

# BarnGuide

Version 2.9

## BarnGuide contents

- **BarnCare**..... 4
- **BarnOne series**..... 5
  - General information..... 6
  - Physical dimensions and mechanical accessories..... 7
  - Technical specifications..... 9
  - BarnOne - the variations..... 10
  - Functionality diagram..... 11
  - BarnOne frame with extended functionality - BTF1-10AA..... 12
  - BarnOne ordering information..... 15
- **Stage Box Break-Out**..... 17
  - Module based break-out panel..... 18
  - Stage box ordering information..... 19
- **BarnMini series**..... 21
  - BTF-Mini-16..... 22
  - BarnMini-01..... 23
  - BarnMini-02..... 24
  - BarnMini-03/04..... 26
  - BarnMini-05..... 27
  - BarnMini-06..... 30
  - BarnMini-07..... 31
  - BarnMini-08..... 32
  - BarnMini-11 ..... 33
  - BarnMini-12..... 34
  - BarnMini ordering information..... 35
- **LGX Series - Passive Optical Products**..... 37
  - Housing for LGX series..... 38
  - Optical Changeover Switch..... 38
  - Optical splitters..... 39
  - CWDM multiplexers..... 41
  - LGX series ordering information..... 42
- **SFPs**..... 43
  - How to read the SFP label..... 44
  - Data sheet examples..... 46
  - SFPs ordering information..... 50



|   |     |
|---|-----|
| • <b>BarnAcademy</b> .....                          | 53  |
| - Wavelength division multiplexing .....            | 54  |
| - Coarse wavelength division multiplexing .....     | 54  |
| - HiLo technology.....                              | 55  |
| - Optical budget calculation .....                  | 56  |
| - Light travelling through fiber.....               | 58  |
| - The electromagnetic spectrum.....                 | 59  |
| • <b>Software &amp; Control</b> .....               | 61  |
| - BarnStudio - Installation.....                    | 62  |
| - Overview.....                                     | 63  |
| - Device list.....                                  | 64  |
| - Take list.....                                    | 65  |
| - Basic information.....                            | 66  |
| - Network settings.....                             | 67  |
| - Matrix.....                                       | 69  |
| - Inputs.....                                       | 70  |
| - Outputs.....                                      | 71  |
| - Signal redundancy switch.....                     | 72  |
| - AA-MADI - MADI Router with analog interfaces..... | 74  |
| - SFPs.....   | 76  |
| - Firmware upgrade.....                             | 77  |
| - Diagnostics.....                                  | 78  |
| - BarnMini-05 control.....                          | 80  |
| - Web User Interface.....                           | 84  |
| - Connecting 3rd party products.....                | 87  |
| • <b>Application examples</b> .....                 | 89  |
| • <b>Trouble shooting</b> .....                     | 99  |
| - CAM-CCU in details.....                           | 100 |
| - CAM-CCU trouble shooting workflow.....            | 101 |
| - Trouble shooting.....                             | 104 |
| - Questionnaire.....                                | 108 |

## BarnCare

Barnfind offers 2-YEAR standard warranty for all products. For BarnOne series (Frame, PSU, Fan Cassette), we offer an extra 3-YEAR warranty that can be purchased on request. For even longer warranty requests or other support agreements, please ask! See also **Business Partner Agreement (BPA)** for further information.

Note that the warranty and guarantee handling is to be done via the Business Partner that are seen as Barnfind's local preferred partner. It is the Business Partner that is responsible for the first line service/support to the End Users in the Territory. Barnfind will act accordingly after first line service/support is done by the Business Partner and the outcome is reported to Barnfind.

Support packages that the Business Partner offers are between the Business Partner and its client.

Barnfind will need the Business Partner to administer the warranty and support packages. This means in practice that the customer must forward defective equipment to the Business Partner. If the Business Partner cannot fix the problem the Business Partner forwards to Barnfind at its expense and Barnfind fixes the problem. Barnfind pays postage back to the Business Partner and the Business Partner forwards to its customer. This is a non- discountable service.

The Warranty covers repairs and fixes due to equipment faults that have occurred attributable to Barnfind. Warranty issues not attributable to Barnfind are not covered by this 24+ Warranty Plan. Barnfind shall have full and final jurisdiction in assessing the nature of its liability with regards to Warranty return. All costs related to sending equipment to Barnfind shall be borne by the Business Partner. All costs for sending equipment back to the Business Partner shall be borne by Barnfind.

Barnfind reserves the right to change its repair plan tariffs and terms at the end of each calendar year.



**All** Barnfind products come with standard 2 years warranty, but can be extended to 5 years.

Please ask your local distributor or directly contact Barnfind HQ.



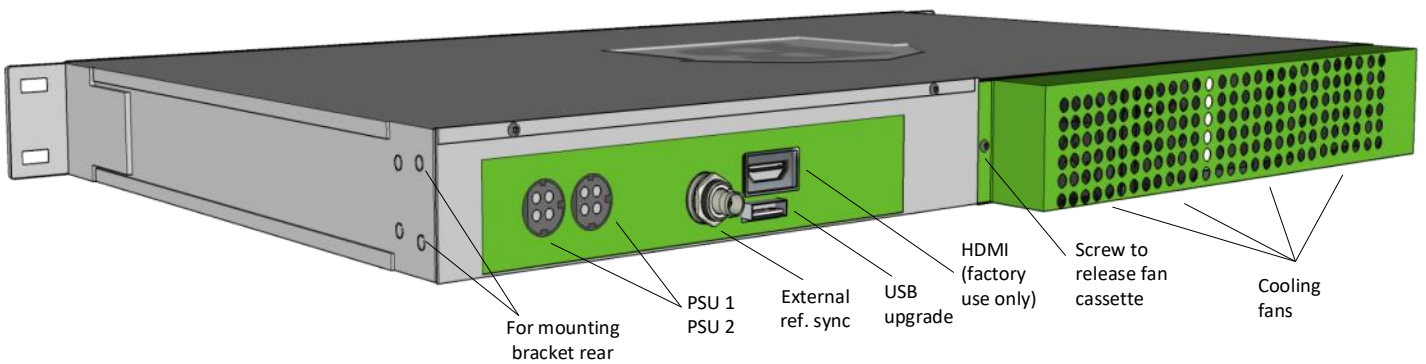
# BarnOne Series



## BarnOne - general information

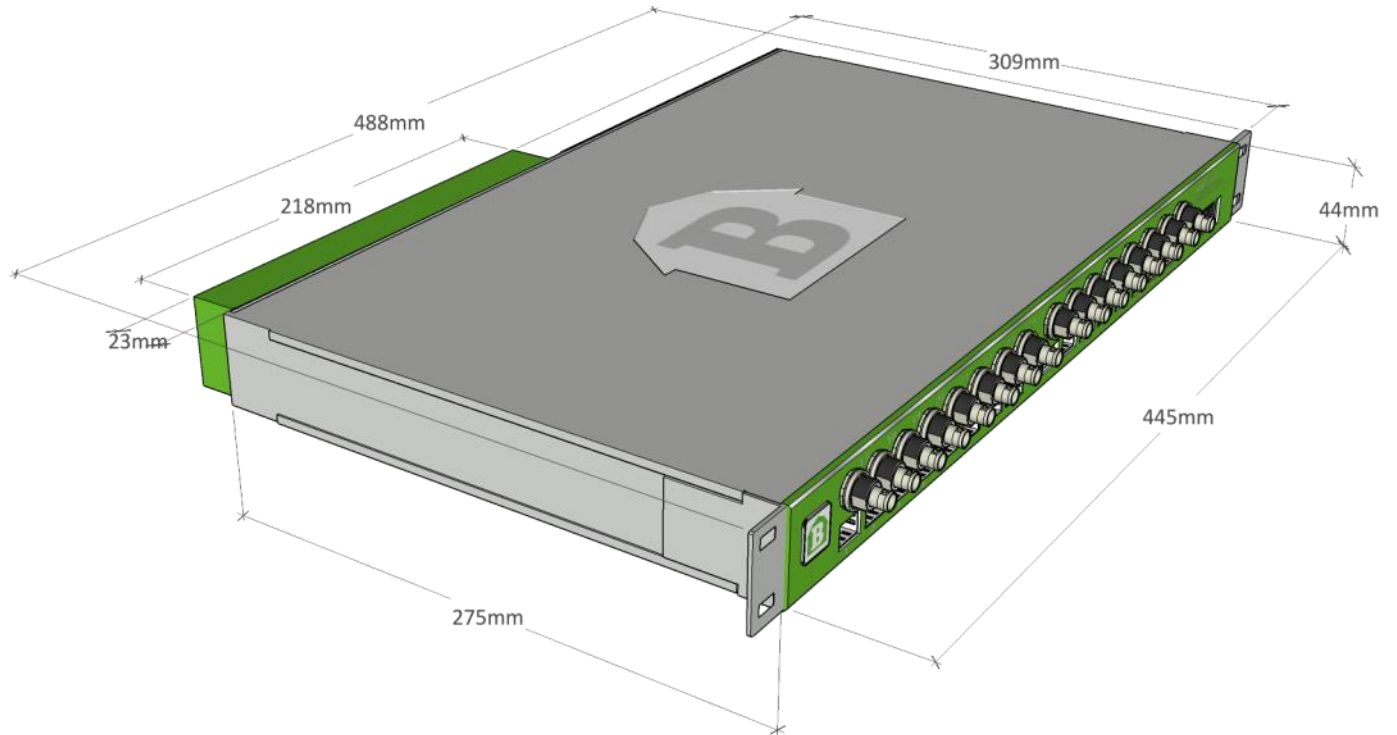


- 32x32 crosspoint matrix
- All SFP ports are bi-directional
- All BNC ports are inputs or outputs
- All outputs are reclocked
- Handles any MSA compliant SFP



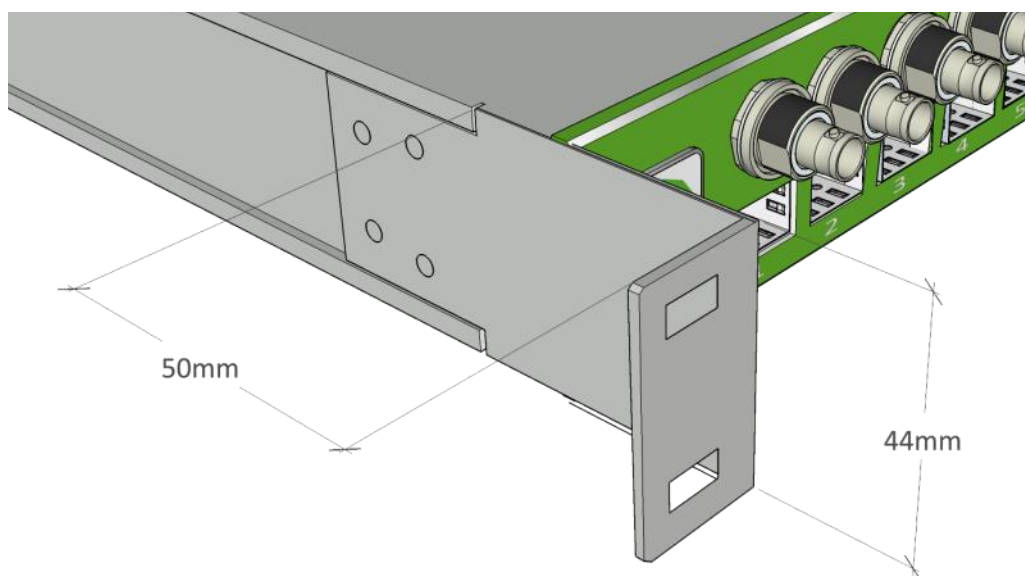
- Replaceable fan cassette
- Sync from external or internal source
- Redundant powersupply
- Front or rear mount in rack
- BarnStudio included

## Physical dimensions and mechanical accessories



### Extension Brackets (optional)

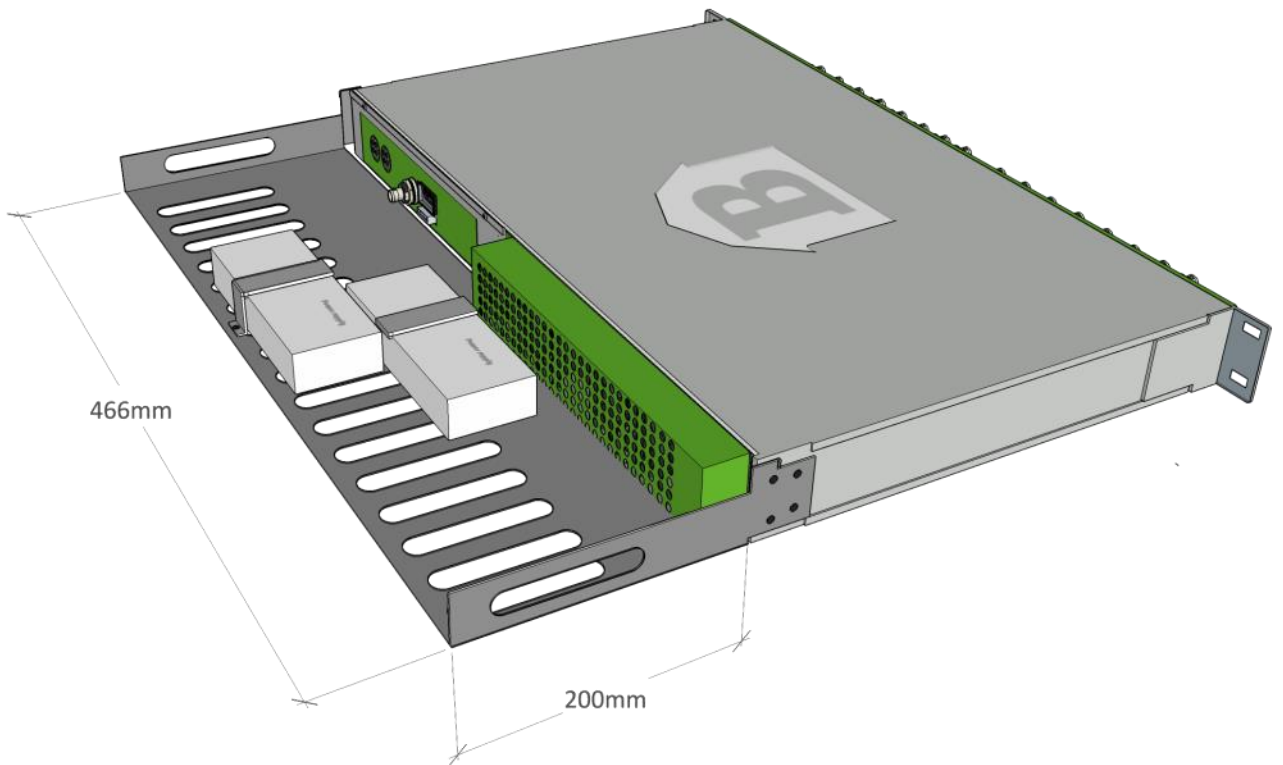
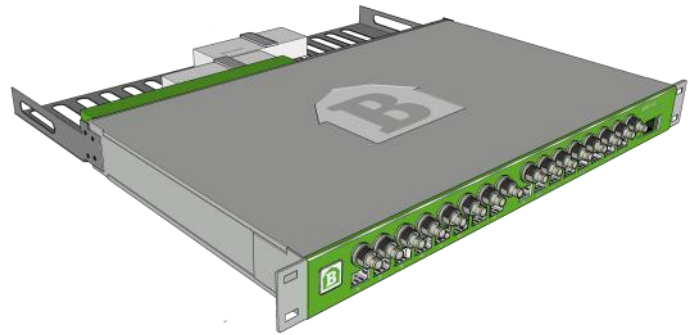
Mod nr: BT-EXT-EARS-5CM



### PSU-Tray (optional)

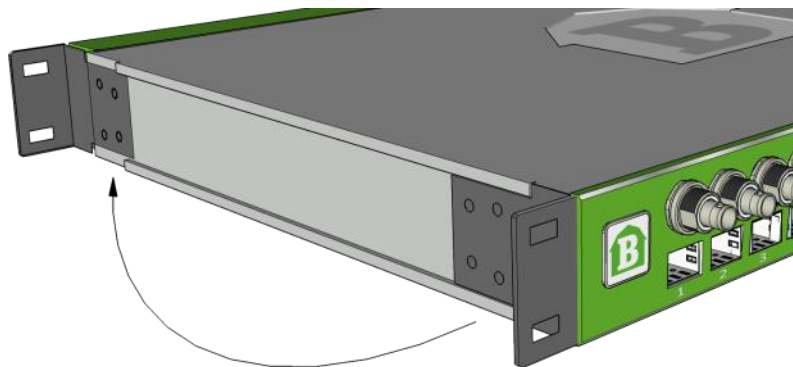
Mod nr: BT-TRAY-PSU

Barnfind PSU tray can be mounted at the rear end of the frame and can secure 2X standard PSU.



### Turn-Brackets (standard)

The mounting brackets (rack ears) can be moved from front to rear side of the frame in order to turn the connectors and SFP direction.





## Technical Specifications

### BNC Ports

- BNC port 75Ω switchable input or output
- SMPTE 259M, 292M, 372M, 424M, DVB-ASI, AES10 (MADI), AES3
- Automatic multirate reclocking of outputs 270Mbit/s - 3Gbit/s
- Automatic cable EQ (Belden 1694A) 270Mbit/s-250m, 1,5Gbit/s140m, 3Gbit/s-80m

### SFP Ports

- Port for Small Form-Factor Pluggable (SFP), supports MSA-compliant (multi source agreement) transceivers
- Suitable for optical transceivers (singlemode/multimode), SFP media converters
- SMPTE 259M, 292M, 372M, 424M, 372M, DVB-ASI, AES10 (MADI), AES3
- Hot pluggable/swappable

### Power Supply

- 12V DC power supply included
- PSU Input 100-240V AC 50/60Hz
- PSU Output 12V DC 8,5A
- redundant PSU optional

### Physical Size

- 445mm x 280mm x 43,5mm (17.5" x 11.0" x 1.7")
- 3,8kg

### Temperature

- Storage temperature -40°C - +70°C
- Operating temperature -20°C - +45°C
- Internal temperature depends on the selection of SFPs inserted. Some SFPs consume more power and are more sensitive to higher temperatures.
- ***Barnfind Technologies recommend to operate BTF1-xx frames in room temperature environment to ensure long lifetime and high performance.***

### Power Consumption

- A BarnOne frame has an average power consumption of 28-30W without SFPs inserted. The total power consumption is frame plus SFPs.
- A standard optical SFP has an average power consumption of 1.5W. See data sheet for the specific SFP to calculate an accurate power consumption.



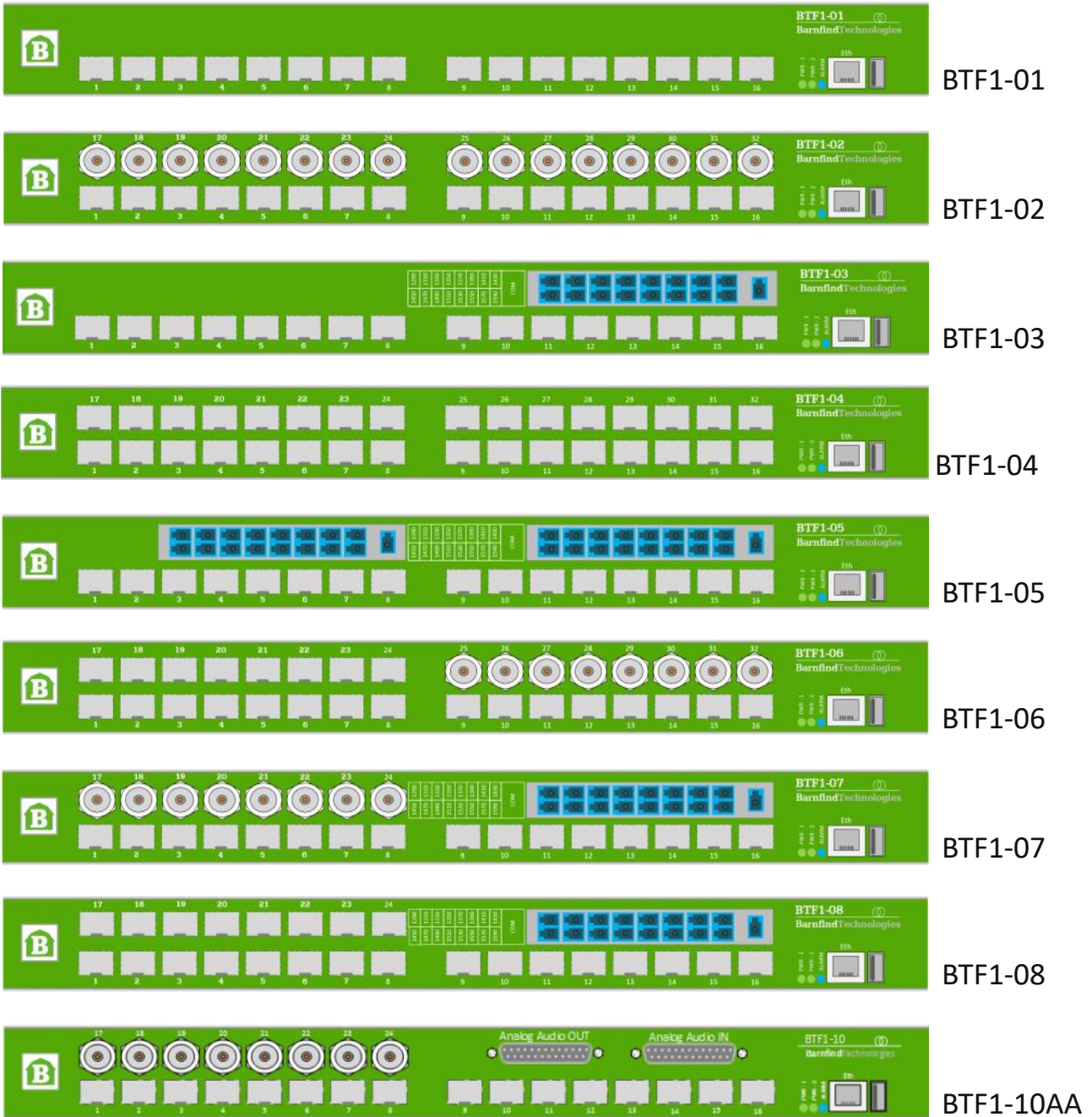
### Power Consumption Example:

1x BTF1-02  
8x BTSFP-CWDM-10-3GXX (see data sheet chapter 'SFPs')

W= Voltage (V) X Current (A)  
0.2A x 3.3V = 0.66W

**28 + (0.66x8) = 32.8 W<sub>tot</sub>**

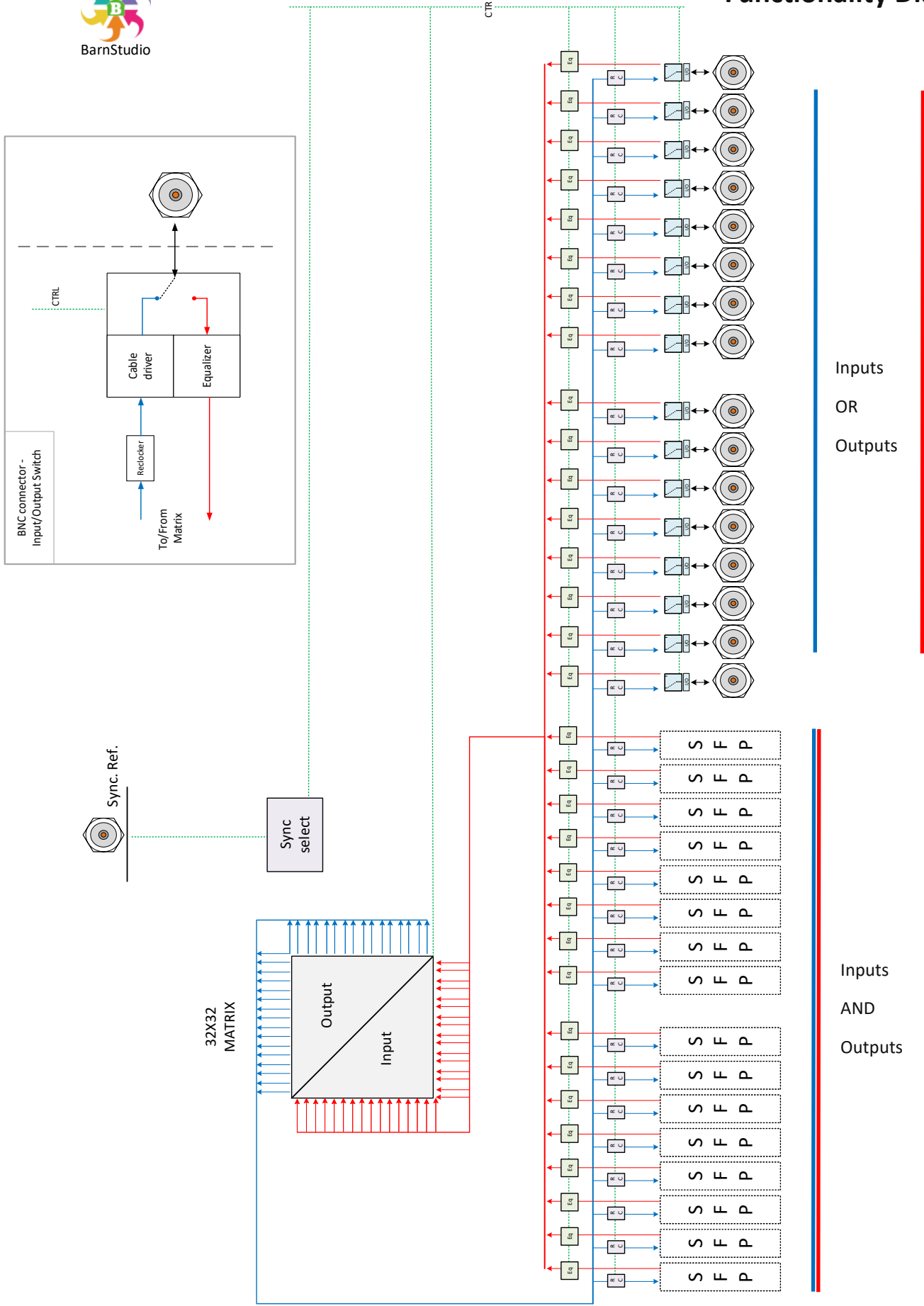
## BarnOne - the variations



|                    | BTF1-01 | BTF1-02 | BTF1-03 | BTF1-04 | BTF1-05 | BTF1-06 | BTF1-07 | BTF1-08 | BTF1-10AES | BTF1-10AA |
|--------------------|---------|---------|---------|---------|---------|---------|---------|---------|------------|-----------|
| SFP ports          | 16      | 16      | 16      | 32      | 16      | 24      | 16      | 24      | 16         | 16        |
| Bi-directional BNC | -       | 16      | -       | -       | -       | 8       | 8       | -       | 8          | 8         |
| CWDM channels      | -       | -       | 8/16    | -       | 2x 8/16 | -       | 8/16    | 8/16    | -          | -         |
| AES3 I/O           |         |         |         |         |         |         |         |         | 8          |           |
| Analog Line I/O    |         |         |         |         |         |         |         |         |            | 8         |



