CAEN n
Tools for Discovery

x1081B
Four-fold programmable Logic Unit

LOGIC GATES
Fanout/AND/OR/Majority
NIM/TTL translator
Veto
Coincidence

COUNTERS
Scaler
Rate Meter
Counter
Chronometer

TIMING
Timestamping
ToF
ToT

GENERATOR
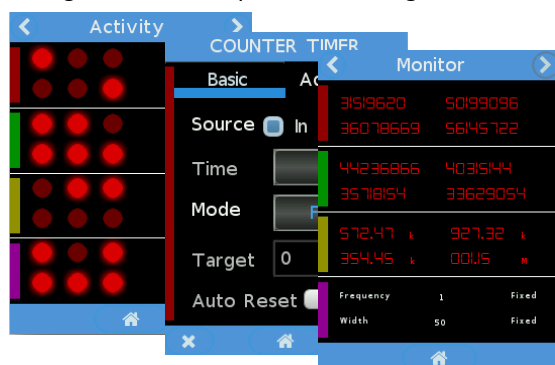NIM/TTL generator
Poisson statistics
Pattern generator

KEY FEATURES

♦ NIM unit or Desktop form factor

♦ Wide range of **user-selectable functionalities:** logic functions, counters, timing, digital pulse generator.

♦ 4 independent sections, each with:
  • 6 NIM/TTL/Discriminator input
  • 4 NIM/TTL output

♦ Input stage with **Gate&Delay** and **Leading Edge Discriminator** for analog input signals

♦ Output stage with **Monostable** capability

♦ **2.8" touch screen display** with user-friendly widgets to configure each section and monitor real-time data

♦ Ethernet (1 Gbps) and USB2.0 connectivity

The **x1081B –Four Fould Programmable Logic Unit** is a laboratory tool that incorporates in a single **NIM** or **Desktop** module the most common functionalities that you need to implement the **logic capabilities** of your experiment.
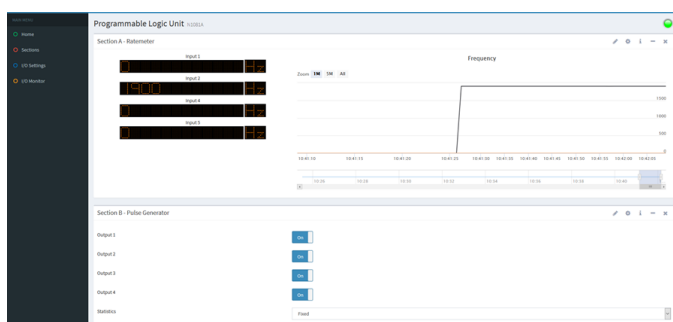
The module is organized in four sections, with 6 inputs and 4 outputs each accepting TTL/NIM signals, with the possibility to feed in analog signals and process them through a leading-edge discriminator. The input stage features an asynchronous **Gate&Delay** with 5 ns resolution while the output stage feature an asynchronous **Monostable** stage. This allows the user to trim at best the needed parameters and to perform accurate measurements using the available logic functions.

Each section is configurable independently according to one of the available pre-programmed functions. The board configuration can be performed using the 2.8" touch screen display or via the web-interface, accessible via USB or Ethernet.

On the **touch screen** interface, each function is associated to a widget, meant to be used for configuration and monitor purposes.

The **web-interface** allows the user to remotely configure the instrument via USB or Ethernet, monitor the functions output, dump data on file or history chart and access to the most advanced functions. No software installation is required!

Developed in collaboration with **Nuclear**Instruments

TECHNICAL SPECIFICATIONS

General	Form Factor N1081B - 2U NIM module DT1081B - Desktop 257x102x331 mm^3 (WxHxD)
Power consumption	N1081B - 1.5 A @ 12 V (Typ.) DT1081B - 90 mA @ 220 Vac (Typ.)

Functions	Logic	Counter	Timing	Generator
	FANOUT	SCALER	*TIME TAGGING*	*PULSE GENERATOR*
	WIRE	*COUNTER*	*ToF*	DIGITAL GENERATOR
	AND	*COUNTER TIMER*	*ToT*	*PATTERN GENERATOR*
	OR	*CHRONOMETER*		
	OR+VETO	*RATE METER*		
	MAJORITY			
	MAJORITY+VETO			
	LUT			
	COINCIDENCE			
	Note: functions in *Italic* font are synchronous to the system clock, the other ones are asynchronous			

Input	Nr. of inputs 6 per section	Connector LEMO	Input impedance 50 Ω / 1 kΩ	Signal type NIM/TTL/DISCR
	Min input width 2 ns		**Min input voltage** ±10 mV	
			Gate and Delay stage	
	Gate 15ns ÷ 10μs	**Delay** 0 ÷ 10μs	**Step** 5ns	**Resolution** ±1% ±3 ns

Output	Nr. of outputs 4 per section	Connector LEMO	Signal type NIM/TTL	Min output width 5.5 ns
	Output NIM rise/fall time ≤2.5 ns	**Output TTL rise/fall time** ≤5 ns	**Output TTL Amplitude** 3.1 V	
			Monostable stage	
	Width 15ns ÷ 1μs	**Step** 5ns	**Resolution** ±1% ±3 ns	

Minimum I/O delay	30 ns

Leading Edge Discriminator	Min. input voltage ± 10 mV	Max Input Voltage ± 5.2V	Threshold range [-800 mV ÷ 2.5 V]	Threshold step 1 mV
	Non linearity 4% ± 6.5 mV		**Efficiency** 3 mV threshold variation to pass from 0% to 100% of the trig rate	

Max. sustainable frequency	• 80/100 MHz asynchronous functions • 40 MHz synchronous functions • Scaler max. division rate 130 MHz

AND	Minimum overlap 1.5 ns

VETO	Veto must precede the event by at least 3 ns

Timing functions	Minimum detectable time 13 ns	Resolution 10 ns
	Bin size [10 ns ÷ 1s], up to 1024 bins	**Time reconstruction** t = 13 ns + bin size*bin number

Pulse Generator	Signal type NIM/TTL	Max. frequency 20 MHz	Min. pulse width 10 ns

Connectivity	Ethernet (1Gbps) , USB 2.0
Touchscreen	2.8" LCD, Transmissive type
Software	**Touch screen** widgets **Web-based** Graphical User Interface

Note: this technical specification table is given in short format. Refer to the website or User Manual for more details.

Ordering Option

Ordering code	Description
WN1081BXAAAA	N1081B—Four-fold programmable Logic Unit
WDT1081BXAAA	DT1081B—Desktop Four-fold programmable Logic Unit