REPEATER VHD15
AHD, HD – CVI, HD – TVI Signal Regenerator

The VHD15 repeater is designed to amplification of the video signal transmitted via twisted-pair cable or coaxial cable, what enables high resolution video transmission of (AHD, HD-CVI, HD-TVI) signals for long distance.

A single regenerator allows to correct attenuation of approx. 150 m UTP cable and approx. 300 m - 500 m coaxial cable (depending on the type of cable used). It has built-in symmetrization and desymmetrization circuits (video transformers). The device has diodes signaling the presence and correct polarity of power supply (red) and the presence of video signal (green).

1 – Symmetrical output (UTP)
2 – Video signal indicator
3 – Asymmetrical output (COAX)
4 – Symmetrical input (UTP)
5 – Asymmetrical input (COAX)
6 – Power supply
7 – Power indicator
8 – Output transformer switch
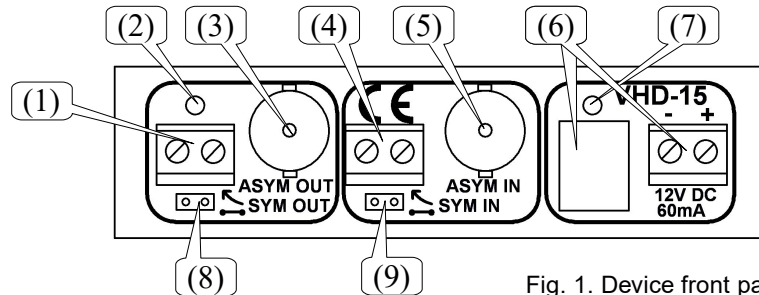9 – Input transformer switch

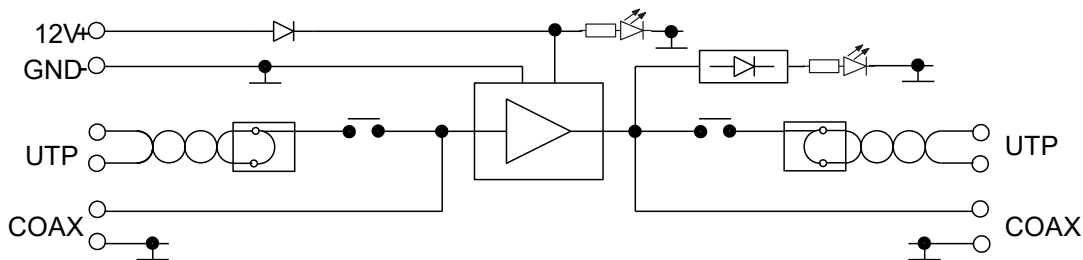Fig. 1. Device front panel view

Fig. 2. Regenerator diagram

Recommended placement of regenerators in the installation

The using of single regenerator ensures good quality of image for twisted-pair cable at a distance up to 300 m. At a distance up to 450 m two regenerators are required, and at a distance up to 600 m you should use three regenerators. For coaxial cable, depending on type, these distances will be correspondingly longer. The device is designed for remote power supply. The device has inputs: symmetrical and asymmetrical and outputs: symmetrical and asymmetrical. Do not use both symmetrical and asymmetrical inputs at the same time. The same applies to the outputs. The matching transformer is switched on by inserting a jumper under the appropriate connector. If you do not use the symmetrical input/output, the jumper should be removed. Only then you can use the asymmetrical input/output. You can, however, use both the symmetrical input and the asymmetrical output or the asymmetrical input and the symmetrical output Fig. 3b and 3c.

Figures 3a, 3b, 3c, 4 show a configuration using a single regenerator.
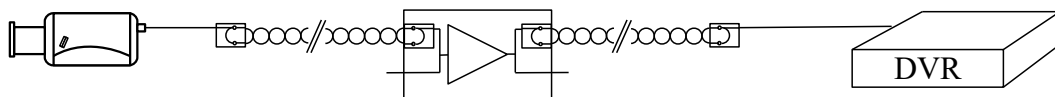

Fig. 3a. The most preferred configuration for reasons of noise. Regenerator at a distance of approx. 50% - 70% of the cable length.
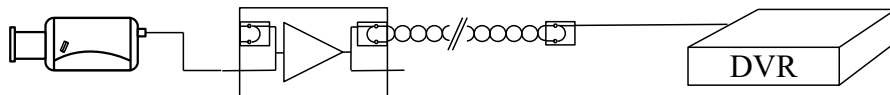

Fig. 3b. The risk of overdriving of the regenerator by a strong signal from the close placed camera. The discoloration may be visible.
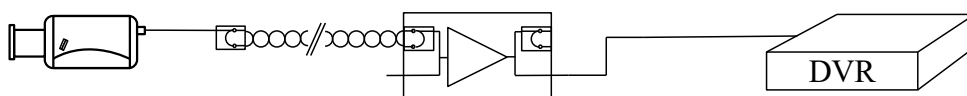

Fig. 3c. Due to the amplification of heavily suppressed signal obtained worst signal-to-noise ratio.
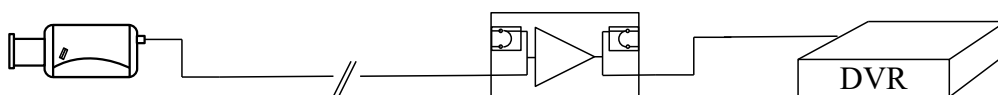

Fig. 4. Example configuration with application of a single regenerator and coaxial cable.

