# FODL-MDX

Modular rack system for fiber optic delay lines





# Product overview

FODL-MDX is a plug-and-play solution for applications where multiple optical delay lines are required in a single setup - e.g. coherent beam combining. The default configuration comes with 8 delay line units + 1 controller all supplied as insert modules in a 19" subrack with 2 × 3U height. Thanks to the modularity of MDX, basically any number of delay line units can be configured.

#### Variants

(any combination of the parameters can be chosen)

Number of delay line units (subrack height):	1-3 (1×3U) / 4-8 (2×3U)
Operating wavelength:	1550 nm / 2000 nm
Optical delay range:	330 ps / 660 ps
Fiber type:	polarization maintaining (PM) / single mode (SM)
Fiber connectors:	FC/APC / FC/PC

# Full specifications

Specification	Delay lines				
Operating wavelength [nm]	1550		2000		
Optical delay range [ps]	330	660	330	660	
Typical insertion loss [dB]	1.4	1.7	2.5	2.5	
Insertion loss uniformity [dB]	0.25	0.35	0.2	0.2	
Return loss <sup>1</sup> [dB]	> 50				
Optical delay resolution [fs]	< 0.33				
Polarization extinction ratio <sup>2</sup> [dB]	> 20				
Max power [mW]	1000				
Position accuracy [µm]	± 10				
Position repeatability [µm]	± 1				
Fiber type	PM-1550 / SM-1550 PM-1950 / SM-1950			/ SM-1950	
Fiber connectors	FC/APC, FC/PC				
Dimensions <sup>3</sup> [mm]	76.4 × 106 × 286.5				
Weight <sup>4</sup> [kg]	2.2 / 2.5				
Operating temperature <sup>5</sup> [°C]	10 - 40				
Storage temperature [°C]	-30 - 70				
	Controller				
Power requirements	12/24V, 5A				
Control	web GUI / ethernet / USB				
Dimensions <sup>6</sup> [mm]	177.9 × 106 × 286.5				
Weight [kg]	2.2				
Operating temperature [°C]	10 - 40				
Storage temperature [°C]	-30 - 70				
	Subrack (MDX)				
Number of delay lines	1-3		4	-8	
Dimensions [mm]	482.6 × 265.9 × 298.5		482.6 × 132.5 × 298.5		
Weight [kg]	2.5		4	4.3	
Weight of fully loaded MDX [kg]	11.3 / 12.2		24.1	/ 26.5	

