MARENIUS
ELEKTRONIKUTVECKLING AB

A/V fiber optical transceiver
HOT-3322
| Manual |

Version 1.00

Table of contents

1. General description

The HOT-3322 handles transmission and reception of one video signal, one stereo signal and one RS-232 signal. The HOT-3322 supports CVBS, S-VIDEO and Y/Pb/Pr video. The unit decodes standard definition PAL, NTSC and SECAM. The output format is factory programmed to PAL (NTSC as option). Transmission distance is up to 10km depending on the type and quality of the fiber. The unit is housed in a heavy duty aluminum case, measuring a half-rack unit (mounting wings available as option).

2. Connections

2.1 Power supply

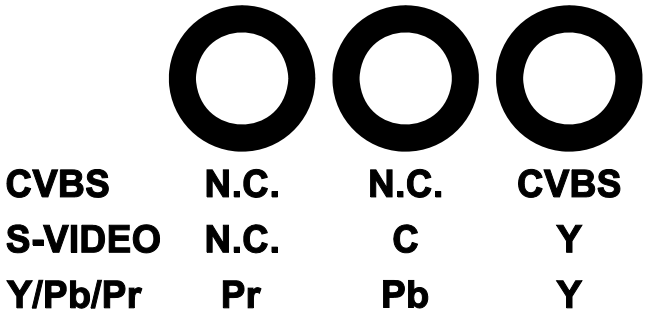
The 1.9mm power jack on the back of the unit accepts 9-18 VDC, minimum 1A with positive supply at the center pin. The polarity can be switched without damaging the unit.

Input voltage: 9-18 VDC
Minimum input current: 1A

! Caution: Voltages above the recommended supply voltage can damage the device.

2.2 Video inputs

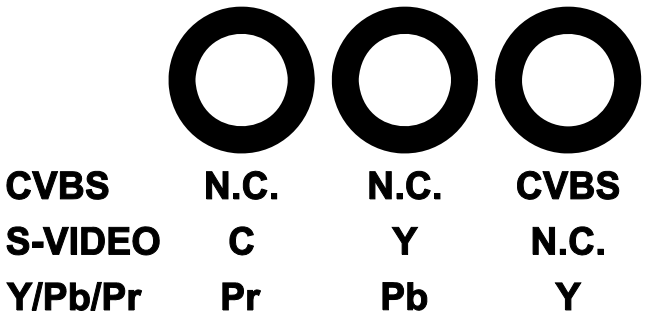
The HOT-3322 has three analog video inputs supporting CVBS, S-VIDEO and Y/Pb/Pr. The input selection on the front panel must be equal to the used video interface. The inputs consist of three 75Ω BNC connectors. The figure below illustrates the connection diagram for the different input video interfaces seen from the back of the unit.



The recommended input level is 0.7-1V p-p. The input level shall not exceed 3V p-p, this may damage the unit.

2.3 Video outputs

The HOT-3322 has three analog video outputs supporting CVBS, S-VIDEO and Y/Pb/Pr selectable from the front panel. The user can select any of the three interfaces regardless of the used video input interface. The outputs consist of three 75Ω BNC connectors. The figure below illustrates the connection diagram for the different output video interfaces seen from the back of the unit.



2.4 Format conversion

The HOT-3322 can work with different video signals at each endpoint. For example a CVBS video signal can be connected at one endpoint and converted to component or S-VIDEO at the other endpoint.

2.5 Analog audio connections

The analog audio connections consist of two inputs and two outputs. The input connectors accept XLR or TRS connectors. The audio interface is fully balanced and is designed for professional +4dBu level, the maximum input level is +18dBu. The output level is equal to the input level. The table below shows standard connection diagram for balanced audio.

Balanced audio connections		
Connector type	***XLR***	***TELE***
Ground	Pin 1	Sleeve
Hot	Pin 2	Tip
Cold	Pin 3	Ring

The audio interface is designed to be used with balanced audio signals, however it accepts unbalanced signals. If the user wants to connect an unbalanced audio signal to the audio inputs the following connections shall be used.

Unbalanced to balanced audio	
Unbalanced output	***Balanced input***
Signal pin	Hot
Ground	Cold
Ground	Cold

To connect a balanced output to an unbalanced audio input the following connections shall be used.

Balanced to unbalanced audio	
Balanced output	***Unbalanced input***
Hot	Signal pin
Cold	No connection
Ground	Ground

2.6 RS-232

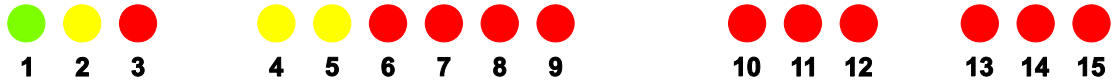
The HOT-3322 has a built in RS-232 channel which can be used for camera control or similar. The unit support 9.6kbaud, 19.2kbaud, 38.4kbaud and 115.2kbaud, 1 stop bit, 8 data bits. Parity is not supported and the interface only carries RX (pin 3) and TX (pin 2) lines. The unit can handle different baud rates at each endpoint, however the internal FIFO has a limit of 256 characters and it is up to the user to avoid overflowing the FIFO when using different baud rates. RX and TX LEDs are located on the front panel.

