MOVICOM

MOVILINK
Camera Connection Module

User Manual

Content

1 Revision History

Revision	Date	Major changes
1.0	06.2017	First edition

2 General Description

Movilink is a family of camera connection systems that allow to transmit all necessary connections to/from a camera via one or multiple optic-fiber lines. Movilink transmits the following signals:

- Up to 4 3G-SDI channels (in either direction);
- 1 Gb Ethernet;
- One serial interface with Sony 700 protocol support;
- Intercom audio;
- Tally.

In addition, Movilink is capable of converting Sony Simple Ethernet protocol into Sony700 serial. Movilink consists of two modules – a Camera unit and a Base unit. Each unit may either connect to a balanced 4-wire +4 dBu intercom line or have a headset output.

Movilink may be supplied in a portable or rack cases and has a rich set of available order options.

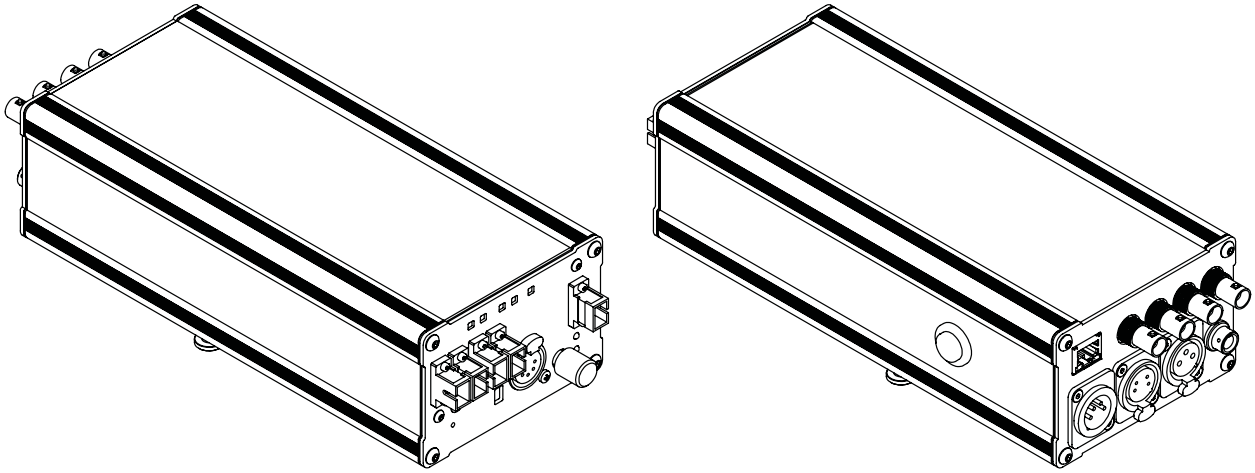


Fig. 1 Movilink portable unit (exact connector location and quantity depend on order options). A proper camera mount available on request.

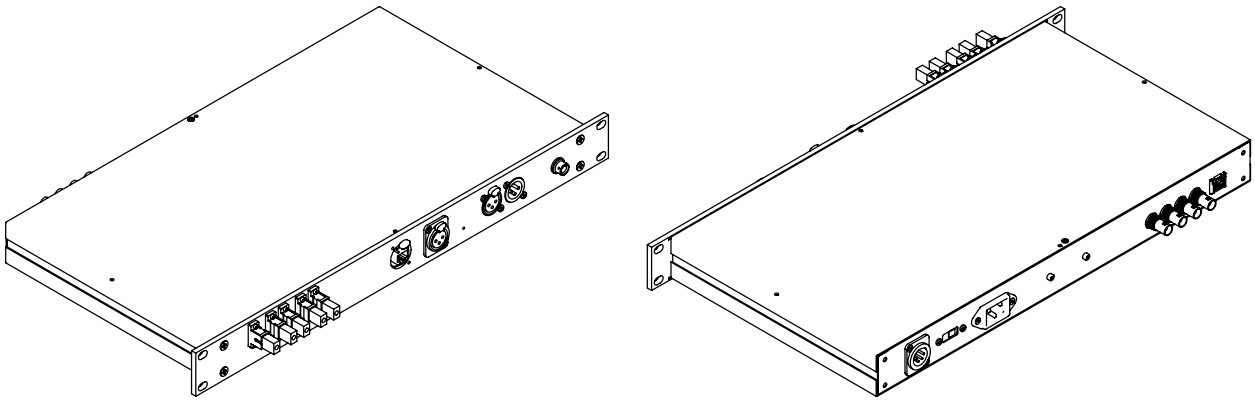


Fig. 2 Movilink rack unit (exact connector location and quantity depend on order options

3 Specifications

Parameter	Value
SDI Inputs/outputs	
Supported formats	SMPTE 424M (**3G**), SMPTE 292 (**HDSDI**), SMPTE 259M (**SDI**), DVB-ASI
Signal reclocking at inputs and outpuuts	Yes
Connectors	BNC 75 Ohm
Cable Equalizer	3G – up to 100 m (Belden 1694A cable or equal) HD – up to 150 m SD, ASI – up to 300 m
Ethernet	
Ethernet protocols	IEEE 802.3i 10 Base-T (10 Mbit/s) IEEE 802.3u 100 Base-T (100 Mbit/s) IEEE 802.3ab 1000 Base-TX (1 Gbit/s)
Fiber-optic parameters	
Fiber-optic connectors	ST, FC or SC
Fiber-optic transmission distance	20 km (80 km as an option)
Fiber-optic wavelengths	1310 and 1550 nm (other options including CWDM are possible)
Intercom parameters	
Headset connector	XLR 5
Microphone type	Dynamic and electret microphone supported
General	
Supply voltage	9÷18 VDC (optional 220 VAC power for rack units)
Dimensions of a portable unit	240 x 110 x 70 mm
Dimensions of a rack unit	1U 19”
Operation temperature range	-20..+35 °C
Protection class	IP54

4 Ordering guide

Each unit has the following options, coded in its name:

Movilink aTbREcF-SC-OR-*BR-SX-NT-E-PL*
(mandatory part is marked with **bold**, optional – with *italics*)

