

FDA-301

Frequency Distribution Amplifier

pendulum

DATA SHEET

- 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 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 E1clock/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

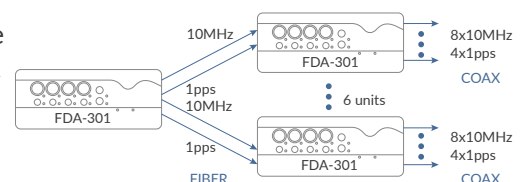
In coax distribution networks, there is a risk for ground loops and other types of EMI. Distances are limited to some tens of meters depending on environment and the quality of the coax cables used. By converting the electrical signal to a fiber optic signal, ground loops and EMI are avoided and the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

Fiber optic distribution advantages

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.

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



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_{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

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).