



DA101010: 10 MHz Distribution Amplifier



Key Features

- 10 MHz Main Input
- AGC Level Controlled
- 10 sinewave outputs plus a slave
- 2 squarewave outputs
- High channel isolation
- Low Phase Noise
- Optional second 10 MHz “Back-up” input
- Optional internal 10 MHz back-up oscillator
- Above two options automatically switched in
- Optional Alarm Relay, enabled on alarm condition
- Optional Redundancy (two units with automatic switchover)
- Available in other frequencies from 1 to 100 MHz.

General Description

The DA101010 can be used to synchronize up to thirteen instruments (ten sinewave, two squarewave and one slave output) to a frequency reference input. The reference input frequency is 10 MHz and the output frequency is exactly the same as the input. The DA101010 incorporates AGC (automatic gain control) so that a 10 MHz input can be varied from -10 dBm to +20 dBm without the outputs changing by more than 0.4 dB. Inputs as low as -30 dBm still produce a useable output. The pure sinewave output (harmonics are typically 70 dB down) enables the DA101010 to work in the most demanding applications.

Outputs

There are ten 10 MHz, sinewave outputs. Each 10 MHz output is isolated from the input and each other. Therefore the reference oscillator connected to the DA101010 input is protected against load variations, short circuits etc. that may be applied to the outputs. Two additional squarewave outputs can be switched in frequency from 10 MHz, 5 MHz, 2 MHz, 1 MHz, 100 kHz and 1 pps. These outputs are ideal for instruments that do not use a 10 MHz timebase. A rear slave output can be connected to a second DA101010 (or more) to give additional outputs. See “Applications” below. There is also a TTL alarm output. This TTL signal will show when a valid input signal is present.

Allan Deviation

The DA101010 has very low Allan deviation, lower than most oscillators or frequency sources. This means the DA101010 will not increase the Allan deviation of the source connected to it.

A plot of the typical Allan deviation of the DA101010 is shown below:



Applications

The DA101010 10 MHz Distribution Amplifier is ideal for use in calibration or standard laboratories, radio repair workshops or production facilities. By using the rear slave output, many DA101010's can be connected together to give multiple outputs. Over 1000 outputs can be derived from one reference input.

Miscellaneous Information

The DA101010 is a highly reliable unit with an MTBF of over 60 years. The DA101010 is housed in a fully screened 19" rack mount case and operates from a 100 - 240 VAC supply (usable 90 – 260 VAC) or external 12 V DC. The DA101010 is CE marked for sale within the EEC.

Options

Various options for the DA101010 are shown below. Note that not all options can be fitted at the same time. Consult Precision Test Systems for more details.

The DA series can be modified upon special request to work at different frequencies than 10 MHz. For example the DA151510 accepts a 15 MHz input and has 15 MHz outputs. Other frequencies to 100 MHz can also be accommodated.

Option 01 is an Alarm Relay that is activated when the 10 MHz input signal is present. Two changeover relay contacts can be used to raise an alarm should the input signal or power be lost. A TTL alarm output is provided as standard.

Option 02 is a redundancy option allowing two DA101010's to be operated together giving a fully redundant output. If one unit fails, the outputs will be sourced from the second unit. The option includes a second DA101010.

Option 03 is an internal 10 MHz back up oscillator. Should the input 10 MHz fail, the internal oscillator switches in.

Option 04 converts the outputs to 5 MHz. So with a 10 MHz input, there are five outputs at 5 MHz. The squarewave outputs remain switchable from 10, 5, 2, 1, 0.1 MHz and 1 pps.

Option 05 deletes five outputs and one squarewave output. So this is a negative option that reduces the price.

Option 06 adds a second 10 MHz “back-up” input. Normally the first input is used as the reference for all the outputs. If this first input fails, the second “back-up” input is automatically switched in and used as the reference.

