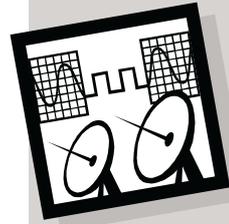
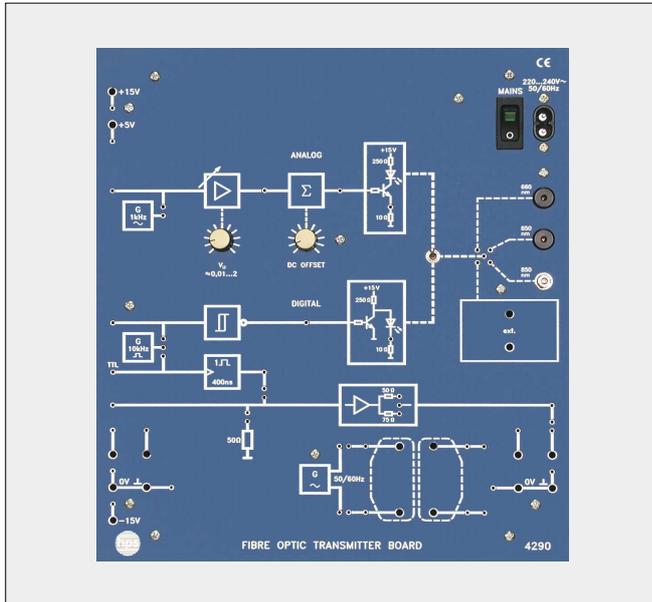


Communications – Transmission Technology

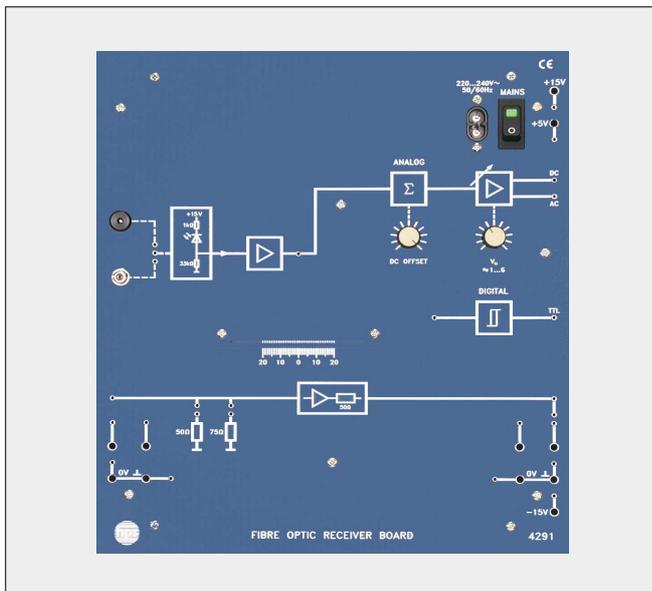


Training System Fibre Optics

Type 4290
Type 4291



Fibre Optic Transmitter Board (Type 4290)



Fibre Optic Receiver Board (Type 4291)

The Fibre Optics Training System from hps SystemTechnik offers a comprehensive program for conducting experiments in the field of opto-electronic communications. The training system is suitable for both demonstrations and practical experiments.

- For plastic and glass fibres
- With built-in transmit diodes in different wavelengths of the light
- Characteristic recording and attenuation measurement also possible with DC voltages
- Coupling attenuations can be simulated directly on the Receiver Board
- All necessary power supplies and generators on Board
- Additional experiments with laser diode

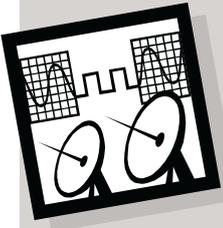
Essential components of the Fibre Optics Training System:

- **Fibre Optic Transmitter Board**
with integrated transmit diodes, built-in sine wave generator (1 kHz), pulse generator and square wave generator (10 kHz)
- **Fibre Optic Receiver Board**
with integrated receive diodes
- **Optic Fibres**
plastic and glass fibres

A variety of types of Optic Fibres to be connected to the transmitter and receiver are available as transmission media.

The system therefore offers the possibility of various Optic Fibres and thus setting up a variety of fibre optic transmission lines to investigate the influence of the individual transmission parameters in experiments.

A laser diode makes it possible to compare the performance characteristics of such diodes with those of conventional LEDs.



Training System Fibre Optics

Type 4290
Type 4291

The training system and the accompanying experiment manual: „Fibre optics“ (Type V 0134) have been designed to impressively demonstrate the advantages of this technique over conventional transmission media.

Subjects dealt with in the experiments section of the experiment manual

- Experiments on fibre optics with plastic fibre
- Characteristics of transmit diodes
- Attenuation of plastic fibres and connectors
- Transmission of TTL signals
- Immunity to interference of the optical fibre
- Experiments on optic fibre with glass fibre
- Measurement of propagation time
- Experiments in fibre optics with a laser diode

Mechanical data

The front panel of the Boards is made of 5 mm thick laminate, matt blue in colour with white printing representing the built-in function groups.