Option	Name coding	Possible variants
Number of SDI inputs/outputs and number of fiber-optic lines	***a***T***b***RE***c***F	***a*** – number of SDI inputs ***b*** – number of SDI outputs (a sum of ***a*** and ***b*** should be any number between 1 and 4) If ***a*** or ***b*** equals zero, the corresponding letter (**T** or **R** respectively) is omitted ***c*** – number of fiber lines (from 1 to 6)
Fiber-optic connector type	SC	**SC**, **ST** or **FC** (LC on request)
Intercom type	OR	**OR** – 4-wire balanced line **OT** - headset
Case type	BR	**Nothing** – portable unit **BR** – rack unit
Serial connector type	SX	**Nothing** – Sony Serial Hirose **SX** – XLR5
Tally connector	NT	**Nothing** – Tally connector is present **NT** – No Tally connector
Additional Ethernet connector	E	**Nothing** – not present **E** - present
Power loopback	PL	**Nothing** – not present **PL** - present

5 Typical applications

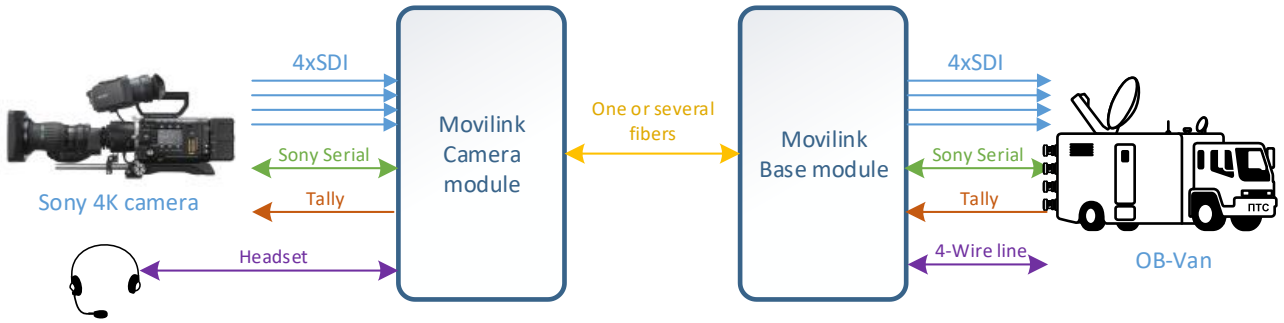


Fig. 3 4K Sony camera connection with serial interface

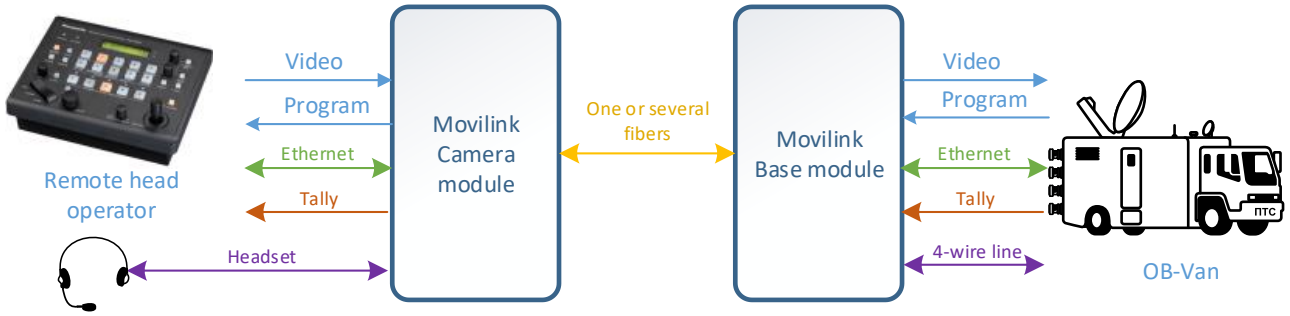


Fig. 4 Remote head operator's position connection.

6 Controls, connectors and LED Indicators

6.1 LED Indicators

A module may have the following LED indicators (the exact quantity and functions of LEDs depend on system configuration):

- *SDI 1..SDI 4* – a valid signal is present at SDI input of the unit.
- *Video Fiber 1..Fiber 4* (at fiber receiver end) – a valid SDI signal is received via fiber connection (fed to the corresponding SDI output).
- *Link* – a valid Ethernet link via fiber has been established.
- *PWR* – Power has been applied to the device.
- *Pair* - A pair device (a camera unit related to a base unit or vice versa) has been connected. The LED lights with red when only audio is received (even, if nothing is connected to audio inputs/outputs). The LED blinks, when serial data is received.

6.2 User controls

User controls for units with headset connectors:

- *Volume* – adjusting volume of headphones. At an end position the knob switches off intercom/audio/tally power supply.
- *Mic On/Off* – constantly turning a headset microphone on.
- *Talk* button – allows to talk to the line when the *Mic On/Off* switch is in Off position.

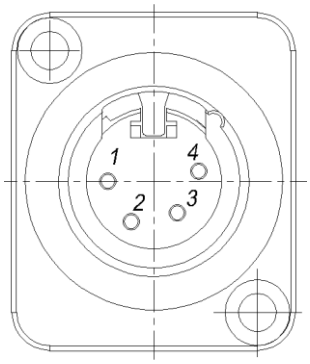
6.3 IP Reset

All units have a hidden *Reset* button to reset the unit to a default IP address 172.16.200.10. To apply a reset, turn the unit off, press the button and turn the unit on. The device will start with the default IP address. Store a new IP address in the setup program pressing *Store Values*, otherwise the IP address will return to the last stored value after unit repowering.

6.4 Connector pinouts

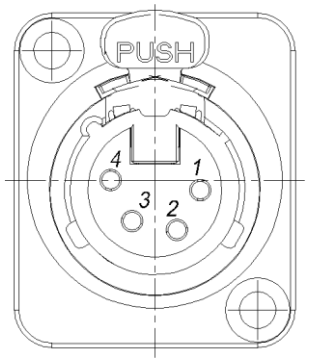
All connectors are shown from the cable mating side.
The exact number and function of connectors may vary depending on unit configuration.