Option 07 adds a separate 1 pps input with 5 x 1 pps outputs. Option 05 must be ordered at the same time since the maximum number of outputs is limited to ten

Other models in the series include:

DA050510:	5 MHz input with 10 x 5 MHz outputs and 2 x squarewave outputs
DA051010	5 MHz input with 10 x 10MHz outputs and 2 x squarewave outputs
DA101010:	10 MHz input with 10 x 10 MHz outputs and 2 x squarewave outputs
DA101010-04:	10 MHz input with 5 x 10 MHz outputs and 5 x 5 MHz outputs, plus 2 x squarewave outputs
DA101030	10 MHz input with 25 sinewave outputs and 5 x squarewave outputs
DA101530	10 MHz input with 25 x 15 MHz outputs and 5 x squarewave outputs
DA1-100-10	1 MHz to 100 MHz wideband input. Up to 15 outputs, same frequency as the input

Special Modification

The DA101010 can be modified to customer’s specific requirements. If the customer requires a feature not already mentioned in this brochure, then the customer should consult Precision Test Systems to see whether that feature can be added for a nominal charge. Many of the existing options started out as customers specific requests. These “specials” have now become standard options.

DA101010 SPECIFICATIONS

Specification Parameter	Specification	Comments
Input		
Frequency / Bandwidth (3 dB)	10.000000 MHz / 250 kHz	50 Ω BNC Connector on rear panel
Input Impedance / VSWR	50 Ω / < 1.15 @ 10 MHz (0 dBm input)	< 1.30 @ 10 MHz for option 03
Input Level	+20 dBm to -10 dBm	Output Changes by < 0.4 dB
Sinewave Outputs (10)		
Output Waveform	Sinewave	50 Ω BNC Connector on rear panel
Number of Outputs	Ten	Options for 5 or 15 outputs available
Output Frequency	Exactly the same as the input frequency	Subject to the DA101010’s jitter spec
Output VSWR	< 1.5: 1 @ 10 MHz	
Output level	From 0 dBm to > +13 dBm Factory default setting is +10 dBm	Each output factory adjustable. Specify output level when ordering
Harmonic Distortion at 10 MHz	-65 dBc (typically -70 dBc)	Output set to +10 dBm
Allan Deviation	< 1 x 10 ⁻¹² (1 sec), < 2 x 10 ⁻¹⁵ floor	
Channel to channel isolation	> 40 dB	Typical 45 dB to 60 dB
Input to Output Isolation	> 85 dB	Typical 86 dB to 105 dB
Squarewave Outputs (2)		
Output Waveform	Squarewave	50 Ω BNC Connector on rear panel
Level	0 - 5V (open circuit) 0 - 2.7 V (50 Ω)	TTL Compatible
Frequency	10, 5, 2, 1, 0.1 MHz, and 1 pps	1 pps = 1 pulse per second (1 Hz)
Risetime	< 50 ns	At 1 MHz
Slave Output (1)		
Output Waveform	Sinewave @ > -5 dBm	50 Ω BNC Connector on rear panel
Phase Noise (Typical)		
At 1/10 / 100 /1k/ 10k / 100k Hz Offsets	-90 / -115 / -142 / -142 / 147 / -152	Lower phase noise option available
General		

Power: AC / DC	100 - 240 VAC / 11-13 VDC @ 1.4 A	50 Watts max / 1.6Amps with opt 03
Size and weight	483 x 300 x 44 mm and 4.6 kg	Width x Depth x Height
Ambient Operating Temperature	-10°C to +50 °C	
Options		
Option 01	Dual changeover alarm relay contacts	Plus two 8V logic alarm outputs
Option 02	Redundancy	Requires two units
Option 03	Internal Backup 10 MHz oscillator	Activated if input signal/power is lost
Option 04	Convert five outputs to 5 MHz	Remaining 5 outputs remain 10 MHz
Option 05:	Delete five sinewave outputs	
Option 06	Second "back-up" 10 MHz input	Automatically switched in
Option 07	5 x 1 pps outputs with separate input	Option 05 must be added as well
Precision Test System Contact Details		
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Full specifications available from www.ptsyst.com. Specifications and features subject to change without notice (240616)