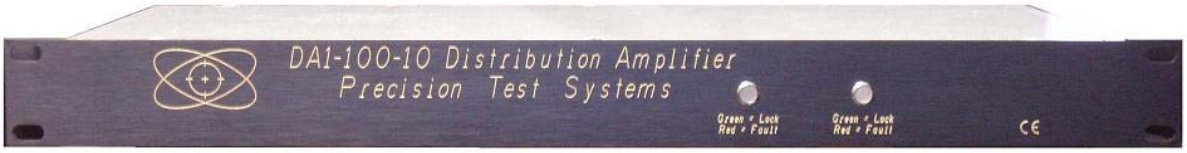
PTS PRECISION TEST SYSTEMS

DA1-100-10: 1 MHz -100 MHz Wide Band Distribution Amplifier



General Description

The DA1-100-10 is a wide band distribution amplifier with a wide bandwidth of 1 MHz to 100 MHz (usable to 150 MHz). It can be used to synchronize up to ten instruments to a frequency reference input. The reference input will typically be an OXCO, Rubidium, Caesium or Hydrogen Maser Frequency Standard. Typical frequencies are 5 and 10 MHz, but any frequency from 1 MHz to 100 MHz can be sued.

The DA1-100-10 has features not found in any competitive unit. This makes the DA1-100-10 the industries leading distribution amplifier.

The DA1-100-10 has outstanding phase noise. Therefore the DA1-100-10 will not add any noise or jitter to the frequency reference input.

Phase noise is typically at -132 dBc @ 1 Hz). This low phase noise enables units to be cascaded for over 1000 outputs.

Amplifier with Gain

Unlike most competitive units, the DA1-100-10 accepts inputs from +7 dBm to +13 dBm and provides an output of 0 to +13 dBm. The output will not vary with input variations. This is very useful when long cable runs are being used, or input signals have different levels. Lower input levels can also be used without AGC.

Outputs

There are ten sinewave outputs with a bandwidth from 1 to 100 MHz. Each output is completely isolated from the input and each other. Therefore the reference oscillator connected to the DA1-100-10 input is protected against load variations, short circuits etc. that may be applied to the outputs.

Channel to channel isolation is typically > 100 dB at 10 MHz and > 65 dB at 100 MHz. Output to input isolation is typically > 135 dB at 10 MHz and > 90 dB at 100 MHz. Each output port can be independently set to any level from 0 to +13 dBm.

Over 1000 outputs can be obtained without any significant increase in phase noise.

Phase Stable with matched outputs

The outputs are phase stable to 10 ps/°C. Also the delay match between outputs is better than 2.5 ns overall and typically less than 300 ps between groups of five outputs.

Alarms

Every output has alarm monitoring. Should the RF level drop on any output, an alarm will be raised. Also front panel Led's shows the status of the alarms. The alarm signals are also available on the rear panel.

Applications

The DA1-100-10 Distribution Amplifier is ideal for use in calibration or standard laboratories, space research, satellite systems or anywhere where ultimate performance is needed.

Miscellaneous Information

The DA1-100-10 is a highly reliable unit. The DA1-100-10 is housed in a fully screened 19" rack mount case and operates from a 90 to 260 VAC supply. The DA1-100-10 is CE marked for sale within the EEC.

Options and Other Amplifiers available from Precision Test Systems

Options for the DA1-100-10 include:

- Fully isolated outputs. Useful in preventing ground loops on long cable runs.
- Squarewave outputs. Either at the same frequency as the input, or at different frequencies.
- Multiplied or divided outputs. E.g. 10 MHz, input with 5 MHz output. 10 MHz input with 100 MHz output. Any type of multiplication / division can be incorporated.
- Low pass filter on outputs. This reduces the harmonic output.
- Guaranteed phase noise specifications. Measured phase noise specifications supplied with unit.
- Higher output levels, up to +15 dBm.
- Additional five outputs, giving 15 outputs in all
- External DC Power Input. The DA1-100-10 also has an external 12VDC input (12 - 15 VDC). This can be used to provide back up power. If the main AC power is lost, the DA1-100-10 will immediately switch to the external 12VDC external input without loss of output.
- Redundancy. Two units operate together. If one unit fails, the outputs are switched to the secondary unit.
- Internal backup oscillator. This oscillator is automatically enabled should the input signal fail. The oscillator can be specified in any frequency from 1 to 100 MHz.

