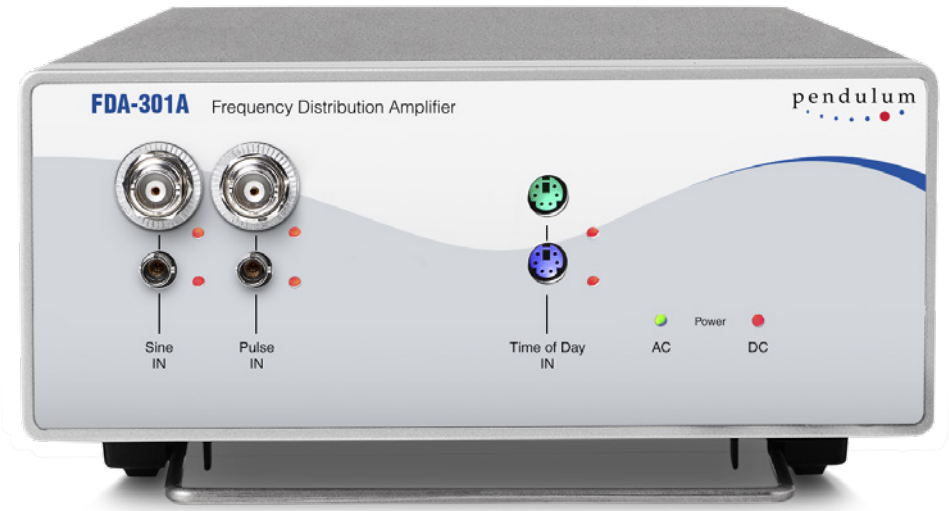
FDA-301A

Frequency Distribution Amplifier

DATA SHEET

- Distributes sine, pulse, and ToD signals over fiber and/or coax
- Narrowband sine input for distribution of reference frequency
- Pulse distribution of e.g. 1-pps or unmodulated IRIG time code
- 3 modular output slots provides easy upgradability in the field. Up to 18 fiber or 12 coax outputs
- No-noise and EMP-proof distribution over fiber
- Distribute up to 2 km over fiber
- Auto-change-over when connecting two input sources (Master-Slave)
- Optional DC power input for power redundancy



The Pendulum FDA-301A is a very versatile Frequency Distribution Amplifier for distributing a central time sync or frequency reference signal to multiple users, between rooms, floors, buildings and sites. The FDA-301A can distribute sine, pulse (e.g. 1-pps or IRIG DCLS), serial ToD, via noise-free optical fibers to up to 18 receivers, located up to 2 km away. The FDA-301A offers modularity, redundancy and ease-of-use.

Versatile frequency distribution

The main application of FDA-301A, Frequency Distribution Amplifier, is distribution of a 10 MHz reference sine wave frequency to multiple users, over extended distances, providing galvanic isolation and redundant operation with ultimate ease-of-use. Other applications are:

- Distribution of 1-pps or unmodulated IRIG (pulse) to multiple users
- Distribution of serial ToD (Time of Day) to multiple users
- Distribution of other sine frequencies

up to 6 input signal connectors on front panel:

- Coax and fiber sine wave inputs (standard)
- Coax and fiber pulse inputs (optional)
- 2xTime of day input (electrical only, optional)

1, 2 or 3 Output modules, with 4 or 6 outputs each, on rear panel:

- Coax: 4x 10 MHz Sine, or 4x Pulse
- Fiber: 6x 10 MHz Sine, or 6x Pulse
- 4x ToD electrical

Fiber optic distribution advantages

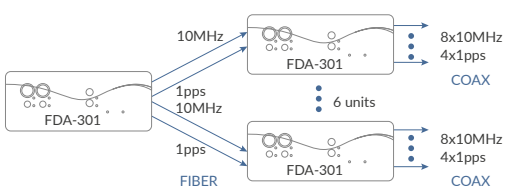
In coax distribution networks, there is a risk for ground loops and other types of EMI. Distances are limited to some tens of meters depending on environment and the quality of the coax cables used. By converting the electrical signal to a fiber optic signal, ground loops and EMI are avoided and the distance can be extended up to 2 km.

Fiber optic distribution advantages

When the FDA-301A is used in fixed installation, with mission critical 24/7 operation, fail safe operation with redundancy is very important. The FDA-301A will provide:

Power supply redundancy via the optional External DC power supply.
Input source redundancy via parallel Coax and Fiber inputs. By connecting a Master source to the fiber input and a Slave source to the coax input, the Master will supply the signal to distribute, until it fails, when the Slave source automatically takes over.