2.7 Fiber connectors

One fiber TX and one fiber RX are located on the back of the HOT-3322. Both single-mode and multi-mode fiber can be used. The unit support standard SC fiber connectors. The transmission range is direct relative to the mode and quality of the fiber. In multi-mode the maximum transmission distance is 550m and in single-mode the maximum transmission distance is 10km.

3. User interface

The user interface of the HOT-3322 consists of three buttons and fifteen LEDs. The front panel LEDs is shown below.



LED	Name	Description
1	POWER	The POWER LED is lit when the unit has power.
2	LINK	The LINK LED is lit when the unit detects a valid signal on the RX fiber connector.
3	ERROR	The ERROR LED is flashing if any error is detected. Try repowering the unit.
4	Rx	The Rx LED is flashing when a character is detected on the RS-232 RX pin.
5	Tx	The Tx LED is flashing when a character is transmitted on the RS-232 TX pin.
6	9600	Selected RS-232 baud rate = 9600
7	19200	Selected RS-232 baud rate = 19200
8	38400	Selected RS-232 baud rate = 38400
9	115200	Selected RS-232 baud rate = 115200
10	CVBS	The input video format is set to CVBS.
11	S-VIDEO	The input video format is set to S-VIDEO.
12	Y/Pb/Pr	The input video format is set to Y/Pb/Pr.
13	CVBS	The output video format is set to CVBS.
14	S-VIDEO	The output video format is set to S-VIDEO.
15	Y/Pb/Pr	The output video format is set to Y/Pb/Pr.

4. Using the HOT-3322

The HOT-3322 requires a pair of units to function, however the user can loop the fiber interface for testing the functionality. One unit can function as transmitter, receiver or both (transceiver). The system can be used to transmit audio, data or video separate or together.

4.1 Transmitter-receiver configuration

When using one unit as transmitter and one unit as receiver, only one fiber is required. The transmitter can transmit video, audio and data independently of each other. When a valid video source is present the receiver will synchronize to the transmitter minimizing disturbances.

4.2 Transceiver mode

If full duplex transmission is required, two fiber links are required. The unit can work with unsynchronized video sources; however, when working in transceiver mode it is highly recommended to synchronize the video sources thru genlock. This minimizes the disturbance in both the audio and the video signals. If only using audio, it is recommended to use a video signal or genlock signal at one endpoint and loop the video signal in the other endpoint to

minimize disturbances in the audio channels. The internal test pattern generator described in *chapter 4.3* can be used as sync generator.

4.3 Internal test pattern generator / sync generator

To test or generate sync signals the internal pattern generator can be used. The pattern generator can be enabled by holding down the output format set button for three seconds. The pattern generator interface is equal to the selected format selected before the unit enters test pattern mode. If the unit is used as an audio transceiver the user is recommended to enter the test mode and loop the video signal at both endpoints to minimize disturbances, a short coaxial cable at both endpoints using only Y component is the best approach. When the generator is active the selected output format LED is flashing. To exit test mode press the output format set button again.

! When using loop mode, only set one endpoint to generate test pattern signal.

5. Technical specifications

Power supply

Supply voltage	9-18 VDC
Current consumption	6.5W (typ.)

Video input

Connectors	BNC
Input impedance	75Ω
Nominal input level	0.7V p-p
Maximum input level	3V p-p
Frequency range	1kHz-10MHz
Video resolution	10-bit

Video output

Connectors	BNC
Output impedance	75Ω
Nominal output level	0.7V p-p
Frequency range	1kHz-10MHz
Video resolution	10-bit

Balanced analog input

Connector	XLR/TRS
Input impedance	10kΩ
Nominal input level	+4dBu
Maximum input level	+18dBu
Frequency range	20Hz – 20kHz
Dynamic range A-weight (ADC)	102dB
Audio resolution	24bit
Audio sampling frequency	52.73kHz

Balanced analog output

Connector	XLR
Output impedance	100Ω
Maximum output level	+18dBu
Frequency range	20Hz – 20kHz
Dynamic range A-weight (DAC)	103dB
Audio resolution	24bit
Audio sampling frequency	52.73kHz

Fiber channel

Connector	SC
Transmission rate	540Mbit
Maximum distance single-mode	10km
Maximum distance multi-mode	550m
Nominal optical wavelength	1300nm
Laser class	IEC 60825-1 Class I

Transmitter-receiver mode or synchronized transceiver mode

Video transmission resolution	8-bit
Video transmission format	4:2:2 YCrCb
Audio transmission resolution	24bit
Audio THD+N	-85dB
Audio/Video sync	±0.5 frames