Simulate, Stimulate, Test...

PRODUCT GUIDE

Signal Amplifiers Line

Distribution in the UK & Ireland

Lambda

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Leading The Way In Waveform Generation

TABOR ELECTRONICS Ltd.

Since 1971

Signal Amplifiers Series

Many applications require high voltage or high current signals that are well beyond the capabilities of most signal sources. Therefore, external amplifiers must be used together with dedicated waveform, function or pulse generators in order to achieve the required signal. The Tabor line of signal amplifiers was designed to operate in conjunction with its series of waveform generators thus providing a complete solution for all of your signal generation needs.

Simple Operation
All of the amplifiers in Tabor's product line offer short circuit protection and require virtually no adjustment or setting. They are simple and easy to use; simply connect the amplifier to the signal source and turn it on.

Various platforms and sizes
A common problem with PXI and PCI equipment is the inability to produce high voltages resulting from the low power supply rails. In addition to its bench top amplifiers and ultra-small 'snap-on' amplifiers, Tabor Electronics' amplifiers series also offers PCI and PXI amplifiers that output up to 180Vpp thus providing the ultimate solution for any instrument platform.

Expanding Product line
The Tabor line of signal amplifiers has been growing in the last few years and now offers more than 10 different signal amplifiers for various applications. The series includes high voltage amplifiers up to 400Vpp, high current amplifiers up to 1A and high bandwidth amplifiers with a bandwidth of up to 150MHz at 20Vpp.

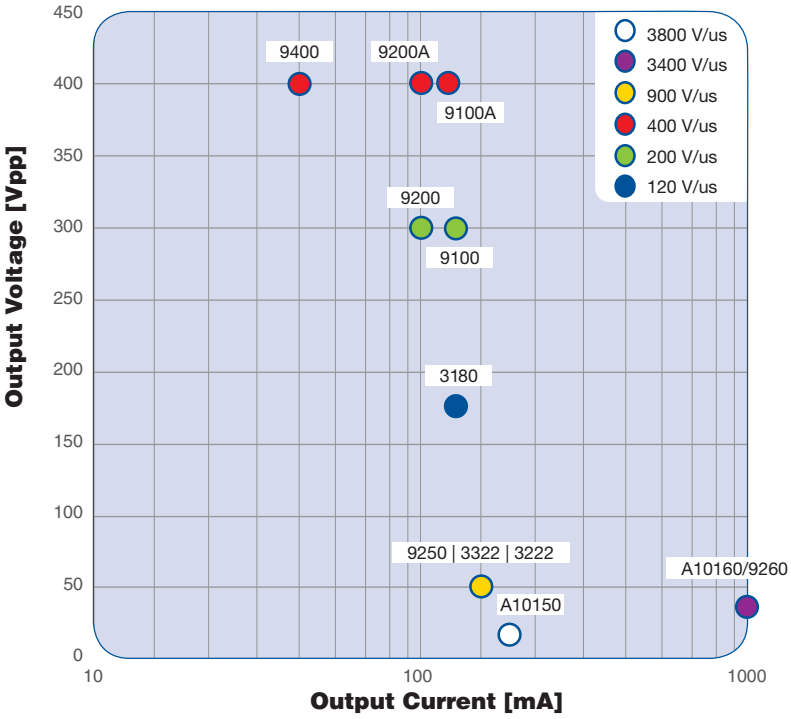
Optional Configurations
All of Tabor's amplifiers arrive with a preconfigured fixed gain. However, for maximum flexibility Tabor offers custom gain configurations as well as customizable configurations of the input impedance, output impedance, floating or grounded output and DC or AC coupled output.