# Functionality Diagram

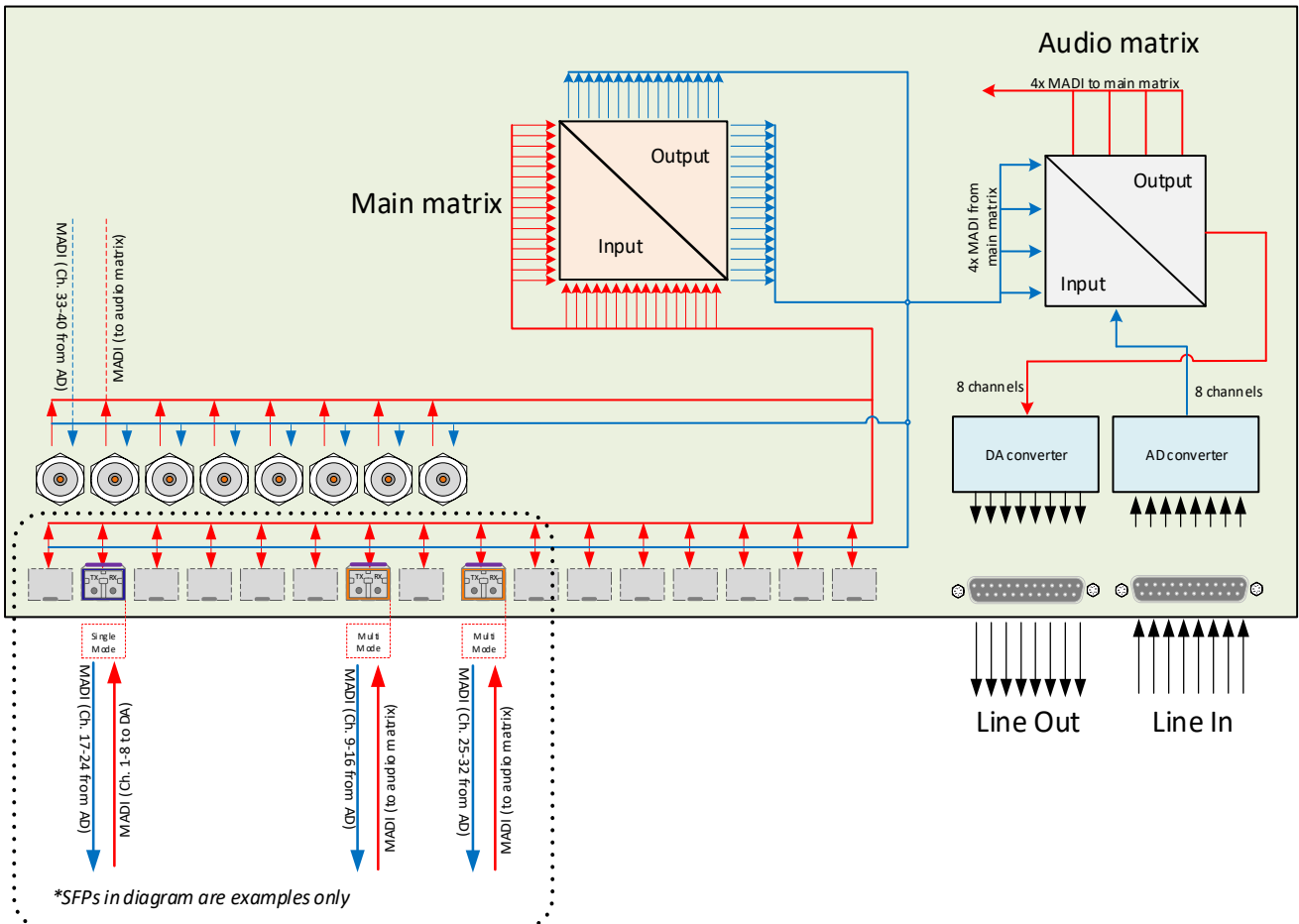
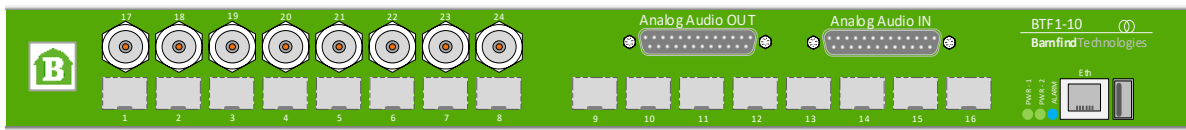


## BarnOne frame with extended functionality

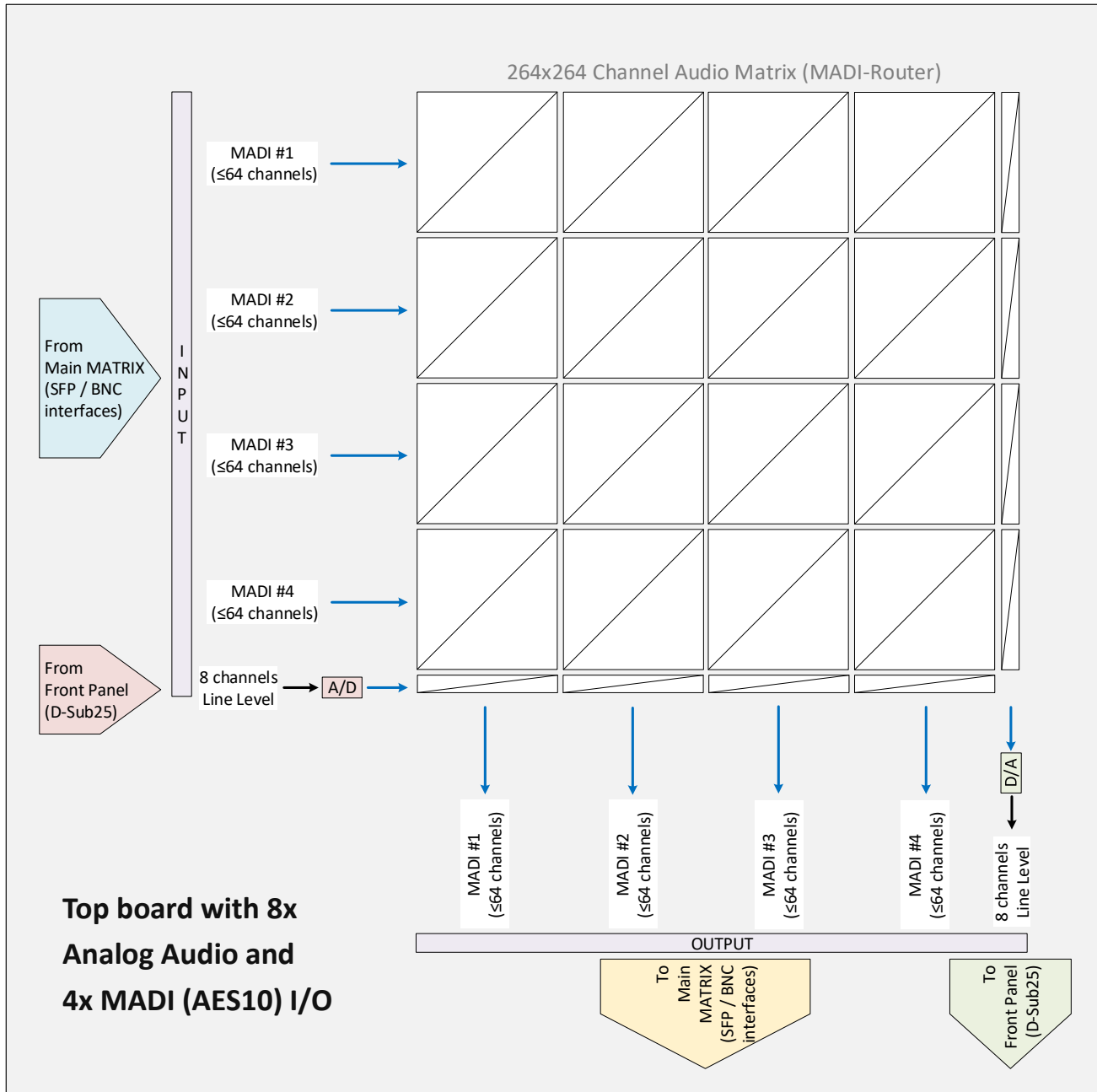
**BTF1-10 AA** - featuring 8x analog audio I/O with integrated MADI-Router



BTF1-10-AA houses a top board with AD/DA converters for 8x balanced analog line level audio. A 264x264 channel audio matrix with 4 bi-directional MADI interfaces connects the audio board to the main matrix of the BarnOne frame. The audio matrix offers single channel routing between all 4 MADI interfaces and the 8 analog ports. This makes the card a powerful MADI-Router on a per channel base with analog interfaces. In conjunction with the main matrix of BTF1-10AA it can be used for MADI electrical-optical conversion and/or distribution. You can as well simply use it to connect analog audio equipment directly to an audio console or matrix. Hereby the interface to the console can be optical by singlemode or multimode fiber or electrical by coax cable (BNC).



- Same basic functionalities as all other members of the BarnOne family
- Integrated A-D/D-A converter for analog line level audio signals
- Built-in audio matrix with single channel routing for up to 4 MADI streams and 8x analog line signals

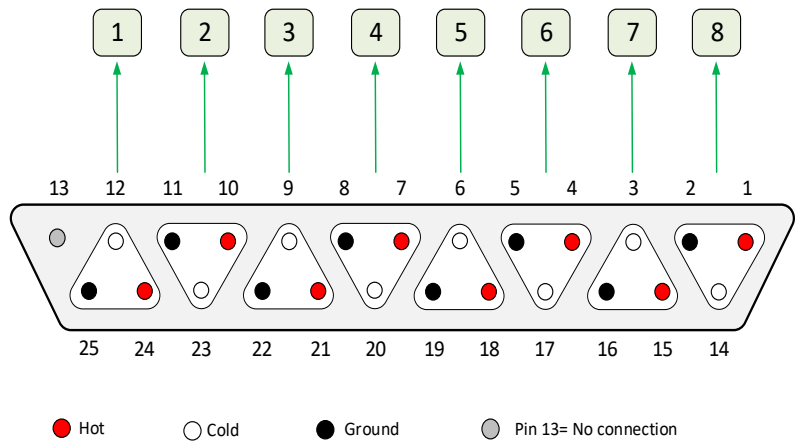


## Technical Specifications

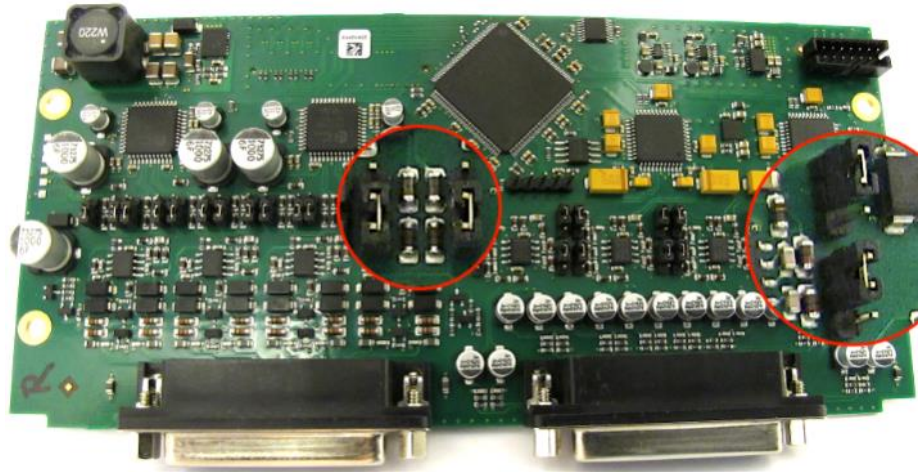
| Internal ports  | A/D converter   |
|---|---|
| <ul style="list-style-type: none"> <li>4x internal MADI (AES10) I/O connected to main matrix</li> <li>Sample rate 44.1kHz/48kHz (1FS), 2FS and 4FS also supported</li> <li>Synchronisation to one of the MADI ports or internally 44.1kHz/48kHz (2FS and 4FS also supported)</li> <li>Single channel routing for all MADI analog I/O</li> </ul> | <ul style="list-style-type: none"> <li>THD -115dB</li> <li>SNR -115dB unweighted</li> <li>THD+N -108dB</li> </ul> |
| <b>Analog ports</b> <ul style="list-style-type: none"> <li>8x balanced analog line inputs (DB25), individually configurable +18dBu/+24dBu (default setting: +18dBu)</li> <li>8x balanced analog line outputs (DB25), individually configurable +18dBu/+24dBu (default setting: +18dBu)</li> </ul>   | <b>D/A converter</b> <ul style="list-style-type: none"> <li>SNR -115dB</li> <li>THD+N -107dB</li> </ul>           |

### Pinout and Jumper settings BTF1-10AA analog line inputs and outputs

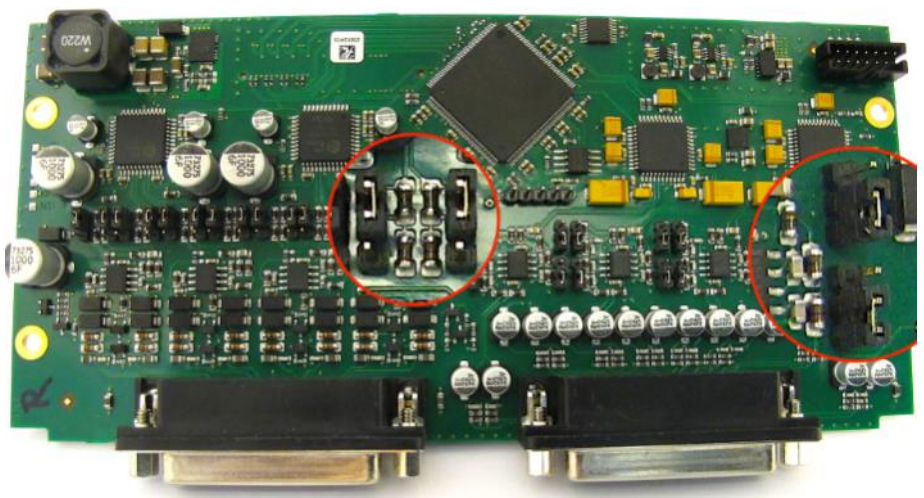
Pin-out for DB25 8 Channel  
Balanced Connector  
(TASCAM<sup>1</sup> pinout applies)



To change the jumper settings from +18dBu (default) to +24dBu, open the top lid of the BTF1-10AA frame with a Torx #15. The magnification in the pictures shows the settings for Input8 and Output8. You can change the settings for each input and output individually.



Jumper setting +18dBu (default)



Jumper setting +24dBu

<sup>1</sup> TASCAM is a registered trademark of TEAC corporation



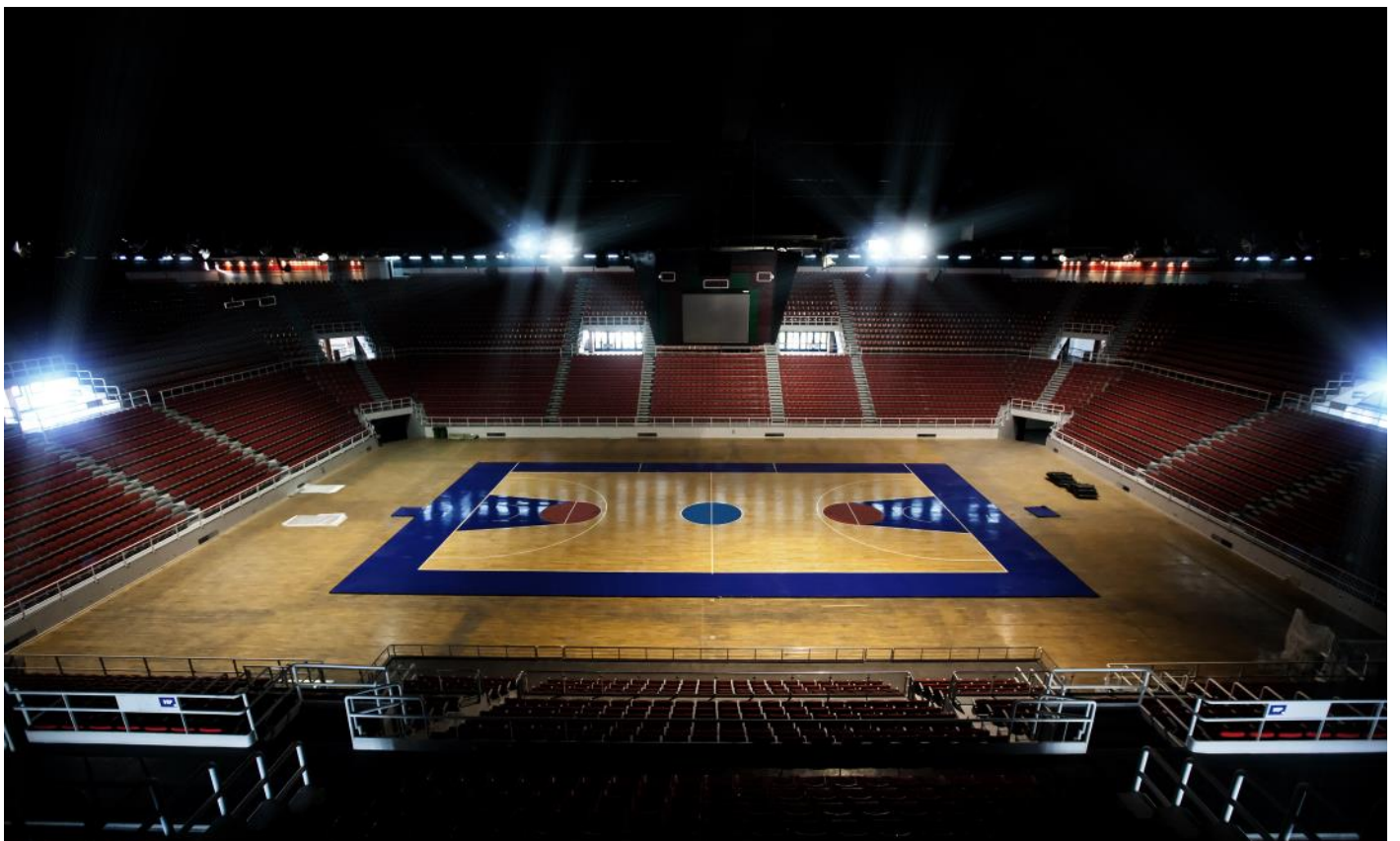
## BarnOne

| Order Number   | Description   |
|----------------|---|
| BTF1-01        | 16 SFP ports  |
| BTF1-02        | 16 SFP ports and 16 BNC   |
| BTF1-03-08     | 16 SFP ports and a 8 channel CWDM (de-)mux built in.                                |
| BTF1-03-16     | 16 SFP ports and a 16 channel CWDM (de-)mux built in.                               |
| BTF1-04        | 32 SFP ports  |
| BTF1-05-08     | 16 SFP ports and 2X 8 channel CWDM (de-)mux built in.                               |
| BTF1-05-16     | 16 SFP ports and 2X 16 channel CWDM (de-)mux built in.                              |
| BTF1-06        | 24 SFP ports, 8 BNC   |
| BTF1-07-08     | 16 SFP ports, 8 BNC and a 8 channel CWDM (de-)mux built in.                         |
| BTF1-07-16     | 16 SFP ports, 8 BNC and a 16 channel CWDM (de-)mux built in.                        |
| BTF1-08-08     | 24 SFP ports and a 8 or channel CWDM (de-)mux built in.                             |
| BTF1-08-16     | 24 SFP ports and a 16 or channel CWDM (de-)mux built in.                            |
| BTF1-10 AESemb | 16 SFP ports, 8 BNC and 8 ch. AES3 digital audio embedding / de-embedding           |
| BTF1-10 AA     | 16 SFP ports, 8 BNC and 8 ch. analog line level audio AD/DA conversion to/from MADI |

All base frames are 1RU-19". Price includes single PSU, CPU and BarnStudio software for configuration and control.

## BarnOne Accessories

| Order Number     | Description   |
|------------------|---|
| BT-PSU-100-240AC | 110-240VAC to 12V, 120W, Redundant PSU for BarnOne / BTF-Mini-16  |
| BT-PSU-36-72DC   | 48VDC to 12V, 100W, Redundant PSU for BarnOne / BTF-Mini-16       |
| BTF1-TRAY-PSU    | Tray for PSU to be mounted on the rear side of BarnOne            |
| BT-EXT-PAIR-5CM  | Extention mounting brackets for BarnOne, 5cm deep. Price per pair |
| BT-FAN-BARNONE   | Fan Cassette for BarnOne  |



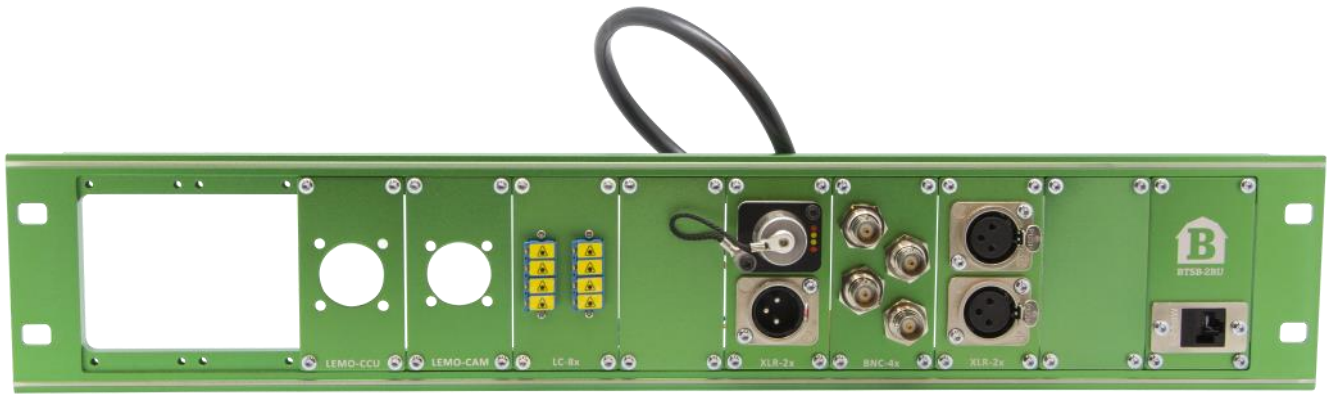




# Stage Box Break-Out



## Module-based break-out panel

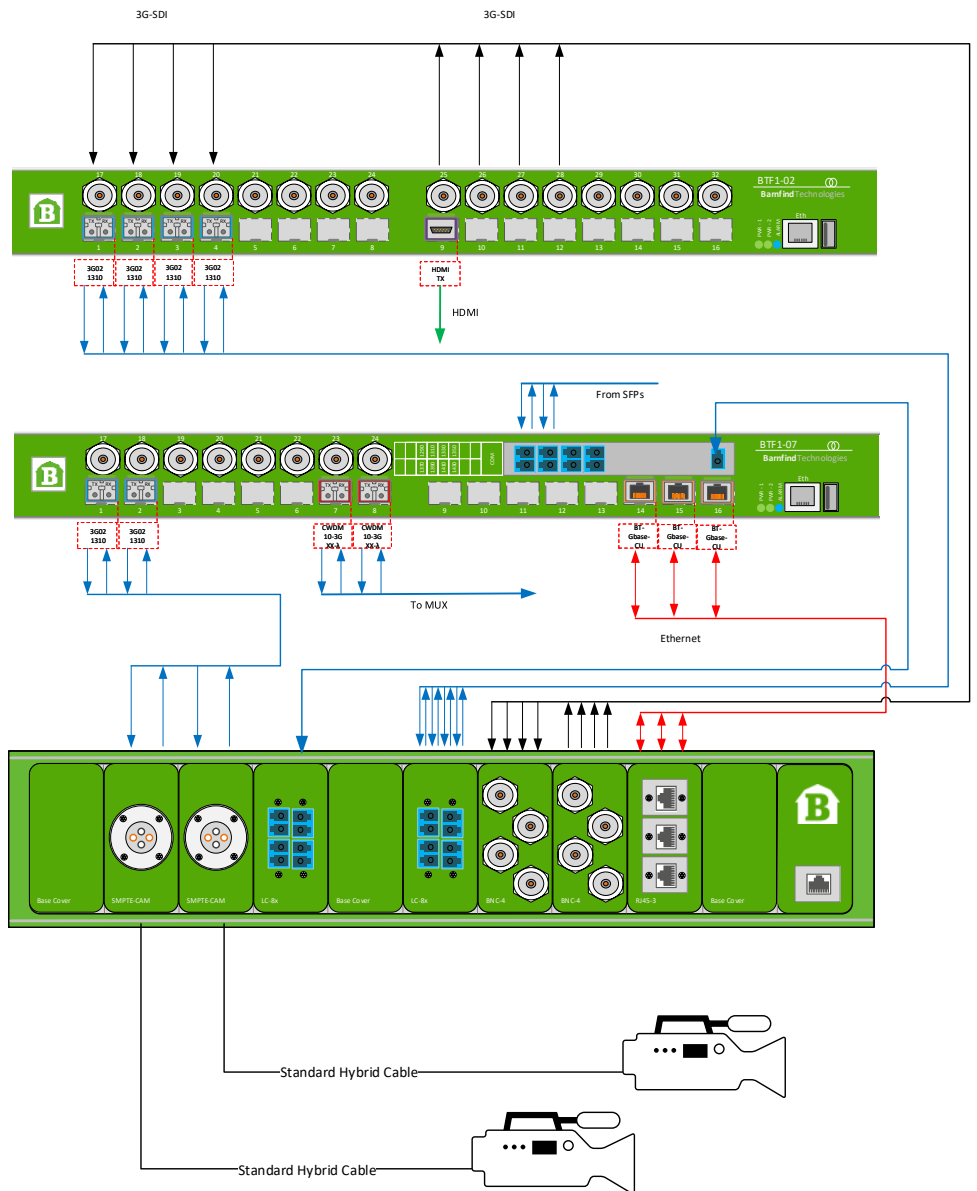


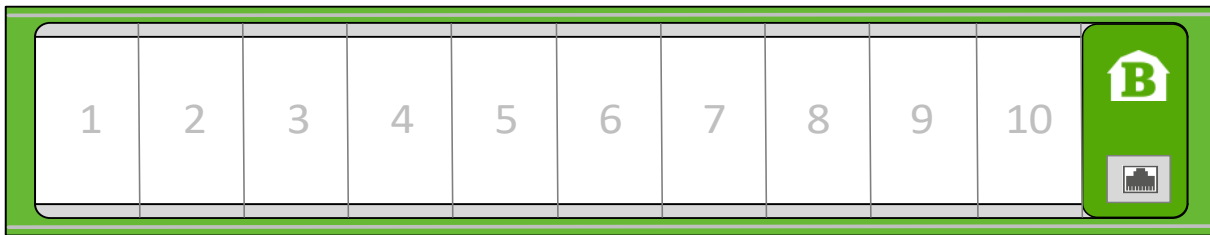
The Barnfind Stagebox break-out panel allows you to customize your own front panel based on the required connectors. The various selection of modules will be the connection points to one or more frames.

All modules are made of solid aluminium, with high performance connectors.

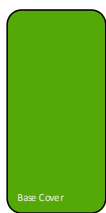
**Note!**

- The BTSB-BASE blind cover can be customized to fit any other connector outside the Barnfind selection.
- Cables between break-out panel and frames are not included.





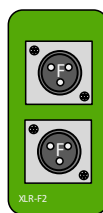
**BTSB-2RU**



**BTSB-BASE**

Blind cover to fill up unused slots in BTSB-2RU.

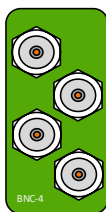
Note, can also be used to customize for a special preferred connector.



**BTSB-XLR-F2x**

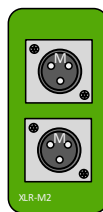
Panel mounted XLR (female) connectors.

Also available without connector, suitable for Neutrik panel mount connectors.



**BTSB-BNC-4x**

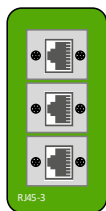
Panel mounted BNC connectors.



**BTSB-XLR-M2x**

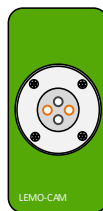
Panel mounted XLR (male) connectors.

Also available without connector, suitable for Neutrik panel mount connectors.



