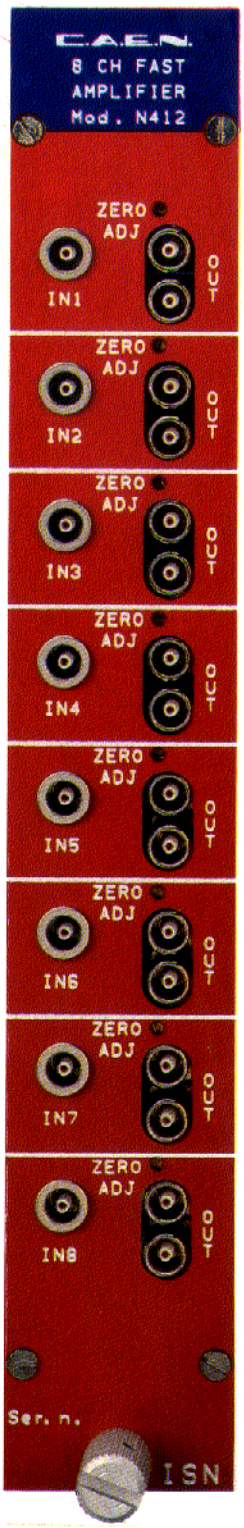
Technical Information Manual

MOD. N 412

4 CHANNEL FAST AMPLIFIER

20th January 1992


C.A.E.N.
8 CH FAST
AMPLIFIER
Mod. N412
ZERO
ADJ
IN1
OUT
IN2
IN3
IN4
IN5
IN6
IN7
IN8
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ISN

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. DESCRIPTION

1.1 FUNCTIONAL DESCRIPTION

The CAEN Model N 412 8 CHANNEL FAST AMPLIFIER is a one unit wide NIM module provided with eight independent amplifier channels of a fixed 10X gain.

Each channel has a non-inverting-gain fast amplifier equipped with one input and two parallel outputs. This built-in fan-out simplifies the simultaneous use of the amplified signal in different applications. The output offset of each channel is adjustable via a front panel trimmer.

The amplifier device is composed of three transistors followed by an impedance adapter. The thermal stability is guaranted by an operational amplifier which compares the input voltage with the output one and controls the bias point of the amplifier input stage.

A 50Ω resistor in series with each output prevents the two channels' outputs to be directly coupled.

2. SPECIFICATIONS

2.1 PACKAGING

1-unit wide NIM module.

2.2 EXTERNAL COMPONENTS

CONNECTORS:

- No. 8 LEMO 00 type "IN1..IN8". Input connectors 1 to 8.

- No. 16 LEMO 00 type "OUT". Output connectors 1 to 8 (two per channel).

TRIMMERS:

- No. 8 screwdriver trimmers "ZERO ADJ" (one per channel). For the output offset adjustment.

2.3 CHARACTERISTICS OF THE SIGNALS

INPUTS:

- 50Ω impedance.

- Reflection coefficient: ≤ 6% over input dynamic range.

- Quiescent voltage: < ± 5 mV.

OUTPUTS:

- Risetime: ≤ 3.0 ns.

- Falltime: ≤ 2.0 ns.

- Maximum positive amplitude (linear): 400 mV (50Ω impedance).

- Maximum negative amplitude (linear): -4 V (50Ω impedance).

- Overshoot: ± 10% for input risetimes of 2 ns and with the 2nd output terminated in 50Ω.

- Quiescent voltage adjustable (via front panel trimmer for each channel) in the range from -20 mV to +50 mV.

GENERAL:

- Gain: fixed 10 ± 3%, non-inverting.

- Coupling: direct.

- I/O delay: ≤ 12 ns.

- Noise: less than 1 mV, referred to input.

- Interchannel crosstalk: better than -56 dB in the worst test condition, and with both the outputs of the tested channel terminated in 50Ω.

- Bandwidth:

  • 160 MHz (with both the channel's outputs terminated in 50Ω);
  • 180 MHz (single ended output).

2.4 POWER REQUIREMENTS (quiescent conditions)

+ 12 V at 400 mA
- 12 V at 300 mA.

3. OPERATING MODES

3.1 GENERAL INFORMATION

The Model N 412 8-CHANNEL FAST AMPLIFIER has eight independent channels of a fixed 10X gain.

Each channel can accept one input signal through the relevant "IN" connector, and is provided with two parallel outputs ("OUT" connectors). The output offset is adjustable (via front panel trimmer) in the range from -20 mV to +50 mV.

3.2 OPERATIONS TO BE PERFORMED

CAUTION: *turn OFF the NIM crate before inserting or removing the module.*

1. Insert the N 412 module into the NIM crate.
2. Turn the NIM crate ON.

The voltage offset of each channel can be adjusted in the range from -20 mV to +50 mV via front panel trimmer.

3. Connect the signal sources to the "IN" connectors of each module's channel to be used.
4. Connect the output connectors of each module's channel to the output devices to be used.

The unused output connectors must be terminated in 50 Ω.

4. TEST PROCEDURE

4.1 INTRODUCTION

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

Each procedural step contains the operation to be performed and the corresponding effect or the verification to be perfomed.

4.2 SUGGESTED INSTRUMENTS

- No. 1 Oscilloscope (300 MHz minimum bandwidth).
- No. 1 Signal Generator.
- 1 NIM crate.

4.3 PROCEDURE

The N 412 module comes from CAEN fully tested and calibrated. This procedure allows the user to accomplish a functional test of the module.

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

1. Insert the module into the crate.
2. Turn the crate ON.
3. For each module's channel, perform the following operations:
   (a) with a screwdriver, turn the "ZERO ADJ" front panel trimmer until a 0 V output offset is obtained.
   (b) supply the input connector with an appropriate signal (see par. 2.3 CHARACTERISTICS OF THE SIGNALS) and verify that both the outputs generate a signal with an amplitude corresponding to the fixed gain (10 ±3%).

THE MODULE IS TESTED AND OPERATES CORRECTLY