Example: Distribute 10MHz & 1pps to 6 remote receivers



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Inputs

Fiber optic inputs Sine, Pulse

Fiber optical connector: ST
Wavelength: 820nm
Fiber type: Multimode fiber, 62.5/125µm or 50/125µm
Frequency for sine input: 10 MHz (default); for other frequencies, 0.1 to 60 MHz, contact factory

Connection fiber from an FDA-301A output to another FDA-301A input:

Max. optical attenuation: 6dB (including fiber and all connectors and splices)
Max. distance: 2km

Coax Input Sine

Connector: BNC female
Frequency: 10 MHz (default); for other frequencies, 0.1 to 60 MHz, contact factory
Impedance: 50 Ohm nominal
Amplitude range: 0.2 Vrms to 2 Vrms (nom.)
Max. Voltage without damage: 7Vrms

Coax Input Pulse

Connector: BNC female
Frequency range: 1 Hz to 20 MHz
Min. Pulse width: ≤ 20ns
Max. Pulse width: ≥ (signal period – 20ns
Impedance: 50 Ohm nominal
Amplitude range: 0V to +5V (nom.)
Low level <0.8V; high level > 2V
Max. Voltage without damage: 15Vp-p (-5V to +10V)

Time of Day (ToD) Input

Connector: Mini Din 6 pins Female; RS232C electrical levels accepted from -10V to +10V
Maximum repetition rate: 500 kHz

Outputs

Fiber optic outputs Sine, Pulse

Connectors: ST
Wavelength: 820nm
Fiber type: Multimode fiber, 62.5/125µm or 50/125µm
Max. distance: 2km
Pulse jitter (rms): < 10 ps + optical jitter). Optical jitter is due to optical attenuation and dispersion and depends on quality and length of fiber used. Optical jitter is 0 ps for 1m and typically <100ps for 1km

Coax Output Sine

Connectors: BNC female
Impedance: 50 Ohm nominal
Output voltage: 1Vrms (sine) ±10% in 50 ohm

Coax Output Pulse

Connectors: BNC female
Impedance: 50 Ohm nominal
Output voltage: TTL-levels in 50 Ohm; low level ≤ 0.4 V; high level ≥ 2.4 V

Time of Day (ToD) Output

Connector: Mini Din 6 pins Female:
Output voltage levels: Low level is -5V nom.; High level is +5V nom.
Max cable length: 100 m

Output modules

Coax Sine: 4x 10 MHz
Fiber Sine: 6x 10 MHz
Coax Pulse: 4x pulse out
Fiber Pulse: 6x pulse out
T.o.D: 4x T.o.D. electrical

Power Supply

AC power

Input voltage range: 90 - 264V_{AC}, 47 - 63Hz
Power consumption: <40 W

DC power - Option

Input voltage range: 24 V ±10%
Power consumption: <40 W

Dimensions and Weight

Width: ½*19 inch (210 mm)
Height: 2U (90 mm)
Depth: 395 mm
Weight: approx. 3 kg (approx. 6 lb)

Environmental conditions

Class: MIL-PRF-28800F, Class 3
Operating temperature: 0 to 50°C
Storage temperature: -40 to +70°C
Vibration: Random and sinusoidal according to MIL-PRF-28800F, Class 3
Shock: Half-sine 30G per MIL-PRF-28800F; Bench handling
Transit drop test: Heavy-duty transport case and soft carrying case tested according to MIL-PRF-28800F
Safety: EN 61010-1:2011, pollution degree 2, meas cat I, CE, indoor use only
EMC: EN 61326 :2013-6, increased test levels according to EN 61000-6-2:2008, Group 1, class B, CE

Ordering Information

Basic Model

FDA-301A/11000: Frequency Distribution Amplifier, 10 MHz sine coax and fiber inputs, no output modules, AC power.
At least one output module must be ordered simultaneously.
Included with Instrument:

- 2 year product warranty[1]
- Line cord (dependent on destination country)
- Link to User documentation (PDF)
- Certificate of Calibration
- Important information document

*1 Warranty period may be extended to 3 years, at no cost, by registering the product

Input Frequency Options

(10 MHz sine, coax and fiber, inputs are standard)
Option 41: Pulse coax and fiber inputs
Option 42: 2x ToD electrical (mini DIN 6-pin F)
The Input options are factory installed only.

Output Frequency Options

(1, 2 or 3 modules can be installed)
Option 44C: 4x 10 MHz coax
Option 44F: 6x 10 MHz fiber
Option 45C: 4x pulse coax
Option 45F: 6x pulse fiber
Option 46E: 4x ToD electrical
The Output options can be field installed by the user

Power Supply Option

Option 49: External DC power supply for 24V DC
The Power supply option is factory installed only

Optional Accessories

Option 22/90: Rack-mount kit for one FDA-301A unit
Option 22/05: Rack-mount kit for two FDA-301A units
Option 27: Soft carrying case
Option 27H: Heavy-duty hard transport case
Option 95/05: Extended warranty to 5 years
OM-301: Printed User's Manual

Ordering numbers:

FDA-301A/XYZZZ
X = Input options
Y = Power options
Z = Output options (3 slots)
X=1: 10 MHz only
X=2: 10 MHz + pulse
X=3: 10 MHz + ToD
X=4: Not used
X=5: 10 MHz + pulse + ToD
Y=1: AC power
Y=2: AC + DC power
Z=0: module not installed
Z=1: 4x 10 MHz coax
Z=2: 6x 10 MHz fiber
Z=3: 4x pulse coax
Z=4: 6x pulse fiber
Z=5: 4x ToD electrical
Example: FDA-301A/11021 = FDA-301A with 10 MHz inputs only (X), no DC option (Y) plus one empty output slot, one 6x 10 MHz fiber output, and one 4x 10 MHz coax output (ZZZ).

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Specifications subject to change or improvements without notice.

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