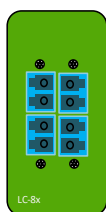
**BTSB-RJ45-3x**

Panel mounted RJ45 connectors.



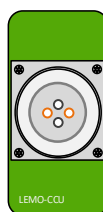
**BTSB-LEMO-CAM**

Panel mounted LEMO FXW.3K SMPTE connector. Used as standard on many hybrid fiber cameras. **CAM connector (not included)\***



**BTSB-LC-8x**

Panel mounted LC connectors. Metal enclosure



**BTSB-LEMO-CCU**

Panel mounted LEMO EDW.3K SMPTE connector. Used as standard on many hybrid fiber cameras. **CCU connector (not included)\*\***



\* LEMO 3K.93C SMPTE PANEL PLG, FXW with LC fibre



\*\* LEMO 3K.93C SMPTE PANEL SKT, EDW with LC fibre

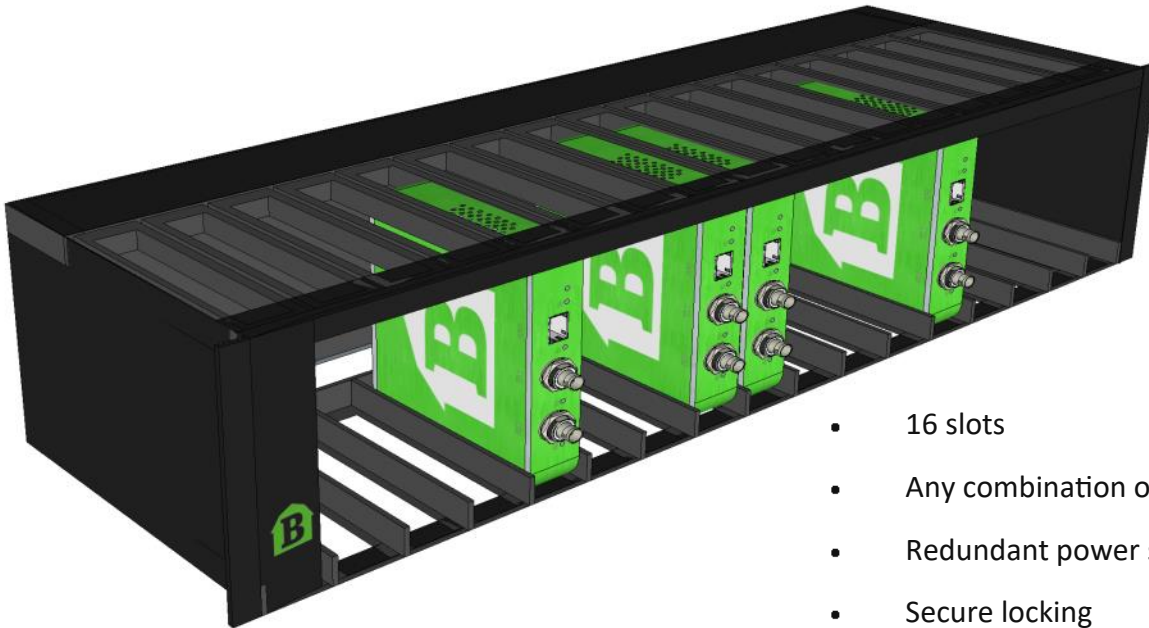




# BarnMini Series



## BTF-Mini-16



- 16 slots
- Any combination of BarnMinis
- Redundant power supply (optional)
- Secure locking



The **BTF-Mini-16** comes with 2 x LEDs in the front to indicate which PSU are connected

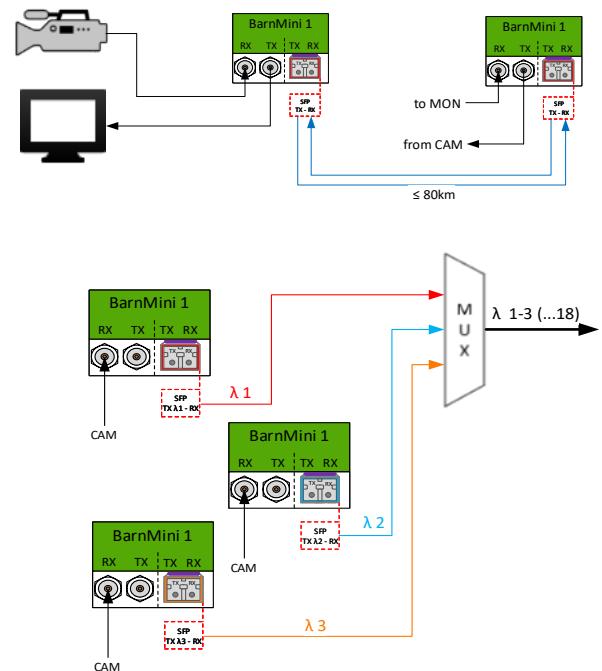
The BarnMini frame, **BTF-Mini-16**, is a housing with space for up to 16 x BarnMini modules of any kind. The BarnMini frame uses the same PSU as the BarnOne family, BTF1-XX. Note that the **BTF-Mini-16** comes with one standard single PSU (redundant PSU is optional mod nr: **BT-PSU-100-240AC**)



The **BarnMinis** are secured and released with thumb screws

## BarnMini-01 - Coaxial to SFP Converter

This is the most popular BarnMini. It gives a unique platform to take in most video electrical signals and convert it to optical. The BarnMini-01 handles also SDTI signals from e.g. EVS. It comes with a second BNC that could be used for monitoring and other redundancy applications. Any optical SFPs can be used and even we can house a HDMI SFP for converting to HDMI or even coming in HDMI and convert back to electrical SDI. All outputs are re-clocked. BarnMini-01, can rightly claim to be the most flexible electrical to optical converter in the market.



### Technical Specifications

#### BNC ports

- 1x BNC port 75Ω TX
- 1x BNC port 75Ω RX
- SMPTE 259M, 292M, 372M, 424M, DVB-ASI, AES10 (MADI), AES3
- Automatic multirate reclocking of outputs 270Mbit/s - 3Gbit/s
- Automatic cable EQ (Belden 1694A) 270Mbit/s - 250m, 1,5Gbit/s - 140m, 3Gbit/s - 80m

#### SFP port

- Port for Small Form-Factor Pluggable (SFP), supports MSA-compliant (multi source agreement) transceivers
- Suitable for optical transceivers (singlemode/multimode), SFP media converters (HDMI, SDI, CVBS etc.)
- SMPTE 259M, 292M, 372M, 424M, 372M, DVB-ASI, AES10 (MADI), AES3
- Hot pluggable/swappable

#### Power Supply

- 12-24V DC power supply included
- redundant power supply available with BTF-Mini-16

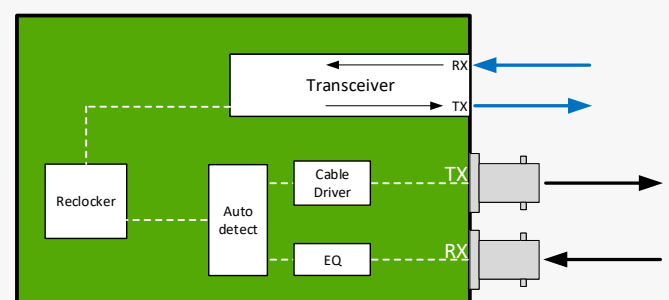
#### Physical Size

- 92mm x 98mm x 22mm
- 200g

#### Model Name

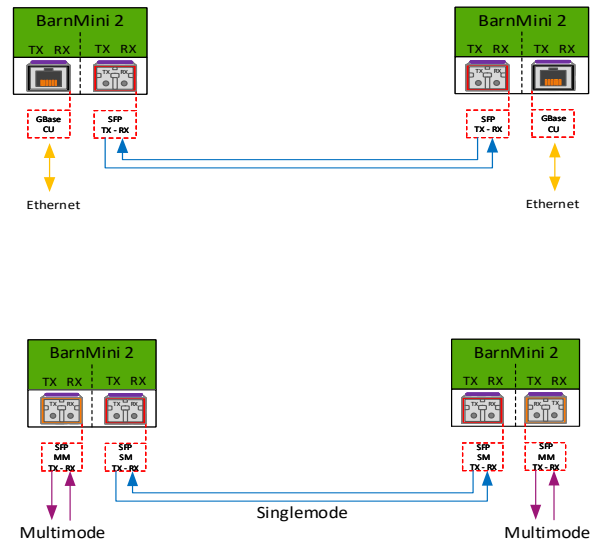
- BM-01

### SFP ↔ BNC



## BarnMini-02 - SFP to SFP Converter

You can use any SFP from Barnfind or any other SFP as long as they are MSA compatible. BarnMini-02 is also popular due to the flexibility it brings. Imagine you need to go from multimode to single mode, taking an Ethernet signal into the fiber, using it as an affordable optical repeater etc. BarnMini-02 is our “Swiss army knife” and the great thing is that you can change your application by changing SFPs. As any of the BarnMini modules the BarnMini-02 can be used as a standalone box or in advanced systems with BarnOne or any 3<sup>rd</sup> party solution.



### Technical Specifications

#### SFP ports

- 2x Port for Small Form-Factor Pluggable (SFP), supports MSA-compliant (multi source agreement) transceivers
- Suitable for optical transceivers (singlemode/multimode), SFP media converters (HDMI, Ethernet, SDI, CVBS etc.)
- SMPTE 259M, 292M, 372M, 424M, 372M, DVB-ASI, AES10 (MADI), AES3, Ethernet, proprietary protocols
- Hot pluggable/swappable

#### Power Supply

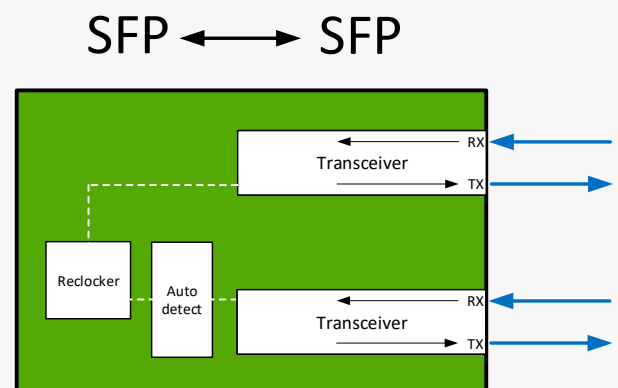
- 12-24V DC power supply included
- redundant power supply available with BTF-Mini-16

#### Physical Size

- 92mm x 98mm x 22mm
- 200g

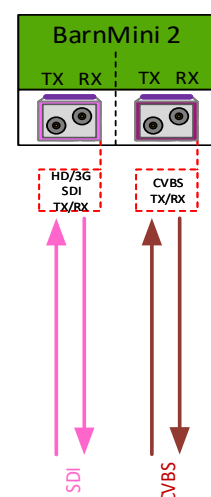
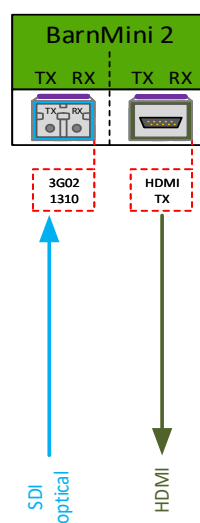
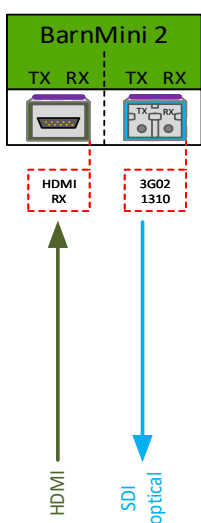
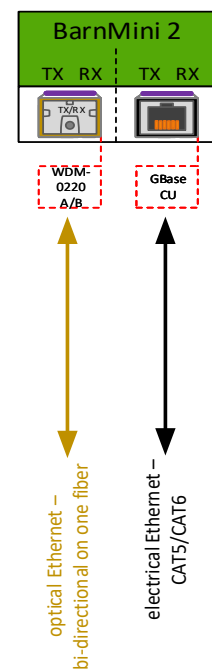
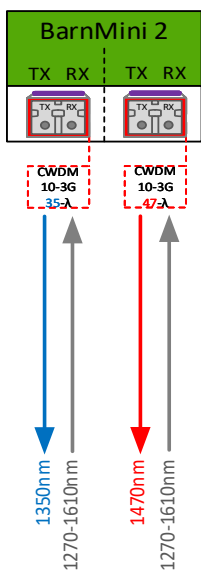
#### Model Name

- BM-02





BarnMini-02 is equipped with 2x SFP cages, the SFP cages are connected TX to RX and RX to TX. The functionality will depend on the kind of SFPs which are inserted. A signal conversion does not take place inside BarnMini-02, it happens inside the SFP. The examples below only show a selection of typical user setups.



## BarnMini-03 / BarnMini-04 - HDMI to SFP Converter

### BarnMini-03

BarnMini-03 takes your HDMI signal to any optical fiber SFPs. This gives you a great flexibility how far and into what part of the value chain you wish to take your HDMI signal. If you have a mux to transport any other signals you can use one of our CWDM SFPs and directly transport it with other signals. The BarnMini-03 is very often used as a standalone unit for your monitor signals.

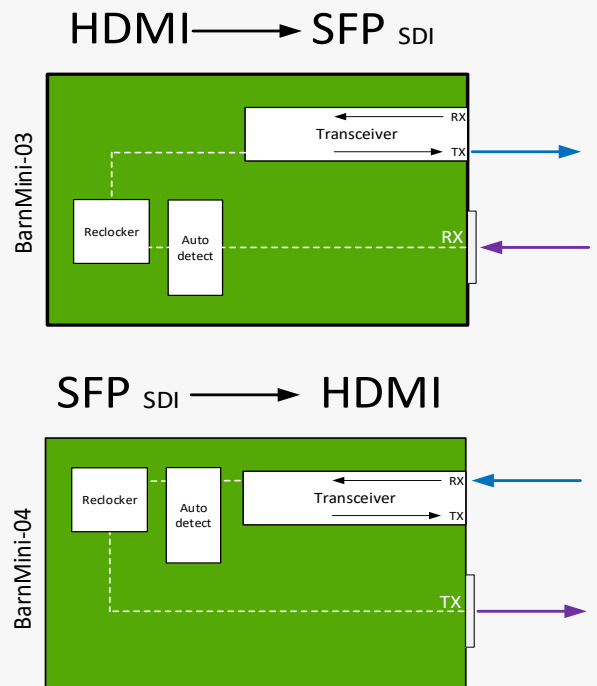
### BarnMini-04

BarnMini-04 takes your optical SDI signal and convert it to a HDMI signal. This gives you a great flexibility in designing different monitoring solutions. The BarnMini-04 is very often used as a standalone unit. As any of our other BarnMini modules, the BarnMini-04 is also operational from 5V to 24V. As any of our other BarnMini modules, the BarnMini-04 brings unparalleled flexibility and it can serve several tasks.



## Technical Specifications

|  |
|--|
| <b>HDMI port</b>   |
| <ul style="list-style-type: none"> <li>• supports HDMI version 1.4</li> </ul>  |
| <b>SFP port</b>  |
| <ul style="list-style-type: none"> <li>• Port for Small Form-Factor Pluggable (SFP), supports MSA-compliant (multi source agreement) transceivers</li> <li>• Suitable for optical transceivers (singlemode/multimode), SFP media converters (SDI, CVBS etc.)</li> <li>• SMPTE 259M, 292M, 372M, 424M</li> <li>• Hot pluggable/swappable</li> </ul> |
| <b>Power Supply</b>  |
| <ul style="list-style-type: none"> <li>• 12-24V DC power supply included</li> <li>• redundant power supply available with BTF-Mini-16</li> </ul>   |
| <b>Physical Size</b>   |
| <ul style="list-style-type: none"> <li>• 92mm x 98mm x 22mm</li> <li>• 200g</li> </ul>   |
| <b>Model Name</b>  |
| <ul style="list-style-type: none"> <li>• BM-03 / BM-04</li> </ul>  |

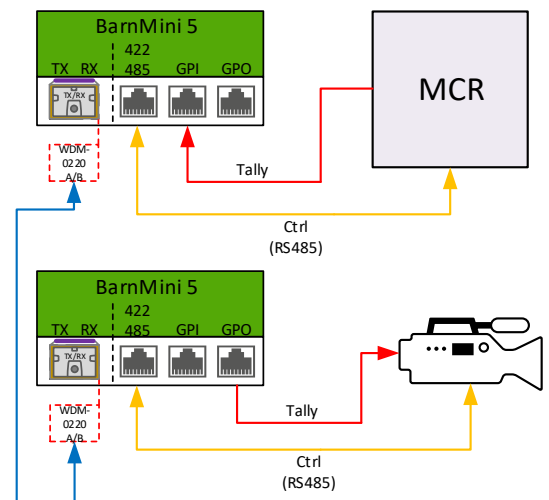


## BarnMini-05 - GPIO and Serial Data (RS422/RS485) to Ethernet Converter

The BarnMini-05 is our most advanced BarnMini module. This is a compact way to combine serial data RS422/RS485, 4 x GPI and 4 x GPO, controllable via an Ethernet/SFP port. The unit can serve as an intelligent bridge between many third-party devices, for example transferring an RS422 signal or tally between two locations, or it can control an external optical changeover switch (BarnMini-06) in a redundancy setup. Triggers are easily set. BarnStudio, Barnfind's control software, can be used to configure and monitor BarnMini-05.

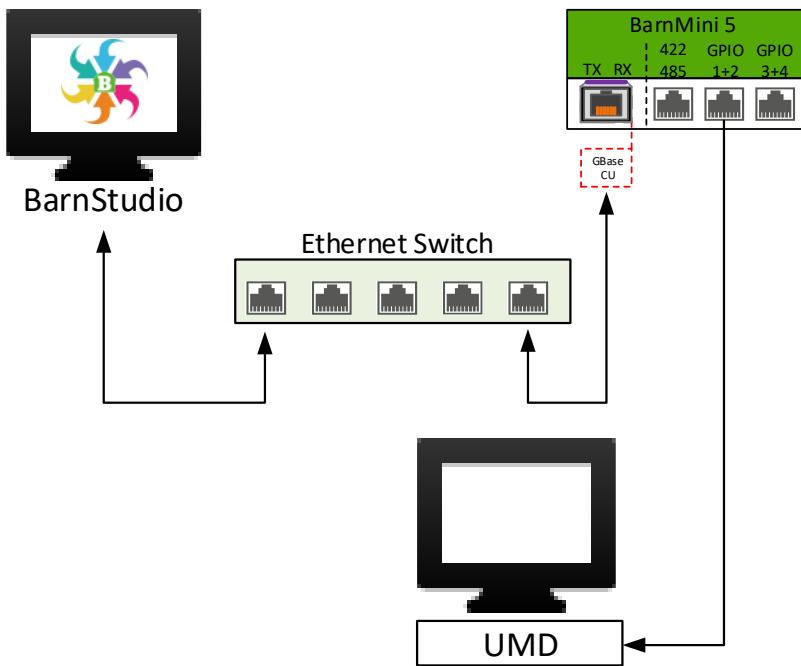


- 4x GPI
- 4x GPO
- RS422/485
- adjustable BAUD rate
- Supports TSL protocol for UMDs and Tally
- SFP port for optical or electrical interface (BTSFP-GBase-CU required for configuration with BarnStudio)



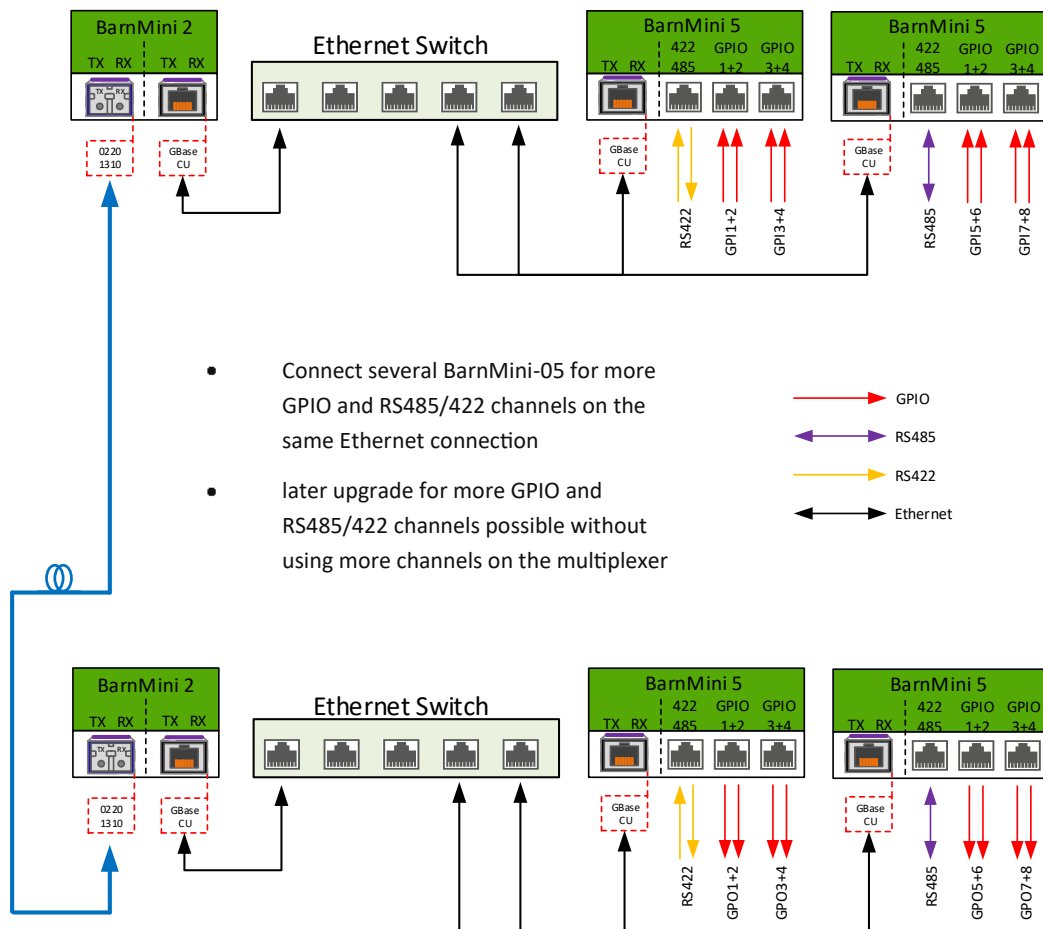
### Technical Specifications

|   |  |
|---|--|
| <b>Serial Data Port</b> <ul style="list-style-type: none"> <li>• RJ45 connector</li> <li>• selectable RS422 or RS485</li> </ul>   | <b>Power Supply</b> <ul style="list-style-type: none"> <li>• 12-24V DC power supply included</li> <li>• redundant power supply available with BTF-Mini-16</li> </ul> |
| <b>GPIO ports</b> <ul style="list-style-type: none"> <li>• 2x RJ45 connector with 2x GPI and 2x GPO per connector</li> <li>• 4x GPI - optocoupled; common floating 5V reference; 240<math>\Omega</math> resistor in series; connect to 0V reference to trigger</li> <li>• 4x GPO - Relays; max. 50V AC/DC; max 100mA</li> </ul> | <b>Physical Size</b> <ul style="list-style-type: none"> <li>• 92mm x 98mm x 22mm</li> <li>• 200g</li> </ul>  |
| <b>SFP port</b> <ul style="list-style-type: none"> <li>• Port for Small Form-Factor Pluggable (SFP), supports MSA-compliant (multi source agreement) transceivers</li> <li>• Suitable for optical transceivers (singlemode/multimode), SFP media converters (Ethernet)</li> <li>• Hot pluggable/swappable</li> </ul>            | <b>Model Name</b> <ul style="list-style-type: none"> <li>• BM-05</li> </ul>  |

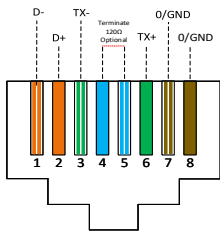


Use BarnStudio (free software) to access all the great functionalities and configurations in BarnMini-05 and frames in BarnOne family.

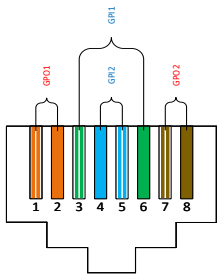
A complete and free version of BarnStudio can be downloaded from: <https://www.barnfind.no/downloads/>



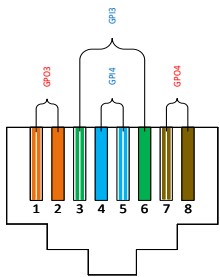
- Connect several BarnMini-05 for more GPIO and RS485/422 channels on the same Ethernet connection
- later upgrade for more GPIO and RS485/422 channels possible without using more channels on the multiplexer



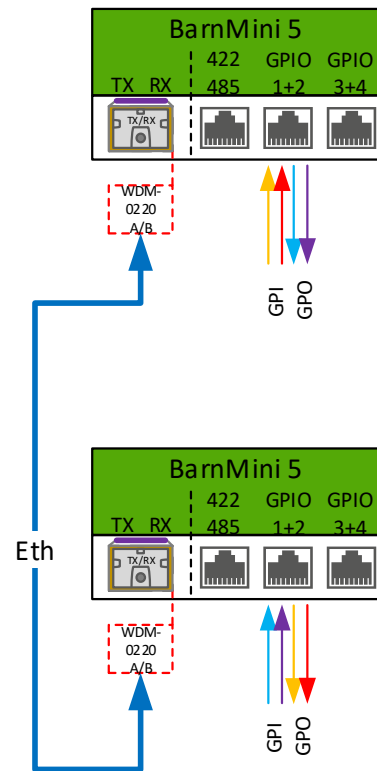
RS422/485 pinout (RJ45)



GPIO 1+2 pinout (RJ45)



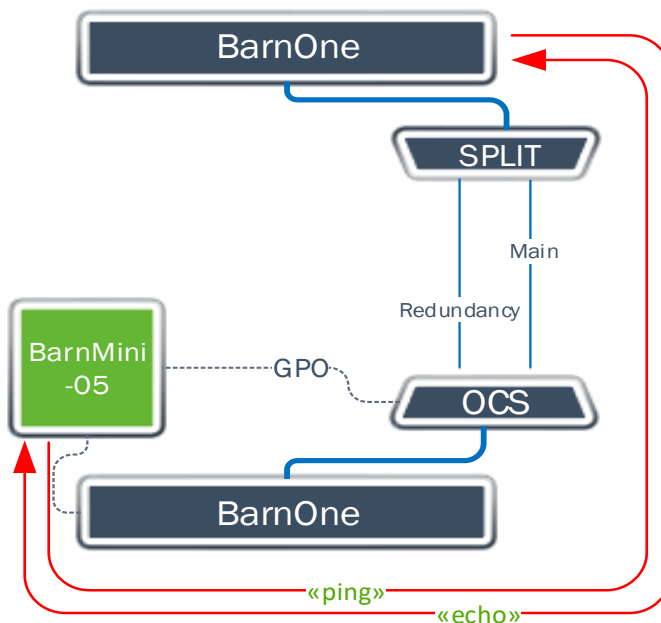
GPIO 3+4 pinout (RJ45)



### Automatic redundancy switching

BarnMini-05 can be configured to generate ping requests to a selected remote peer, e.g a computer, another BarnMini 05 or a BarnOne frame, and will expect an echo to validate the connection between them. If the requested echo is missing, the BarnMini-05 will activate one or more GPO connection.

In practical use, this can be used to toggle between main and redundant fiber lines.