6.4.1 Power in (XLR 4 male)



Pin #	Pin Function
1	GND
4	Power 9..18 V
2,3	Not connected

6.4.2 Power Loopback Out (XLR 4 female)

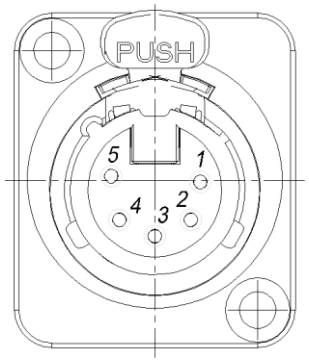


Pin #	Pin Function
1	GND
4	Power 9..18 V
2,3	Not connected

6.4.3 Sony Serial (Hirose MXR-8RA-8S, mating cable connector – MXR-8P-8P)

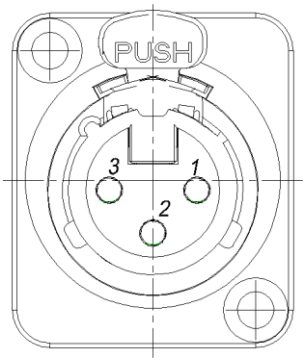
Pin #	Pin Function
1	TX(+) BVP SERIAL DATA
2	TX(-)
3	RX(+) CCU/MSU/RCP/CNU/VCS SERIAL DATA
4	RX(-)
5	Not connected
6	POWER(+) OUT +12 V, 500 mA (MAX) for base units **Not connected for camera units**
7	POWER(-) OUT GND for +12 V for base units **Not connected for camera units**
8	Not connected

6.4.4 Serial interface (XLR 5 female)



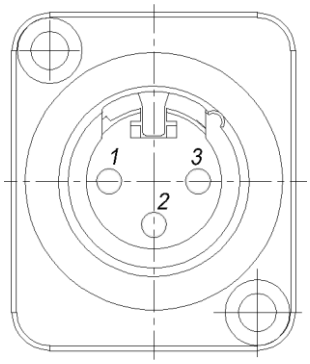
Pin #	Pin Function
1	GND
2	RS-422 TX-
3	RS-422 TX+
4	RS-422 RX-
5	RS-422 RX+

6.4.5 Tally In (XLR 3 female)



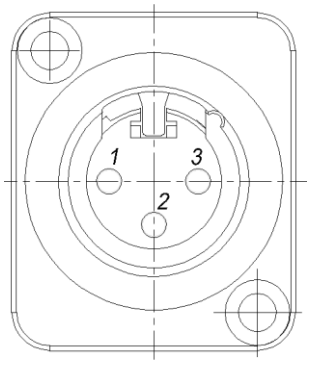
Pin #	Pin Function
1	Not connected
2	GND (Riedel scheme) or Dry contact 1
3	+5..+40 VDC (Riedel scheme) or Dry contact 2

6.4.6 Tally Out (XLR 3 male)



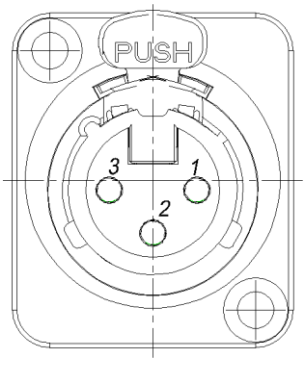
Pin #	Pin Function
1	Not connected
2	Dry contact 1
3	Dry contact 2

6.4.7 4-wire Line In (XLR 3 male)



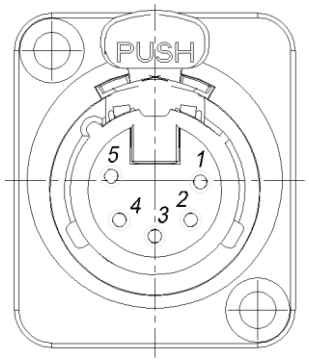
Pin #	Pin Function
1	Not connected
2	LINE_IN-
3	LINE_IN+

6.4.8 4-wire Line Out (XLR 3 male)



Pin #	Pin Function
1	Not connected
2	LINE_OUT+
3	LINE_OUT-

6.4.9 Headset (XLR 5 female)



Pin #	Pin Function
1	MIC -
2	MIC +
3	GND
4	PHONE
5	PHONE

7 Serial port working modes

Serial interface supports the following modes:

- **Disabled**
- **Sony 700 Bridge**
  Sony 700 protocol direct transmission between two units
- **Sony Simple Client (CNA mode)**
  Camera unit converts Sony Simple Ethernet protocol to Sony 700 (no serial communication at the base end). See the detailed description below.
- **Generic Serial Bridge**
  Standard serial protocol transmission between two units (baudrate and other parameters may be configured)

7.1 Working with Sony CNA-1

The optimal use case Sony Simple Client mode is when a Sony camera with serial protocol needs to be integrated into an Ethernet network of OB-Van. An RCP working with Sony 700 serial or Sony Simple Ethernet protocols cannot be a part of MCS (multicamera system) of an OB-van, which limits camera's usability. To overcome this issue an additional Sony CNA-1 unit may be used. It would work as a converter from MCS to Sony Simple. Sony Simple then may be easily transported over Ethernet link (wired, fiber or wireless) and converted to Sony 700 by Movilink camera unit. This would allow to keep the camera controlled by a serial interface within MCS network.

One additional advantage of this mode is that it is insensitive to transmission delays, that might occur when using wireless connection. For example, Sony 700 bridge mode could lose connection in this case.