MODEL	9250	9260 (New)	9100 I 9200	9100A I 9200A	9400
Channels	2 Single or Differential	2 Single or Differential	1 I 2	1 I 2	4
Max. Amplitude into matching Impedance	20Vp-p	34Vp-p	300Vp-p	400Vp-p	400Vp-p
Large Signal Bandwidth	15MHz	30MHz	500kHz	500kHz	500kHz
Small Signal Bandwidth	30MHz	45MHz	1MHz	1.5MHz	1.5MHz
Max. Output Current	200mA (50Ω)	750mA	150mA I 100mA	125mA I 100mA	50mA
Input Impedance	50Ω, 75Ω or 1MΩ	50Ω, 75Ω or 1MΩ	1MΩ	1MΩ	1MΩ
Output Impedance	50Ω, 75Ω or 600Ω	2.5Ω,50Ω,75Ω or 600Ω	0.1Ω	0.1Ω	0.1Ω
Gain	10 (or custom)	10 (or custom)	15 (or custom)	50 (or custom)	50 (or custom)
Transition Time	<22ns	<15ns	<1.5μs	<1μs	<1μs
Platform	Bench	Bench	Bench	Bench	Bench

Multi-Channel units
Many applications require more than a single output to be amplified. For this reason Tabor's amplifier series offers dual and four channel amplifiers built in a small case size saving space and cost without compromising bandwidth or signal integrity.

Target Applications
Tabor's amplifiers are designed to extend the capabilities of low voltage or low current signal sources. While some were designed to offer a solution to specific applications such as MEMS, piezo-electronics and transducer characterization these are general purpose amplifiers suitable for countless applications in all industries.

8.25"



MODEL	3180	3222	3322	A10150	A10160
Channels	1	1	1	1	1
Max. Amplitude into matching Impedance	180Vp-p	20Vp-p	20Vp-p	20Vp-p	34Vp-p
Large Signal Bandwidth	300kHz	20MHz	20MHz	150MHz	30MHz
Small Signal Bandwidth	1MHz	50MHz	50MHz	200MHz	45MHz
Max. Output Current	150mA	200mA (50Ω)	200mA (50Ω)	250mA	750mA
Input Impedance	50Ω	50Ω, 1MΩ	50Ω, 1MΩ	50Ω	50Ω
Output Impedance	0.1Ω	50Ω, 75Ω or 600Ω	50Ω, 75Ω or 600Ω	50Ω	2.5Ω
Gain	20 (or custom)	10 (or custom)	10 (or custom)	5 (or custom)	10 (or custom)
Transition Time	<1.5μs	<22ns	<22ns	<3ns	<15ns
Connectivity	PXI	PXI	PCI	Snap-On	Snap-On

Specification

	9250	9260
CONFIGURATION		
Platform:	Bench	Bench
Output Channels:	2 Single-Ended outputs or 1 Differential output	2 Single-Ended outputs or 1 Differential output
INPUT CHARACTERISTICS		
Type:	Single-Ended	Single-Ended
Connectors:	Front panel BNC	Front panel BNC
Impedance:	50Ω, 75Ω or 1MΩ	50Ω, 75Ω or 1MΩ
Coupling:	DC or AC	DC or AC
Damage Level:	12Vp-p (-6V to +6V peaks)	12Vp-p (-6V to +6V peaks)
Frequency Range:	DC to 15MHz	DC to 45MHz
OUTPUT CHARACTERISTICS		
GENERAL		
Type:	Single-Ended or Differential	
Connectors:	Front panel BNC	Front panel BNC
Impedance:		
Source	50Ω, 75Ω, or 600Ω	2.5Ω ± 5%, 50Ω or 75Ω
Load	N/A	N/A
Coupling:	DC or AC	DC or AC
Protection:	Short-circuit, 10 seconds	Short-circuit, 10 seconds
Gain:	x10 (1), fixed	x10 (1), fixed
Polarity:	Normal	Normal
Max. Amplitude:		
Peak	20Vp-p into 50Ω (2)	34Vp-p into 50Ω
Continuous	20Vp-p into 50Ω (2)	30Vp-p into 50Ω
Max. Output Current:		
Peak	200mA	1A
Continuous	200mA	750mA
SQUARE WAVE CHARACTERISTICS		
Transition Time (typ.):	<22ns	<15ns
Aberrations (typ.):	<7%	<7%
SINE WAVE CHARACTERISTICS		
Bandwidth:		
Small Signal	30MHz, at 2Vp-p	45MHz, at <10Vp-p
Large Signal	15MHz, at 20Vp-p	30MHz, at <34Vp-p
Accuracy (Sine wave at 1kHz):	±(3% of full-scale amplitude range + 25mV)	±(3% of full-scale amplitude range + 25mV)
Flatness (10Vp-p):		
DC to 1MHz	5%	5%
1MHz to 15MHz	10%	10%
THD:	0.1%, 10Hz to 100kHz	0.1%, 10Hz to 100kHz
OUTPUT MONITOR CHARACTERISTICS		
Connectors:	N/A	N/A
Source Impedance:	N/A	N/A
Load Impedance:	N/A	N/A
Ratio:	N/A	N/A
GENERAL		
Voltage Range:	85VAC to 265VAC	85VAC to 265VAC
Frequency Range:	47Hz to 63Hz	47Hz to 63Hz
Power Consumption:	25W	25W
Signal Ground:	Grounded to case ground	Grounded to case ground
Dimensions:		
With Feet	315 x 102 x 395 mm (WxHxD)	315 x 102 x 395 mm (WxHxD)
Without Feet	315 x 88 x 395 mm (WxHxD)	315 x 88 x 395 mm (WxHxD)
Weight:		
Without Package	3.5kg	3.5kg
Shipping Weight	4kg	4kg
Temperature:		
Operating	0°C to 50°C	0°C to 50°C
Storage	-40°C to 70°C	-40°C to 70°C
Humidity:	80% RH, non condensing	80% RH, non condensing
Safety:	CE Marked, IEC61010-1	CE Marked, IEC61010-1
Calibration:	1 year	1 year
Warranty:	3 years standard	3 years standard