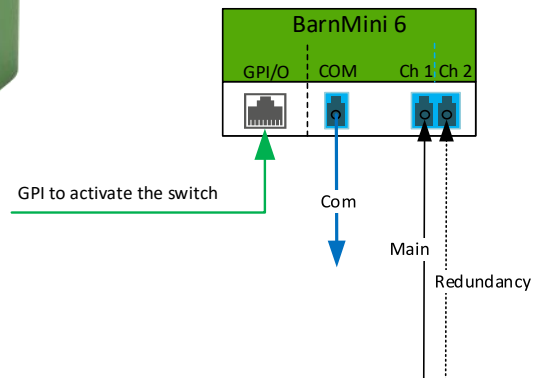


## BarnMini-06 - Optical Change-Over

The BarnMini-06 is the optical changeover switch, which is very easy to integrate with the GPO devices that are found in many broadcast applications. A great advantage is the ability to provide its own power needed to drive the switch either as a stand alone or in the BarnMini frame with common PSU. The BarnMini-06 is often used in conjunction with the BarnMini-05. This is a great combination to create advanced signal redundancy solutions.

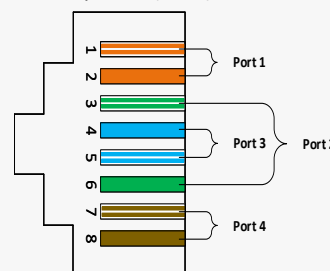


*\*example*



### Technical Specifications

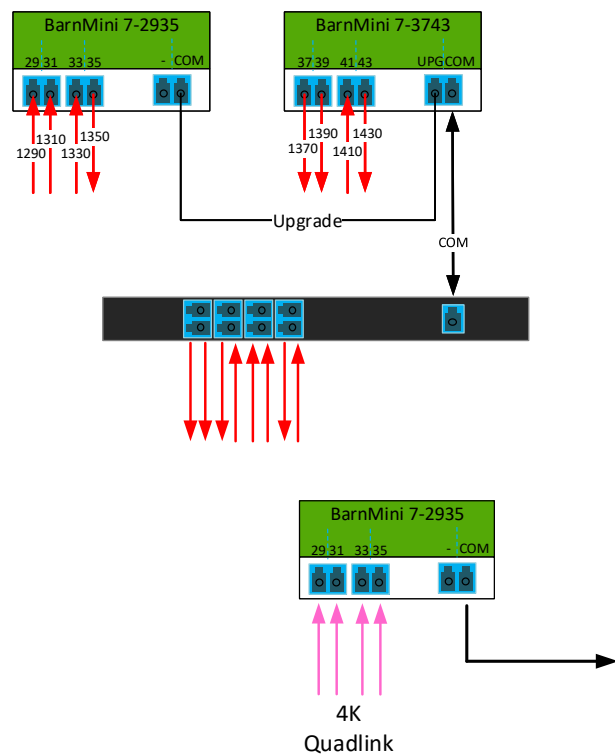
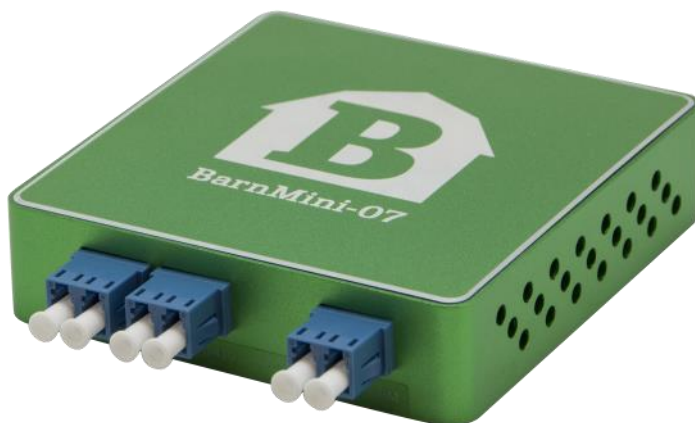
|   |  |
|---|--|
| <b>Optical Ports</b> <ul style="list-style-type: none"> <li>• LC/PC connectors</li> <li>• Operating Wavelength 850-1620nm</li> <li>• Fiber type Single Mode</li> <li>• Insertion Loss &lt;1,2dB</li> <li>• Wavelength dependant loss &lt;0,3dB</li> <li>• Polarisation dependant loss 0,05dB</li> <li>• Crosstalk &gt;35dB</li> <li>• Return loss &gt;35dB</li> </ul> | <b>GPI port</b> <ul style="list-style-type: none"> <li>• RJ45 connector with 4x GPI wired parallel, non latching</li> </ul>  |
| <b>Optical Switch</b> <ul style="list-style-type: none"> <li>• Switching time &lt;10ms (typically 4ms)</li> <li>• Max. switching cycles 10.000</li> </ul>   | <b>Power Supply</b> <ul style="list-style-type: none"> <li>• 12-24V DC power supply included</li> <li>• redundant power supply available with BTF-Mini-16</li> </ul> |
|   | <b>Physical Size</b> <ul style="list-style-type: none"> <li>• 92mm x 98mm x 22mm</li> <li>• 200g</li> </ul>  |
|   | <b>Model Name</b> <ul style="list-style-type: none"> <li>• BM-06</li> </ul>  |



a contact closure on any of the GPI ports will trigger the switch

## BarnMini-07 - Optical Multiplexer

The BarnMini-07 is a 4-channel CWDM mux that can be used e.g. for transportation of 3G-quad over different mediums. This is a compact, efficient and affordable mux. It fits into the BarnMini BTF-Mini-16 frame. The BarnMini-07 saves you both rack space and money. For growing up to 8 channels, we can offer optional upgrade.



### Technical Specifications

#### Optical Ports

- LC/PC connectors
- Center Wavelength BM-07 2935 1290, 1310, 1330, 1350nm
- Center Wavelength BM-07 3743 1370, 1390, 1410, 1430nm
- Channel clear passband +/- 6,5nm
- Insertion Loss <1,2dB
- Passband ripple <0,5 dB
- Adjacent Channel Isolation >30dB
- Non-Adjacent Channel Isolation >45dB
- Polarisation dependant loss 0,02dB
- Directivity >50dB
- Return loss >45dB
- Polarisation Mode Dispersion <0,2ps

#### Physical Size

- 92mm x 98mm x 22mm
- 200g

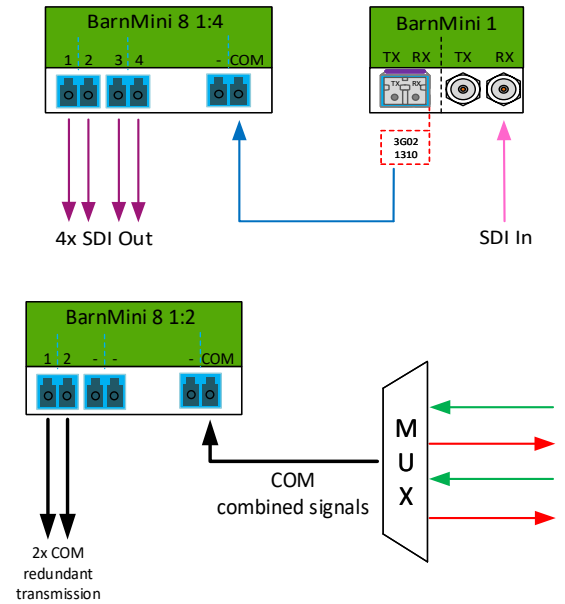
#### Model Name

- BM-07 2935 / BM-07 3743

| BarnMini-07 |          |          |
|-------------|----------|----------|
|             | mod 2935 | mod 3943 |
| Wavelength  | 1290     |          |
|             | 1310     |          |
|             | 1330     |          |
|             | 1350     |          |
|             | Upgrade  | 1370     |
|             | 1390     |          |
|             | 1410     |          |
|             | 1430     |          |

## BarnMini-08 - Optical Splitter

This BarnMini unit comes in two optical splitter versions; either as BarnMini-08-1:2 or BarnMini-08-1:4. It is a great supplement in smaller BarnMini systems, but can also be used in more advanced BarnOne configurations. As with any of our other BarnMini modules; the BarnMini-08 has rock solid mechanics and technology and it can work in harsh environments.



### Technical Specifications

#### Optical Ports

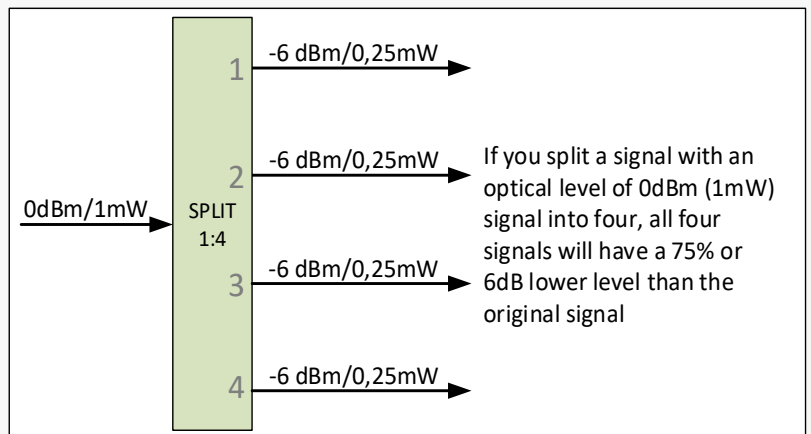
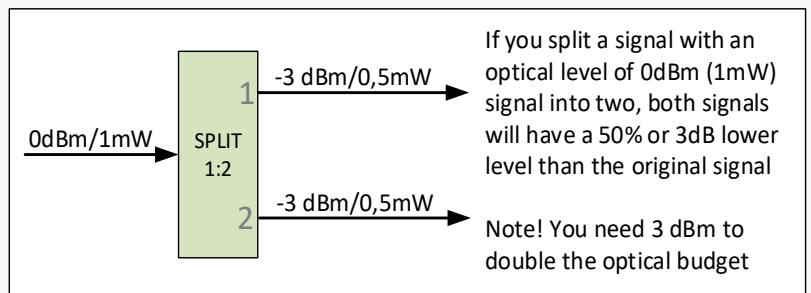
- LC/PC connectors
- Insertion Loss <1,2dB + 3 or 6, see figures
- Adjacent Channel Isolation >35dB
- Non-Adjacent Channel Isolation >45dB
- Polarisation dependant loss <0,10dB

#### Physical Size

- 92mm x 98mm x 22mm
- 200g

#### Model Name

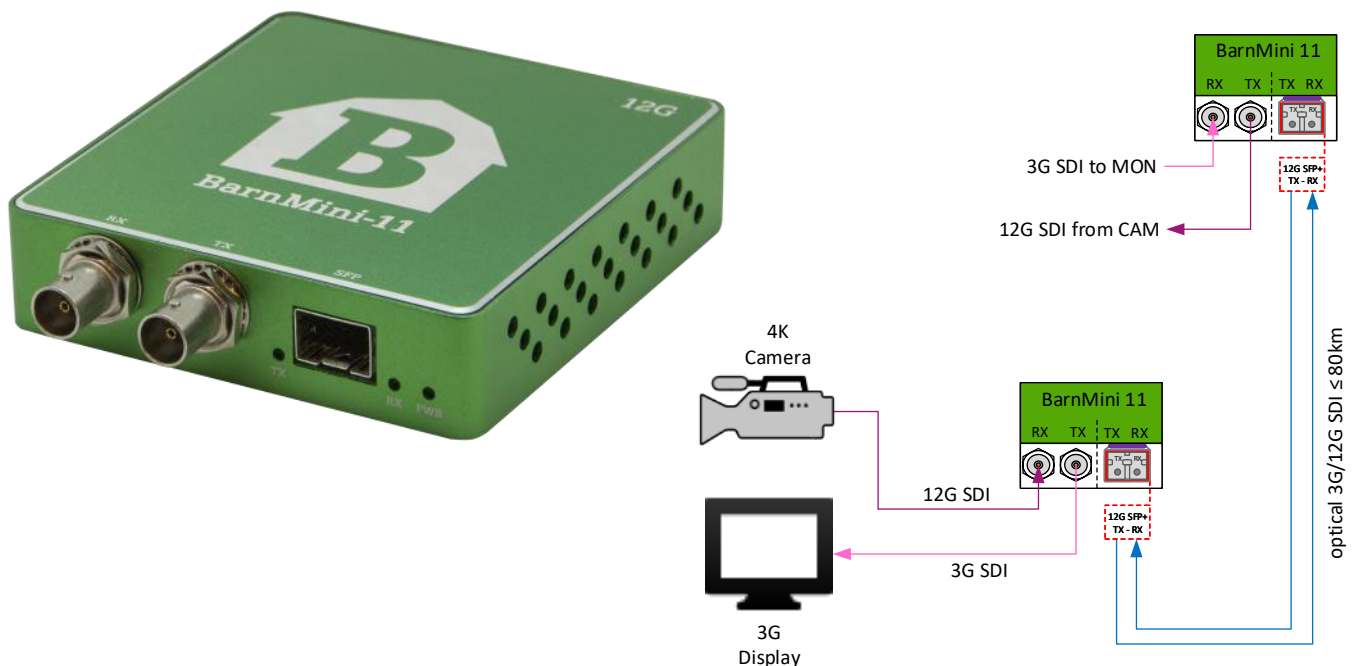
- BM-08 1:2 / BM-08 1:4





## BarnMini-11 - Coaxial to SFP/SFP+ Converter 12G

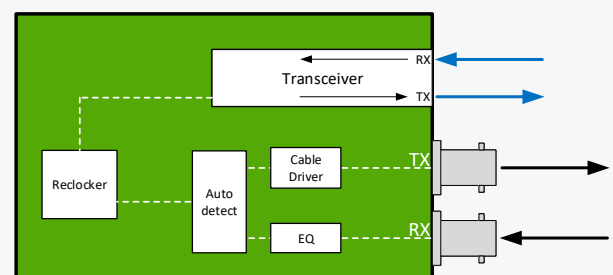
The BarnMini-11 is the big brother to the popular BarnMini-01 solution that delivers simple and reliable point-to-point digital extension. BarnMini-11 offers support for up to 12Gbit/s bandwidth. It can handle 12G, 10G, 6G and any other video/data format with a lower data rate than 12Gbit/s. BarnMini-11 is equipped with a re-clocker. And as any other BarnMini module it is flexible and with comprehensive video specifications.



### Technical Specifications

|   |   |
|---|---|
| <b>BNC ports</b> <ul style="list-style-type: none"> <li>• 1x BNC port 75Ω TX</li> <li>• 1x BNC port 75Ω RX</li> <li>• SMPTE 259M, 292M, 372M, 424M, ST-2081, ST-2082, DVB-ASI, AES10 (MADI), AES3</li> <li>• Automatic multirate reclocking of outputs 270Mbit/s - 12Gbit/s</li> <li>• Automatic cable EQ (Belden 1694A) 270Mbit/s - 250m, 1,5Gbit/s - 140m, 3Gbit/s - 80m, 12Gbit/s - 60m</li> </ul>                 | <b>Power Supply</b> <ul style="list-style-type: none"> <li>• 12-24V DC power supply included</li> <li>• redundant power supply available with BTF-Mini-16</li> </ul>                    |
| <b>SFP/SFP+ port</b> <ul style="list-style-type: none"> <li>• Port for Small Form-Factor Pluggable Plus (SFP+) and SFP, supports MSA-compliant (multi source agreement) transceivers</li> <li>• Suitable for optical transceivers (singlemode/multimode), SFP media converters (HDMI, SMPTE 259M, 292M, 372M, 424M, 372M, ST-2081, ST-2082, DVB-ASI, AES10 (MADI), AES3</li> <li>• Hot pluggable/swappable</li> </ul> | <b>Physical Size</b> <ul style="list-style-type: none"> <li>• 92mm x 98mm x 22mm</li> <li>• 200g</li> </ul> <b>Model Name</b> <ul style="list-style-type: none"> <li>• BM-11</li> </ul> |

### SFP+ ↔ BNC



## BarnMini-12 - SFP+ to SFP+ Converter 12G

BarnMini-12 supports data rates up to 12Gbit/s. It can handle 12G, 10G, 6G and any other video format with a lower data rate than 12Gbit/s. It is equipped with a re-clocker. As any BarnMini module it is available as a standalone unit with a separate PSU or mounted into the BarnMini BTF-Mini-16 frame that houses any combination of 16 x BarnMini modules with a common PSU.



### Technical Specifications

#### SFP/SFP+ ports

- 2x Port for Small Form-Factor Pluggable Plus (SFP+) and SFP, supports MSA-compliant (multi source agreement) transceivers
- Suitable for optical transceivers (singlemode/multimode), SFP/SFP+ media converters (HDMI, Ethernet, SDI, CVBS etc.)
- SMPTE 259M, 292M, 372M, 424M, 372M, ST-2081, ST-2082, DVB-ASI, AES10 (MADI), AES3, Ethernet, proprietary protocols
- Hot pluggable/swappable

#### Power Supply

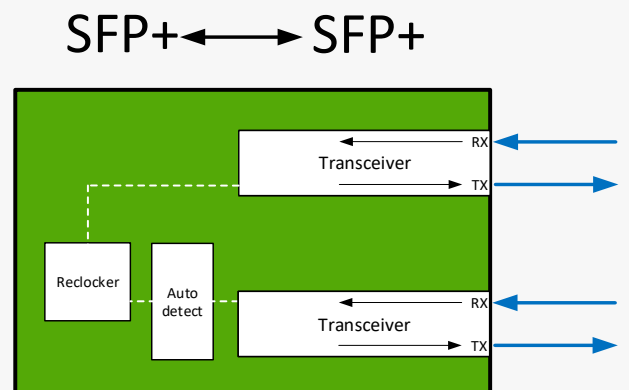
- 12-24V DC power supply included
- redundant power supply available with BTF-Mini-16

#### Physical Size



- 92mm x 98mm x 22mm
- 200g

#### Model Name

- BM-12



## BarnMini

| Order Number     | Description  |
|------------------|--|
| BarnMini-01      | BNC TX/RX, SFP port for transceiver (TX/RX), incl. PSU.  |
| BarnMini-02      | 2xSFP port for transceiver (TX/RX), incl. PSU.   |
| BarnMini-03      | HDMI-SFP, HDMI RX, SFP port for transmitter (TX), incl. PSU.   |
| BarnMini-04      | SFP-HDMI, HDMI TX, SFP port for receiver (RX), incl. PSU.  |
| BarnMini-05      | 4x GPI and 4x GPO through ethernet / fiber, incl. PSU.   |
| BarnMini-06      | Optical Change Over (OCS) GPI controlled   |
| BarnMini-07-2935 | Passive 4 channel CWDM Mux/Demux in BarnMini Housing (1290-1350nm)   |
| BarnMini-07-3743 | Passive 4 channel CWDM Mux/Demux in BarnMini Housing (1370-1430nm)+Upgrade Port for BarnMini-07-2935   |
| BarnMini-08-1:2  | Passive distribution of optical signals 1:2 out  |
| BarnMini-08-1:4  | Passive distribution of optical signals 1:4 out  |
| BarnMini-11      |  BNC TX/RX, SFP+ port for transceiver (TX/RX), incl. PSU. 12G |
| BarnMini-12      |  2xSFP+ port for transceiver (TX/RX), incl. PSU. 12G          |
| BTF-Mini-16      | 2.5RU frame for housing of up to 16 BarnMinis, incl. PSU.  |

## BarnMini Accessories

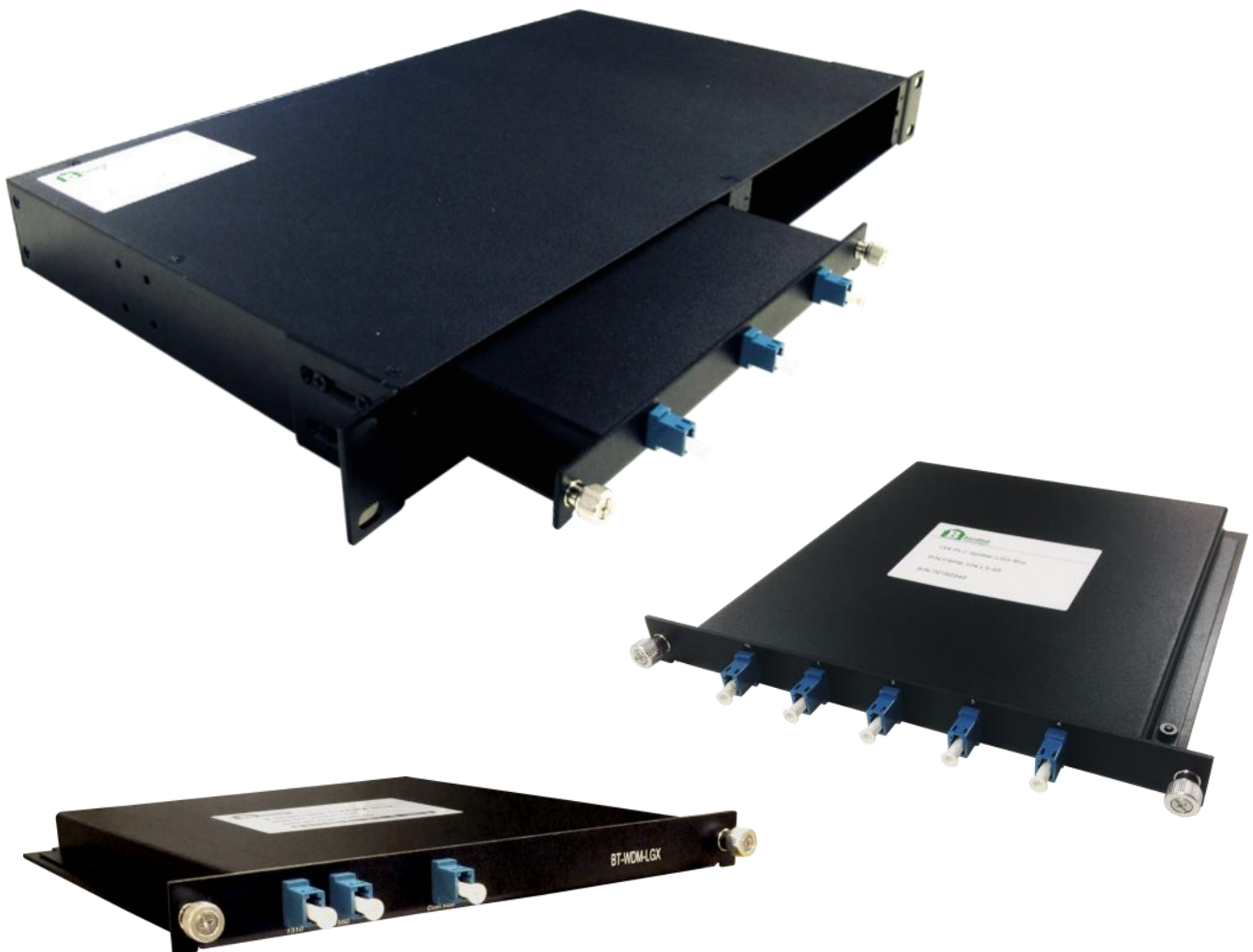
| Order Number     | Description  |
|------------------|--|
| BT-Mini-PSU      | Spare PSU for BarnMini series (stand-alone)                      |
| BT-PSU-100-240AC | 110~240VAC to 12V, 120W, Redundant PSU for BarnOne / BTF-Mini-16 |
| BT-PSU-36-72DC   | 48VDC to 12V, 100W, Redundant PSU for BarnOne / BTF-Mini-16      |





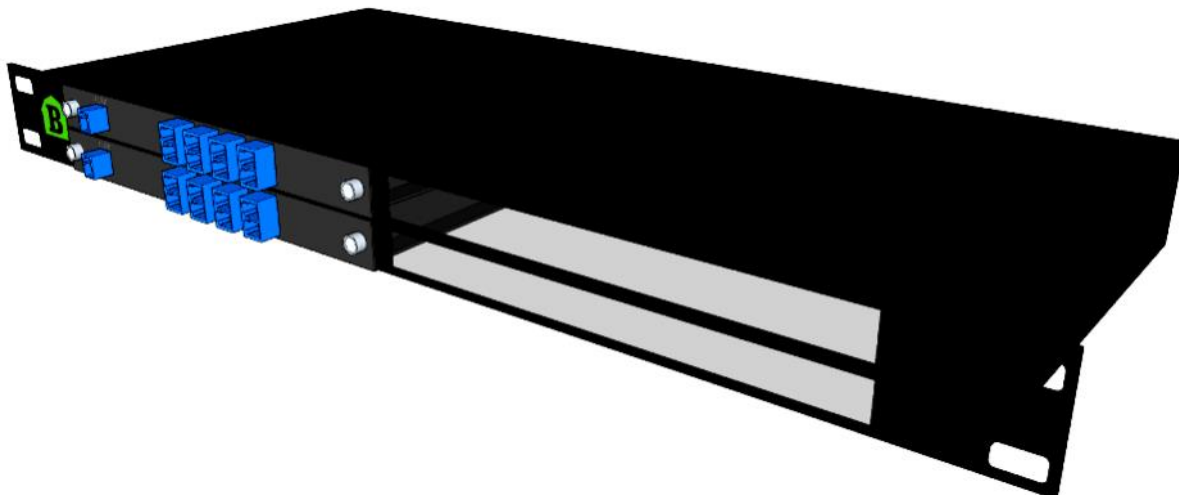
# LGX Series

Passive Optical Products



## BT-HOUS-LGX-1RU

BT-HOUS-LGX-1RU is a 1 rack unit housing for passive optical products. It can accommodate up to 4 pcs of modules, eg. CWDM multiplexers, splitters and optical changeover switches. Each module is secured with a thumbscrew for easy and quick replacement.



## BT-OCS-2-LGX - Optical Change-Over Switch

BT-OCS-2-LGX is a passive change over unit, which is triggered by an externally provided 5V signal. In combination with optical splitters it provides a redundant optical transmission of any optical signal, combined or single wavelengths.



