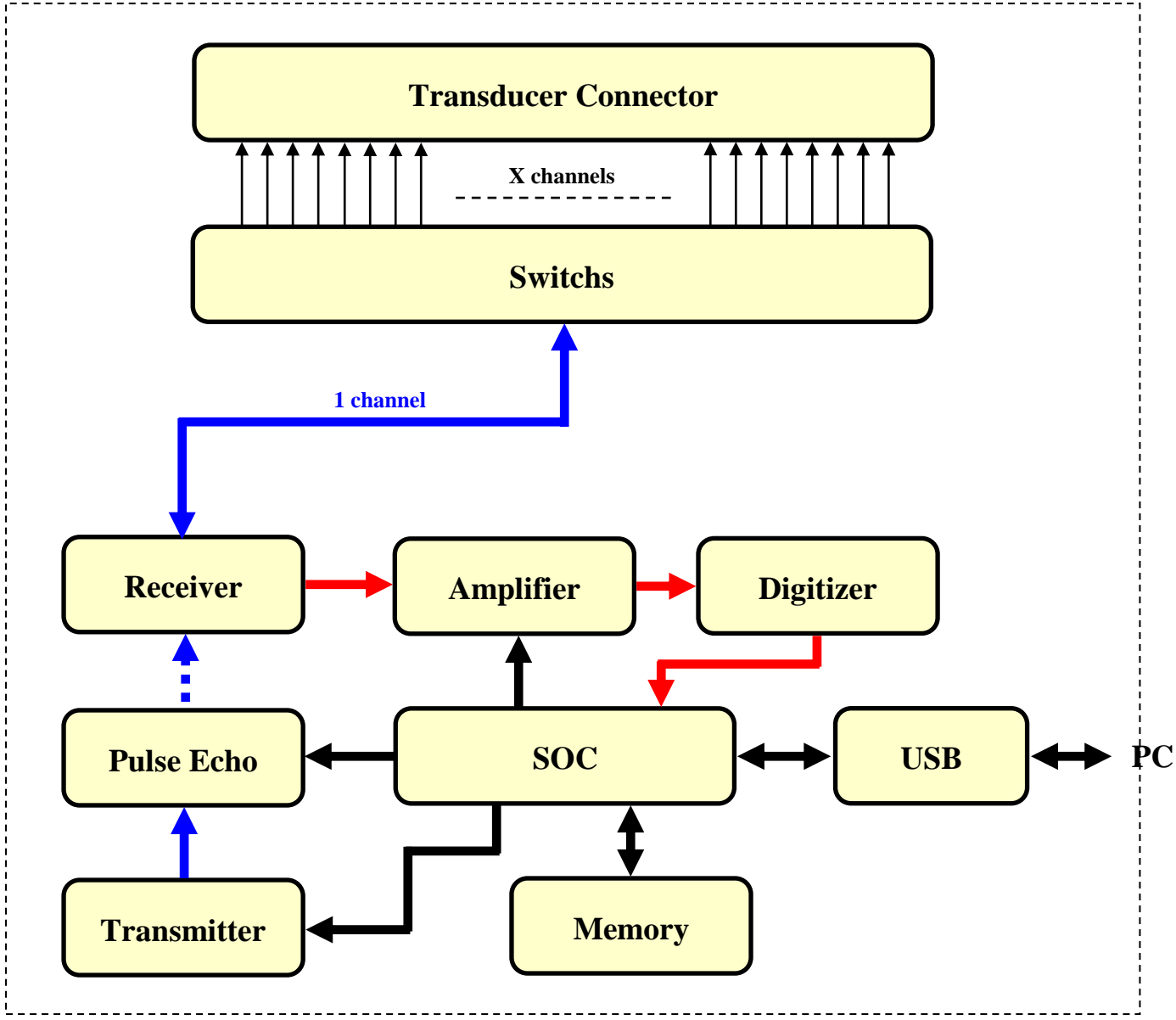
### General Description

Multiplexer 1 to 128 was designed to help people to develop specific applications with a defined number of channels. It is composed of US-Box, a ultrasound device single channel to transmit and receive ultrasonic waves. Its advanced technology allows to have an unique product for more applications like the NDT and also for the research and university.

The transmitter can generate pulses with a voltage level and a width programmed by the user. A low noise preamplifier combined to a VGA gives a gain range between -20 and 60 dB, a DAC curve is also available. A 12 bits analog digital converter with a sampling frequency of 80 MHz is used to digitize ultrasound signals.

The device works on a single mode : pulse echo (using of one transducer)

**Block Diagram**

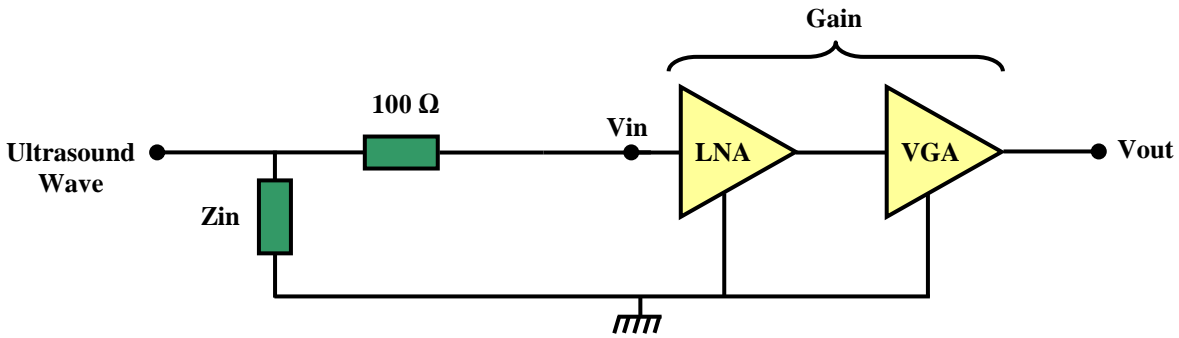


SOC : System On Chip

## Electrical Characteristics

(Over operating conditions unless otherwise specified)