Precision Test Systems also manufacturers the PTS50 and DA1010 series of distribution amplifiers. These models are lower cost alternatives to the DA1-100-10 but still give very good performance.

DA1-100-10 SPECIFICATIONS

Specification Parameter	Specification	Comments
Input		
Frequency	1 MHz to 100 MHz	Wideband Frequency Input
Bandwidth 1 MHz – 100 MHz	± 3.0 dB	± 1 dB from 3-100 MHz
Impedance	50 Ω	
Input VSWR	< 1.08 @ 10 MHz, < 1.4 @ 100 MHz	Slave output terminated in 50 Ω
Input Level	7 dBm to + 19 dBm	AGC Controlled. Can be used with lower inputs levels
Sinewave Outputs		
Output Waveform	Sinewave	50 Ω BNC Connector on rear panel
Output Frequency	Exactly the same as the input frequency	
Output VSWR	< 1.08: 1 @ 10 MHz, <1.8:1 @ 100 MHz	
Output level (individually adjustable)	Adjustable from 0 dBm to +10 dBm	Option to +15 dBm available
Harmonic Distortion (0 dBm input)	-25 dBc	Can be improved with options
Spurious Outputs	-125 dBc	Spurs are line frequency related
Channel to Channel Isolation	> 90 dB @ 10 MHz, > 60 dB @ 100 MHz	Typically > 100 dB @ 10 MHz
Input to Output Isolation	> 130 dB @10 MHz, > 80 dB at 100 MHz	Typically 138 / 90 dB - 10/100 MHz
Delay match between outputs	< 2.5 ns	< 300 ps within group of 5 outputs

Temperature Stability of delay	10 ps/°C	
Slave Output		
Slave Output	Passive output derived from input	Level = input level - 7 dB.
Allan Variance		
Allan Variance	$< 5 \times 10^{-14}$ (1 sec)	Calculated from phase noise
Phase Noise & Broadband Noise		
Phase Noise (dBc/Hz) typical	-132 / -146 / -156 /-164 /-165	@ 1 / 10 / 100 / 1k / 10k Hz offsets
General		
Power (AC)	90 – 260 VAC (100-240 VAC for Europe)	50 Watts max
Size and weight	483 x 257 x 44 mm and 2.8 kg	Width x Depth x Height
Ambient Operating Temperature	-10°C to +50 °C	
Alarm Output	Alarm Outputs on rear panel	
Options (not all options can be fitted at the same time)		
Option 01	Dual changeover alarm relay contacts	Activated in the event of an alarm
Option 02A	Ground Isolated Input	
Option 02B	Ground Isolated Outputs	
Option 03	Redundancy	Requires two units
Option 04	TNC Connectors	
Option 05	SMA connectors	
Option 06	Guaranteed phase noise specifications	
Option 07	UKAS traceable certificate	
Option 08	Increased output level to +15 dBm	
Option 09	Additional five sinewave outputs	15 outputs in all
Option 10	Squarewave outputs	TTL/CMOS or ECL output levels
Option 11	Divided frequency output	E.g. 2.048 MHz, 5 MHz
Option 12	Multiplied output	E.g. X 10, X 100
Option 13	Low Pass filter on output	Improved harmonic rejection
Option 14	External 12VDC input	Operates from 12.0 to 15.0 VDC
Option 15	Internal temperature controlled fan for increased ambient temperature operation	Allows operation to 60 °C
Option16-XXX	Internal backup oscillator	XXX = frequency in MHz.

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Full specifications available from www.ptsyst.com. Specifications and features subject to change without notice (260906)