

Technical
Information
Manual

MOD. N 454

*4 - 8 LOGIC
FAN-IN FAN-OUT*

28th February 1991

CAEN
4-8 LOGIC
FAN-IN FAN-OUT
Mod. N454

4x4 2x8

IN
OUT

TCO

SEL A
IN
OUT

TCO

IN
OUT

TCO

SEL B
IN
OUT

TCO

Ser. n.

CAEN will repair or replace any product within the guarantee period if the Guarantor declares that the product is defective due to workmanship or materials and has not been caused by mishandling, negligence on behalf of the User, accident or any abnormal conditions or operations.

CAEN declines all responsibility for damages or injuries caused by an improper use of the Modules due to negligence on behalf of the User. It is strongly recommended to read thoroughly the CAEN User's Manual before any kind of operation.

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CAEN reserves the right to change partially or entirely the contents of this Manual at any time and without giving any notice.

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1. FUNCTIONAL DESCRIPTION

The CAEN Model N 454 is a four channel, logic fan-in/fan-out packaged in a single width NIM module. Model N 454 is a multifunctional fast logic module and yet is easy to use. With the price of one low-cost module, the user can take advantage of logic fan-in, logic fan-out, and polarity inversion.

Each of the 4 channels of the Model N 454 has four inputs which accept NIM signals. The module allows the logic summing of these input signals. Both inverted and noninverted output levels are produced simultaneously allowing very complex triggers to be fast and easy to develop. Direct coupling of all inputs and outputs eliminates the baseline shifts due to rate or duty cycle effects, while making the device useful for performing logic functions.

Each channel of the Model N 454 includes four normal logic outputs and two complementary logic outputs. Channels may be paralleled to provide up to 8 inputs and 12 outputs by means of front-panel switch, this way extra cabling and time delay involved is eliminated.

The Model N 415 is provided with a single front-panel switch that facilitates the upper/lower pair channel paralleling. This way the unit can be programmed to work as 4 OR sections (4-inputs/4-normal outputs and 2-complementary outputs) or 2 OR sections (8-inputs/8-normal outputs and 4-complementary outputs). Front-panel LED's located between channels that are combined, providing a clear, easily interpreted display of the unit's status.

NIM Crate supplies the module with $\pm 6V$ voltage. The maximum power dissipation is 4 Watt.

2. SPECIFICATIONS

2.1 GENERAL

Number of channels:	Four; may be cascaded by means of front-panel switch to form dual 8-fold fan-in/ 12-fold fan out, with LED indication.
Rate:	DC to 100 MHz with 50% duty cycle.
Input/Output Delay:	7±0.5 ns

2.2 EXTERNAL COMPONENTS

2.2.1 INPUTS

Number of Inputs:	Four per channel
Input Levels:	Std. NIM levels on 50 Ω impedance
Reflections:	<15% for input risetimes ≥ 2 nsec
Quiescent level:	<20 mV
Signal Width Requirements:	5 ns minimum, FWHM
Coupling:	Direct

2.2.2 OUTPUTS

Number of Outputs:	4 normal; 2 complementary per channel
Output Levels:	Std. NIM levels on 50 Ω impedance
Risetimes and Falltimes:	2.7 ns typical, 3.5 ns maximum.
Width:	Equal to the logical sum of the input durations.

2.2.3 DISPLAYS

The Model N 454 is provided with a single front-panel switch that facilitates the upper/lower pair channels paralleling.

Front-panel LED's located between upper and lower pair channels that are combined, providing a clear, easily interpreted display of the units status. When the front-panel switch is set to 2×8 position these LED's would be alighted meaning that upper pair channels have been paralleled together and also the lower pair channels have been paralleled together.

2.3 POWER REQUIREMENTS:

All the power measurements has done by unconnecting all inputs and outputs and the front-panel switch to form dual 8-fold fan-in/ 12-fold fan-out.

+6 V 60 mA

-6 V 600 mA

3. TEST PROCEDURE

3.1 INTRODUCTION

The following is intended to be a guide for the user. CAEN do not claim to be exhaustive and therefore the module may be tested in various other ways.

Each procedural step contains the operation to be performed and its effect to be verified.

3.2 SUGGESTED INSTRUMENTS

- No.1 Pulse Generator with 100 MHz max. output freq.
- No.1 Oscilloscope with 300 MHz bandwidth.
- No.1 NIM crate.

3.3 PROCEDURE

CAUTION: Turn OFF the crate before inserting in or removing the module.

1. Insert Mod. N 454 in the NIM crate and turn the Power On.
2. Set the Pulse Generator so as to generate a standard NIM pulse with width of 10 ns.
3. Set the front-panel switch as to select 4x4.
4. Connect the output of the Pulse Generator to the one of inputs of Channel 1.
5. With the Oscilloscope verify that (in channel 1):
 - (a) A normal NIM level signal is present at the 4 "OUT" connectors.
 - (b) A complementary NIM level signal is present at the "OUT" connectors.
6. Repeat steps 4-5 for the rest of inputs of channel 1 to verify that all the inputs and outputs of channel 1 have the same width.
7. Repeat steps 4-6 for the other three channels.
8. Set the front-panel switch as to select 2x8.
9. Connect the output of the Pulse Generator to the one of inputs of Channel 1 or channel 2.

10. With Oscilloscope verify that (in channel 1 and channel 2):
 - (a) A normal NIM level signal is present at the 4 "OUT" connectors.
 - (b) A complementary NIM level signal is present at the "OUT" connectors.
11. Connect the output of the Pulse Generator to the one of inputs of Channel 3 or channel 4.
12. With Oscilloscope verify that (in channel 3 or channel 4):
 - (a) A normal NIM level signal is present at the 4 "OUT" connectors.
 - (b) A complementary NIM level signal is present at the "OUT" connectors.