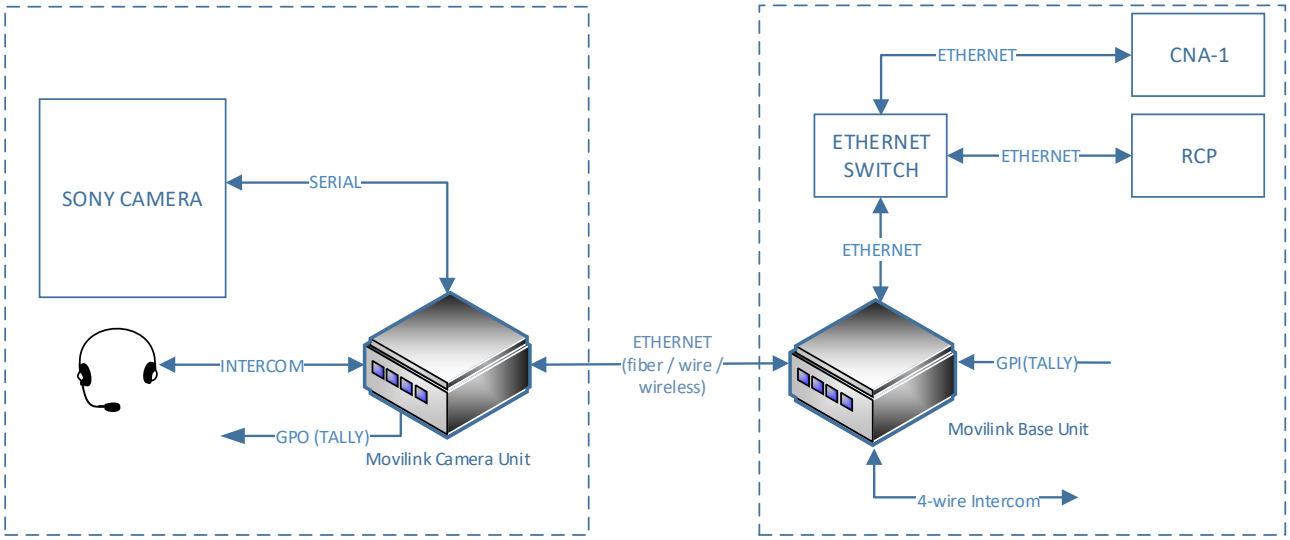


Fig. 5 Working with CNA-1 schematics (video transmission is not shown)

To work with CNA-1, a scheme as shown on the Fig. 5 should be used. For proper operation the following settings should be configured:

Movilink base unit	Serial interface mode	Disabled
Movilink camera unit	Serial interface mode	Sony Simple Client
	CNA-1 IP Address	IP Address of CNA-1
	CNA-1 TCP port	Same, as for CNA-1
CNA-1	Apply settings as described in *CNA-1 User Manual*, *Transport Converting Function Setting* chapter, *When using the multi-camera system* section	

8 Tally

8.1 Tally modes

Tally signal at the camera unit has multiple sources and may have several destinations. The logical scheme of the tally transmission is summarized in the Fig. 6.

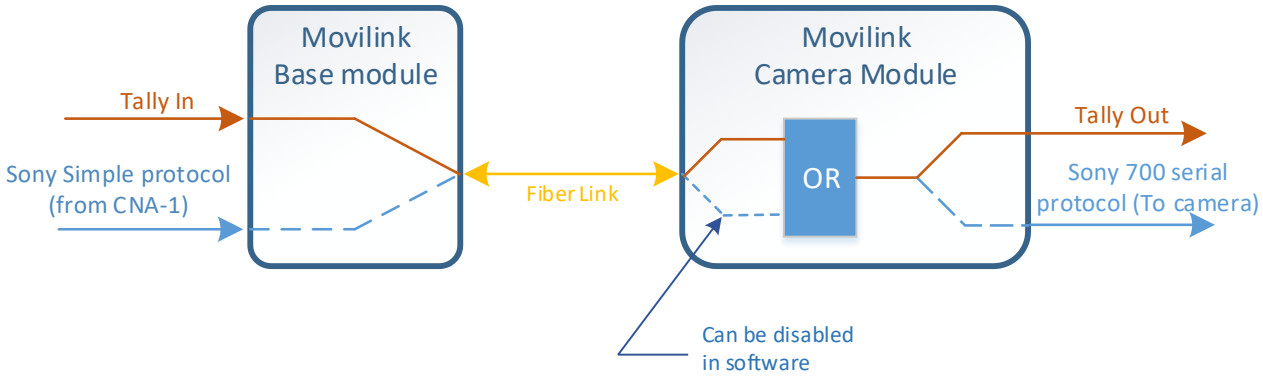


Fig. 6 Tally signal sources and destinations

Tally state of the camera module always depends on the state of *Tally In* input of the base module. Whenever Tally input is active, tally output is active as well.

Additionally, when the camera module works as *Sony Simple Client*, state of tally may be fetched from the protocol. In this case the fetched value is logically ORed with the tally input value. Thus, do not connect anything to *Tally In* if the tally lamp should be controlled directly from the Sony protocol. Protocol parsing may be disabled from the software (see chapter 9.3.4).

The tally state is always output to the *Tally Out* connector. Additionally, when the camera module works as *Sony Simple Client*, the state is forwarded to the camera as a part of the protocol.

8.2 Tally In schematics

Tally In connector may be configured to one of the following schemes:

- Dry contact
- “Riedel” scheme

The Riedel scheme copies Tally in schematics of Riedel equipment. Its schematics is shown on the Fig. 7. In this case positive voltage 5..48 V should be applied to between pins 2 and 3 of *Tally In* connector to light the tally lamp up.

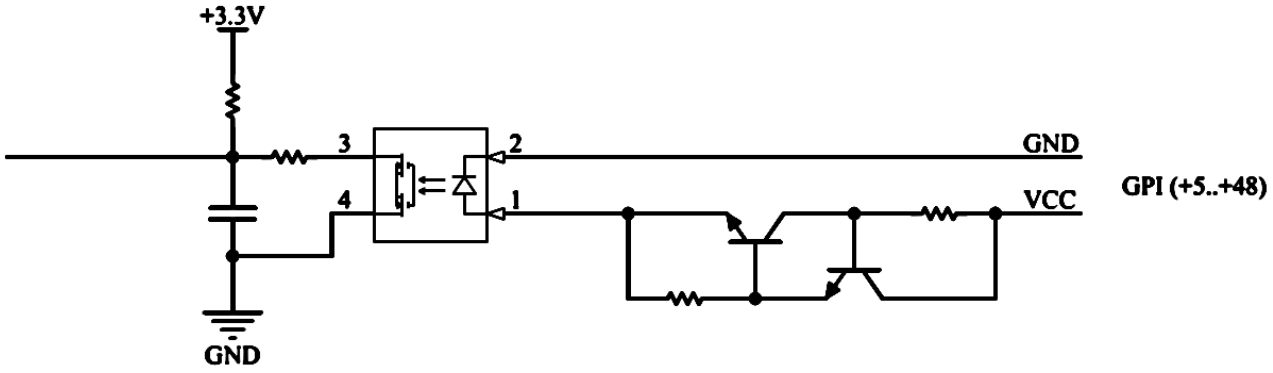


Fig. 7 Tally In schematics for Riedel scheme

Dry contact would require a simple button to be connected between pins 2 and 3 of *Tally In* connector to light the tally lamp up.