Figures 5a, 5b, 5c, 5d and 6 show the configurations with application of two regenerators. The performed tests show that the maximum distance segments connecting device for twisted pair cable should not exceed 300 m due to deteriorating the signal-to-noise ratio. For a coaxial cable, this distance is approx. 600 m – 1000 m depending on cable type.
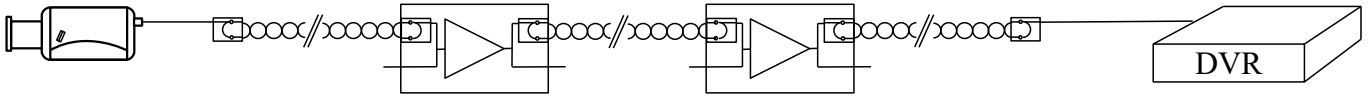

Fig. 5a. For best results, place the devices at similar distances from each other.
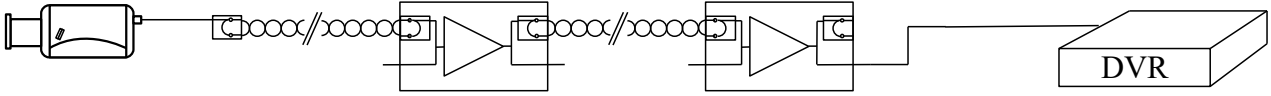

Fig. 5b. Signal amplification in the end results in a worse signal-to-noise ratio, because the amplified signal is strongly suppressed.
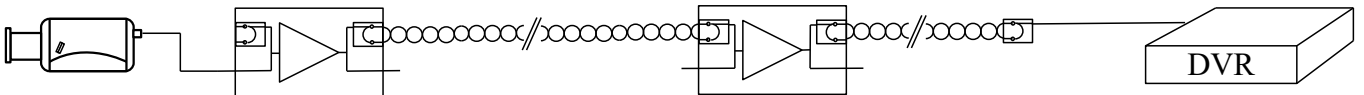

Fig. 5c. Increasing the distance between the devices causes a worse signal-to-noise ratio and increases the risk of distortion of the regenerator.
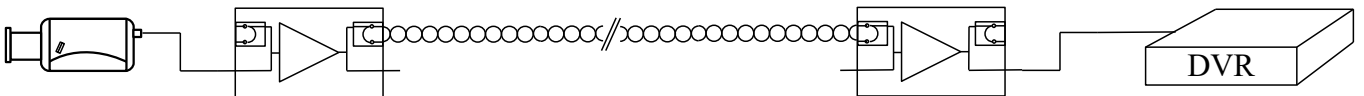

Fig. 5d. The least recommended configuration (although the easiest to do); large distance between the devices results in a low signal-to-noise ratio and a regenerator placed close to the camera increases the risk of overdriving.
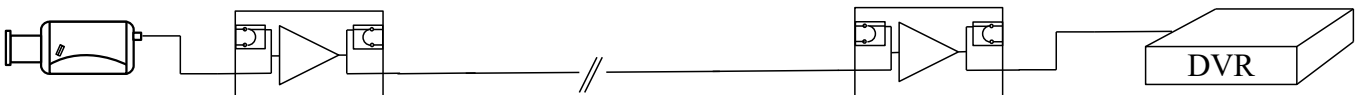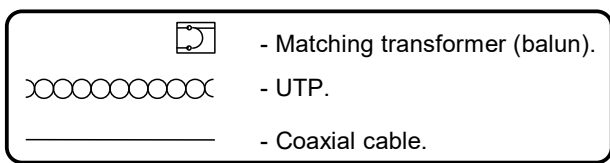

Fig. 6. Example configuration with application of two regenerators and coaxial cable.

- Matching transformer (balun).

- UTP.

- Coaxial cable.

Remote powering

The VHD-15 can be powered remotely eg with another pair of twisted-pair cable. Remember to not exceed the permissible supply voltages. The input is protected against reverse polarity by means of the diode Fig. 2. If the device is located near the camera, eg Fig. 4c, 4d, it should be powered with a voltage of not less than 12V, as the risk of overdriving the device increases. At a current consumption of about 50mA one should expect a voltage drop of approx. 0.9V for every 100m of cable.

SPECIFICATION:

Number of inputs	- 1
Number of outputs	- 1
Symmetrical input/output impedance	- 100 Ohm
Asymmetrical input/output impedance	- 75 Ohm
Power voltage	- 8 – 24VDC (typical 12VDC)
Current consumption	- < 50mA
Dimensions	- 100x62x28mm
Weight	- 70g