<b>Receiver / Amplifier</b>			
Sym	Parameter	+25°C	Units
<b>BW</b>	<b>Bandwidth to - 6dB</b>	<b>0.45 to 26</b>	<b>MHz</b>
<b>F0</b>	<b>Central Frequency</b>	<b>4.5</b>	<b>MHz</b>
<b>Lin</b>	<b>Gain Linearity</b>	<b>+/- 1</b>	<b>dB</b>
<b>Gain</b>	<b>Gain Range</b>	<b>-20 to 60</b>	<b>dB</b>
<b>Zin</b>	<b>Input Impedance (+/- 5%)</b>	<b>50</b>	<b>Ω</b>
<b>Vin</b>	<b>Input Voltage Range</b>	<b>+/- 800</b>	<b>mV</b>
<b>Noise</b>	<b>RMS noise</b>	<b>200</b>	<b>μV</b>



Simplified Receiver / Amplifier Schematic

### Amplifier's components

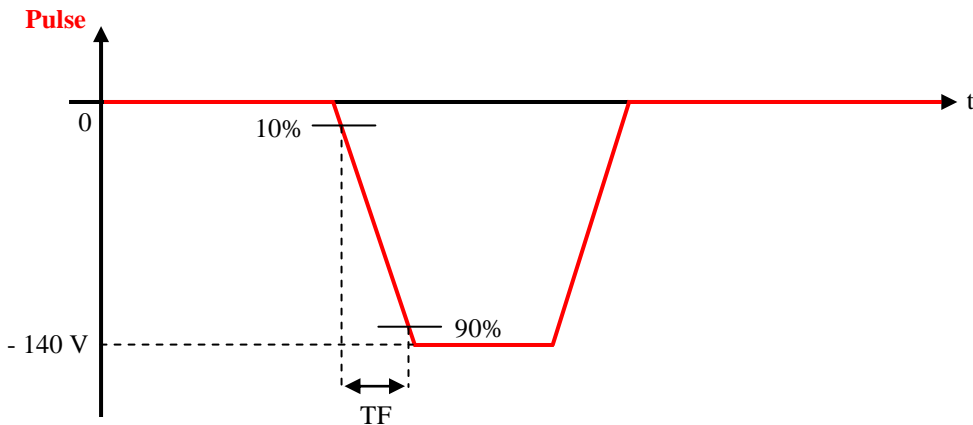
- LNA : Low Noise Amplifier (≡ Preamplifier)
- VGA : Variable Gain Amplifier

<b>Digitizer</b>			
Sym	Parameter	+25°C	Units
<b>Resolution</b>	<b>ADC Resolution</b>	<b>12</b>	<b>Bits</b>
<b>Fs</b>	<b>Sampling Frequency</b>	<b>80</b>	<b>MHz</b>

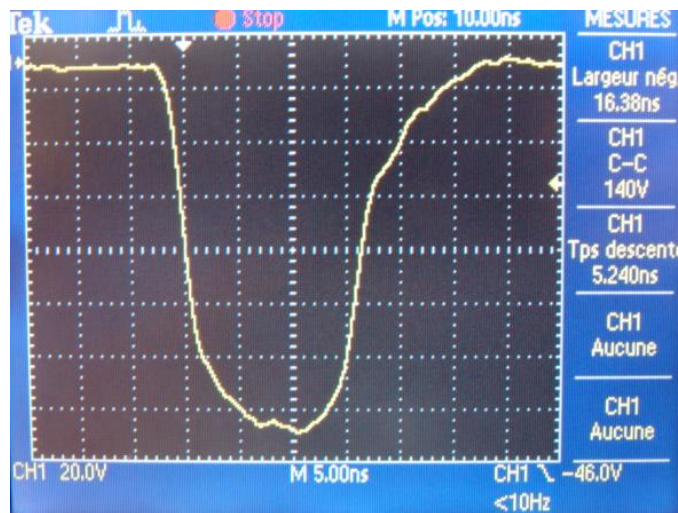
<b>Transmitter *</b>			
<b>Sym</b>	<b>Parameter</b>	<b>+25°C</b>	<b>Units</b>
<b>HV Min</b>	<b>High Voltage Min</b>	<b>- 30</b>	<b>V</b>
<b>HV Max</b>	<b>High Voltage Max</b>	<b>- 150</b>	<b>V</b>
<b>HV Step</b>	<b>High Voltage Variation Step</b>	<b>5</b>	<b>V</b>
<b>PW Min</b>	<b>Pulse Width Min (- 6dB)</b>	<b>16</b>	<b>ns</b>
<b>PW Max</b>	<b>Pulse Width Max (- 6dB)</b>	<b>1650</b>	<b>ns</b>
<b>PW Mean Step</b>	<b>Pulse Width Variation Step</b>	<b>6</b>	<b>ns</b>
<b>TF **</b>	<b>Pulse Fall Time</b>	<b>5.2 to 7.8</b>	<b>ns</b>

\* These tests were carried out with a 50Ω load and at - 140 V for the widths.

\*\* Depend on the pulse width (5.2 ns for a width of 16 ns)



### Typical Performance Characteristic



Pulse with 50Ω load

## Software & DLL

- **Delivered with an executable**
- **Graphical interface for the user**
- **DLL compatible with Labview, Matlab, Visual Basic, C, C++ and Visual C**

**More informations on our web site :**  
**[www.lecoeur-electronique.com](http://www.lecoeur-electronique.com)**

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