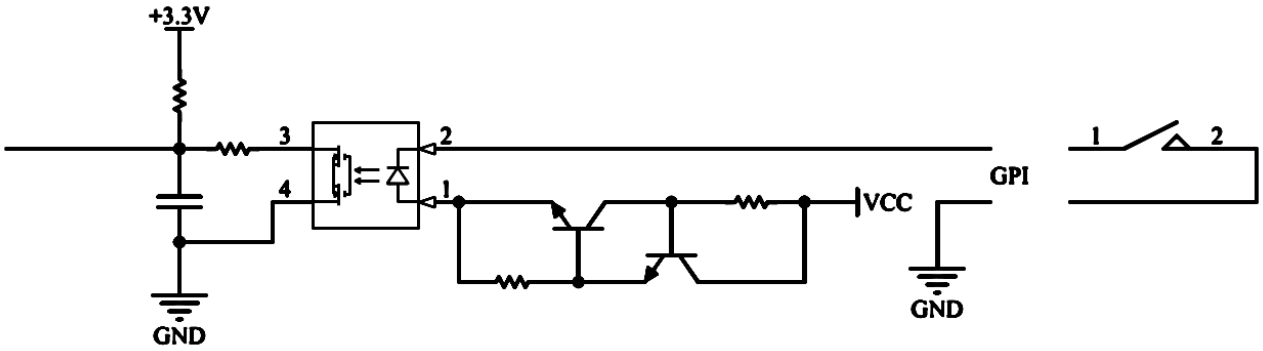
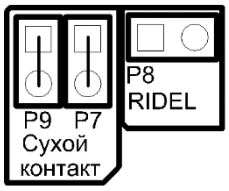


Fig. 8 Tally In schematics for "Dry contact" scheme

Tally mode is configured by setting P7, P8 and P9 jumpers of OB401 module inside of the Movilink device. The setup is shown in the Fig. 9.



Desired Mode	P7	P8	P9
Dry contact	Set	Not set	Set
Riedel	Not set	Set	Not set

Fig. 9 Tally In hardware configuration

Warning: incorrect jumper settings may lead to device damage.

Pay additional attention to signal polarity in Riedel mode.

8.3 Tally Out schematics

Tally out is designed as a dry contact between pins 2 and 3 of *Tally Out* connector. Maximal output current should not exceed 100 mA.

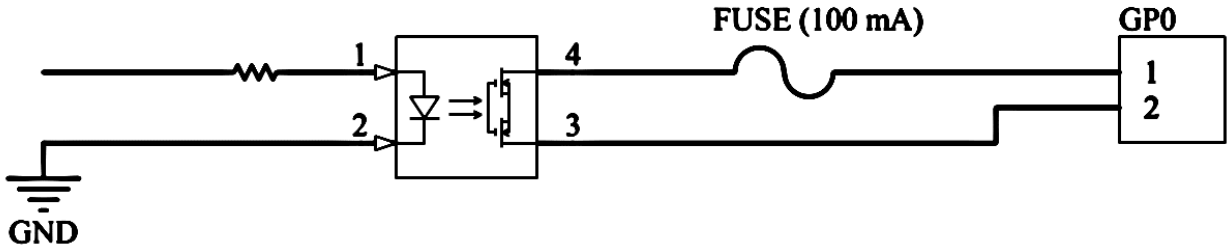


Fig. 10 Tally Out schematics

9 Unit configuration

9.1 Setup program connection

Each Movilink unit may be configured via Ethernet with a dedicated *Movicom Device Monitor* software (supports Windows OS). To connect to the device do the following steps:

1. Connect LAN cable to your PC
2. Setup network card settings, so that your PC is in the same network, as the Movilink unit. The IP address, set by the manufacturer, is written at the unit's outer case. It is recommended to renew the value written on the unit's case if the IP address is changed**.**
   If the current IP address of the device is unknown, it can be reset to a default value, as described in chapter 6.3.
3. Run *Movicom Device Monitor* software. Switch interface language with Language menu in the bottom left corner.
4. Enter the following connection settings:
   - Comm. Channel – TCP/IP
   - Protocol – Modbus
   - IP Address – local IP of the Movilink unit

   The resulting setting window should look as on Fig. 11.

