

Frequency Distribution Amplifier

Economy Version

5 to 100 MHz, Dual Chain: 1 Input to 8 Outputs each

Issue 03

Part No: 10376



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Key features:

- Compact design (1HU), rack mountable
- Low phase noise
- High output-to-output and reverse isolation
- Excellent input and output match to 50 Ω
- Useable from 100 kHz to 200 MHz
- Excellent for high performance frequency references
- AC and 2 x DC inputs, automatic switch-over

The Frequency Distribution Amplifier is a one-height unit rack mountable unit. The unit allows a cost and space efficient way to distribute reference frequencies throughout a system without any loss or degradation. The standard product gain is 0 dB. A different gain is available on customer request.

The Distribution Amplifier is optimised for very low phase noise, a very good input and output match to 50 Ω , and for excellent isolation for the output to output path and output to input path.

The Distribution Amplifier provides a very high stability of signal delay so that it can be used with high precision frequency sources, such as caesium clocks.

Frequency Distribution Amplifier

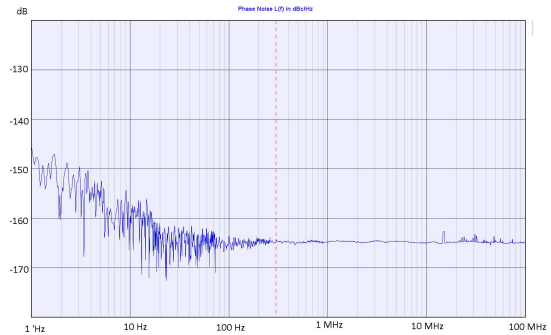


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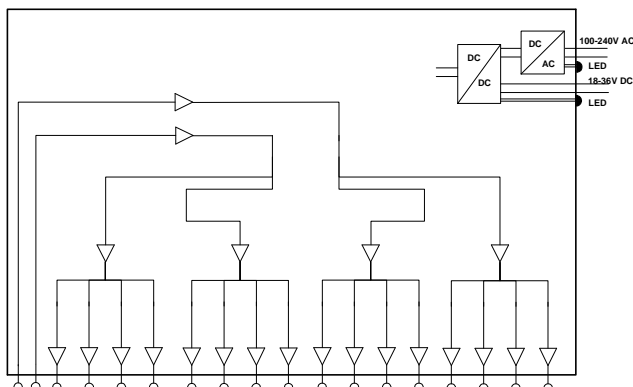
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The Distribution Amplifier is designed to minimise phase noise and shows the following performance, measured under laboratory environment, temperature +15 .. +30°C, controlled to 1K pp with maximum slopes of 0.5 K/h:

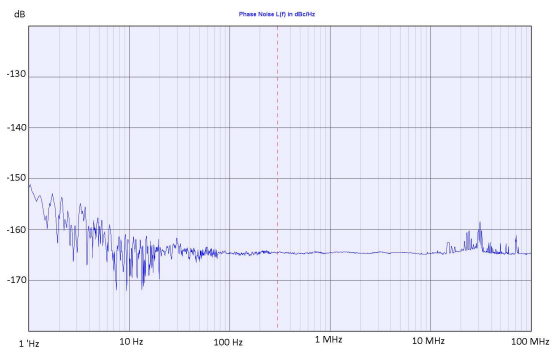
| Freq. Offset [Hz] | Phase Noise [dBc] | | |
|----------------------|-------------------|--------|---------|
| | 5 MHz | 10 MHz | 100 MHz |
| 1 | -154 | -148 | -131 |
| 10 | -165 | -160 | -140 |
| 100 | -165 | -165 | -150 |
| 1000 | -166 | -166 | -153 |
| 10000 | -166 | -166 | -153 |



Phase noise at 10 MHz, 13 dBm, 1 Hz to 100 kHz
(subtract 3 dB for single unit)



Block diagram of the Frequency Distribution Amplifier



Phase noise at 5 MHz, 13 dBm, 1 Hz to 100 kHz
(subtract 3 dB for single unit)

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Specification

Signal Inputs

| | |
|---------------------|--|
| Number of inputs | 1 per chain (total 2 inputs) |
| Frequency | 5 to 100 MHz, sine wave, useable from 100 kHz to 200 MHz |
| Input impedance | 50 Ω , nominal |
| Input level working | +6 to +17 dBm (+14 dBm @ 100 MHz) |
| Input level nominal | +13 dBm |
| Input return loss | > 45 dB @ 5MHz and 10 MHz, > 30 dB @ 100 MHz |
| Connectors | BNC |