<sup>1</sup> For version with FC/APC connectors

<sup>&</sup>lt;sup>2</sup> For version with PM fibers

<sup>&</sup>lt;sup>3</sup> Front plate dimensions 81 × 128.4 mm

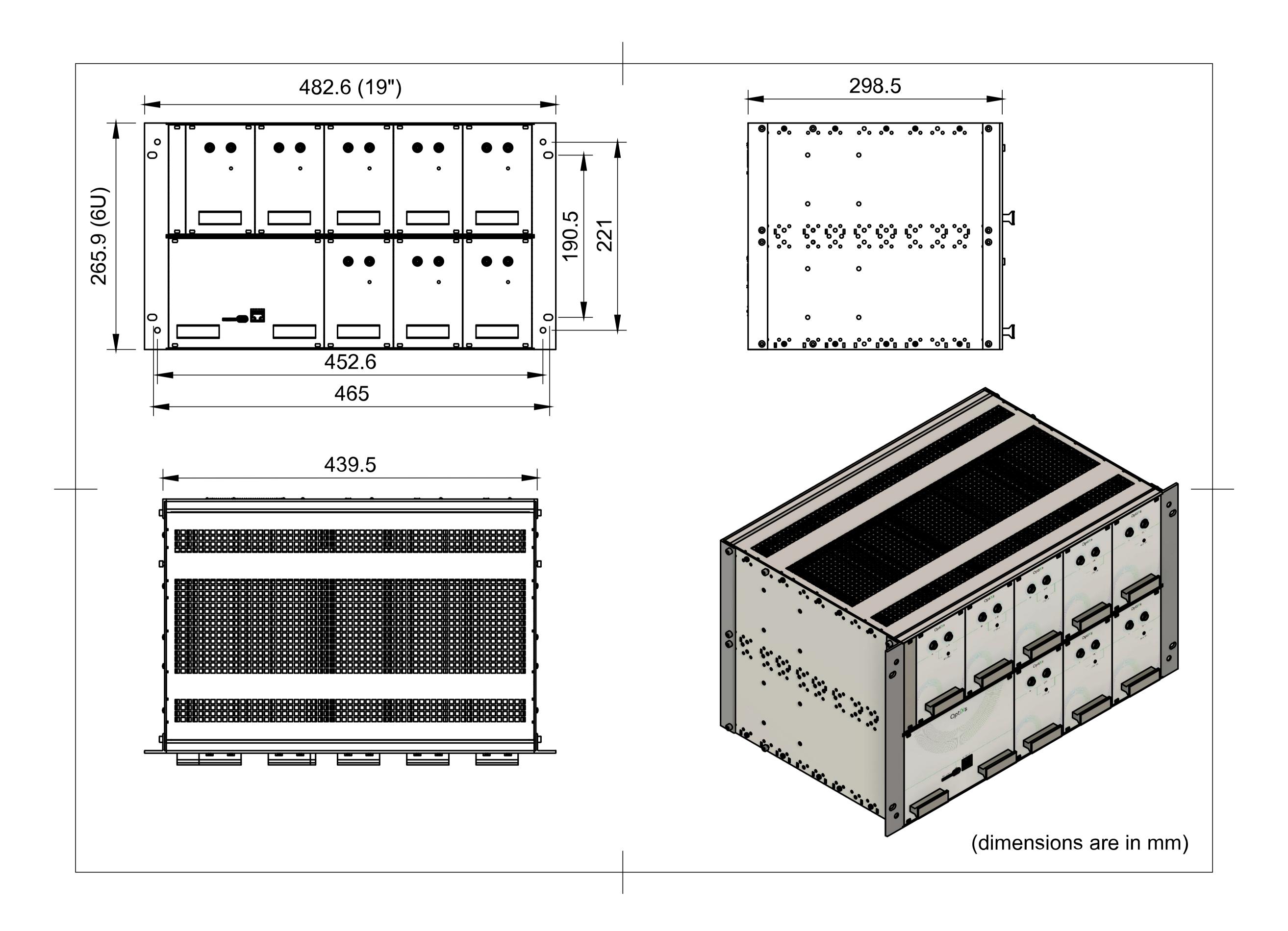
<sup>&</sup>lt;sup>4</sup> Values for 330 ps and 660 ps versions, respectively

<sup>&</sup>lt;sup>5</sup> Range of temperatures where temperature-driven additional insertion loss < 1 dB is maintained