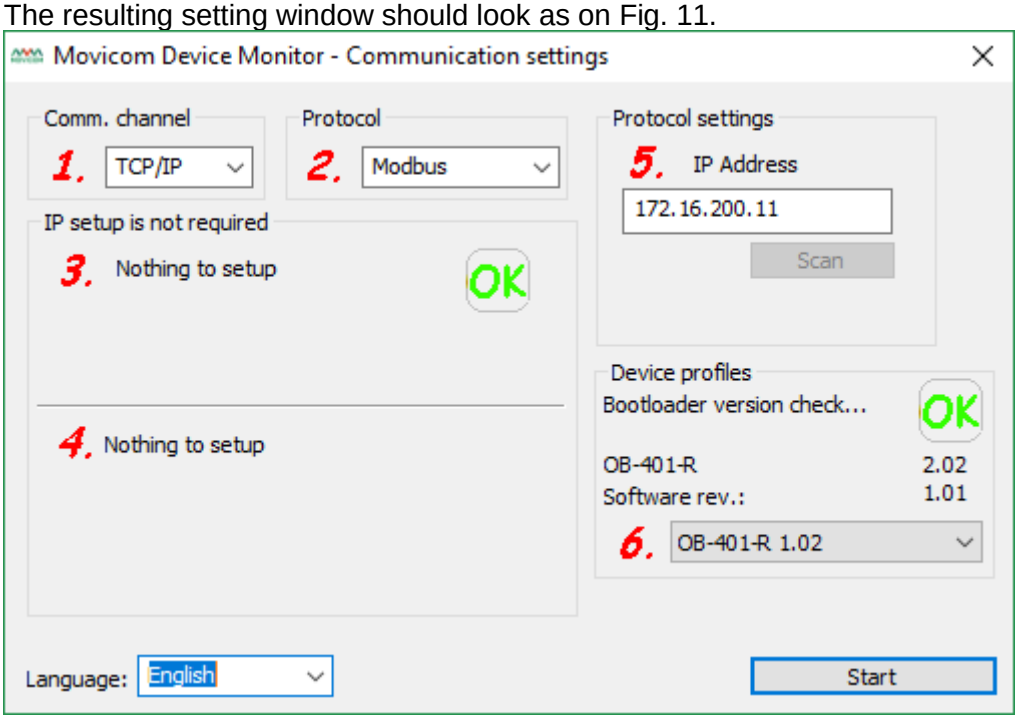


Fig. 11 Configuration software setup

5. If everything is correct, a green OK sign appears in the *Device profiles* view and a correct profile is shown in a dropdown menu. It should be *OB-401-R* for a unit with 4-wire intercom and *OB-401-T* for a unit with a headset output.
6. Press *Start* button.

9.2 Software interface

The interface of the Configuration software is shown on the Fig. 12.

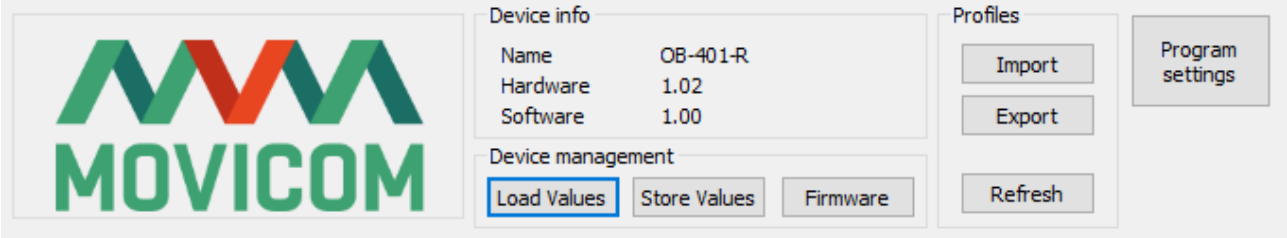


Fig. 12 Configuration software interface

The following functions are available:

- Store Values – save current setting values to the non-volatile memory of the device.
- Load Values – loads the currently stored values (and discards all unsaved changes).
- Firmware – currently inactive for Movilink devices.

- Export – store current settings to a file. Use this function if you will reuse the current device settings in future. Make sure, that you have write/read permissions to the folder with the setting files.
- Import – applies settings, exported in a file, to the current device.

- Refresh – read all current setting values from the device

The Program Settings button allows to set a Timeout between consecutive requests to the device. Low timeout values provide higher data refresh rate, but also increase network load.

9.3 Device settings

NOTE: Store settings values with *STORE VALUES* button, otherwise <u>all unsaved changes would be lost</u> after device power-off.
RESTART THE DEVICE TO APPLY THE SETTINGS CHANGE!

9.3.1 LAN settings (Fig. 13)

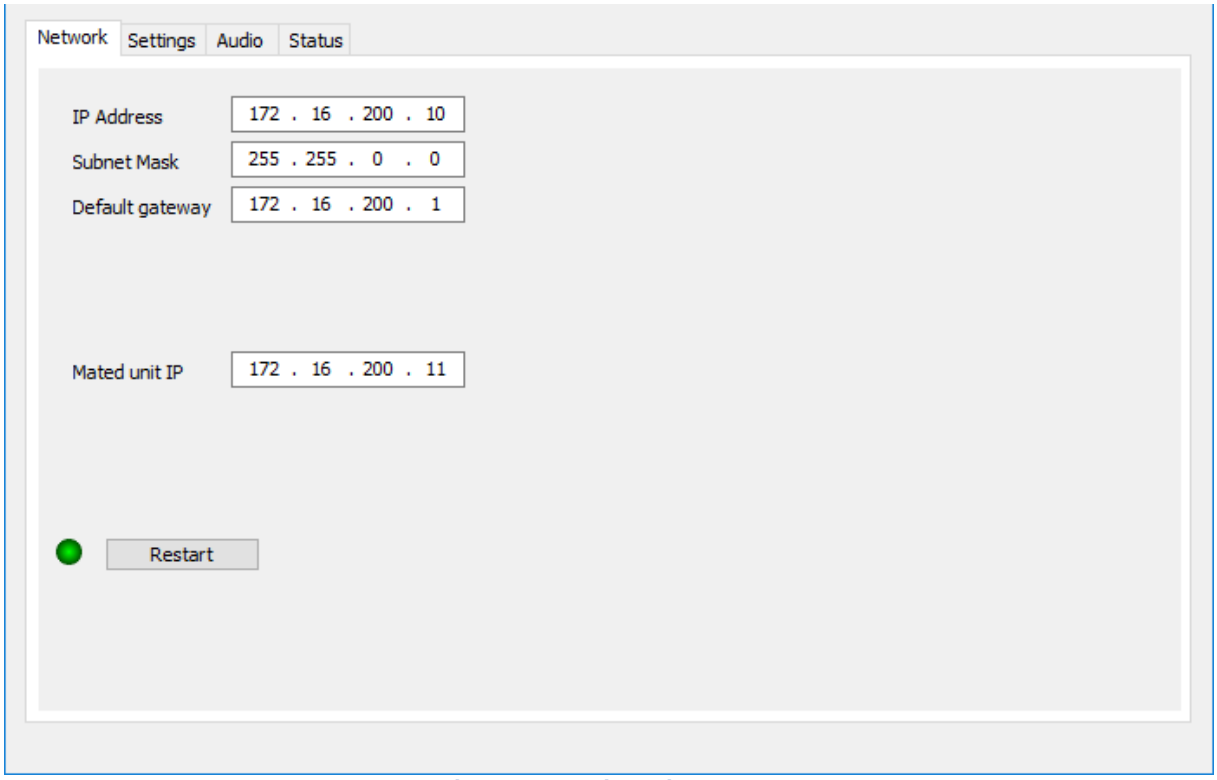


Fig. 13 Network settings page

- **IP Address** – IP address of the current Movilink unit
- **Subnet mask** – sets a subnet, available to the Movilink unit
- **Default gateway** – a gateway IP address, used in a case, when the Movilink devices operate in different subnets.
- **Mated unit IP**– IP address of a paired Movilink unit. The device will send audio, tally and serial data to this IP address.