The rear of the Boards is protected with a grey plastic cover. Its shape allows the Boards to be placed at an ergonomically favourable angle for example on a table.

Dimensions / weight

- Fibre Optic Transmitter Board:
266 x 297 x 110 mm (w x h x d) / approx. 1.9 kg
- Fibre Optic Receiver Board:
266 x 297 x 110 mm (w x h x d) / approx. 2.0 kg

Communications – Transmission Technology

Technical Data

Fibre Optic Transmitter Board (Type 4290)

Inputs (via 2 mm jacks)

- 1 analog / 1 digital

Optical outputs

- 660 nm / 850 nm (plastic fibre)
- 850 nm (glass fibre, ST-standard)

Electrical output (via 2 mm jacks)

- With preceding driver circuit for connecting a two-wire line or coaxial cable for comparative measurements on a fibre optic transmission path
- Output impedance: 50 Ω ; 75 Ω

Function groups

- Sinewave generator: $f = 1 \text{ kHz}$; $u_{pp} = 3 \text{ V}$
- Squarewave generator: $f = 10 \text{ kHz}$ (TTL)
- Pulse generator: impulse duration 400 ns
- Patch field and power supply for plug-in transformer to simulate interferences
- Patch field for Laser Module

Fibre Optic Receiver Board (Type 4291)

Optical input

- Plastic fibre / Glass fibre

Electrical input (2 mm jacks)

- For connecting a two-wire line or coaxial cable for comparative measurements
- Input impedance: 50 Ω ; 75 Ω

Output amplifier

- Voltage gain: 1 ... 6 (adjustable)
- DC offset: +0,5 V ... -5,5 V (adjustable)

Outputs (2 mm jacks)

- DC: $V_{out} = 0 \dots \pm 8 \text{ V}$
- AC: $V_{out pp} = 0 \dots 16 \text{ V}$
- TTL: with Schmitt trigger; fan-out = 10;

Adjustable fibre coupler

- For simulation of attenuation

Common Technical Data

Mains connection

- Voltage: 230 V AC; 50 ... 60 Hz; 20 VA

Power supply output (for external Extensions)

- +15 V / -15 V / +5 V (0,3 A)

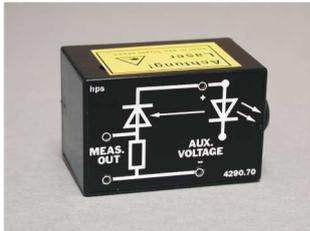
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Training System Fibre Optics

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Laser Module (Type 4290.70)

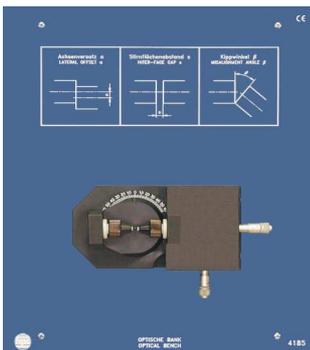


The Laser Module can be plugged into the patch field of the Fibre Optic Transmitter Board. It is used in conjunction with the plastic fibres.

With the integrated monitor diode it is possible to measure the transmitted light. The wave length of the laser diode is 670 nm.

Housing dimensions / weight:
57 x 38 x 35 mm (w x d x h) / 50 g

Optical Bench (Type 4185)



The Optical Bench is used to simulate faults that can occur on fibre optic links or at fibre optic connections and which lead to increased attenuation: inter-face gap, lateral offset, angular offset.

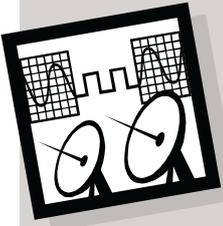
It is suitable for accepting optical fibres with a diameter of approx. 1 mm.

The Optical Bench is mounted on a standard hps Board and can be placed on a table or suspended in an hps rack for demonstration purposes. The rear of the Board is protected with a grey plastic cover.

- Dimensions:
266 x 297 x 130 mm
(w x h x d)
- Weight: approx. 1.8 kg

Necessary Accessories

- Set of Accessories (Type 4290.1), consisting of:
 - Plastic fibres: 20 m, 5 m and 0,5 m
 - Glass fibres: 20 m and 1 m
 - Optical coupling for glass fibres
 - Connecting plugs, 2 mm (12 piece)
 - Coils: N = 900 and N = 100
 - Tape-wound core (pair)
 - Connecting lines, 2 mm (8 piece)
- Multimeter



Training System Fibre Optics

Type 4290

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Communications – Transmission Technology

Accessories Recommended, for conducting experiments in fibre optics

- Experiment manual „Fibre optics“ (Type V 0134)
- COAXIAL BOARD (Type 4284)
- Optical power meter
- Oscilloscope

Subject to technical modifications.