BT-OCS-2-LGX



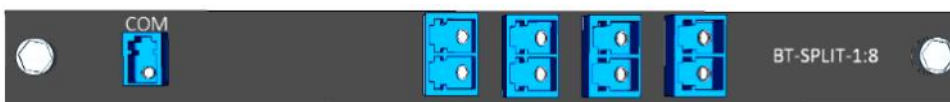
## BT-SPLIT-X:X-LGX - Optical Splitter (Passive Distribution)



BT-SPLIT-1:2-LGX



BT-SPLIT-1:4-LGX



BT-SPLIT-1:8-LGX

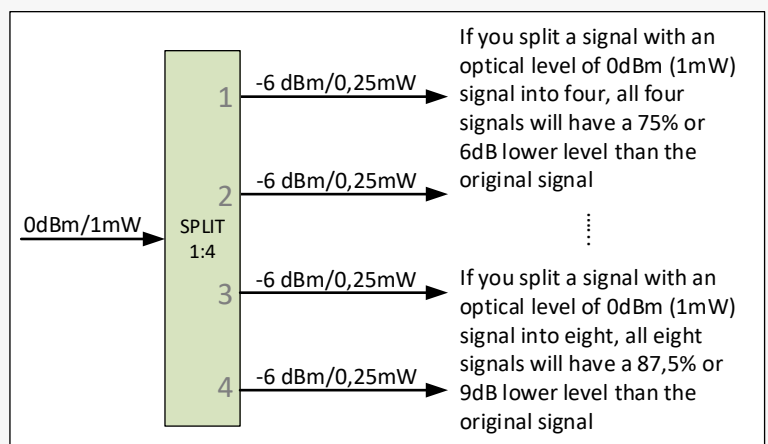
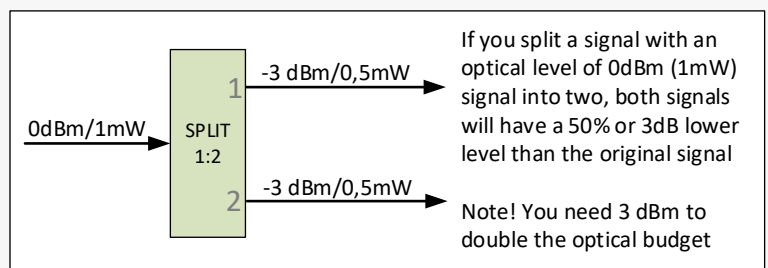
## Technical Specifications

### Optical Ports

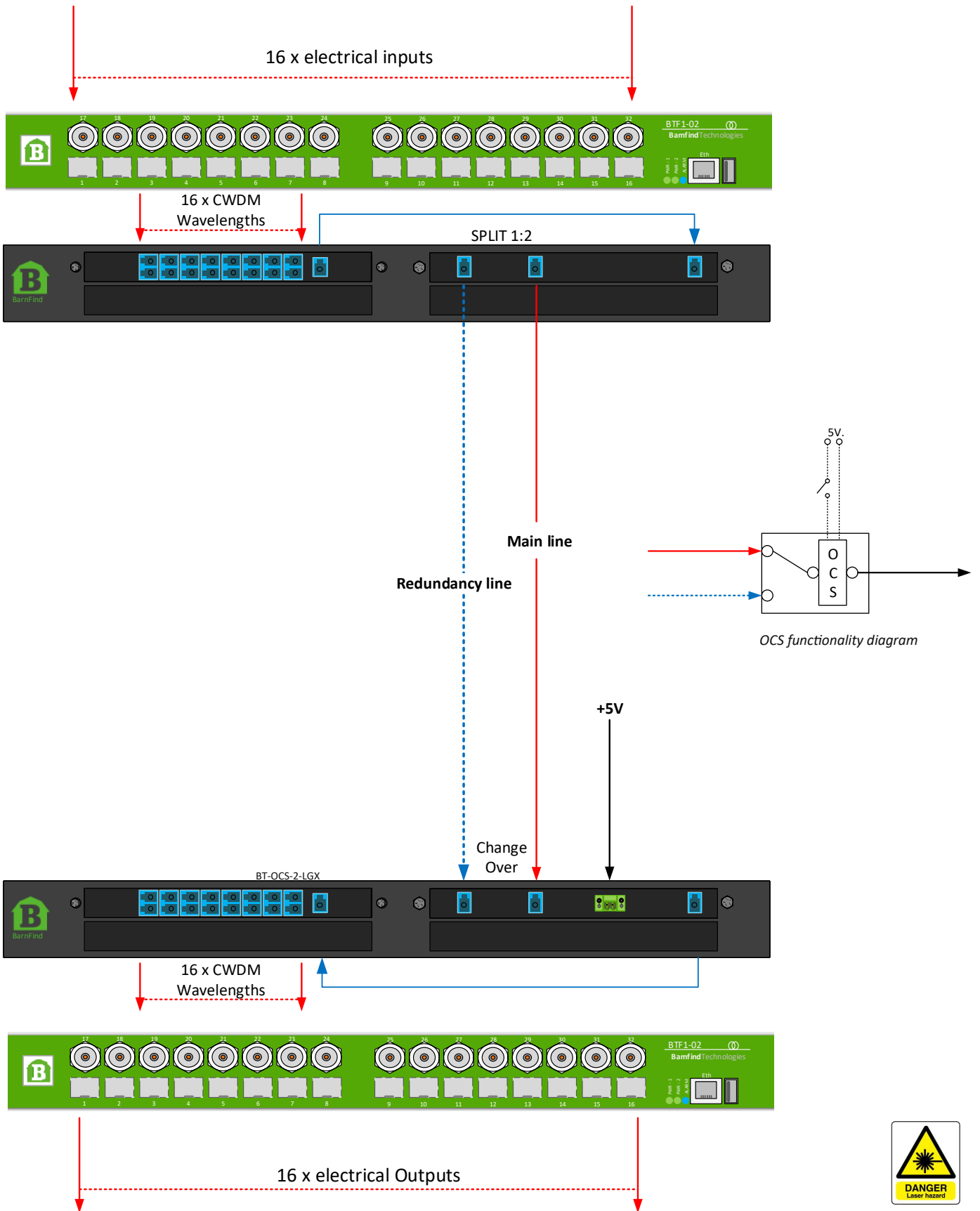
- LC/PC connectors
- Insertion Loss <math><1,2\text{dB} + 3, 6 \text{ or } 9\text{ see figures}</math>
- Adjacent Channel Isolation >35dB
- Non-Adjacent Channel Isolation >45dB
- Polarisation dependant loss <math><0.10\text{dB}</math>

### Model Name

- BT-SPLIT-1:2-LGX / BT-SPLIT-1:4-LGX / BT-SPLIT-1:8-LGX

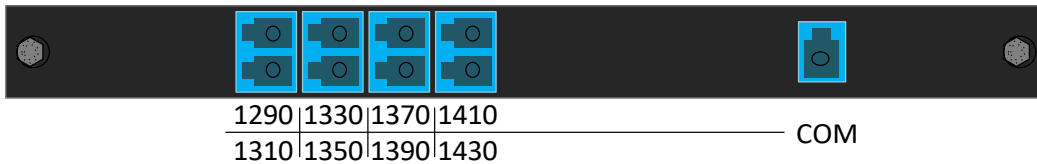


# System Example - Optical Split and Change-Over

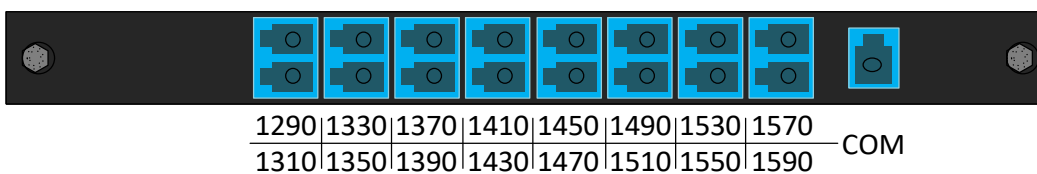




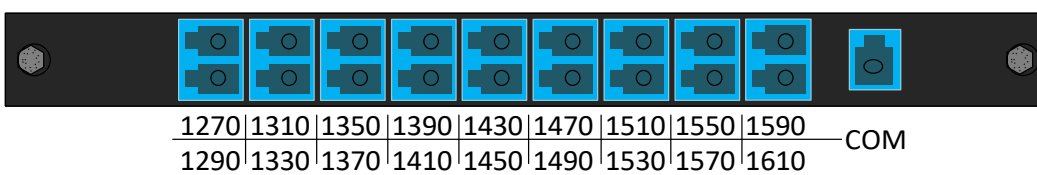
# CWDM - (De)Multiplexer



BT-CWDM-MUX-08-LGX



BT-CWDM-MUX-16-LGX



BT-CWDM-MUX-18-LGX

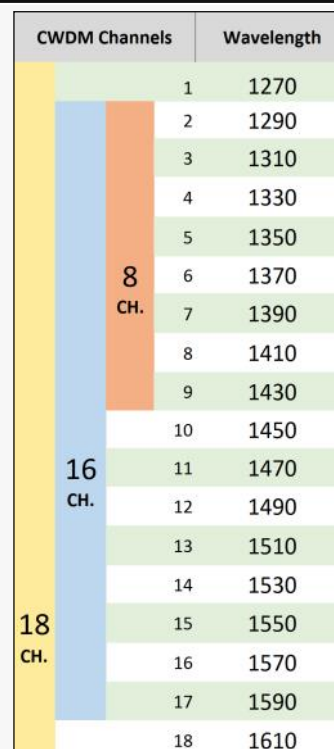
## Technical Specifications

### Optical Ports

- LC/PC connectors
- Center Wavelengths according to ITU-T G.694.2
- Channel center wavelengths 1270 - 1610nm
- Channel clear passband +/- 7nm
- Insertion Loss 8-ch: -2.0dB; 16-/18-ch: -3.2dB (max.)
- Passband ripple <0,5 dB
- Adjacent Channel Isolation >30dB
- Non-Adjacent Channel Isolation >45dB
- Polarisation dependant loss <0,1dB
- Directivity >45dB
- Return loss >45dB
- Polarisation Mode Dispersion <0,2ps

### Model Name

- BT-CWDM-MUX-08-LGX / BT-CWDM-MUX-16-LGX / BT-CWDM-MUX-18-LGX



| <b>Housing for LGX-Modules</b> |  |
|--------------------------------|--|
| <b>Order Number</b>            | <b>Description</b>   |
| BT-HOUS-LGX-1RU                | Barnfind standard empty chassis for up to 4 LGX Boxes in 1RU |

| <b>CWDM (De-)Multiplexer</b> |  | <b>Fit into BT-HOUS-LGX-1RU</b> |
|------------------------------|--|---------------------------------|
| <b>Order Number</b>          | <b>Description</b>                               |                                 |
| BT-WDM-LGX                   | 2 channels (1310/1550nm) in LGX box stand-alone  |                                 |
| BT-CWDM-MUX-08-LGX           | 8 channels (1290-1430nm) in LGX box stand-alone  |                                 |
| BT-CWDM-MUX16-LGX            | 16 channels (1290-1590nm) in LGX box stand-alone |                                 |
| BT-CWDM-MUX-18-LGX           | 18 channels (1270-1610nm) in LGX box stand-alone |                                 |

| <b>Optical Splitter</b> |  | <b>Fit into BT-HOUS-LGX-1RU</b> |
|-------------------------|--|---------------------------------|
| <b>Order Number</b>     | <b>Description</b>                                   |                                 |
| BT-SPLIT-2-LGX          | Passive distribution of optical signals 1 In : 2 Out |                                 |
| BT-SPLIT-4-LGX          | Passive distribution of optical signals 1 In : 4 Out |                                 |
| BT-SPLIT-8-LGX          | Passive distribution of optical signals 1 In : 8 Out |                                 |

| <b>Optical Change-Over Switch</b> |                                       | <b>Fit into BT-HOUS-LGX-1RU</b> |
|-----------------------------------|---------------------------------------|---------------------------------|
| <b>Order Number</b>               | <b>Description</b>                    |                                 |
| BT-OCS-2-LGX                      | Optical Change-Over 2:1; non-latching |                                 |

| <b>Optical Accessories</b> |  |
|----------------------------|--|
| <b>Order Number</b>        | <b>Description</b>                             |
| BT-ATT-LC-SM-05            | Single-Mode-Attenuator for LC connectors, 5dBm |
| BT-ATT-LC-MM-05            | Multi-Mode-Attenuator for LC connectors, 5dBm  |
| BT-PA-LC/LC-SM-SX-0.5M     | Fiber patch cable LC-LC, Single Mode, Simplex  |
| FAULT LOCATOR 8-10km       | Visual fault locator optical tester, 10mW      |
| BT-POWER METER             | Portable optical power meter                   |
| BarnClean                  | Fiber-Optical Connector-Cleaner                |
| BarnClean Refill           | Refill-Cassette for BarnClean                  |



# SFPs



## SFP [Small Form-factor Pluggable]

is a compact, hot-pluggable transceiver used for both telecommunication and data communications applications. The form factor and electrical interface are specified by a multi-source agreement (MSA). It interfaces a network device motherboard (for a switch, router, media converter or similar device) to a fiber optic or copper networking cable. It is a popular industry format jointly developed and supported by many network component vendors. SFP transceivers are designed to support SONET, Gigabit Ethernet, Fibre Channel, and other communications standards.

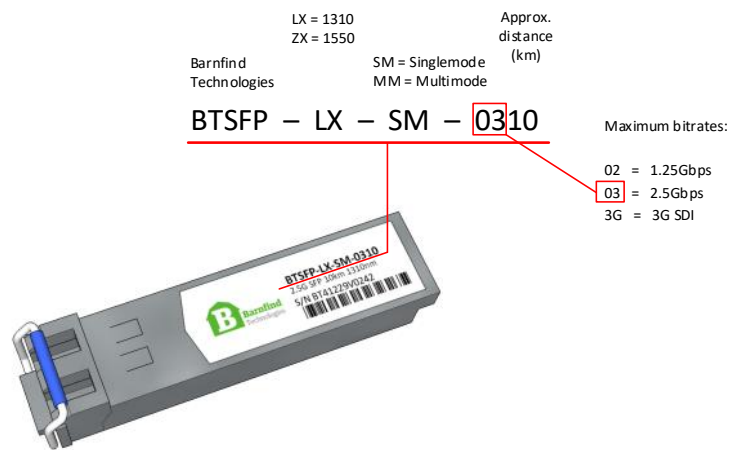
Source, Wikipedia

### How to read Barnfind's SFPs

#### Standard SFPs

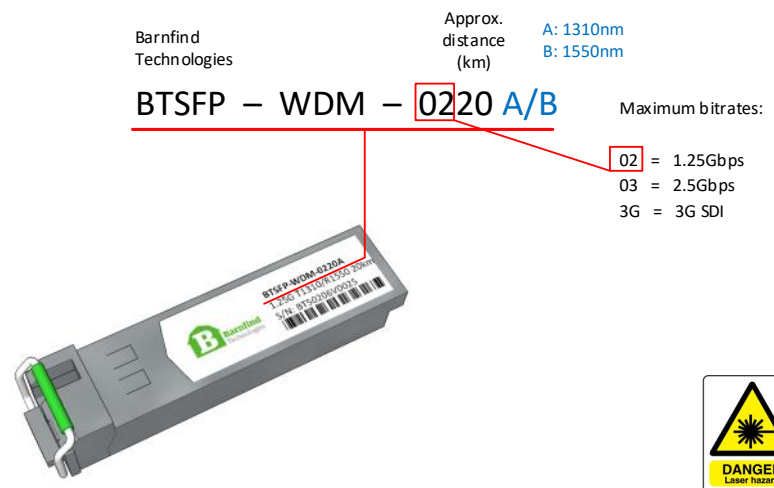
A transceiver SFP is normally used point to point over short, medium and long distances. The most significant information is; the maximum distance and the maximum data rate.

*Note! The RX (receiver) can read all wavelengths, even CWDM wavelengths. See application 'Color converting'*



#### BIDI SFPs


BIDI SFPs has a WDM multiplexer integrated to transmit and receive on the same port. Normally used for a point to point transmission with only one (1) single fiber.



## CWDM SFPs

To be able to multiplex a number of signals in one optical fiber, each CWDM channel must have an unique wavelength (frequency). The label of a Barnfind SFP describes the approximate distance, maximum data rate and wavelength. *Due to a limitation of characters, the wavelength is shorten down to the two middle digits.*

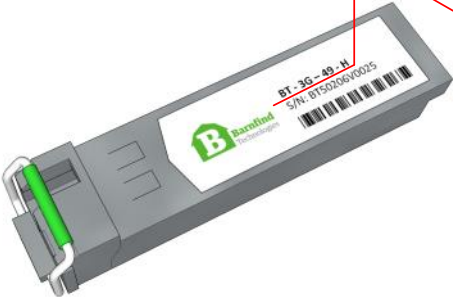
| Barnfind Technologies | Approx. distance (km) | Max. bitrate | Wavelength (nm) |
|-----------------------|-----------------------|--------------|-----------------|
| BT - CWDM - 10 - 3G31 | 10                    | 3G31         | 1270            |
|                       |                       |              | 1290            |
|                       |                       |              | 1310            |
|                       |                       |              | 1330            |
|                       |                       |              | 1350            |
|                       |                       |              | 1370            |
|                       |                       |              | 1390            |
|                       |                       |              | 1410            |
|                       |                       |              | 1430            |
|                       |                       |              | 1450            |
|                       |                       |              | 1470            |
|                       |                       |              | 1490            |
|                       |                       |              | 1510            |
|                       |                       |              | 1530            |
|                       |                       |              | 1550            |
|                       |                       |              | 1570            |
| 1590                  |                       |              |                 |
| 1610                  |                       |              |                 |



## HiLo SFPs

The HiLo SFPs are BIDI SFPs with CWDM transmitter. The SFPs are using a narrow channel spacing, and allows you to transmit 2 channels into 1 standard CWDM wavelength. Can be used with a standard CWDM optical multiplexer. They are labeled with **H** (high) or **L** (low) and work as pair in the link.

| Barnfind Technologies | Max. bitrate | H: High<br>L: Low | Wavelength (nm) |
|-----------------------|--------------|-------------------|-----------------|
| BT - 3G - 49 - H      | 3G           | 49 - H            | 1270            |
|                       |              |                   | 1290            |
|                       |              |                   | 1310            |
|                       |              |                   | 1330            |
|                       |              |                   | 1350            |
|                       |              |                   | 1370            |
|                       |              |                   | 1390            |
|                       |              |                   | 1410            |
|                       |              |                   | 1430            |
|                       |              |                   | 1450            |
|                       |              |                   | 1470            |
|                       |              |                   | 1490            |
|                       |              |                   | 1510            |
|                       |              |                   | 1530            |
|                       |              |                   | 1550            |
|                       |              |                   | 1570            |
| 1590                  |              |                   |                 |
| 1610                  |              |                   |                 |



## Other SFPs

Any SFP transceiver following the MSA pinout can be used inside Barnfind's BarnOne or BarnMinis. Barnfind does accept SFPs from other manufacturers and welcomes customers to use

### SFP - Media Converter

Some SFPs offer integrated media conversion:

- RJ45 connector for Ethernet
- HDMI converting to SDI
- HD-BNC for SDI
- HD-BNC for CVBS converting to SDI



## Data Sheet - Example

### BTSFP-LX-SM-3G02

#### 3G-SDI Video SFP MSA 1310nm 2km LC Single-Mode Optical Transceiver DDM

The **BTSFP-LX-SM-3G02** is a Single mode transceiver module designed to transmit/receive optical serial digital signals as defined in SMPTE 297-2006. It supports from 50Mbps to 3 Gbps and is specifically designed for transmitted the SMPTE 259M, SMPTE 344M, SMPTE 292M and SMPTE 424M SDI pathological patterns. It is with the SFP 20-pin connector to allow hot plug capability. Digital diagnostic functions are available via an I<sup>2</sup>C. It is with 1310nm VCSEL transmitters. The transmitter can transmit signal from 50 Mbps to 3 Gbps with up to 2km of Single mode fiber. A maximum distance of 2km is achievable with 3Gbps pathological signals.

#### Features

- SMPTE 297-2006 Compatible
- Hot-Pluggable SFP Footprint LC Optical Transceiver
- Small Form-Factor Pluggable (SFP) MSA compatible
- Speed from 50Mbps to 3Gbps with up to 2km Single mode Fiber
- Distance up to 2km for 3G-SDI
- Support Video Pathological Patterns for SD-SDI, HD-SDI and 3G-SDI
- SFF-8472 Digital Diagnostic Function
- Single +3.3 V Power Supply
- RoHS-6 Compliant
- 0 to 70oC Operation
- Hot Pluggable
- Class 1 Laser International Safety Standard IEC-60825 Compliant

#### Application:

- SMPTE 297-2006 Compliant Electrical-to-Optical Interfaces
- High-density Video Routers

#### Absolute Maximum Ratings

Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

| Absolute Maximum Ratings   |        |     |     |        |                |
|----------------------------|--------|-----|-----|--------|----------------|
| Parameter                  | Symbol | Min | Max | Units  | Notes          |
| Storage Temperature        | Tstg   | -40 | 85  | °C     |                |
| Operating Case Temperature | Tc     | 0   | 70  | °C     |                |
| Power Supply Voltage       | Vcc    | 0   | 4   | V      |                |
| ESD Tolerance on all pins  |        |     | 1   | KV HBM |                |
| Relative Humidity          | ---    | 5   | 95  | % RH   | non-condensing |



| Recommended Operating Conditions |                 |      |     |      |               |
|----------------------------------|-----------------|------|-----|------|---------------|
| Parameter                        | Symbol          | Min  | Typ | Max  | Units / Notes |
| Power Supply Voltage             | V <sub>cc</sub> | 3.13 | 3.3 | 3.47 | V             |
| Operating Case Temperature       | T <sub>c</sub>  | 0    |     | 70   | °C            |
| Baud Rate                        |                 | 50   |     | 3000 | Mb/s          |
| Power Supply Current             | I <sub>cc</sub> |      | 200 | 300  | mA            |

| Transmitter Specifications (0°C < T <sub>c</sub> < 70°C, 3.13V < V <sub>cc</sub> < 3.47V) |                                   |      |      |                      |       |                    |
|---|-----------------------------------|------|------|----------------------|-------|--------------------|
| Parameter   | Symbol                            | Min  | Typ  | Max                  | Units | Notes              |
| <b>Optical</b>  |                                   |      |      |                      |       |                    |
| Optical Transmit Power  | P <sub>o</sub>                    | -5   | -2   | 0                    | dBm   | 1                  |
| Output Center Wavelength  | λ                                 | 1290 | 1310 | 1330                 | nm    | At 25°C            |
| Output Spectrum Width   | Δλ                                | ---  | 1.5  | 3                    | nm    | RMS (σ)            |
| Extinction Ratio  | ER                                | 5    | 7.5  |                      | dB    |                    |
| Relative Intensity Noise  | RIN                               |      |      | -120                 | dB/Hz |                    |
| Optical Rise Time / Fall Time   | t <sub>r</sub> / t <sub>f</sub>   |      |      | 135                  | ps    | 2, SMPTE 424M      |
|   |                                   |      |      | 270                  | ps    | 2, SMPTE 292M      |
|   |                                   |      |      | 800                  | ps    | 2, SMPTE 344M      |
|   |                                   |      |      | 1.5                  | ns    | 2, SMPTE 259M      |
| <b>Electrical</b>   |                                   |      |      |                      |       |                    |
| Differential Input Voltage  | V <sub>IH</sub> - V <sub>IL</sub> | 200  |      | 1200                 | mVp-p | AC coupled input   |
| Disable Input Voltage -- Low  | V <sub>TDIS,L</sub>               | 0    |      | 0.8                  | V     | TX Output Enabled  |
| Disable Input Voltage -- High   | V <sub>TDIS,H</sub>               | 2.0  |      | V <sub>cc</sub> +0.3 | V     | TX Output Disabled |
| SCL, SDA  | V <sub>OH</sub>                   | 2.5  |      | V <sub>cc</sub> +0.3 | V     |                    |
|   | V <sub>OL</sub>                   | 0    |      | 0.5                  | V     |                    |

| Receiver Specifications (0°C < T <sub>c</sub> < 70°C, 3.13V < V <sub>cc</sub> < 3.47V) |        |      |     |      |       |                                    |
|--|--------|------|-----|------|-------|------------------------------------|
| Parameter  | Symbol | Min  | Typ | Max  | Units | Notes                              |
| <b>Optical</b>   |        |      |     |      |       |                                    |
| Wavelength of Operation  |        | 1260 | --- | 1620 | nm    |                                    |
| Sensitivity for SMPTE 424M<br>2.97 Gb/s  | Sen    | 0    | --- | -18  | dBm   | Pathological                       |
|  |        | 0    | --- | -20  | dBm   | PRBS 2 <sup>23</sup> -1, BER=1E-12 |
| Sensitivity for SMPTE 292M<br>1.485 Gb/s   | Sen    | 0    | --- | -20  | dBm   | Pathological                       |
|  |        | 0    | --- | -21  | dBm   | PRBS 2 <sup>23</sup> -1, BER=1E-12 |
| Signal Detect -- Asserted  | Pa     | ---  | --- | -20  | dBm   | Transition: low to high            |
| Signal Detect -- Deasserted  | Pd     | -29  | --- | ---  | dBm   | Transition: high to low            |
| Signal detect -- Hysteresis  |        | 1    |     | 6    | dB    |                                    |
| Optical Return Loss  |        |      | -27 |      | dB    |                                    |
| <b>Electrical</b>  |        |      |     |      |       |                                    |
| CML Output (Differential)  |        | 550  | 660 | 850  | mVp-p | AC coupled output                  |

|                               |                                 |     |  |                      |    |  |
|-------------------------------|---------------------------------|-----|--|----------------------|----|--|
| Optical Rise Time / Fall Time | t <sub>r</sub> / t <sub>f</sub> |     |  | 135                  | ps | 3, SMPTE 424M                            |
|                               |                                 |     |  | 270                  | ps | 3, SMPTE 292M                            |
|                               |                                 |     |  | 800                  | ps | 3, SMPTE 344M                            |
|                               |                                 |     |  | 1.5                  | ns | 3, SMPTE 259M                            |
| Output LOS Voltage -- Low     | V <sub>OL</sub>                 | 0   |  | 0.5                  | V  | I <sub>OL</sub> =-1.6mA, 1 TTL unit load |
| Output LOS Voltage -- High    | V <sub>OH</sub>                 | 2.5 |  | V <sub>cc</sub> +0.3 | V  | I <sub>OH</sub> =40μA, 1 TTL unit load   |
| SCL, SDA                      | V <sub>OH</sub>                 | 2.5 |  | V <sub>cc</sub> +0.3 | V  |  |
|                               | V <sub>OL</sub>                 | 0   |  | 0.5                  | V  |  |

All statements, technical information, and recommendations related to the products herein are based upon information believed to be reliable or accurate. However, the accuracy or completeness thereof is not guaranteed, and no responsibility is assumed for any inaccuracies. Please contact Barnfind Technologies AS for more information.

