

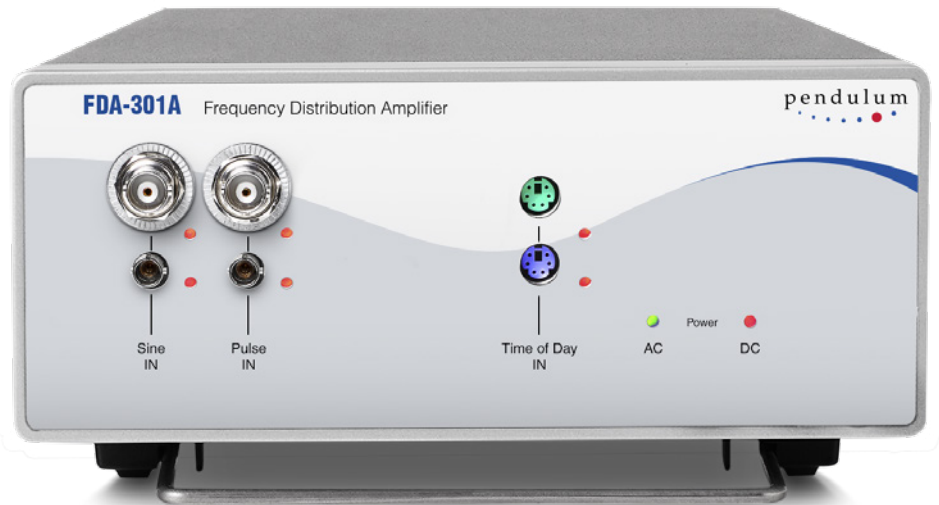
# FDA-301A

## Frequency Distribution Amplifier

pendulum

### 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

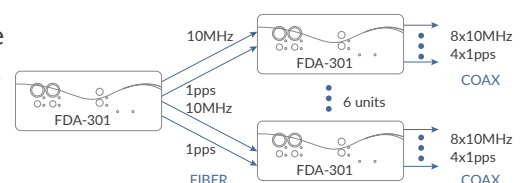
In coax distribution networks, there is a risk for ground loops and other types of EMI. Distances are limited to some tens of meters depending on environment and the quality of the coax cables used. By converting the electrical signal to a fiber optic signal, ground loops and EMI are avoided and the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



Ihr Ansprechpartner /  
Your Partner:

dataTec AG  
E-Mail: [info@datatec.eu](mailto:info@datatec.eu)  
>>> [www.datatec.eu](http://www.datatec.eu)

## 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<sub>AC</sub>, 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<sup>1</sup>
- Line cord (dependent on destination country)
- Link to User documentation (PDF)
- Certificate of Calibration
- Important information document

<sup>1</sup> 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).