(1) Custom gain from x10 to x20 can be ordered however, bandwidth may change (2) Into matching impedance

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Leading The Way In Waveform Generation

	9100 | 9200	9100A | 9200A | 9400
CONFIGURATION		
Platform:	Bench	Bench
Output Channels:	1 | 2	1 | 2 | 4
INPUT CHARACTERISTICS		
Type:	Single-Ended	Single-Ended
Connectors:	Front panel BNC	Front panel BNC
Impedance:	1MΩ	1MΩ
Coupling:	DC	DC
Damage Level:	50Vp-p	8Vp-p (±4V peaks)
Frequency Range:	DC to 500kHz	Full Power: DC to 500kHz; Unipolar: DC to 200kHz
OUTPUT CHARACTERISTICS		
GENERAL		
Type:	Single-Ended	Single-Ended or Unipolar
Connectors:	Front panel BNC	Front panel BNC
Impedance:		
Source	0.1Ω	0.1Ω
Load	Resistive, limited by the output current, capacitive up to 100pF, Inductive up to 0.5mH	Resistive, limited by the output current, capacitive up to 1nF
Coupling:	DC	DC
Protection:	Short-circuit, 10 seconds	Short-circuit, 10 seconds
Gain:	x15 (1), fixed	x50 (1), fixed
Polarity:	Normal	Normal; Half wave rectified
Max. Amplitude:		
Peak	300Vp-p	Full Power: 400Vp-p; Unipolar: +200V
Continuous	300Vp-p	Full Power: 400Vp-p; Unipolar: +200V
Max. Output Current:		
Peak	150mA | 100mA	125mA | 100mA | 50mA
Continuous	150mA | 100mA	125mA | 100mA | 50mA
SQUARE WAVE CHARACTERISTICS		
Transition Time (typ.):	<1.5µs	<1µs
Aberrations (typ.):	<15%	<10%
SINE WAVE CHARACTERISTICS		
Bandwidth:		
Small Signal	1MHz, at 20Vp-p	1.5MHz, at 20Vp-p
Large Signal	500kHz, at 300Vp-p	500kHz, at 400Vp-p
Accuracy (Sine wave at 1kHz):	±(2% of full-scale amplitude range + 25mV)	±(2% of full-scale amplitude range + 50mV)
Flatness (10Vp-p):		
DC to 1MHz	5%	5%
1MHz to 15MHz	10%	10%
THD:	0.1%, 10Hz to 10kHz; 1.2%, 10kHz to200kHz	0.1%, 10Hz to 50kHz; 0.8%, 50kHz to200kHz
OUTPUT MONITOR CHARACTERISTICS		
Connectors:	N/A	Rear panel BNCs
Source Impedance:	N/A	3kΩ
Load Impedance:	N/A	1MΩ
Ratio:	N/A	100:1, ±10%
GENERAL		
Voltage Range:	100V/115V/230V	100V/115V/230V
Frequency Range:	47Hz to 63Hz	47Hz to 63Hz
Power Consumption:	60W	120W
Signal Ground:	Floated to the same level as the source, 250VDC max.	Floated to the same level as the source, 250VDC max.
Dimensions:		
With Feet	315 x 102 x 395 mm (WxHxD)	315 x 102 x 395 mm (WxHxD)
Without Feet	315 x 88 x 395 mm (WxHxD)	315 x 88 x 395 mm (WxHxD)
Weight:		
Without Package	6kg	6.5kg
Shipping Weight	7kg	7.5kg
Temperature:		
Operating	0°C to 50°C	0°C to 50°C
Storage	-40°C to 70°C	-40°C to 70°C
Humidity:	80% RH, non condensing	80% RH, non condensing
Safety:	CE Marked, IEC61010-1	CE Marked, IEC61010-1
Calibration:	1 year	1 year
Warranty:	3 years standard	3 years standard