## BT-CWDM-10-3GXX

### 3G CWDM Video SFP Single-Mode 1270-1610nm 10KM DDM

The **BT-CWDM-10-3GXX** is a single mode transceiver module designed to transmit/receive optical serial digital signals as defined in SMPTE 297-2006. It supports from 50Mbps to 3 Gbps and is specifically designed for transmitted the SMPTE 259M, SMPTE 344M, SMPTE 292M and SMPTE 424M SDI pathological patterns. It is with the SFP 20-pin connector to allow hot plug capability. Digital diagnostic functions are available via an I2C. This module is designed for single mode fiber and operates at a nominal wavelength of CWDM wavelength. There are eighteen center wavelengths available from 1270 nm to 1610 nm, with each step 20 nm. A guaranteed minimum optical link budget of 20 dB is offered. The transmitter section uses a multiple quantum well CWDM DFB laser and is a class 1 laser compliant according to International Safety Standard IEC-60825. The receiver section uses an integrated InGaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

#### Features

- SMPTE 297-2006 Compatible
- Hot-Pluggable SFP Footprint LC Optical Transceiver
- Small Form-Factor Pluggable (SFP) MSA compatible
- Speed from 50Mbps to 3Gbps with up to 10km Singlemode Fiber
- Support Video Pathological Patterns for SD-SDI, HD-SDI and 3G-SDI
- Power Budget > 20 dB
- 18-CH CWDM: 1270 nm to 1610 nm
- SFF-8472 Digital Diagnostic Function
- Single +3.3 V Power Supply
- RoHS-6 Compliant
- 0 to 70oC Operation
- Hot Pluggable
- Class 1 Laser International Safety Standard IEC-60825 Compliant

#### Application:

- SMPTE 297-2006 Compliant Electrical-to-Optical Interfaces
- High-density Video Routers

#### Absolute Maximum Ratings

CWDM\* Wavelength (0 to 70°C)

| Central Wavelength | Min. (nm) | Typ. (nm) | Max. (nm) | Clasp Color Code | Central Wavelength | Min. (nm) | Typ. (nm) | Max. (nm) | Clasp Color Code |
|--------------------|-----------|-----------|-----------|------------------|--------------------|-----------|-----------|-----------|------------------|
| -C270              | 1264.5    | 1270      | 1277.5    | Light Purple     | -C450              | 1444.5    | 1450      | 1457.5    | Yellow Orange    |
| -C290              | 1284.5    | 1290      | 1297.5    | Sky Blue         | -C470              | 1464.5    | 1470      | 1477.5    | Gray             |
| -C310              | 1304.5    | 1310      | 1317.5    | Yellow Green     | -C490              | 1484.5    | 1490      | 1497.5    | Violet           |
| -C330              | 1324.5    | 1330      | 1337.5    | Yellow Ocher     | -C510              | 1504.5    | 1510      | 1517.5    | Blue             |
| -C350              | 1344.5    | 1350      | 1357.5    | Pink             | -C530              | 1524.5    | 1530      | 1537.5    | Green            |
| -C370              | 1364.5    | 1370      | 1377.5    | Beige            | -C550              | 1544.5    | 1550      | 1557.5    | Yellow           |
| -C390              | 1384.5    | 1390      | 1397.5    | White            | -C570              | 1564.5    | 1570      | 1577.5    | Orange           |
| -C410              | 1404.5    | 1410      | 1417.5    | Silver           | -C590              | 1584.5    | 1590      | 1597.5    | Red              |
| -C430              | 1424.5    | 1430      | 1437.5    | Black            | -C610              | 1604.5    | 1610      | 1617.5    | Brown            |

CWDM\*: 18 Wavelengths from 1270 nm to 1610 nm, each step 20 nm.





| Absolute Maximum Ratings   |                  |     |     |        |                |
|----------------------------|------------------|-----|-----|--------|----------------|
| Parameter                  | Symbol           | Min | Max | Units  | Notes          |
| Storage Temperature        | T <sub>stg</sub> | -40 | 85  | °C     |                |
| Operating Case Temperature | T <sub>c</sub>   | 0   | 70  | °C     |                |
| Power Supply Voltage       | V <sub>cc</sub>  | 0   | 4   | V      |                |
| ESD Tolerance on all pins  |                  |     | 1   | KV HBM |                |
| Relative Humidity          | ---              | 5   | 95  | % RH   | non-condensing |

| Recommended Operating Conditions |                 |      |     |      |               |
|----------------------------------|-----------------|------|-----|------|---------------|
| Parameter                        | Symbol          | Min  | Typ | Max  | Units / Notes |
| Power Supply Voltage             | V <sub>cc</sub> | 3.13 | 3.3 | 3.47 | V             |
| Operating Case Temperature       | T <sub>c</sub>  | 0    |     | 70   | °C            |
| Baud Rate                        |                 | 50   |     | 3000 | Mb/s          |
| Power Supply Current             | I <sub>cc</sub> |      | 200 | 300  | mA            |

| Transmitter Specifications (0°C < T <sub>c</sub> < 70°C, 3.13V < V <sub>cc</sub> < 3.47V) |                                   |                     |                |                      |       |                    |
|---|-----------------------------------|---------------------|----------------|----------------------|-------|--------------------|
| Parameter   | Symbol                            | Min                 | Typ            | Max                  | Units | Notes              |
| <b>Optical</b>  |                                   |                     |                |                      |       |                    |
| Optical Transmit Power  | P <sub>o</sub>                    | -8                  |                | -3                   | dBm   | 1                  |
| Output Center Wavelength  | λ                                 | λ <sub>c</sub> -5.5 | λ <sub>c</sub> | λ <sub>c</sub> +7.5  | nm    | 2                  |
| Output Spectrum Width   | Δλ                                | ---                 |                | 1                    | nm    | -20 dB width       |
| Side Mode Suppression Ratio   | SMSR                              | 30                  |                |                      | dB    |                    |
| Extinction Ratio  | ER                                | 5                   | 7.5            |                      | dB    |                    |
| Relative Intensity Noise  | RIN                               |                     |                | -120                 | dB/Hz |                    |
| Optical Rise Time / Fall Time   | tr / tf                           |                     |                | 135                  | ps    | 3, SMPTE 424M      |
|   |                                   |                     |                | 270                  | ps    | 3, SMPTE 292M      |
|   |                                   |                     |                | 800                  | ps    | 3, SMPTE 344M      |
|   |                                   |                     |                | 1.5                  | ns    | 3, SMPTE 259M      |
| <b>Electrical</b>   |                                   |                     |                |                      |       |                    |
| Differential Input Voltage  | V <sub>IH</sub> - V <sub>IL</sub> | 200                 |                | 1200                 | mVp-p | AC coupled input   |
| Disable Input Voltage -- Low  | V <sub>TDIS,L</sub>               | 0                   |                | 0.8                  | V     | TX Output Enabled  |
| Disable Input Voltage -- High   | V <sub>TDIS,H</sub>               | 2.0                 |                | V <sub>cc</sub> +0.3 | V     | TX Output Disabled |
| SCL, SDA  | V <sub>OH</sub>                   | 2.5                 |                | V <sub>cc</sub> +0.3 | V     |                    |
|   | V <sub>OL</sub>                   | 0                   |                | 0.5                  | V     |                    |

| Receiver Specifications (0°C < T <sub>c</sub> < 70°C, 3.13V < V <sub>cc</sub> < 3.47V) |        |      |     |      |       |                                    |
|--|--------|------|-----|------|-------|------------------------------------|
| Parameter  | Symbol | Min  | Typ | Max  | Units | Notes                              |
| <b>Optical</b>   |        |      |     |      |       |                                    |
| Wavelength of Operation  |        | 1260 | --- | 1620 | nm    |                                    |
| Sensitivity for SMPTE 424M<br>2.97 Gb/s  | Sen    | 0    | --- | -18  | dBm   | Pathological                       |
|  |        | 0    | --- | -20  | dBm   | PRBS 2 <sup>23</sup> -1, BER=1E-12 |
| Sensitivity for SMPTE 292M<br>1.485 Gb/s   | Sen    | 0    | --- | -20  | dBm   | Pathological                       |
|  |        | 0    | --- | -21  | dBm   | PRBS 2 <sup>23</sup> -1, BER=1E-12 |
| Signal Detect -- Asserted  | Pa     | ---  | --- | -20  | dBm   | Transition: low to high            |
| Signal Detect -- Deasserted  | Pd     | -29  | --- | ---  | dBm   | Transition: high to low            |
| Signal detect -- Hysteresis  |        | 1    |     | 6    | dB    |                                    |
| Optical Return Loss  |        |      | -27 |      | dB    |                                    |

All statements, technical information, and recommendations related to the products herein are based upon information believed to be reliable or accurate. However, the accuracy or completeness thereof is not guaranteed, and no responsibility is assumed for any inaccuracies. Please contact Barnfind Technologies AS for more information.

### SFP Transceiver Modules - Singlemode

| Order Number     | Max. Data Rate | Distance | nm     | Compatibility                                 |
|------------------|----------------|----------|--------|---|
| BTSFP-LX-SM-0220 | 1.25Gbps       | 20km     | 1310nm | Ethernet, SD-SDI, ASI, AES, MADI              |
| BTSFP-LX-SM-0240 | 1.25Gbps       | 40km     | 1310nm |   |
| BTSFP-ZX-SM-0280 | 1.25Gbps       | 80km     | 1550nm |   |
| BTSFP-LX-SM-0310 | 2.5Gbps        | 10km     | 1310nm | HD-SDI  |
| BTSFP-LX-SM-0340 | 2.5Gbps        | 40km     | 1310nm | Note! Does not support pathological patterns! |
| BTSFP-ZX-SM-0380 | 2.5Gbps        | 80km     | 1550nm |   |
| BTSFP-LX-SM-3G02 | 3G             | 2km      | 1310nm | SD/HD/3G-SDI                                  |
| BTSFP-LX-SM-3G20 | 3G             | 20km     | 1310nm |   |
| BTSFP-ZX-SM-3G40 | 3G             | 40km     | 1550nm |   |

### SFP+ Transceiver Modules - Singlemode

| Order Number    | Max. Data Rate | Distance | nm     | Compatibility    |
|-----------------|----------------|----------|--------|------------------|
| BT-LX-SM-10G20  | 10G            | 20km     | 1310nm | Ethernet         |
| BTSFP-LX-SM-6G  | 6Gbps          | 20km     | 1310nm | 6G/3G/HD/SD-SDI  |
| BTSFP-LX-SM-12G | 12Gbps         | 10km     | 1310nm | 12G/6G/3G/HD-SDI |

### SFP Transceiver Modules - Multimode

| Order Number   | Max. Data Rate | Distance | nm     | Compatibility  |
|----------------|----------------|----------|--------|----------------|
| BTSFP-MM-1G550 | 1Gbps          | 550m     | 850nm  | Ethernet       |
| BTSFP-MM-1G    | 1Gbps          | 2km      | 1310nm | Ethernet, MADI |
| BTSFP-MM-2G550 | 2Gbps          | 550m     | 850nm  | SD/HD-SDI      |
| BTSFP-MM-3G02  | 3Gbps          | 2km      | 1310nm | SD/HD/3G-SDI   |

### SFP - BiDi Transceiver Modules - Singlemode

| Order Number      | Max. Data Rate | Distance | nm            | Compatibility                                 |
|-------------------|----------------|----------|---------------|---|
| BTSFP-WDM-0220A/B | 1.25Gbps       | 20km     | 1310/1550nm   | Ethernet, SD-SDI, ASI, AES, MADI              |
| BTSFP-WDM-0240A/B | 1.25Gbps       |          | 1310/1550nm   |   |
| BTSFP-WDM-0280A/B | 1.25Gbps       | 80km     | 1490/1550nm   |   |
| BTSFP-WDM-0310A/B | 2.5Gbps        | 10km     | 1310/1550nm   | HD-SDI  |
| BTSFP-WDM-0340A/B | 2.5Gbps        | 40km     | 1310/1550nm   | Note! Does not support pathological patterns! |
| BTSFP-WDM-0380A/B | 2.5Gbps        | 80km     | 1490/1550nm   |   |
| BTSFP-WDM-3G20A/B | 3Gbps          | 20km     | T1310/R1550nm | SD/HD/3G-SDI                                  |



## SFP CWDM Transceiver Modules - Singlemode

| Order Number    | Max. Data Rate | Distance | nm          | Compatibility                    |
|-----------------|----------------|----------|-------------|----------------------------------|
| BT-CWDM-40-02XX | 1.25Gbps       | 40km     | 1270-1610nm | Ethernet, SD-SDI, ASI, AES, MADI |
| BT-CWDM-80-02XX | 1.25Gbps       | 80km     | 1270-1610nm |                                  |
| BT-CWDM-40-03XX | 2.5Gbps        | 40km     | 1270-1610nm | HD-SDI                           |
| BT-CWDM-80-03XX | 2.5Gbps        | 80km     | 1270-1610nm | No pathological patterns         |
| BT-CWDM-10-3GXX | 3Gbps          | 10km     | 1270-1610nm | SD/HD/3G-SDI                     |
| BT-CWDM-40-3GXX | 3Gbps          | 40km     | 1270-1610nm |                                  |
| BT-CWDM-80-3GXX | 3Gbps          | 80km     | 1270-1610nm | No pathological patterns         |

## SFP+ CWDM Transceiver Modules - Singlemode

| Order Number     | Max. Data Rate | Distance | nm          | Compatibility |
|------------------|----------------|----------|-------------|---------------|
| BT-CWDM-10-10GXX | 10Gbps         | 10km     | 1270-1610nm | Ethernet      |
| BT-CWDM-40-10GXX | 10Gbps         | 40km     | 1270-1450nm | Ethernet      |
| BT-CWDM-10-12GXX | 12Gbps         | 40km     | 1270-1330nm | up to 12G-SDI |

## SFP HiLo CWDM Transceiver Modules - Singlemode

| Order Number | Max. Data Rate | Distance | nm          | Compatibility |
|--------------|----------------|----------|-------------|---------------|
| BT-3G-XX-H/L | 3Gbps          | 20km     | 1270-1610nm | SD/HD/3G-SDI  |

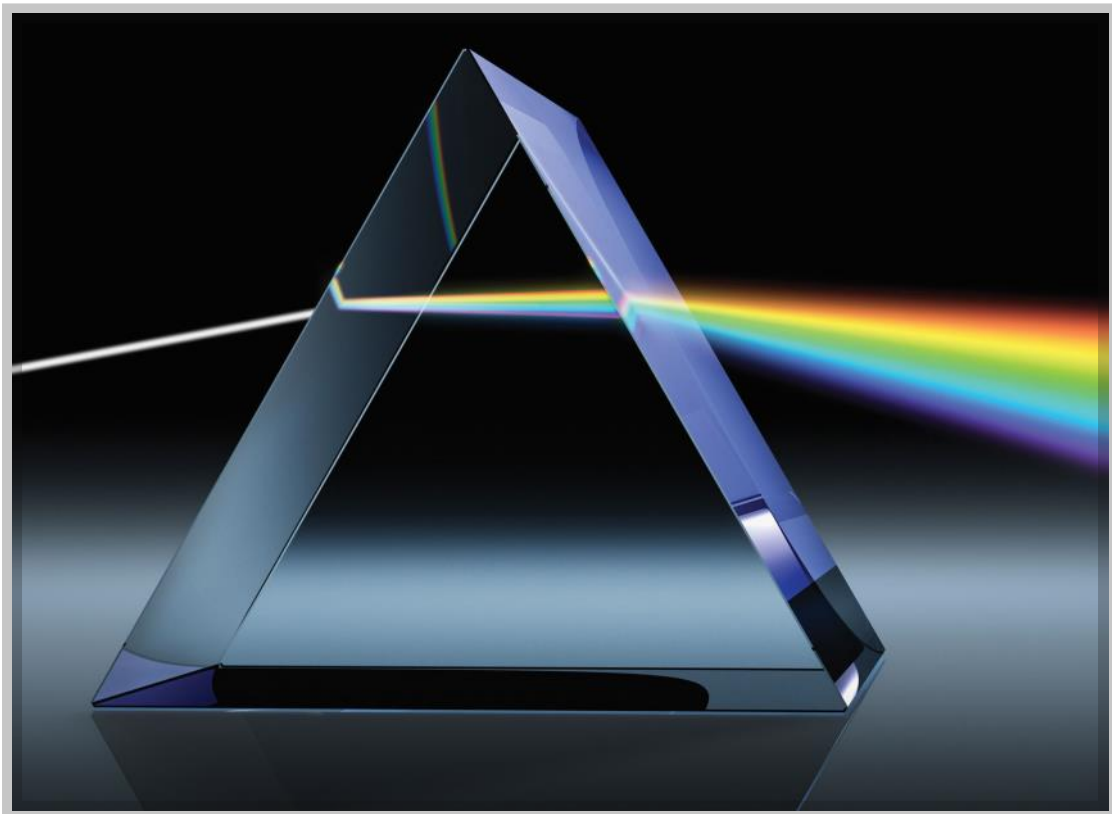
## Other SFPs

| Order Number   | Description   |
|----------------|---|
| EB30HDRT-MM    | SDI SFP (emSFP) Coaxial Transceiver, medium reach, MSA, HD-BNC                      |
| EB30CSRT-MM    | SDI SFP (emSFP) Coaxial Transceiver, medium reach, MSA, DIN 1.0/2.3                 |
| EB34TD1R-SM    | HDMI to 3Gbps SDI Converter, SFP Receiver (emSFP), MSA, Type D with retention clip  |
| EB34TD1T-SM    | SDI to HDMI/DVI Converter, SFP Transmitter (emSFP), MSA, Type D with retention clip |
| EB30CSRT-AM    | CVBS to SDI Converter, SFP (emSFP) Coaxial Transceiver, MSA, DIN1.0/2.3             |
| EB30HDRT-AM    | CVBS to SDI Converter, SFP (emSFP) Coaxial transceiver, MSA, HD-BNC                 |
| BTSFP-Gbase-CU | 10/100/1000 Mbit/s Ethernet   |



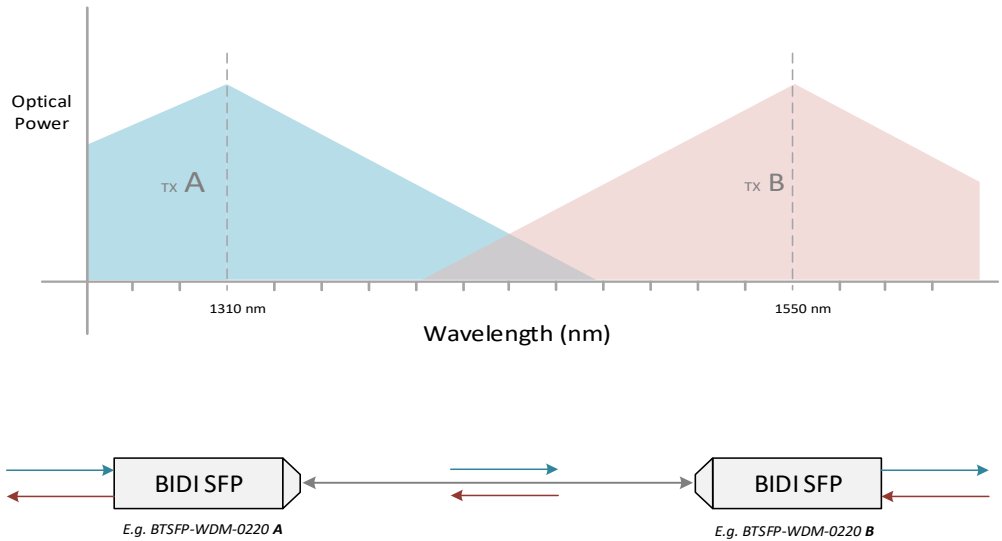


# BarnAcademy

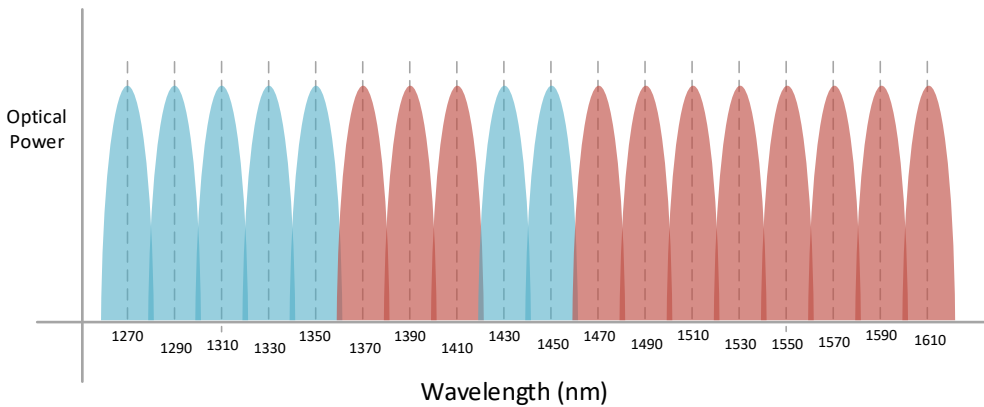


## WDM - Wavelength Division Multiplexing

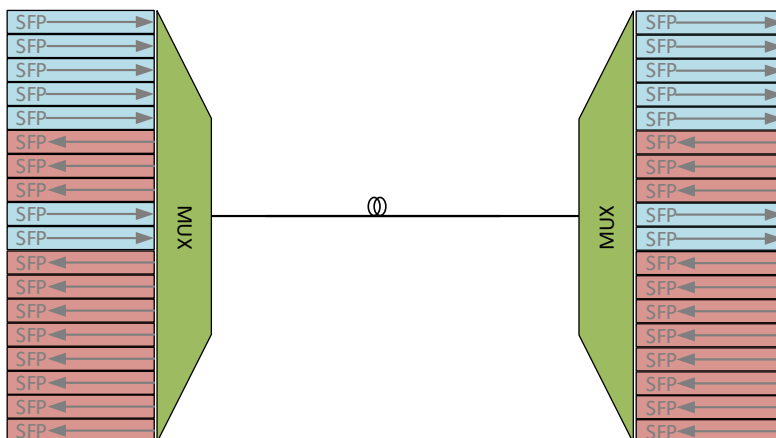
**Wavelength Division**  
**Multiplexing** is a way to transmit two (2) individual signals in one fiber. The BIDI SFP modules are specially made for this purpose. Those SFPs are always working as a pair (A/B) using two different transmitting wavelengths (A:1310nm and B:1550nm). The multiplexer is integrated in the SFP. With a stand alone WDM mux at either end of the fiber, it is possible to have 2 signals traveling the same direction on the fiber.



## CWDM - Coarse Wavelength Division Multiplexing



**Coarse Wavelength Division Multiplexing** (ITU-T G694.2) allows up to 18 signals to travel on one fiber strand. Any protocol can travel beside another over the same link, as long as it is a specific wavelength. (e.g. HD-SDI @1570nm can be transported alongside 3G-SDI @1590nm and MADI @1510nm). This allows for longterm proofing of the infrastructure, because the multiplexers simply refract light at any speed/bitrate, regardless of the protocol being deployed. Channel spacing is 20nm.



# HiLo-Technology

offers the possibility to double the signal count traveling on one fiber using standard CWDM multiplexers in combination with bi-directional HiLo-SFPs

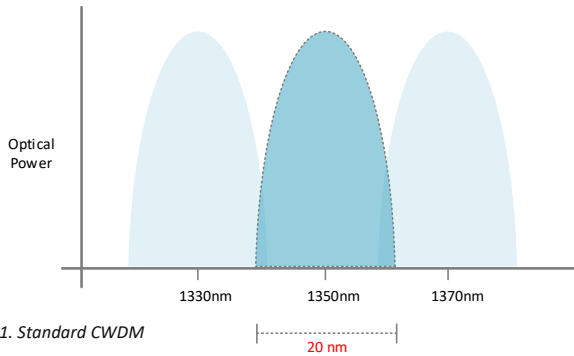


Fig 1. Standard CWDM

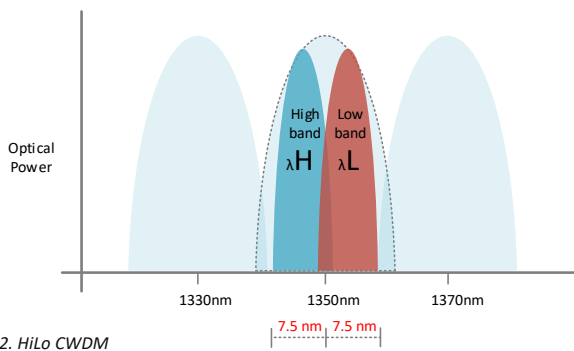


Fig 2. HiLo CWDM

**Figure 1.** shows the standardized channel spacing for use with CWDM (ITU-T G.694.2). It allows totally 18 channels between 1270nm and 1610nm with 20 nm spacing. Due to this limitation of channels deployed in one (1) fiber, system integrators must always prioritize the signals in order to fit a single fiber transmission architecture. *Keep in mind that some signals are bi-directional (e.g. ethernet), and will occupy 2 channels in your CWDM multiplexer*

**Figure 2.** Barnfind HiLo SFPs are designed to meet a need for higher density of signals in one single fiber. By using half of the spacing in each wavelength, *HiLo SFPs can double the capacity of the traditional CWDM bi-directional transmission.*

This enables totally 18 bi-directional links (totally 36 channels).

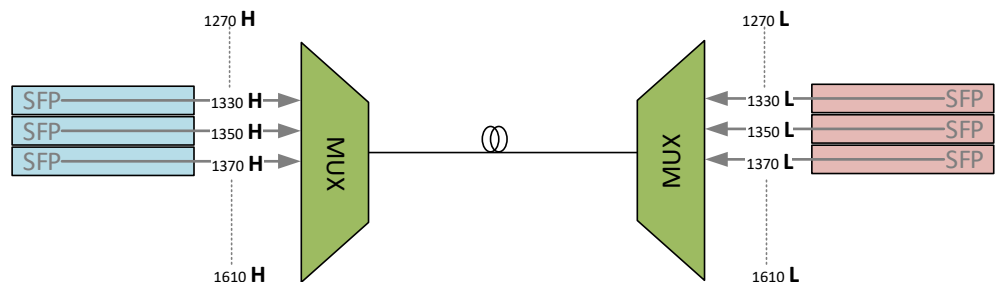
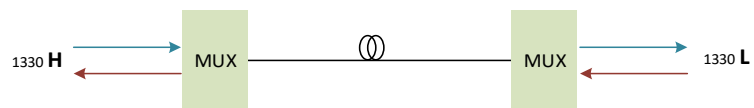
Note!, the HiLo SFPs are designed to be used with a standard optical multiplexer.

## Benefits of using HiLo SFP:

- Up to 18 bi-directional channels in one (1) fiber.
- Can be used with standard optical multiplexer
- Can work along with standard CWDM SFPs to increase the number of channels
- Handles bitrates up to 3Gbps.

## Typical applications:

- Ethernet transmissions
- Camera to CCU
- Video workflow with return
- Add Drop

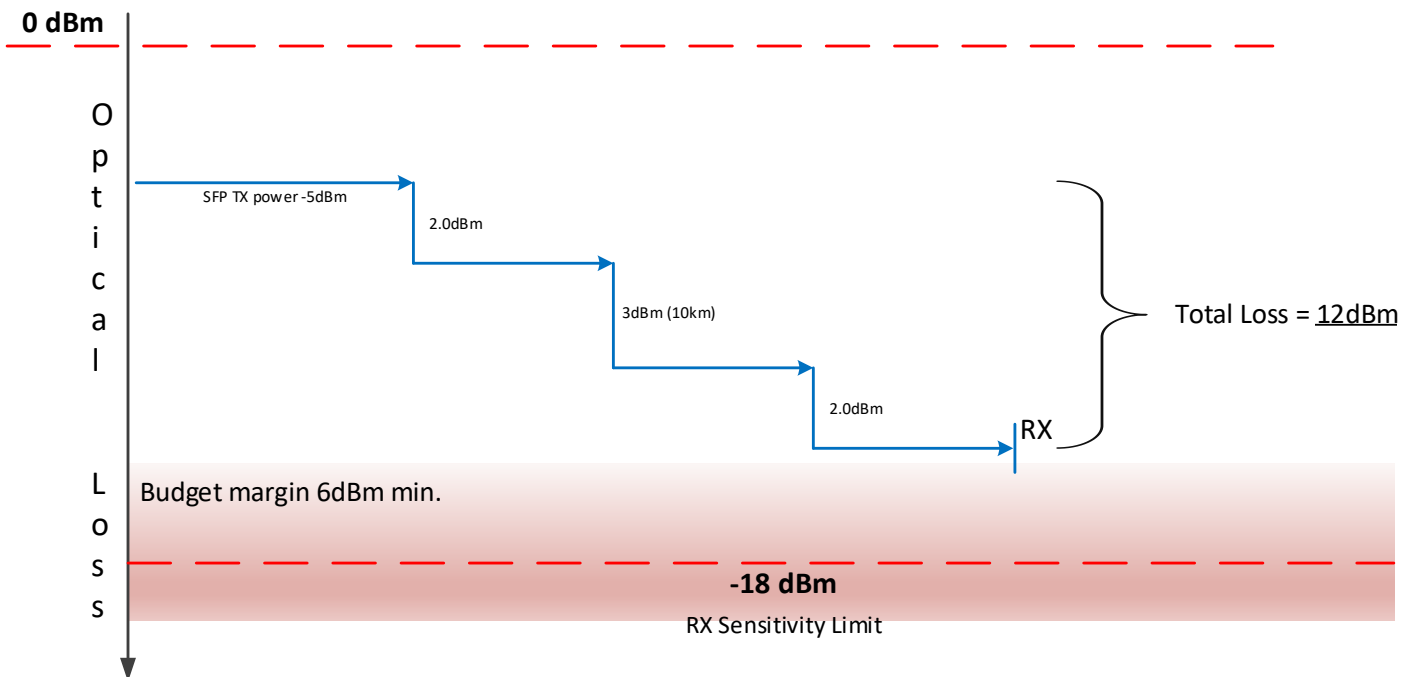
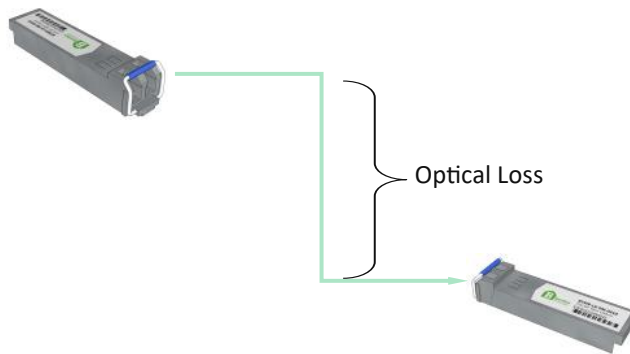


## Optical budget calculation

Prior to designing or installing a fiber optic cabling system, a loss budget analysis is recommended to make certain the system will work over the proposed link. That same loss budget will be used as to compare test results after installation of the cabling to ensure that the components were installed correctly. Both the passive and active components of the circuit have to be included in the loss budget calculation. Passive loss is made up of fiber loss, connector loss, and splice loss. Don't forget any couplers or splitters in the link. Active components are system gain, wavelength, transmitter power, receiver sensitivity, and dynamic range. Prior to system turn up, test the circuit with a source and optical power meter to ensure that it is within the loss budget.

