Optical camera interface for TV studios with repeat function.

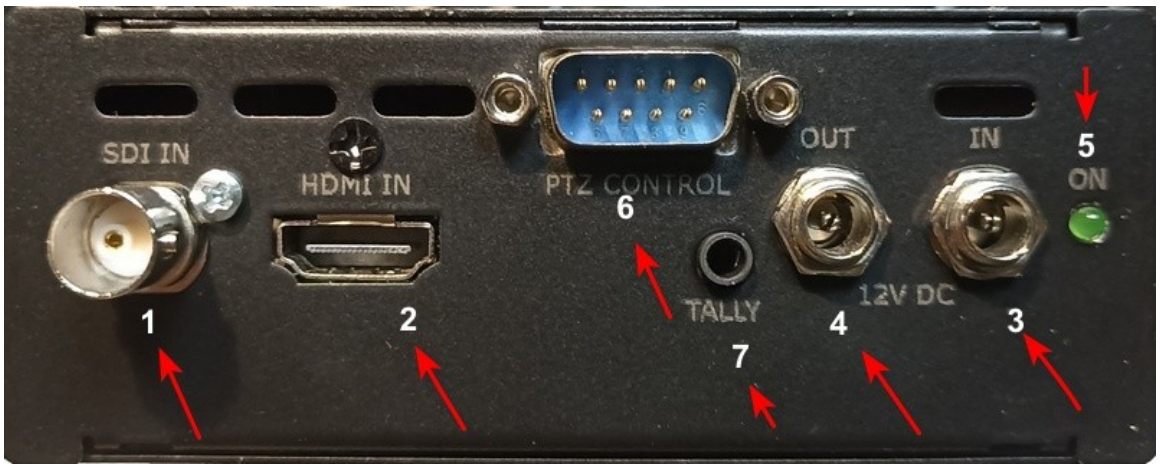
The system consists of a studio unit (Studio fiber module) and several video camera unit (Camera fiber module). Studio unit in the basic set supports work with 3 video camera unit (in the extended set up to 6 video camera units).
The system provides a bidirectional optical connection between the camera units and the studio unit, which allows it to be used in case the distance between the camera and the studio is large for transmitting the SDI signal over a standard coaxial cable, as well as the ability to transmit a signal from cameras to the studio and simultaneously provide video feedback (for example, for the system "Prompter"), control of cameras (genlock), control of PTZ cameras, transmission of information "Tally" (to control the LED indicator attached to the camera).

System Features:

- Transmission of up to 6 video signals from the video cameras to the studio unit on a cheap optical cable over long distances (and then to the video mixer via the SDI interface);
- transmission of signals to control rotating cameras and remote control camera parameters (for PTZ cameras);
- reverse video channel to the camera (for the system "Prompter");
- support of information transmission "Tally" (to control the LED indicator, fixed on the camera);
- Repeat function (realized due to the presence of SSD drives in the video camera units, on which an input signal in DAVC format is continuously recorded (frame-by-frame compression with low degree) and, if necessary, the required fragment can be reproduced with deceleration or acceleration).

Description of video camera unit:

The input signal from the cameras is sent to the camera blocks in the formats "1080p50Hz" or "1080i50Hz" (in this case the camera block is converted to the format "1080p50Hz", which is used for the repetition function).



The input inputs used are SDI (Port 1) or HDMI (Port 2), available on the camera unit. The camera unit shall be powered (connector 3) from a power supply (network or off-grid) providing output parameters:
12(Vdc), 2(A). The housing of the video camera unit also has an output connector (connector 4) for feeding 12 (Vdc) power to the camera if necessary (with a common power supply must provide the required total capacity) and LED indicator of input power (5). To connect the LED indicator «Tally», attached to the camera, on the housing of the video camera unit there is a three-contact socket (connector 7) for the connector 3.5(mm), and the polarity of the output signals can be changed by bars inside the video camera unit .

The camera unit software is updated if necessary via the RG45 connector (connector 8) of the Ethernet interface. There is also an SDI output connector (connector 10) on the housing of the camera unit, to which a return video channel signal is output, allowing the "Prompter" system functions to be implemented. PTZ cameras are controlled via the RS232 interface (VISCA protocol, 9600 (b/s)) whose "DB-9M" connector is located on the housing of the camera unit (connector 6). This connector also sends a "Tri-level sync" signal to drive the camera. The connection to the studio unit is made by an optical cable, which is connected via SFP+ module (Ethernet_10G), for installation of which there is a suitable socket (9).

Description of the studio block:

The optical cables from the camera units are connected via SFP+ (Ethernet_10G) modules to the studio unit (slot s1 for first channel), where video signals are corrected in frame rate convertors and output to SDI connectors (connector s2 for first channel) in "1080p50Hz" formats or "1080i50Hz" (in the latter case, conversion to "1080i50Hz" is performed in the studio unit).

The return channel signal is fed to the studio unit via the SDI input (connector s3) in "1080p50Hz" format, then service packets containing information about the PTZ camera control commands (VISCA) and the repeat function control commands are mixed into it. The return channel signal can also perform the function of system video synchronization.