For correct system operation, the two units should have *Mated unit IP*, that matches *Local IP* of each other.

9.3.2 Remote software reset (Fig. 13)

Use the **Reset** button to remotely restart the device and to apply new settings. Note, that all unsaved settings would be lost after restart. Note, that if an IP address has been changed, the configuration software needs to restart as well.

Use the *Refresh* button to update all setting values of the unit.

9.3.3 Serial and camera control settings (Fig. 14)

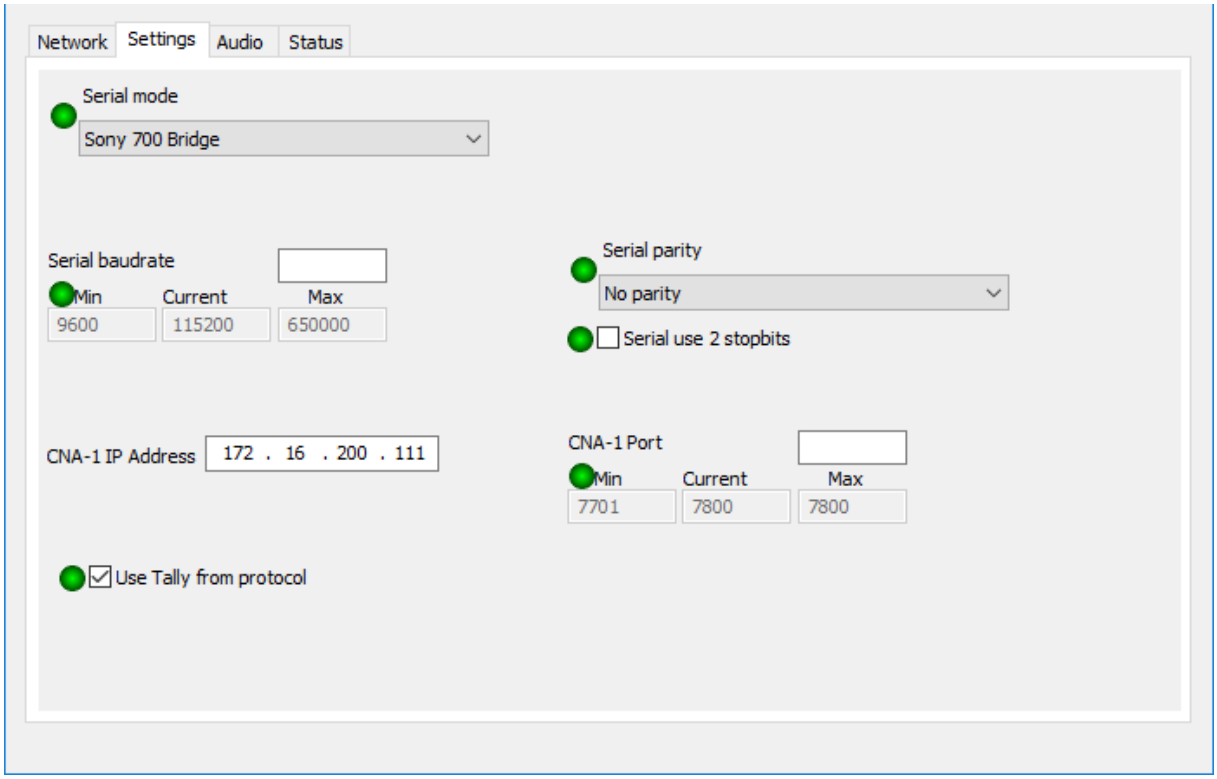


Fig. 14 Settings page

Serial port mode – sets working mode of the serial interface. Refer to chapter 7 for more details.

Serial baudrate, parity and **stopbit** settings define generic serial protocol and are applicable only in *Generic Serial Bridge* mode.

9.3.4 Camera unit specific settings (Fig. 14)

Use Tally from protocol enables/disables fetching tally value from Sony Simple protocol (Refer to chapter 8.1 for more details).

For working with CNA-1 (see chapter 7.1), set the following settings:

- **CNA-1 IP** – IP address of the corresponding CNA-1 unit;
- **CNA-1 TCP port** – TCP port number, set in the corresponding CNA-1 settings.