Example:

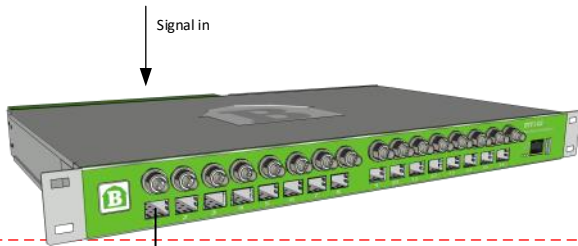
- BTSFP-CWDM-10-3Gxx
- 10 km



Example shows a simple and very common transmission of a signal from A to B. The numbers refer to maximum values.

Figure on next page shows the same scenario with Barnfind products





SFP:  
BTSFP-CWDM-10-3Gxx  
Optical Transmit Power (typ) **-5dBm**

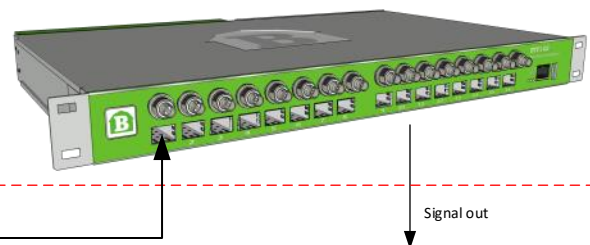


**CWDM Multiplexer:**  
Insertion loss:  
- **8ch: 2.0dBm (max)**  
- **16ch: 3.2dBm (max)**



Single Mode fiber:  
Attenuation:  
Typically **0.3dBm per km**

**CWDM Multiplexer:**  
Insertion loss:  
- **8ch: 2.0dBm (max)**  
- **16ch: 3.2dBm (max)**

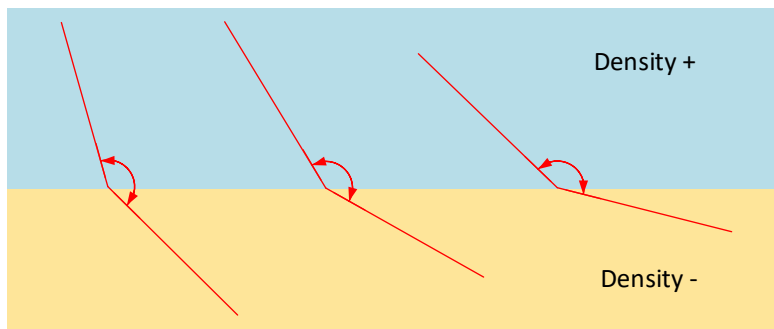


SFP:  
BTSFP-CWDM-10-3Gxx  
RX Sensitivity (3G-SDI) **-18dBm**

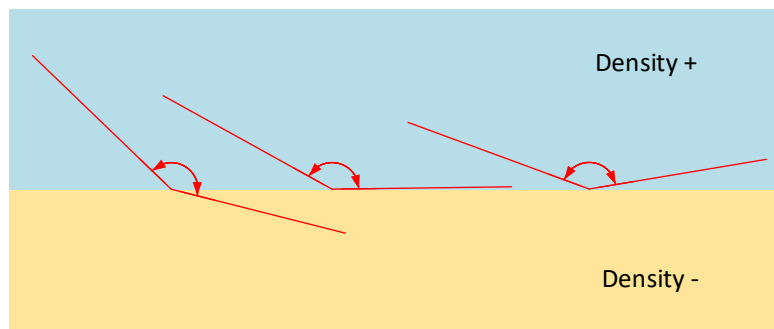
## Light travelling through fiber

There is normally not a requirement for a system designer, installer or an operator to know the fundamental physics in how the light can travel such long distances in a tiny fiber, but it is definitely a fascinating and interesting phenomena.

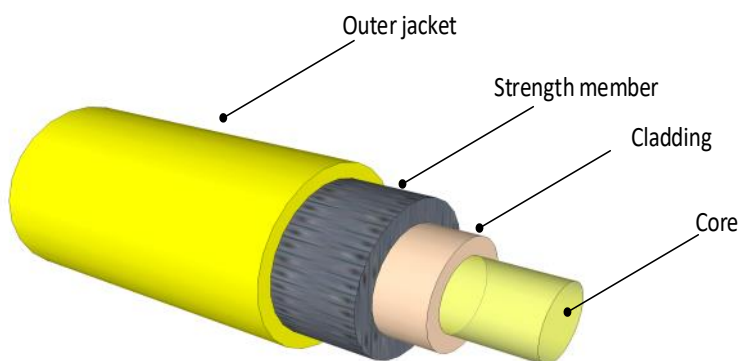
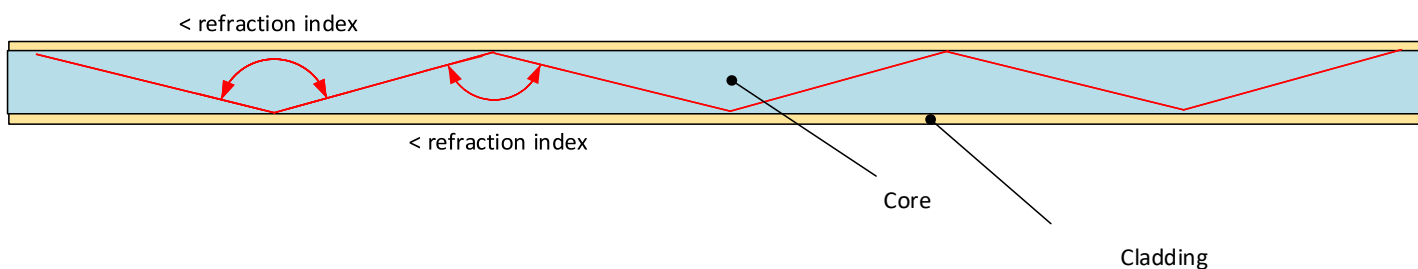
Light travels through a fiber-optic cable by bouncing repeatedly off the walls. You might expect a beam of light, traveling in a clear glass pipe, simply to leak out of the edges. But if light hits glass at a really shallow angle (less than 42 degrees), it reflects back in again—as though the glass were really a mirror. This phenomenon is called total internal reflection. It's one of the things that keeps light inside the pipe.



The light is «bending» when it hits a material with lower density. The incoming angle is too sharp, and light will leak.

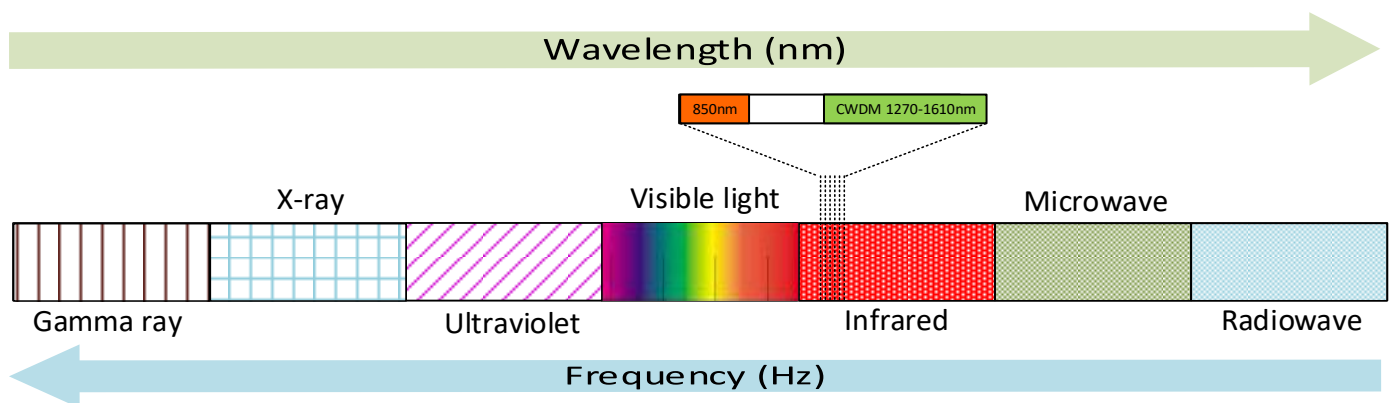


Light always reflects with the same angle as it enters a surface, but when the angle is shallow enough, it will bounce back into the material with higher density again. This sequence repeats when hitting the «roof». See illustration below.

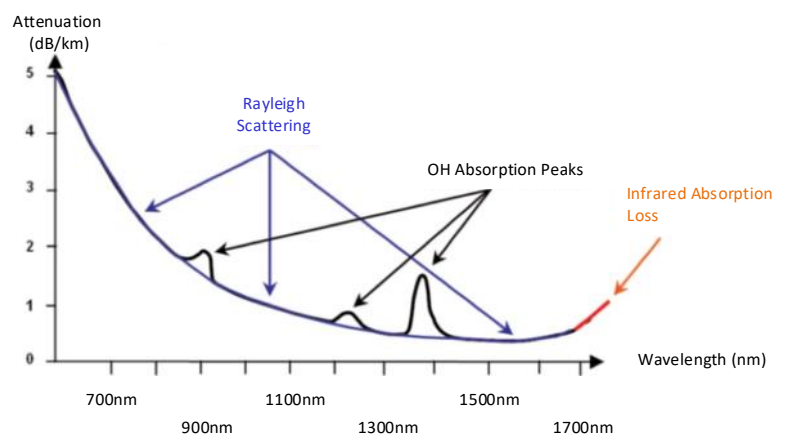


The second factor keeping light in the pipe is the structure of the cable, which is made up of two separate parts. The main part of the cable - in the middle - is called the **core** and that is the part the light travels through. Wrapped around the outside of the core is another layer of glass called **cladding**. The cladding keeps the light signals inside the core, because it is made of a different type of glass than the core itself. More technically, the cladding has a lower refractive index.

## The electromagnetic spectrum



The attenuation/wavelength graph, would suggest that all transmission is best done in the 1550nm window, where the Rayleigh scattering losses are lowest. However, LED and VCSEL (vertical cavity surface emitting laser) sources can currently be manufactured in high volume at very low cost in the 850nm window (multi mode). The higher attenuation due to scattering limits will reduce the transmission distance. Long distance applications (50km+) are owned by transceivers utilizing the 1550nm window. Achieving these distances comes at a price. Sources such as Distributed FeedBack (DFB) and Externally Modulated Lasers (EML) are not easily fabricated in anything but an edge-emitting semiconductor structure, greatly increasing the manufactured cost of these devices. On the receiving side, sophisticated receivers such as Avalanche Photo-Diodes (APDs) also drive up cost. There is a middle ground...the 1310nm window. The availability of inexpensive Fabry-Perot laser sources and simple Positive Intrinsic Negative (PIN) receivers to provide reliable transmission covering a range of 1km to about 50km has made the 1310nm window the third alternative.



### Laser precautions:

One should exercise the same kinds of safety precautions around lasers as with any other power tool or electrical device paying special attention to eye safety.

**Do never look directly into a SFP, multiplexer or fiber-end! It may cause severe damage to your eye!**





# Software & Control



# BarnStudio



**BarnStudio** is first of all a management and configuration tool to be used for BarnOne frames. Further it is a great tool for general monitoring of signal flow and diagnostic of SFPs, BNCs, many different optical parameters, fans, reclockers, equalizers etc.

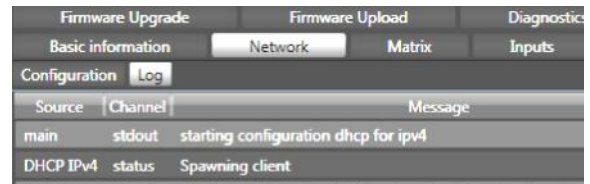
You can run BarnStudio on any Windows based computer (Windows XP SP2 and higher). For users with other operating systems all BarnOne frames run a web server with the same functionality as BarnStudio.

The next chapter of BarnGuide will explain the functionalities and possibilities in BarnStudio.

## Installation

Download latest version of BarnStudio for free, directly from our website. and run «BarnStudio...setup.exe»

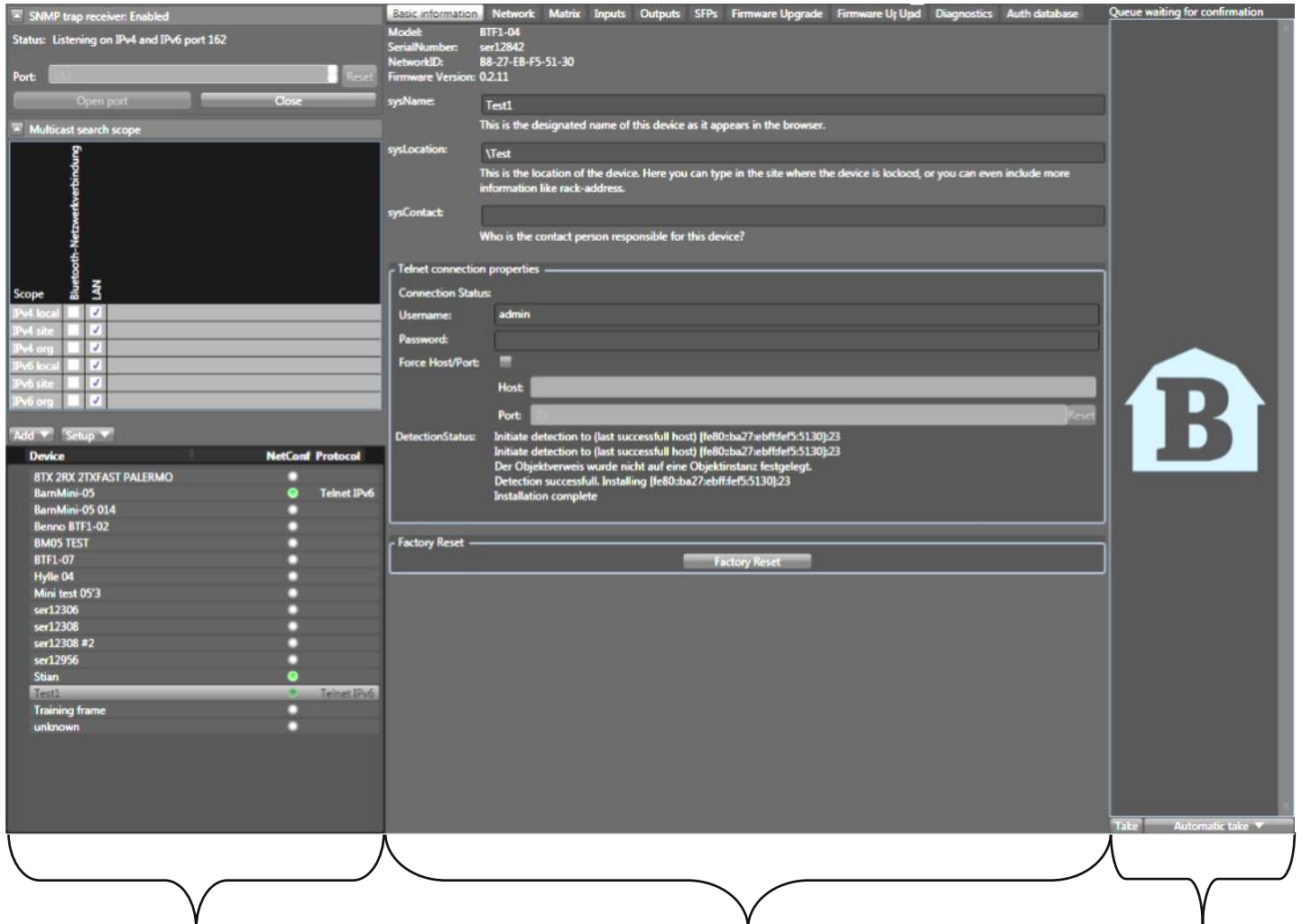
<https://www.barnfind.no/downloads/>



The screenshot displays the BarnStudio interface with a grid of ports. On the left, there are columns for 'MON' (Mini Monitors) and 'No group'. The main grid lists SFP #5 through SFP #19 and BNC #17 through BNC #32. Each port has a grid of status indicators. At the bottom, a detailed view shows SFP #15 (Input port 15) and BNC #17 (Input port 17) with their respective configurations, including direction, 3G ext. reach, and coarse amplitude.

## Overview

The main (and only) window is divided into three columns:



### Connections

connection properties and device list

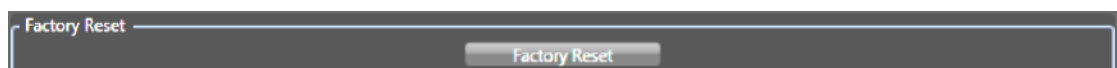
### Frame Operations

detailed information about the frame which was selected in the connections column

### Take List

Every change performed in the Frame Operations section has to be acknowledged in the take list

### Factory Reset:

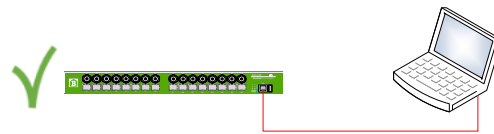


Each BarnOne frame or BarnMini-05 can be reset to it's original factory settings:

- DHCP activated (no IP address)
- Password for Administrator is reset to *no password*

## Discover the frames

**Note:** BTF1-XX is shipped with no IP address set by default, but with DHCP enabled.

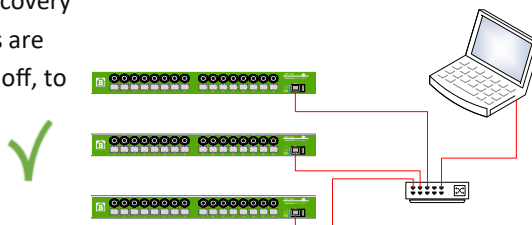


BarnStudio uses multicast for discovering and configuring network parameters for any BTF1-XX frames. The reason for this is that multicast always works regardless of the current IP address/status.



### Multicast search scope:

You can select of which network interfaces you want to search for frames on. Each network interface represents one column. *Note! text appears in your local language.* The Multicast search scope offers you multiple different search addresses: local, site and organization search scope, at both IP version 4 and 6. But only one is needed to be selected at any given time for auto discovery of frames to function. Once all frames are detected, the multicast can be turned off, to reduce traffic.



### Device List:

All BTF1-XX frames that are discovered will appear in alphabetic order in the Device List. The devices can be renamed under the Basic Information Tab.

### NetConf status:

- If you add a new frame and it is not connected, it shows grey color.
- Frame is no longer visible by Multicast autodetection.
- Valid, in operation

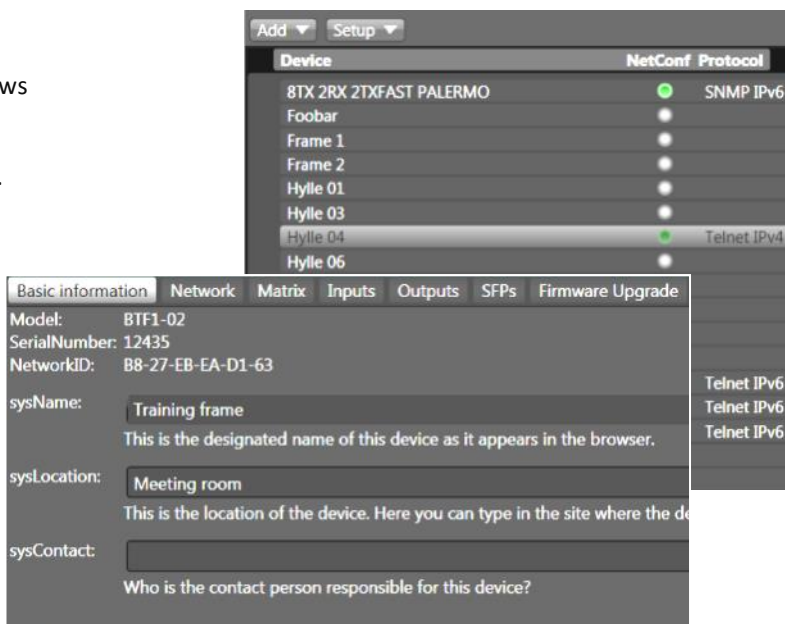
*Note! If you connect remotly, it might appear as red or grey even if you have a valid connection.*

### Add:

Push the Add button to manually add more devices.

### Remove:

If you right click on a given device you can you will get a Pop up menu where you can select to remove that device.





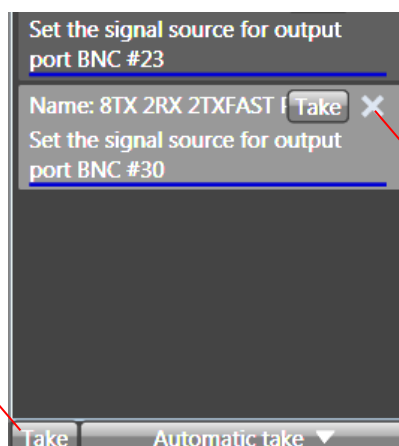
## Acknowledgement (*Take*) of configuration changes

You can protect the setup/configuration against unwanted accidental configuration changes. This means that you need to acknowledge the configuration changes that you want to perform/execute before you actually make them hot. You can activate the changes on this right side of the screen one by one or do them all in one operation. If you wish to undo them, you click the "X" button.

### Automatic Take:

The acknowledge feature can be temporary disabled for given time periods and can also be canceled at any time. This is typically a function used when you preconfigure the device, or other circumstances were multiple settings needs to be performed.

- Disable
- 5 minutes
- 15 minutes
- 30 minutes
- 1 hour



Take all

Undo / do not Take

## Basic Information

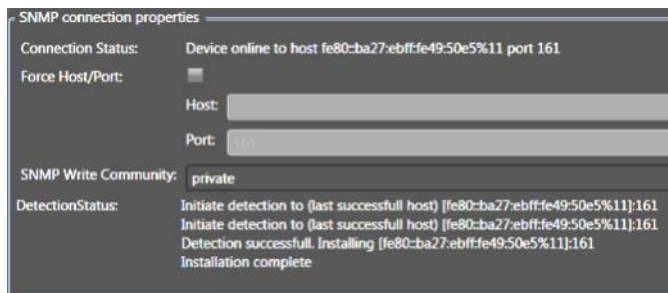
- **sysName:** Set the name of each BTF1-XX frame (this name will appear in the Device List). Note! Only Latin characters and numbers allowed (ASCII).
- **sysLocation:** Where the device is located
- **sysContact:** Who is responsible for the operation or service of the frame

| Basic information | Network   | Matrix | Inputs | Outputs | SFPs | Firmware Upgrade | Firmware Upload | Diagnostics | Auth database |
|-------------------|---|--------|--------|---------|------|------------------|-----------------|-------------|---------------|
| Model:            | BTF1-02   |        |        |         |      |                  |                 |             |               |
| SerialNumber:     | 12435   |        |        |         |      |                  |                 |             |               |
| NetworkID:        | B8-27-EB-EA-D1-63   |        |        |         |      |                  |                 |             |               |
| sysName:          | <input type="text" value="Training frame"/> <p>This is the designated name of this device as it appears in the browser.</p>   |        |        |         |      |                  |                 |             |               |
| sysLocation:      | <input type="text" value="Meeting room"/> <p>This is the location of the device. Here you can type in the site where the device is located, or you can even include more information like rack-address.</p> |        |        |         |      |                  |                 |             |               |
| sysContact:       | <input type="text"/> <p>Who is the contact person responsible for this device?</p>  |        |        |         |      |                  |                 |             |               |

## SNMP connection properties:

This section can be used if you want to connect by SNMP to a remote device that can not be auto discovered.

- **Connection status:** If the device is connected, you can read out IP and port information.
- **Force Host/Port:** This enables the possibilities to write in Ip and port number to connect.
- **Host:** The remote IP address you want to connect e.g. 192.168.0.2
- **Port:** Normally this should be 161
- **SNMP Write Community:** This is normally set to private.
- **Detection Status:** This shows the last log lines of connecting status.
- **Download BarnOne MIB :** <https://media.barnfind.no/20171201%20Barnfind%20MIB.zip>



## Telnet connection properties:

This section can be used if you want to connect via Telnet to a remote device that can not be auto discovered.

- **Connection status:** If the device is connected, you can read out IP and port information.
- **Force Host/Port:** This enables the possibilities to write in Ip and port number to connect.
- **Host:** The remote IP address you want to connect e.g. 192.168.0.2
- **Port:** Normally this should be 23
- **Detection Status:** This shows the last log lines of connecting status.
- **Download BarOne Telnet documentaion:** <https://media.barnfind.no/BTF1%20Telnet%20Documentation%20revision%201.0.pdf>



## Network

The purpose of this section is to see the current network status. Here you can also download, change and upload the network configuration file.

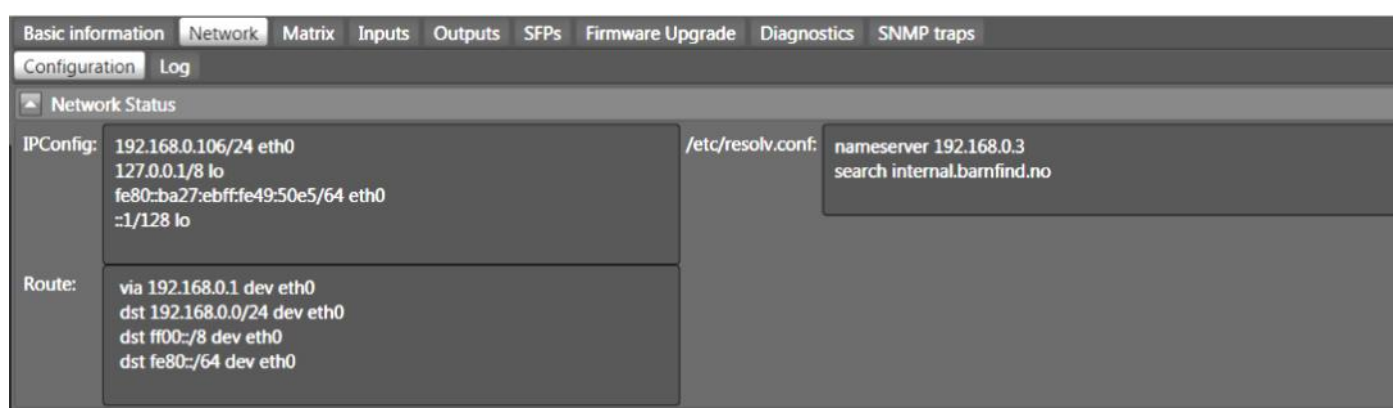
*Note! BarnStudio use prefix length for both IPv4 and IPv6 instead of the traditional netmask. This is due to netmask can only be used for IPv4.*

Examples:

Netmask 255.255.255.0 is equal to prefix length 24.

Netmask 255.255.0.0 is equal to prefix length 16.

Netmask 255.0.0.0 is equal to prefix length 8.