Signal Output

| | |
|---|---|
| Number of outputs | 8 per chain, two chains (total 16 outputs) |
| Gain | 0 dB (+0.15/-0.1 dB, 1 – 100 MHz, +0.15 to -0.5 dB @ 200 MHz) |
| Gain variation | < 0.1 dB, output vs. output |
| Output impedance | 50 Ω , nominal |
| Output return loss | > 50 dB @ 5MHz and 10 MHz, > 30 dB (typ -35 dB) @ 100 MHz |
| Connectors | BNC |
| Noise figure | < 22.0 dB, (21 dB typ. 1 – 100 MHz) |
| Group delay absolute, 1 – 100 MHz | 4.7 ns \pm 0.2 ns |
| Group delay flatness, 1 – 100 MHz | < 0.1 ns pp |
| Group delay variation, channel vs channel | < 0.1 ns |
| Group delay variation versus temperature | < 6 ps / K |

| | 5 MHz | 10 MHz | 100 MHz |
|--|------------------------------|------------------|------------------|
| Np clipping below | +12 dBm | +12 dBm | +12 dBm |
| Reverse Isolation [dB] | > 140 (145 typ.) | > 120 (128 typ.) | > 110 (118 typ.) |
| Output / Output Isolation [dB] | > 100 (108 typ.) | > 90 (100 typ.) | > 75 (83 typ.) |
| Ch-A / Ch-B Isolation [dB] | > 110 (117 typ.) | > 100 (110 typ.) | > 90 (98 typ.) |
| Harmonics [dBc] (1 st , 2 nd , 3 rd) | +10 dBm input -76 -76 -80 | -70 -57 -65 | -44 -46 -60 |
| | +13 dBm input -73 -69 -82 | -65 -55 -65 | -42 -40 -55 |

Electrical interface

| | | |
|--|--|---|
| Power Consumption (all outputs loaded) | AC: < 0.2 A DC: < 0.9 A, Stand-By: < 50 mA | Priority on AC supply input DC is used as back-up supply |
| Supply voltage AC | 100 to 240 V AC, 50/60 Hz | LED indicating AC voltage |
| Supply voltage DC | 18 to 36 V DC, DC isolated | LED indicating DC voltage |
| | 2 redundant DC power input connectors, automatic switchover DC connector included, IEC 61076-2-101 M8 (+) brown (1) & white (2), (-) blue (3) & black (4), polarity reversible | |

Mechanical

| | |
|---------|--|
| Outline | 19 inch, 1 height unit (448.8 mm * 44 mm) depth 448 mm |
| Weight | 4 kg |

Environmental

| | |
|----------------------------|---|
| Transportation and Storage | |
| Temperature. | -20°C to +75°C |
| Humidity | 10% to 90% (non-condensing) |
| Altitude | < 20 000 m |
| Shock | max 10 g acceleration for 11 ms |
| Vibration | max. 0.15 mm at 5 to 8 Hz, max 1g acceleration at 8 to 500 Hz |
| Operation | |
| Temperature | Operational 0°C to +40°C Full spec +15°C to +30°C |
| Humidity | 20% to 90% (non-condensing) |
| Altitude | < 2 000 m |

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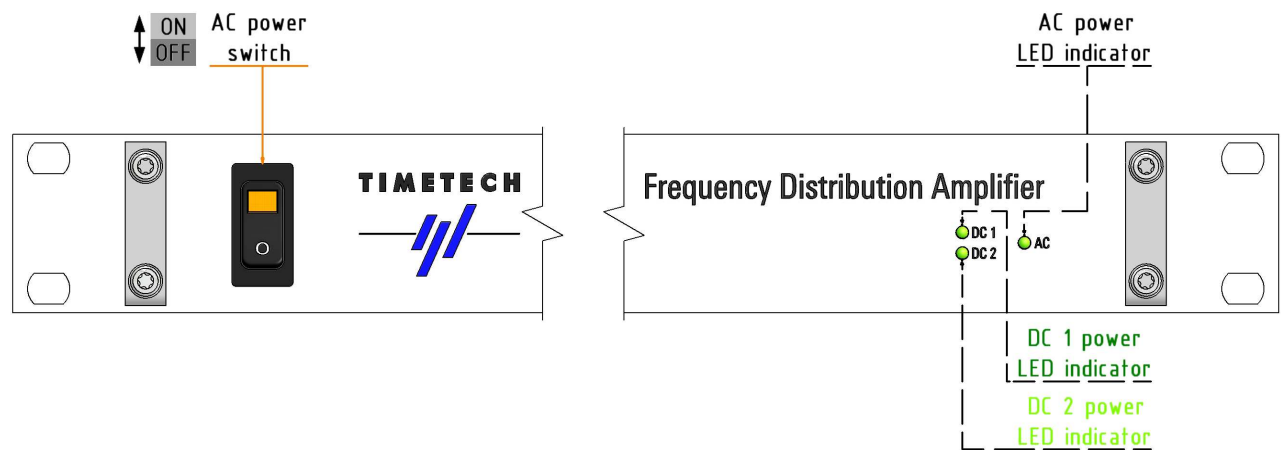


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Unit Outline

Front View



Rear View