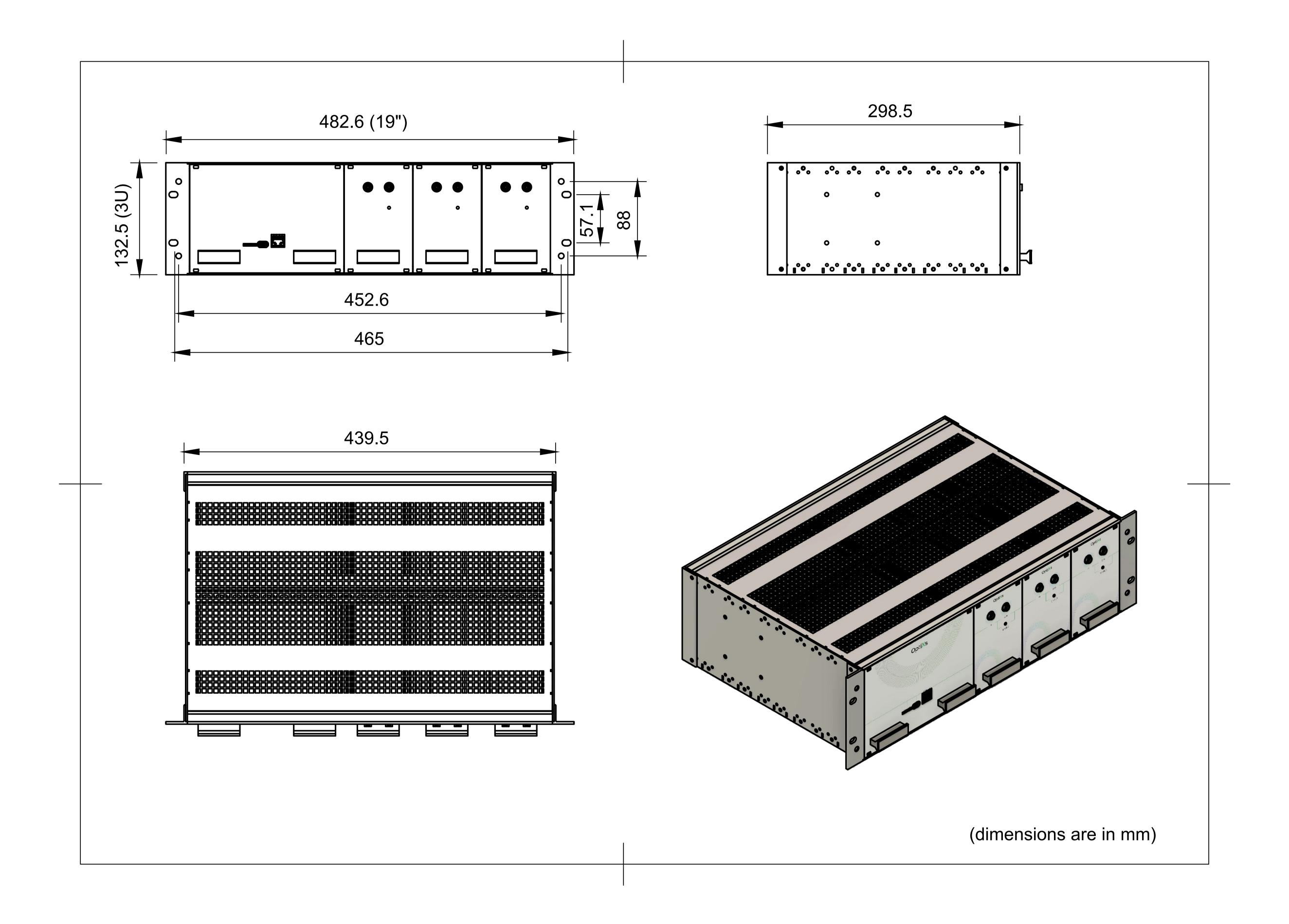
<sup>&</sup>lt;sup>6</sup> Front plate dimensions 182.5 × 128.4 mm