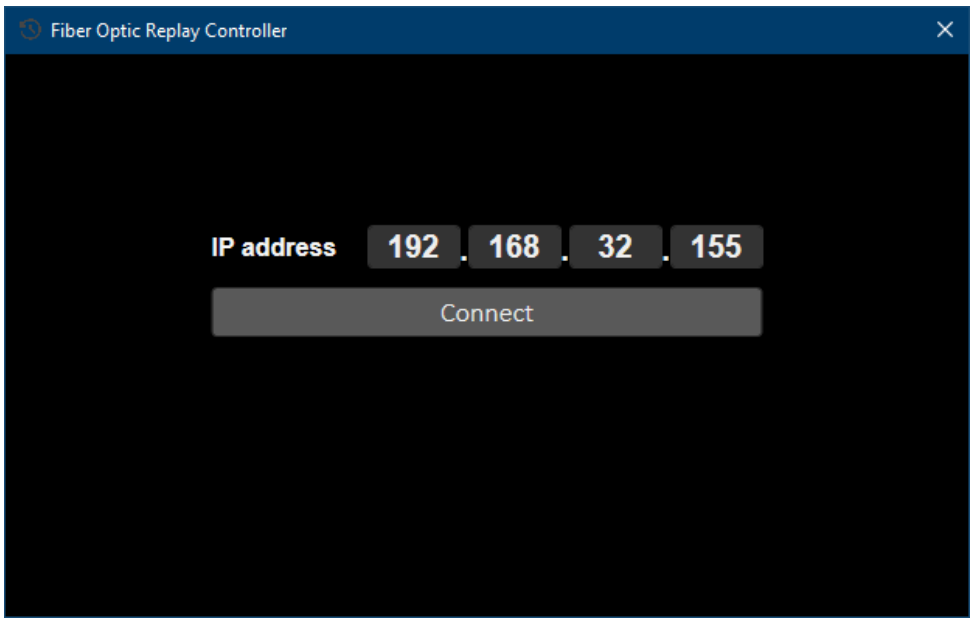
PTZ camera control commands are connected to the studio unit via RS232 interface (VISCA protocol, 9600 (b/s)) from the PTZ camera control panel (s5 connector) or via Ethernet interface (VISCA IP, UDP, port 1259). The Ethernet interface (connector s4) is also used to update the software of the studio unit if necessary, as well as to control the functions of repetitions through the program on the personal computer.

The studio unit must be powered (connector s6) from a power source (network or stand-alone) providing output parameters: 12(Vdc), 2(A).

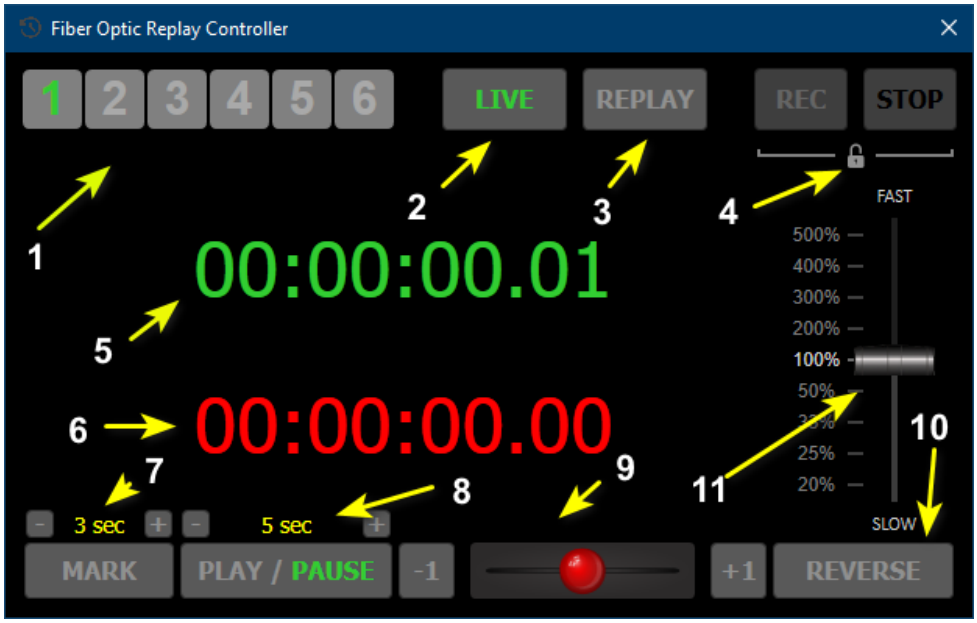
The housing of the studio unit also has a "DB-15F" (connector s7), through which the control signals of the function "Tally" (control LED indicators attached to the cameras) are transmitted.

Description of the camera channel replay program FiberReplay.exe

The program does not require an installation. When you start the program, a window
in which you need to specify the IP address of the studio block. IP address can be changed by using EthernetSetup.exe utility.
When the program is connected to the studio unit, a repeat program window will open.



Assigning control buttons in the program FiberReplay.exe :



1. Camera selection buttons.
2. Select the direct signal mode from the cameras.
3. Repeat mode.
4. Blocking the recording mode and stopping the recording.
The REC and STOP button enables recording and stops recording.
5. Recording process counter.
6. Playback process counter.
7. Set the time to roll back from the start of the repeat label when you press the MARK button.
8. Set the replay time.
PLAY/PAUSE buttons play and pause repeat.
9. Rewind the recording.
10. The REVERSE button replays in the opposite direction.

11. Repeat speed selector.

The REC button must be enabled to use repeat.
Select the repetition speed (11), playback time. Press MARK.
The replay is recorded on all cameras simultaneously.
When you press the PLAY button, the playback from the MARK label will start and roll back to the selected time(7). If you press the STOP button, the recording will stop.
The record is not saved when the hardware is turned off.