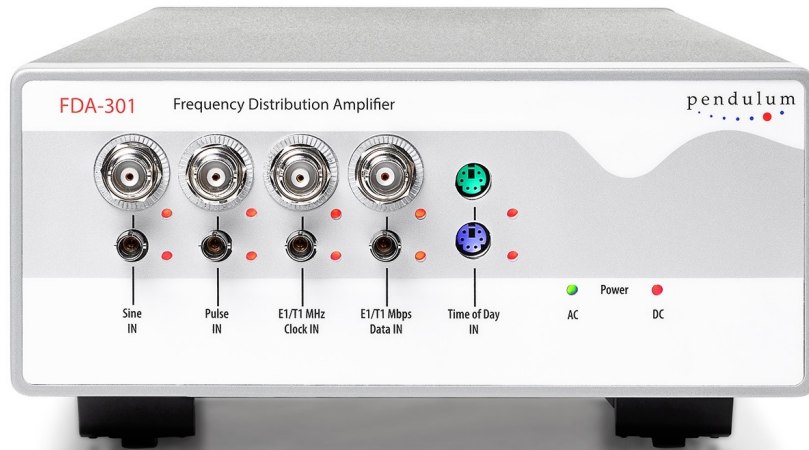


## FDA-301

### Frequency Distribution Amplifier

**NEW**

- Distributes sine, pulse, ToD and E1 clock/data 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-301 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-301 can distribute sine, pulse (e.g. 1-pps or IRIG DCLS), serial ToD and standard telecom signals, via noise-free optical fibers to up to 18 receivers, located up to 2 km away. The FDA-301 offers modularity, redundancy and ease-of-use.

#### Versatile frequency distribution

The main application of FDA-301, 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 E1 clock/data to multiple users in telecom
  - Distribution of other sine frequencies

#### up to 10 input signal connectors on front panel:

- Coax and fiber sine wave inputs (standard)
- Coax and fiber pulse inputs (optional)
- Coax and fiber E1 clock and E1 data 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
- Coax: 2x 2.048 MHz + 2x 2.048 Mbps
- Fiber: 3x 2.048 MHz + 3x 2.048 Mbps
- 4x ToD electrical

#### Fiber optic distribution advantages

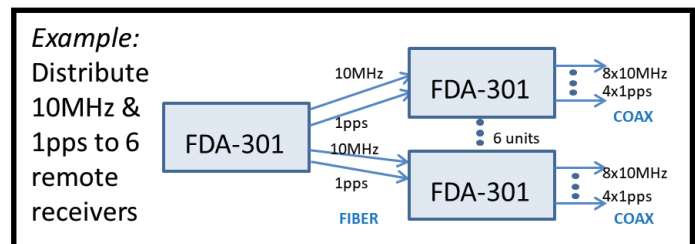
In coax distribution networks, there is a risk for ground loops and other types of EMI. Distances are limited to some tens of meters depending on environment and the quality of the coax cables used. By converting the electrical signal to a fiber optic signal, ground loops and EMI are avoided and the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

#### Redundancy

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



## Technical specifications

### Inputs

#### Fiber optic inputs Sine, Pulse or E1

**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, contact factory

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

**Max. optical attenuation:** 6dB (including fiber and all connectors and splices)

**Max. distance:** 2km

#### Coax Input Sine and Pulse

**Connector:** BNC female

**Frequency for sine input:** 10 MHz

(default); for other frequencies contact factory

**Impedance:** 50 Ohm nominal

**Amplitude range:** 0.2 Vrms to 2 Vrms (sine) -5V to +5V (pulse)

#### Coax Input E1 (2.048 MHz Clock and 2.048 Mbps Data)

**Connector:** BNC female

**Impedance:** 75 Ohm nominal

**Amplitude range:** -1.2V to +1.2V in 75 Ohm

#### Time of Day (ToD) Input

**Connector:** Mini Din 6 pins Female; RS232C electrical levels accepted from -10V to +10V

### Outputs

#### Fiber optic outputs Sine, Pulse, or E1

**Connectors:** ST

**Wavelength:** 820nm

**Fiber type:** Multimode fiber, 62.5/125µm or 50/125µm

#### 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

#### Coax output E1 (2.048 MHz Clock and 2.048 Mbps Data)

**Connectors:** BNC female

**Impedance:** 75 Ohm nominal

**Output voltage:** ±1.2V ±10% in 75 ohm; acc. to ITU-T G703

#### Time of Day (ToD) Output

**Connector:** Mini Din 6 pins Female;

**Output voltage levels:** Low level is -5V nom.; High level is +5V nom.

### 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

**Coax E1:** 2x 2.048 MHz; 2x 2.048 Mbps

**Fiber E1:** 3x 2.048 MHz; 3x 2.048 Mbps

### 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 (210mm)

**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

**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-301/11000:** 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:* Line cord, isolation washers for BNC-connectors, user's manual on CD and Certificate of Calibration.

#### 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)

**Option 43:** 2.048MHz + 2.048Mbps coax and fiber

*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

**Option 47C:** 2x 2.048 MHz + 2x 2.048 Mbps coax

**Option 47F:** 3x 2.048 MHz + 3x 2.048 Mbps fiber

*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-301 unit

**Option 22/05:** Rack-mount kit for two FDA-301 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-301/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: 10 MHz + E1 clock & data

X=5: 10 MHz + pulse + ToD

X=6: 10 MHz + pulse + E1 clock & data

X=7: 10 MHz + ToD + E1 clock & data

X=7: 10 MHz + pulse + ToD + E1 clock & data

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

Z=6: 2x 2.048 MHz + 2x 2.048 Mbps coax

Z=7: 3x 2.048 MHz + 3x 2.048 Mbps fiber

*Example:* FDA-301/11021 = FDA-301 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).