# Mechanical drawing

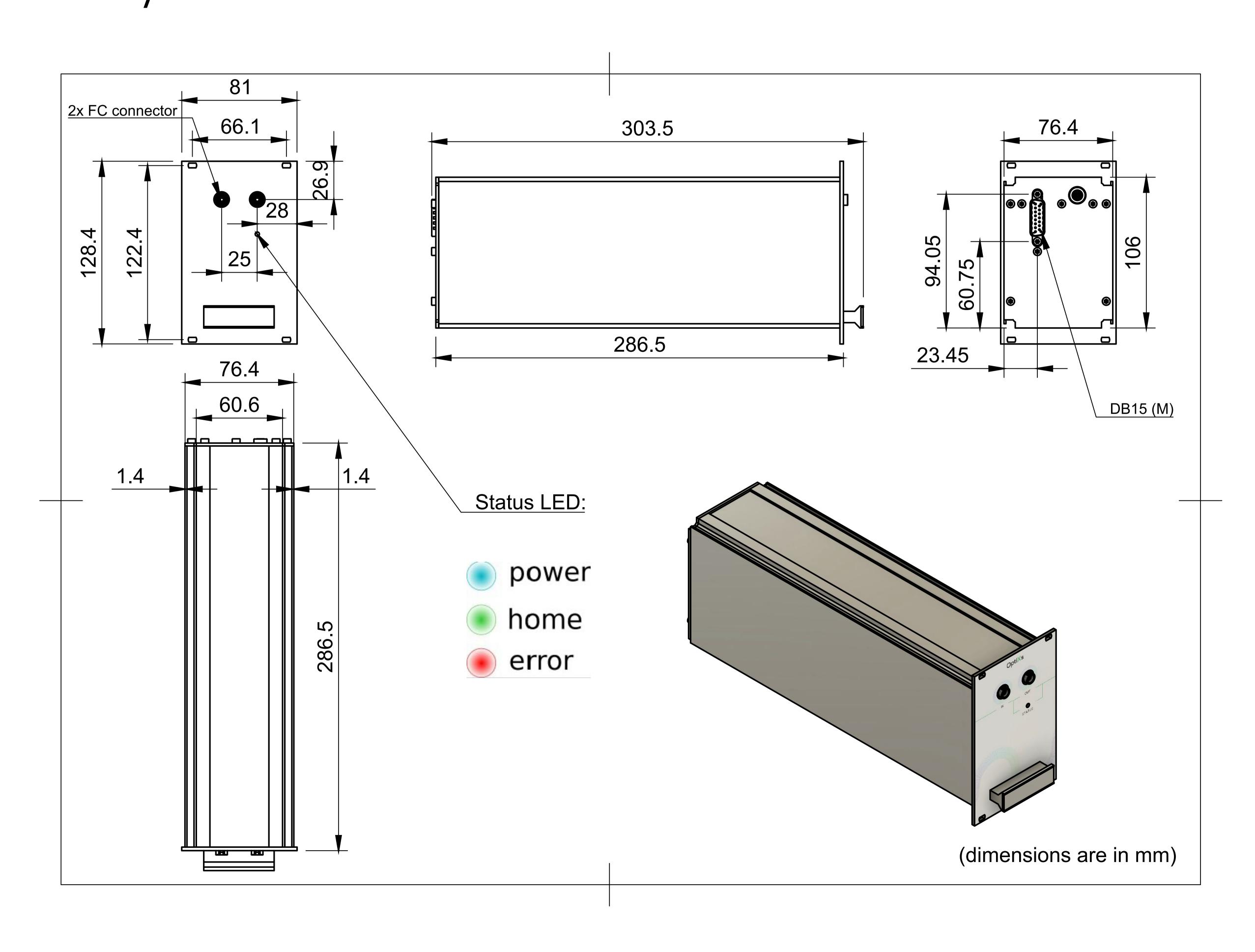
#### Rack (4-8 units + controller):



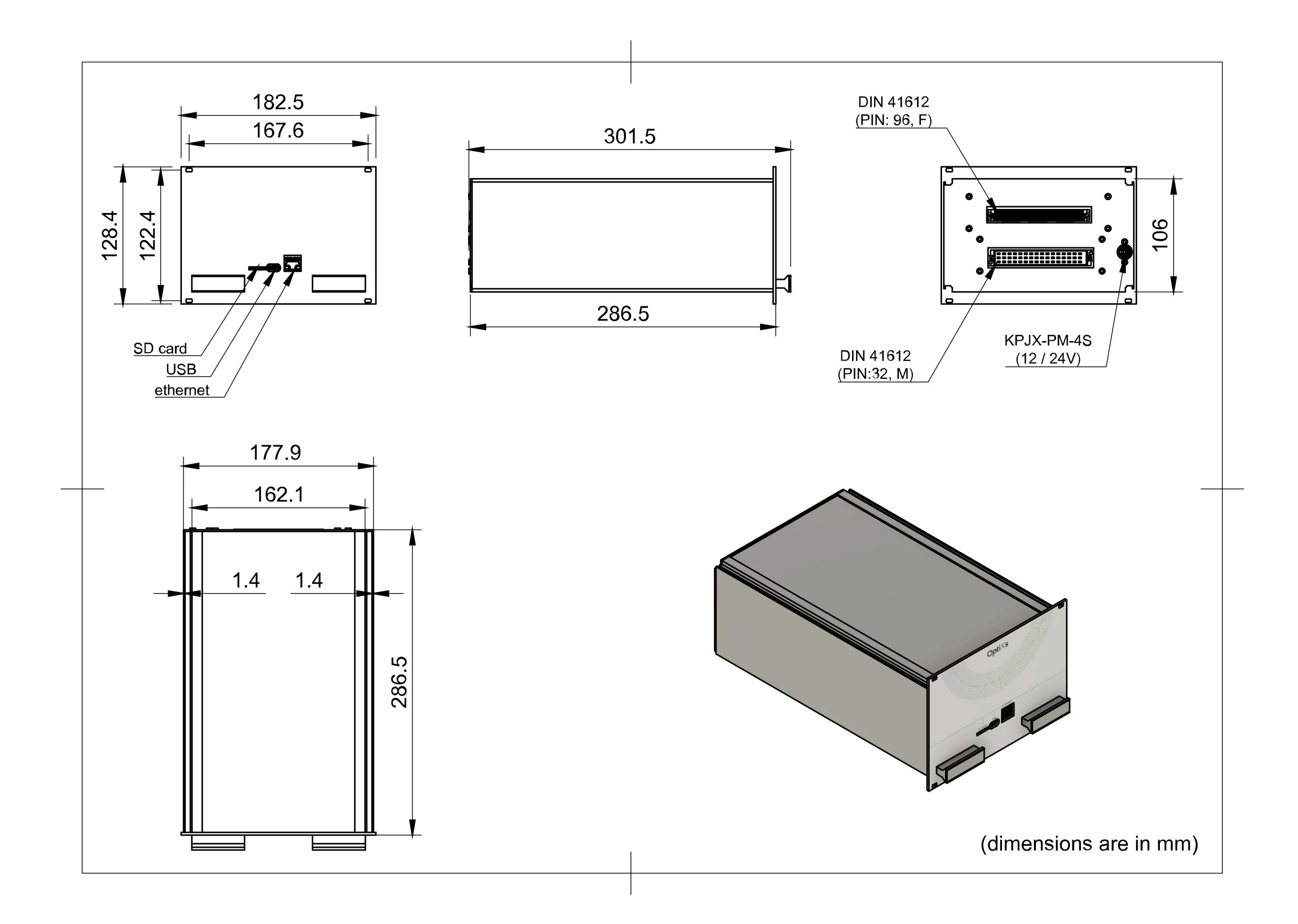
#### Rack (1-3 units + controller):