9.3.5 Audio settings (Fig. 15)

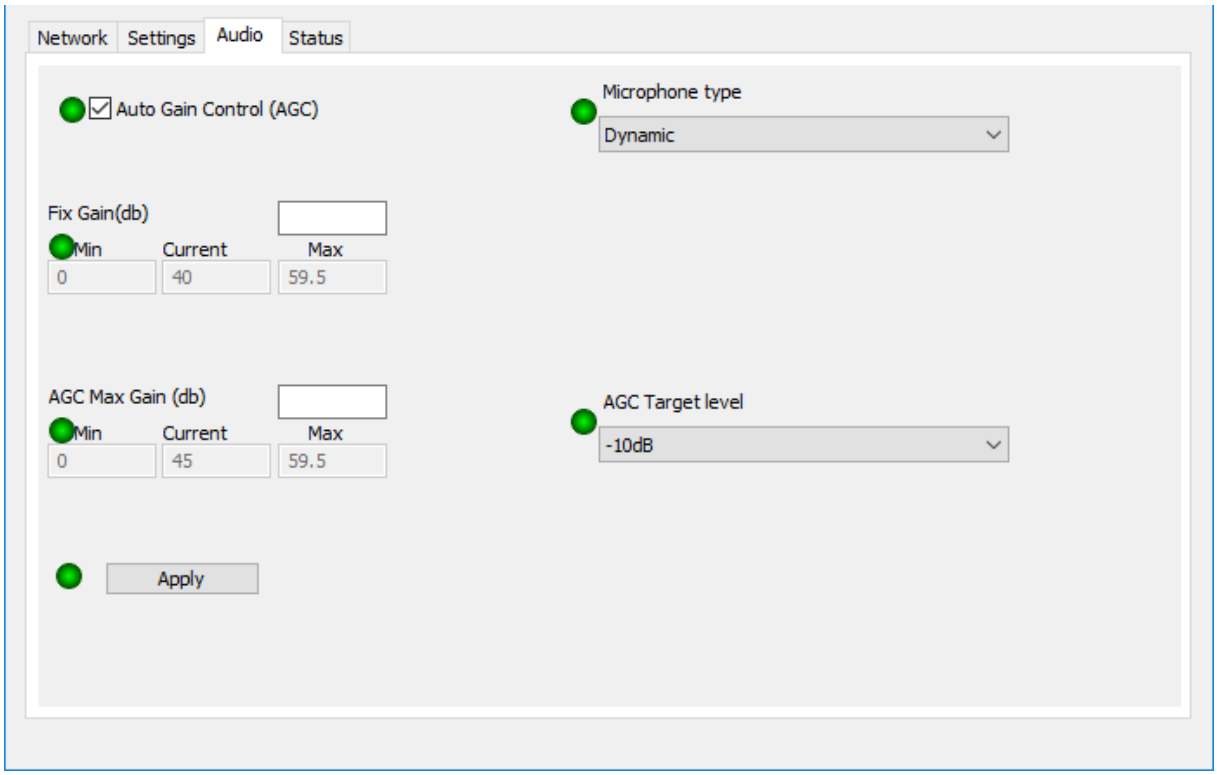


Fig. 15 Audio settings page

- **Microphone type** – a setting available for units with headset outputs only. Choose *Electret* for microphones, that require power supply. Choose *Dynamic* otherwise.
- **Auto Gain Control (AGC)** automatically adjusts input audiosignal amplification. By default, enable AGC for microphone input of modules with a headset and disable AGC for modules with 4-wire intercom line.
- **Fix gain (dB)** – audio input amplification when AGC is disabled. Default value is 0 dB for a line input.
- **AGC Max Gain (dB)** – maximal amplification limit when AGC is enabled. The maximal value is always set, when no one speaks to the microphone.
- **AGC Target level (dB)** – the setting is applied only when AGC is enabled. For loud sharp sounds AGC lowers the gain value to set signal to the target level without saturation. Default is -10 dB.
- **Apply** – pushbutton to apply audio settings.

9.4 Device status (Fig. 16)

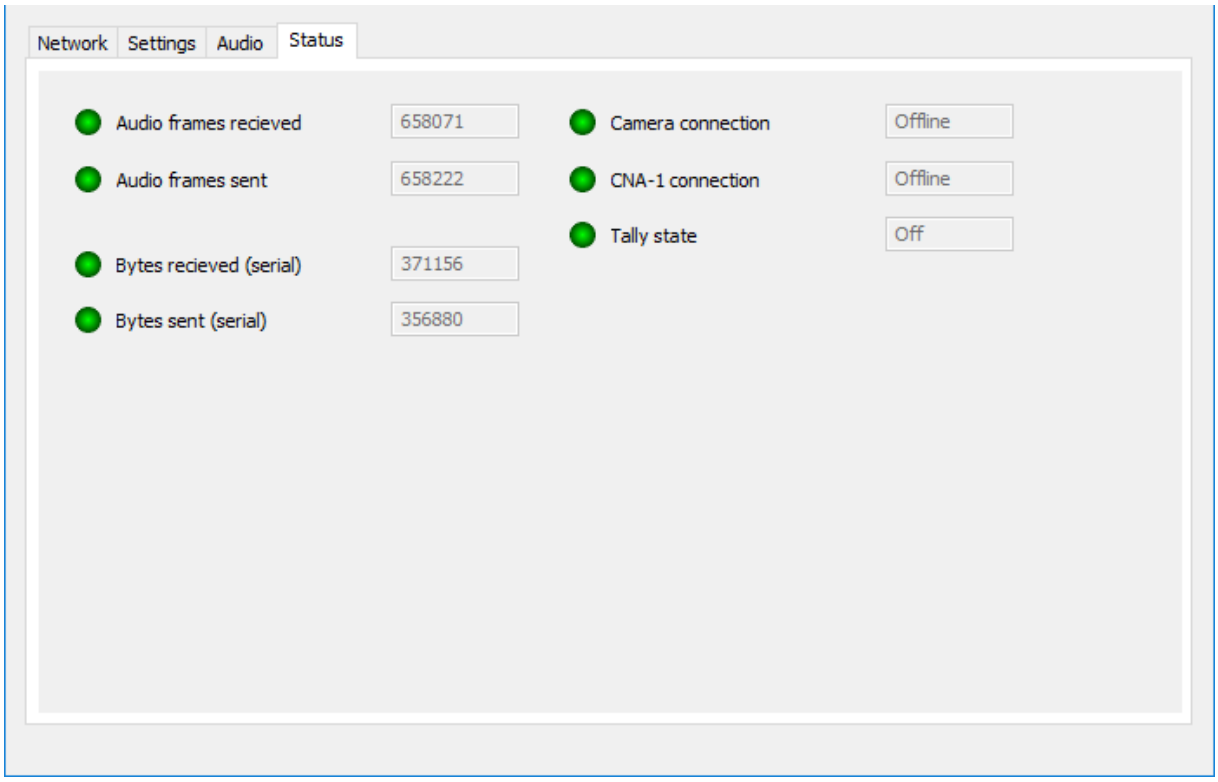


Fig. 16 Status page

The *Status* tab shows the following parameters:

- **Camera connection** – shows state of Sony 700 serial camera connection, when used in *Sony Simple Client* mode
- **CNA-1 connection** – shows, if the link to the CNA-1 unit has been established.
- **Audio frames received** – received audio frames counter.
- **Audio frames sent** – sent audio frames counter.
- **Bytes received (serial)** – number of bytes received from the mated device and sent via serial interface.
- **Bytes sent (serial)** – number of bytes received via serial interface and forwarded to the mated device.
- **Tally state** – current tally in/out state.

10 Contacts


117246, Russia
Moscow, Nauchniy proezd, 20, building 2


+7 (495) 410-06-91, +7 (495) 988-40-78


info@movicom.ru