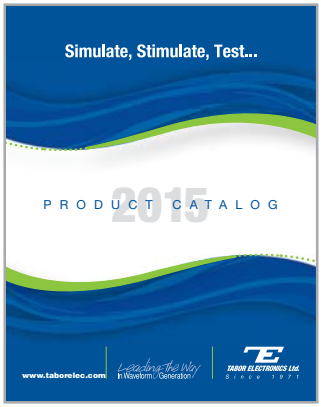
TABOR ELECTRONICS Ltd.

Specification

	3222 | 3322	3180
CONFIGURATION		
Platform:	PXIBus | PCIBus	PXIBus
Output Channels:	1	1
INPUT CHARACTERISTICS		
Type:	Single-Ended	Single-Ended
Connectors:	Front panel BNC	Front panel BNC
Impedance:	50Ω or 1MΩ	50Ω
Coupling:	DC	DC
Damage Level:	50Ω, ±2V peaks; 1MΩ, ±5V peaks	±25V peaks
Frequency Range:	DC to 20MHz	DC to 1MHz
OUTPUT CHARACTERISTICS		
GENERAL		
Type:	Single-Ended	Single-Ended
Connectors:	Front panel BNC	Front panel BNC
Impedance:		
Source	50Ω, 75Ω, or 600Ω	0.1Ω
Load	N/A	N/A
Coupling:	DC	DC
Protection:	Short-circuit, 10 seconds	Short-circuit, 10 seconds
Gain:	x10 (1), fixed	x20 (1), fixed
Polarity:	Normal or inverted	Normal
Max. Amplitude:		
Peak	20Vp-p (2)	180Vp-p
Continuous	N/A	N/A
Max. Output Current:		
Peak	200mA	150mA
Continuous	200mA	150mA
SQUARE WAVE CHARACTERISTICS		
Transition Time (typ.):	<22µs	<1.5µs
Aberrations (typ.):	<7%	<15%
SINE WAVE CHARACTERISTICS		
Bandwidth:		
Small Signal	50MHz, at 2Vp-p	1MHz, at 20Vp-p
Large Signal	20MHz, at 20Vp-p	300kHz, at 180Vp-p
Accuracy (Sine wave at 1kHz):	±(3% of full-scale amplitude range + 25mV)	±(2% of full-scale amplitude range + 25mV)
Flatness (10Vp-p):		
DC to 1MHz	N/A	N/A
1MHz to 15MHz	N/A	N/A
THD:	0.1%, 10Hz to 100kHz	0.1%, 10Hz to 10kHz; 1.2%, 10kHz to 200kHz
OUTPUT MONITOR CHARACTERISTICS		
Connectors:	N/A	N/A
Source Impedance:	N/A	N/A
Load Impedance:	N/A	N/A
Ratio:	N/A	N/A
GENERAL		
Voltage Range:	+5V, 3.5A max.	+12V, 0.4A max.; -12V, 0.4A max.; +5V, 0.1A max.
Frequency Range:	N/A	N/A
Power Consumption:	7.2W max.	11W max.
Signal Ground:	Floated to the same level as the source, 250VDC max.	Grounded
Dimensions:	Single slot PXI | Single slot PCI	Single slot PXI
With Feet	N/A	N/A
Without Feet	N/A	N/A
Weight:		
Without Package	0.5kg	0.5kg
Shipping Weight	1kg	1kg
Temperature:		
Operating	0°C to 50°C	0°C to 50°C
Storage	-40°C to 70°C	-40°C to 70°C
Humidity:	80% RH, non condensing	80% RH, non condensing
Safety:	CE Marked, IEC61010-1	CE Marked, IEC61010-1
Calibration:	1 year	1 year
Warranty:	3 years standard	3 years standard