#### Delay line unit:

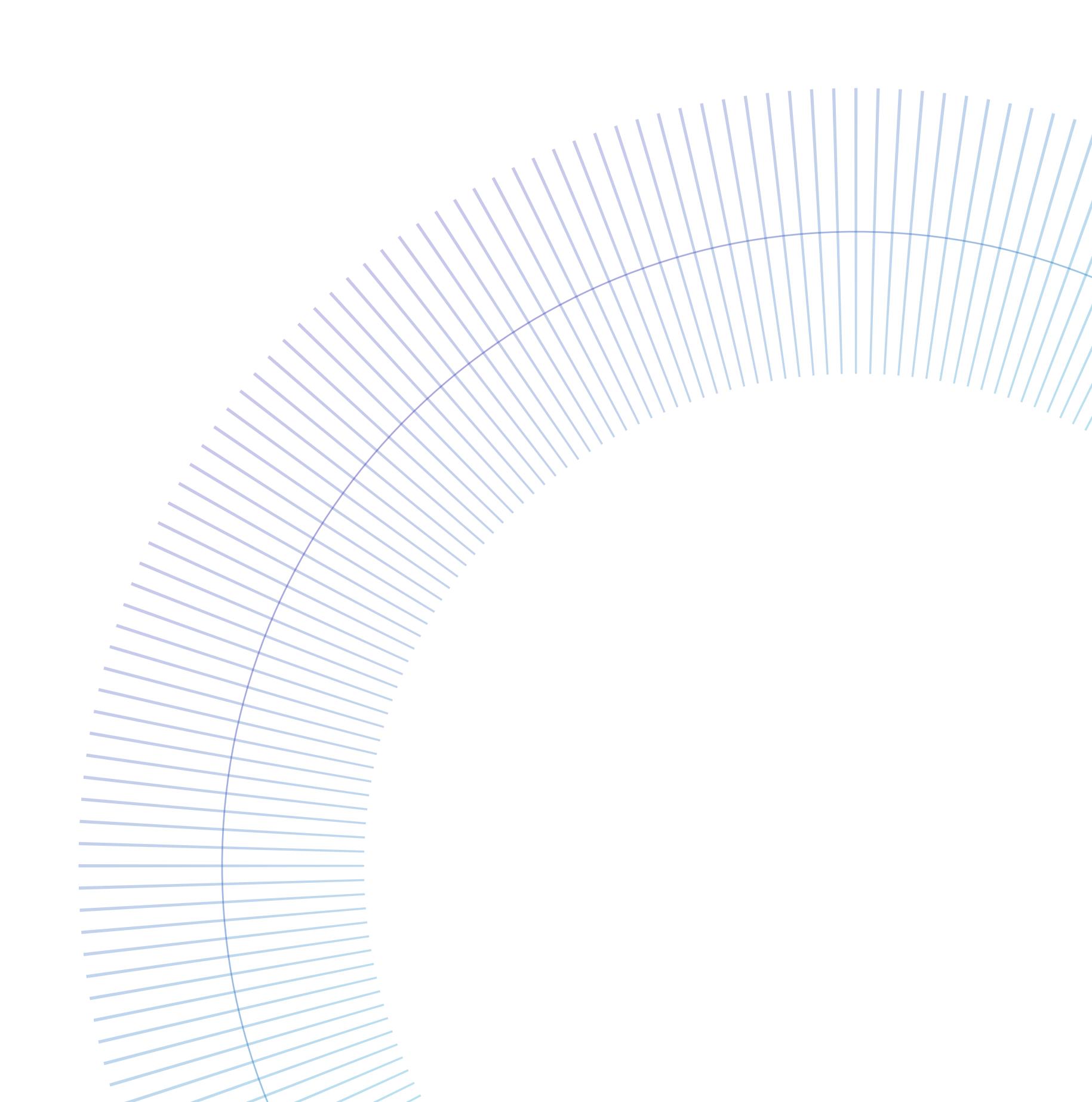


#### Controller:



## Features

- High resolution (< 0.33 fs)
- Low insertion loss even at 2000 nm
- Controller ethernet and USB connections
- Web interface for basic use available
- Up to 8 delay line units can be driven by the same controller
- Compatible with 19" rack system
- Signal LED showing the delay line status
- Plug-and-play set of delay lines + controller + rack



# Order information

#### FODL-MDX

A complete set of delay lines + controller + subrack with PCB connectors - ensures correct configuration of the system. The product number for ordering the FODL-MDX is as follows:

#### FODL-MDX-N-WWWW-DDD-TT-CCC

N = number of delay lines:
WWWW = operation wavelength:
1550 / 2000
DDD = optical delay range:
330 / 660
TT = fiber type:
PM / SM
CCC = fiber connector:
PC / APC

(i)

#### Example:

FODL-MDX with 6 delay lines operating at 2000 nm, with optical delay range 660 ps, PM fibers, and APC connectors:

FODL-MDX-6-2000-660-PM-APC

## Delay lines (if purchased separately)

If needed the modular inserts with delay lines can be purchased separately (outside of FODL-MDX). Note that a stand-alone version of the delay line exists for tabletop applications using individual delay lines. The product number for ordering the 19" subrack-compatible delay lines is as follows:

#### FODL-WWW-DDD-TT-CCC-R

www = operation wavelength: (1550) / (2000)

**DDD** = optical delay range: (330)/(660)

TT = fiber type: (PM)/(SM)

CCC = fiber connector: (PC) / (APC)

i) Example:

Delay line operating at 1550 nm, with optical delay range 330 ps, SM fibers, and PC connectors:

FODL-1550-330-SM-PC-R

## Controller (if purchased separately)

If needed the controller can be purchased separately (outside of FODL-MDX). Note that a stand-alone version of the delay line with a stand-alone controller exists for tabletop applications using individual delay lines.

The product number for ordering the 19" subrack-compatible controller is as follows:

FODL-CRTL-N-R

**N** = number of delay lines:

3 (for 1-3 units)

8 (for 4-8 units)

(i)

#### Example:

Controller for 5 delay lines (capable of driving up to 8 delay lines):

FODL-CRTL-8-R

### 19" subrack (if purchased separately)

If needed the 19" subrack compatible with our delay lines and controllers can be purchased separately (outside of FODL-MDX).

The product number for ordering the 19" subrack is as follows:

FODL-RACK-N

N = number of delay lines:

3 (for 1-3 units)

8 (for 4-8 units)

(i)

#### Example:

Subrack for 3 delay lines:

FODL-RACK-3

# OptiXs



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Developed in collaboration with the HiLASE