(1) Custom gain from x10 to x20 can be ordered however, bandwidth may change (2) Into matching impedance

	A10150	A10160
CONFIGURATION		
Platform:	"Snap-On" Module	"Snap-On" Module
Output Channels:	1	1
INPUT CHARACTERISTICS		
Type:	Single-Ended	Single-Ended
Connectors:	SMAs	SMAs
Impedance:	50Ω	50Ω
Coupling:	DC	DC
Damage Level:	6Vp-p (-3V to +3V peaks)	6Vp-p (-3V to +3V peaks)
Frequency Range:	DC to 150MHz	DC to 45MHz
OUTPUT CHARACTERISTICS		
GENERAL		
Type:	Single-Ended	Single-Ended
Connectors:	BNC	BNC
Impedance:		
Source	50Ω ±1%	2.5Ω ±5%
Load	N/A	N/A
Coupling:	DC	DC
Protection:	Short-circuit, 10 seconds	Short-circuit, 10 seconds
Gain:	x5 (1), fixed	x10 (1), fixed
Polarity:	Normal	Normal
Max. Amplitude:		
Peak	16Vp-p (20Vp-p optional) (2)	34Vp-p into 50Ω
Continuous	N/A	30Vp-p into 50Ω
Max. Output Current:		
Peak	250mA	1A
Continuous	250mA	750mA
SQUARE WAVE CHARACTERISTICS		
Transition Time (typ.):	2V Step, <1.2ns; 10V Step, <2.6ns	<10ns
Aberrations (typ.):	2V Step, <5%; 10V Step, <10%	10V, <5%; 34V, <10%
SINE WAVE CHARACTERISTICS		
Bandwidth:		
Small Signal	200MHz, at 2Vp-p	45MHz, at 10Vp-p
Large Signal	150MHz, at 10Vp-p	30MHz, at 34Vp-p
Accuracy (Sine wave at 1kHz):	±(2% of full-scale amplitude range + 25mV)	±(2% of full-scale amplitude range + 25mV)
Flatness (10Vp-p):		
DC to 1MHz	N/A	N/A
1MHz to 15MHz	N/A	N/A
THD:	N/A	N/A
OUTPUT MONITOR CHARACTERISTICS		
Connectors:	N/A	N/A
Source Impedance:	N/A	N/A
Load Impedance:	N/A	N/A
Ratio:	N/A	N/A
GENERAL		
Voltage Range:	±15VDC (±18VDC with option x20)	±20VDC
Frequency Range:	N/A	N/A
Power Consumption:	7W max.	20W max.
Signal Ground:	Grounded	Grounded
Dimensions:	45 x 30 x 85 mm (W x H x D)	45 x 30 x 85 mm (W x H x D)
With Feet	N/A	N/A
Without Feet	N/A	N/A
Weight:		
Without Package	115g	115g
Shipping Weight	1.25kg	1.25kg
Temperature:		
Operating	0°C to 40°C	0°C to 40°C
Storage	-40°C to 70°C	-40°C to 70°C
Humidity:	80% RH, non condensing	80% RH, non condensing
Safety:	CE Marked, IEC61010-1	CE Marked, IEC61010-1
Calibration:	1 year	1 year
Warranty:	3 years standard	3 years standard



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Leading the Way
In Waveform Generation

TABOR ELECTRONICS Ltd.
Since 1971