The screenshot shows the 'Network Status' section of the BarnStudio interface. It displays the following information:

- IPConfig:** 192.168.0.106/24 eth0, 127.0.0.1/8 lo, fe80::ba27:ebff:fe49:50e5/64 eth0, ::1/128 lo
- Route:** via 192.168.0.1 dev eth0, dst 192.168.0.0/24 dev eth0, dst ff00::/8 dev eth0, dst fe80::/64 dev eth0
- /etc/resolv.conf:** nameserver 192.168.0.3, search internal.barnfind.no

### Network Status:

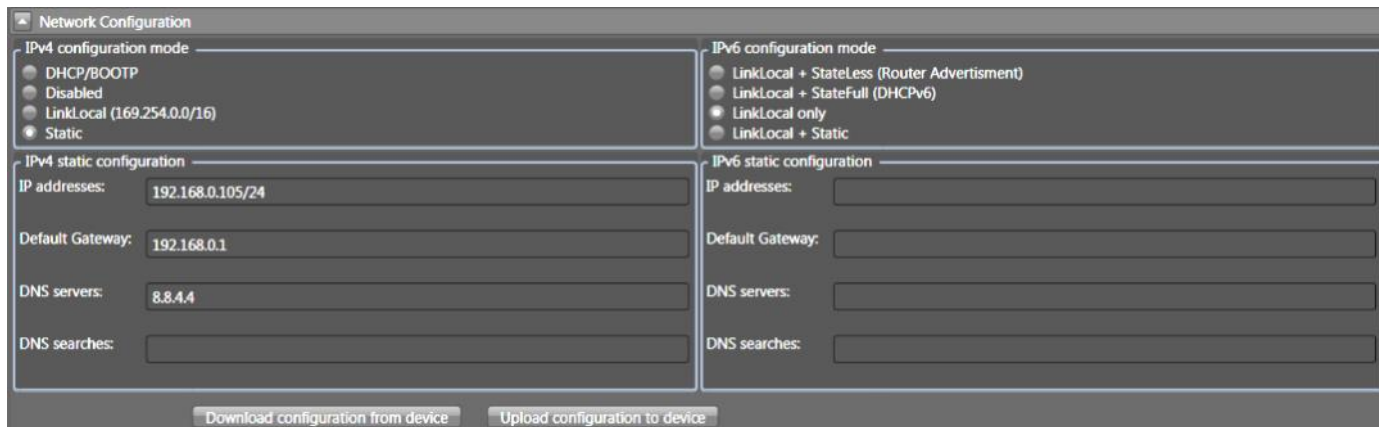
- **IPConfig:** The currently assigned IP addresses.
- **Route:** The currently active routing table.
- **/etc/resolv.conf:** The current DNS resolving configuration file. *This is only used for software upgrades.*

### Network Configuration:

This section is for download, change and upload the current configuration file. This section will not be populated until you click "download configuration from device".

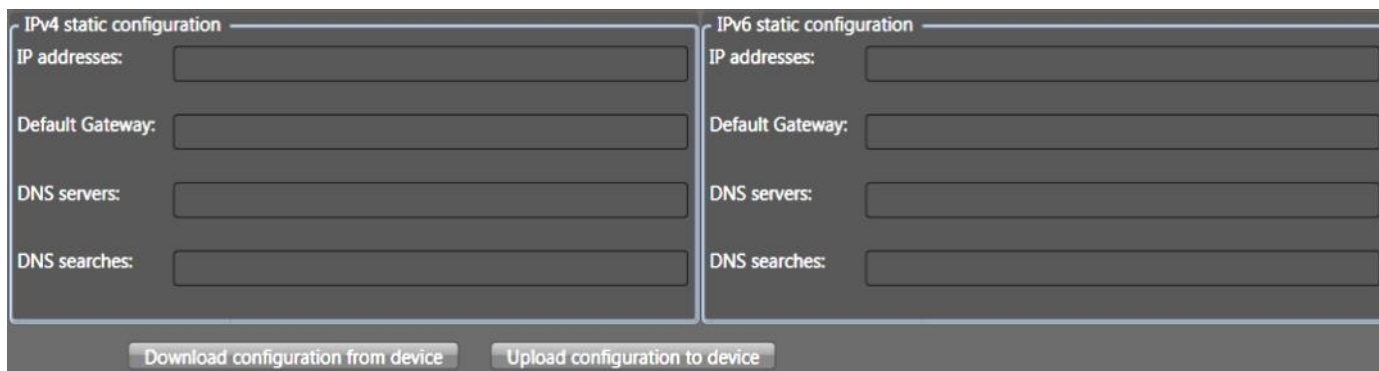
**IP v.4 configuration mode:** Here you can select which configuration mode that should be used. The options are;

- **DHCP/BootP:** This is what the frames are configured with from factory. This is to automatically configure the IP address using a DHCP server.
- **Disable:** Do not configure an IPv4 address.
- **Linklocal (169.254.0.0/16):** To automatically configure the IP address using a Link Local Address.
- **Static:** Use this to manually configure an IP address. This is the recommended setting for the deployment. Get your IP address from your local network administrator.
  - **IP addresses:** Up to 4 different IP addresses. Each address is written with a prefix length (netmask). Each address is separated with a space. Example: 192.168.0.2/24 10.100.10.2/8
  - **Default Gateway:** Default Gateway if any.
  - **DNS Servers:** IP addresses for resolving DNS. This is only used for software upgrades.
  - **DNS Searches:** This feature is for setting the DNS search, normally left blank.



**IP v.6 configuration mode:** Here you can select which configuration mode that should be used. The options are;

- **LinkLocal + StateFull (DHCPv6):** This is to automatically configure the IP address using a DHCPv6 server.
- **LinkLocal + StateLess (Router advertisement):** This is the factory default. This is to automatically configure the IP address using the new Router advertisement Protocol. This is normally the replacement for DHCP in IPv6.
- **Linklocal only:** To automatically configure the IP address using a Link Local Address only.
- **Linklocal + Static:** Use this to manually configure an IP address. This is the recommended setting for the deployment. Get your IP address from your local network administrator.
  - **IP addresses:** Up to 4 different IP addresses. Each address is written with a prefix length (netmask). Each address is separated with a space. Example: 2001::2/64 2002:1234::4321/64
  - **Default Gateway:** Default Gateway if any.
  - **DNS Servers:** IP addresses for resolving DNS. This is only used for software upgrades.
  - **DNS Searches:** This feature is for setting the DNS search, normally left blank.



**Download Configuration from Device – button**

Click this button to download the current configuration file from the device into BarnStudio.

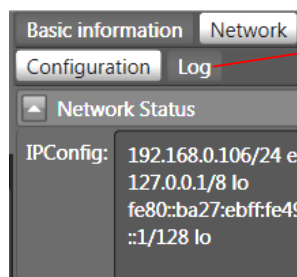
**Upload Configuration to Device – button**

Click this button to upload the configuration from BarnStudio into the device.

Beneath the Download and Upload buttons, you can see a log of the current transfer (upload/download status).

Note! Download/Upload will first attempt to use Telnet for the transfer. If this fails; the multicast search protocol will be used. It uses the settings from the “multicast search scope” dialog for this.

**Log:**



**Log:** This is a live log from the network configuration software running on the device. Currently it shows information from the DHCP clients.

## Matrix

The purpose of this section is to configure the BTF1-XX frames routing of signals. The rows going from top to bottom(Y) are the signal sources. The columns going from left to right (X) are the possible signal destinations. A signal can be routed to as many destinations as you may want, but a destination can only be subscribed to one source at any given time.

### Outputs

The color indication are as following:

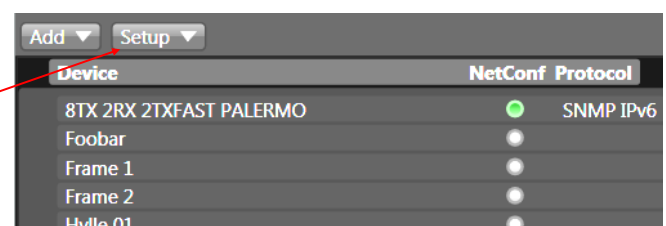
- **Black:** Not able to detect a signal presence.
- **Red:** No signal detected/loss of signal.
- **Green:** Signal is detected (reclocker is locked).

**Inputs**

The color indication are as following:

- **Black:** Not able to detect a signal presence.
- **Red:** No signal detected/loss of signal.
- **Green:** Signal is detected.

By default the ports are sorted by channel number. This can be changed to alphabetically order using the **setup** button.



Groups can be defined using the input and output tabs.

## Inputs

Configure the signal input ports.

Each input port is represented by one row in the table.

| Name   | Label          | Port Equalizer | Signal Analyzer |         |                   |        |  |        |          |
|--------|----------------|----------------|-----------------|---------|-------------------|--------|--|--------|----------|
| SFP #1 | R1DVD player   |                | Enabled         | Prescan | Unknown           | Result | Unknown HD                                     | Errors | NOSIGNAL |
| SFP #2 | R1PC           |                | Enabled         | Prescan | 3G-SDI 1920x1080p | Result | 1920x1080/59.94 (1:1), 425M (3G Level A) 4:2:2 | Errors | none     |
| SFP #3 | R1Ani player   |                | Enabled         | Prescan | 3G-SDI 1920x1080p | Result | 1920x1080/59.94 (1:1), 425M (3G Level A) 4:2:2 | Errors | none     |
| SFP #4 | R1Input port 4 |                | Enabled         | Prescan | Result            | Errors |  |        |          |
| SFP #5 | Input port 5   |                | Enabled         | Prescan | Result            | Errors |  |        |          |

- **Name:** This name of the port is matching the silk print on the front of the BTF1-XX.
- **Label:** This name you may change as you may wish.
- **Groups:** If you want to have grouping of ports in the Matrix tab, you can prefix each label with the name of the group and add a \.

| Name   | Label             |
|--------|-------------------|
| SFP #1 | Source\DVD player |
| SFP #2 | Source\PC         |
| SFP #3 | Source\Ani player |

Source

|                      |                          |                          |                          |                          |                          |                          |                          |
|----------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| SFP #1: DVD player   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #2: PC           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #3: Ani player   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #4: Input port 4 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

|         |               |           |        |               |                  |           |
|---------|---------------|-----------|--------|---------------|------------------|-----------|
| BNC #17 | Input port 17 | Direction | Input  | 3G ext. reach | Coarse amplitude | 800mV p-p |
| BNC #18 | Input port 18 | Direction | Output | 3G ext. reach | Coarse amplitude | 800mV p-p |
| BNC #19 | Input port 19 | Direction | Output | 3G ext. reach | Coarse amplitude | 800mV p-p |

- **Equalizers:** The BNC ports features a cable equalizer that can be fine-tuned here.
  - \* **3G ext reach:** Extends the cable length that the Belden standard allows for a 3G signal.
  - \* **Coarse amplitude:** The expected input voltage of the signal. Normally it should be 800mV.
- **Direction:** Changes the signal direction for this BNC port. Each port can individually be defined to be either an input or an output.

|        |                |         |         |                   |        |  |        |      |
|--------|----------------|---------|---------|-------------------|--------|--|--------|------|
| SFP #2 | R1PC           | Enabled | Prescan | 3G-SDI 1920x1080p | Result | 1920x1080/59.94 (1:1), 425M (3G Level A) 4:2:2 | Errors | none |
| SFP #3 | R1Ani player   | Enabled | Prescan | 3G-SDI 1920x1080p | Result | 1920x1080/59.94 (1:1), 425M (3G Level A) 4:2:2 | Errors | none |
| SFP #4 | R1Input port 4 | Enabled | Prescan | Result            | Errors |  |        |      |

- **Signal analyzer:** Internally in theBTF1-XX frames, there is a SDI deserializer chip that can provide diagnostic information. There is an internal timer that rotate which of the subscribed channels that are sent to the deserializer chip. It will provide information about video resolution detected, if it complies with the an SDI video standard and checking for signal faults like check-sum (CRC).

## Outputs

Configure the signal output ports.

Each output port represent one row in the table.



| Name   | Label         | Automatic Changeover | Port Reclocker | Port Cable Driver | Sync Source |
|--------|---------------|----------------------|----------------|-------------------|-------------|
| SFP #1 | Output port 1 | Enabled              | Rate: Auto     | Unlocked          | No sync     |
| SFP #2 | Output port 2 | Enabled              | Rate: Auto     | Unlocked          | No sync     |
| SFP #3 | Output port 3 | Enabled              | Rate: Auto     | Unlocked          | No sync     |
| SFP #4 | Output port 4 | Enabled              | Rate: Auto     | Unlocked          | No sync     |
| SFP #5 | Output port 5 | Enabled              | Rate: Auto     | Unlocked          | No sync     |

- **Name:** This name of the port is matching the silk print on the front of the BTF1-XX.
- **Label:** This name you may change as you may wish.
- **Groups:** If you want to have grouping of ports in the Matrix tab, you can prefix each label with the name of the group and add a \.



| Name   | Label          |
|--------|----------------|
| SFP #1 | R1DVD player   |
| SFP #2 | R1PC           |
| SFP #3 | R1Ani player   |
| SFP #4 | R1Input port 4 |



- **Port reclocker:** Each output port features a SDI re-clocker chip that can re-clock SD (270M), HD (1.5G) and 3G data rates. Each port can be forced to 'Bypassed', 'Power down' or leave at 'Auto'. In most circumstances, it is safe to leave this at Auto for non-SDI signals as well.

*Examples:*

*ASI: will be re-clocked as SD-SDI*

*SDTI: will be re-clocked as HD-SDI or 3G-SDI*

*Ethernet: will be automatically be bypassed*

- **Port Cable Driver:** The BNC ports features a port cable driver that can be fine-tuned here. For SFP ports, you can see if the SFP is inserted and the status of the TX disabled parameter.
  - \* **Speed:** Adjust the rise and fall time of the signal. For signals above SD (270M) data rate HD should be selected.
  - \* **Output swing:** The output voltage of the signal can be adjusted here. Normally it should be 800mV.
  - \* **Direction:** Changes the signal direction for this BNC port. Each port can be defined to be either an input or an output.
- **Sync Source:** You can select if a given output signal is going to have a reference or not. The reference is only used when changing the signal source for this given destination. If you have selected a source and it is not valid; the change will still happen, but will be delayed approx. 50ms before the change is forced.

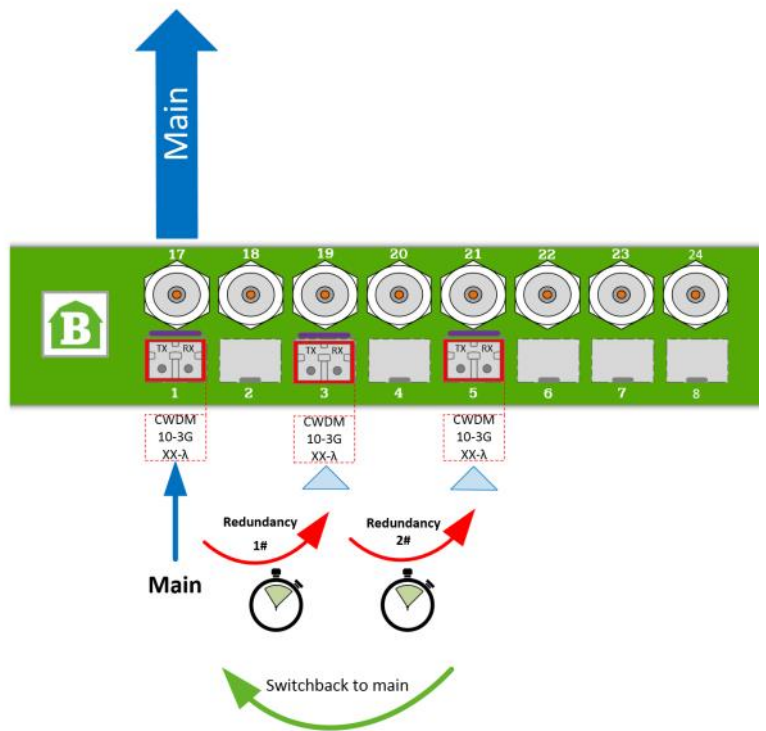
## Signal redundancy switch

As a great-added functionality of Barnfind’s latest release, an integrated signal redundancy switch can be configured to all the BarnOne’s outputs.

Regardless of signal format, bandwidth, optical or electrical; each individual output can be configured with “alternative” inputs, and they all run in parallel individuality.

The change-over function is activated by 3 different validations:

- *Signal LOS*
- *signal analyzer Lock (SDI only)*
- *signal analyzer errors (SDI only)*



Barnfind’s Redundancy Switch functionality gives the user full control of signal presence, quality and status. From being a simple converter/router/ distributor, the range of BarnOne frames have transformed to be a complex and advanced redundancy system. Even with this complexity, the redundancy functions can easily be configured and monitored in the new released BarnStudio web interface.



Press this button to access the redundancy configuration table.

**Operation Mode** - Enable/Disable the redundancy switch function for the selected output.

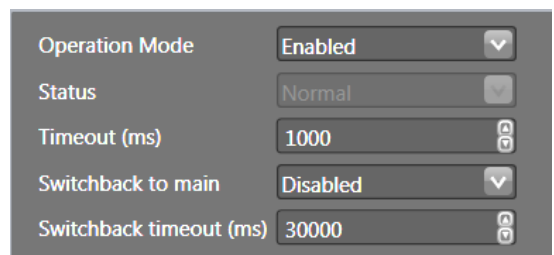
**Status** - Normal/Degraded

- Normal shows when output is connected to Main signal.
- Degraded shows when output is rerouted to one of the backup inputs.

**Timeout (ms)** - Select how many milliseconds before switch will activate.

**Switchback to main** - Enable/Disable a switchback to main signal if main recover.

**Switchback timeout (ms)** - Select how many milliseconds before switch back to main if it recover (to prevent from toggeling if main is unstable)





The list will display all inputs available in the BarnOne frame. Select if input should be **Main** or Backup.

Note, you can use multiple main or backup inputs. The priority is the input numer

| Operation Mode          | Enabled    |                          |                            |                              |
|-------------------------|------------|--------------------------|----------------------------|------------------------------|
| Status                  | Normal     |                          |                            |                              |
| Timeout (ms)            | 1000       |                          |                            |                              |
| Switchback to main      | Disabled   |                          |                            |                              |
| Switchback timeout (ms) | 30000      |                          |                            |                              |
| Name                    | Enabled    | Sensitive to LOS         | Sensitive to analyzer lock | Sensitive to analyzer errors |
| SFP #1: Input port 1    | Main       | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>     |
| SFP #2: Input port 2    | (not used) | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>     |
| SFP #3: Input port 3    | Backup     | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>     |
| SFP #4: Input port 4    | (not used) | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>     |
| SFP #5: Input port 5    | Backup     | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>     |
| SFP #6: Input port 6    | (not used) | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>     |
| SFP #7: Input port 7    | (not used) | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>     |
| SFP #8: Input port 8    | (not used) | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>     |
| SFP #9: Input port 9    | (not used) | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>     |
| SFP #10: Input port 10  | (not used) | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>     |
| SFP #11: Input port 11  | (not used) | <input type="checkbox"/> | <input type="checkbox"/>   | <input type="checkbox"/>     |

The change-over function is activated by 3 different validations:

- *Signal LOS*
- *SDI analyzer lock*
- *SDI analyzer errors*

|                              |   |  |
|------------------------------|---|--|
| No signal detected at input. | Signal analyzer does not verify the signal as a valid SDI signal. | Signal has too many errors (jitters) and will not be verified as a valid signal. |
|------------------------------|---|--|

Possible cause

|   |  |                        |
|---|--|------------------------|
| Broken fiber/coax cable. Signal source missing. | Signal source changed to «unknown» format, not SD, HD or 3G-SDI. | Poor cable/connectors. |
|---|--|------------------------|

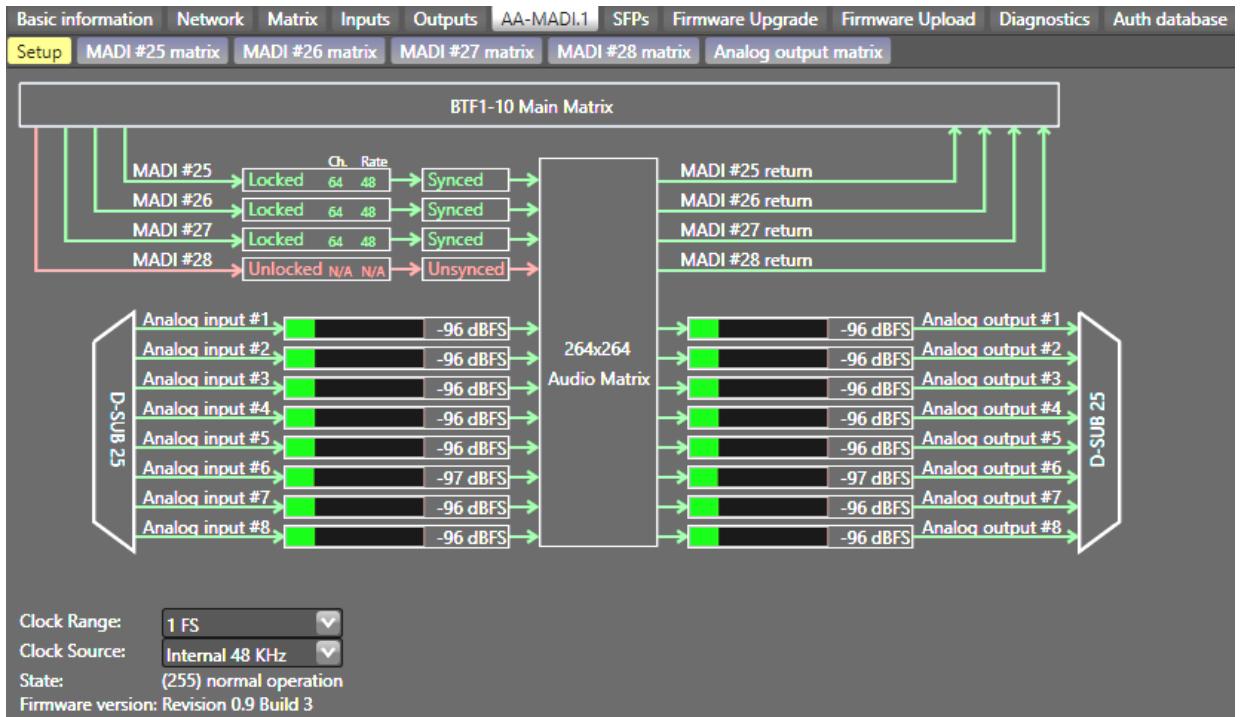
Note! The two functions *Sensitive to analyzer lock* and *Sensitive to analyzer errors* should not be used with other than SDI signals

## AA-MADI - MADI-Router with analog interfaces (only available for BTF1-10AA)

A 264x264 channel audio matrix interfaces to the main matrix with 4 bi-directional MADI connections and 8 balanced analog line level inputs and outputs. The board offers single channel routing for all 4 MADI streams and the 8 analog ports.

### Setup:

The *Setup* tab gives a quick overview of all incoming and outgoing signals. *MADI#25* to *MADI#28* are incoming MADI streams from the main matrix. *MADI#25 return* to *MADI#28 return* are MADI outputs from the audio matrix returning to the main matrix. Green, red or black lines indicate *valid*, *invalid* or *no signal*. The



channel count (56 or 64 channels per MADI) and the sampling rate as well as the sync status are indicated. The returning MADI stream should always be green, the board always generates valid MADI (AES10) signals at it's outputs.

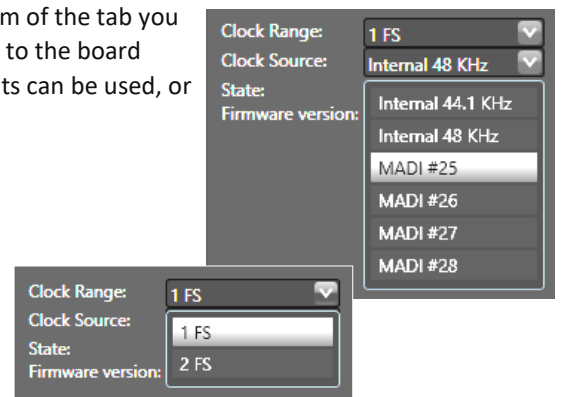
You will find a digital level meter for each single channel for analog input and output channels.

### Clock Setup

While the top part of the *Setup* tab is for monitoring purposes only, at the bottom of the tab you will find two drop down menus for clock setup. All MADI streams which connect to the board need to synchronise to the same clock. As a clock source any of the 4 MADI inputs can be used, or you can choose to clock the board internally.

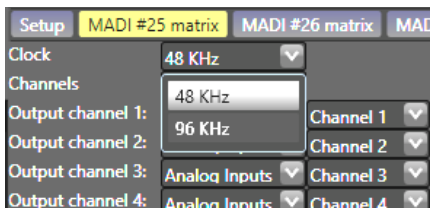
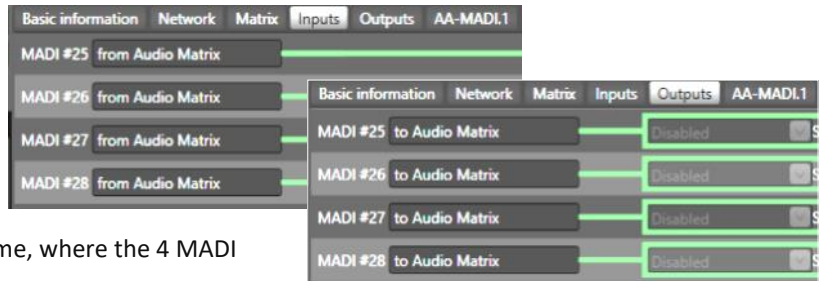
### Sampling Rates

Available sampling rates are 44.1kHz and 48kHz, 88.2kHz and 96kHz are supported by S/MUX. The scaling factor is selected by the drop down menu *Clock Range*, while the selection of the sampling rate for each MADI output is to be found in the tabs *MADI #25 matrix* to *MADI #28 matrix*.



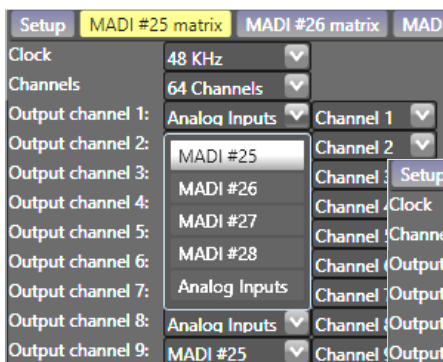
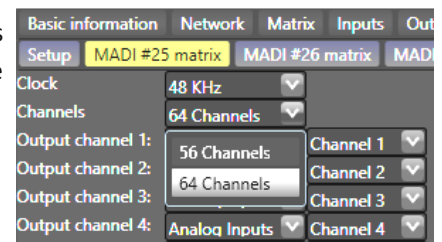
### Audio Routing:

For the 4 MADI interfaces connecting to the main matrix and the eight analog line level interfaces there is an output based routing matrix which is separated into 5 different tabs, one for each MADI output and one for the analog outputs. The unusual numeration of the MADI inputs and outputs (25-28) arises from the port numbers in the main matrix of the BTF1-10AA frame, where the 4 MADI ports have the fix port numbers 25-28.

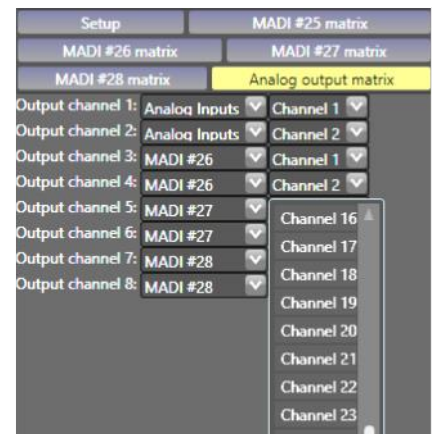
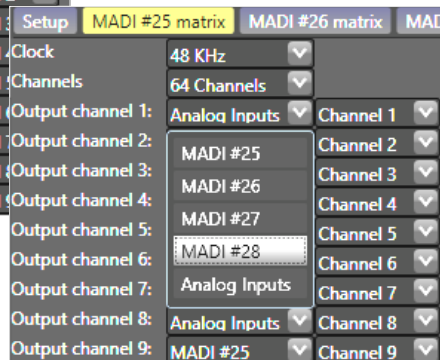


**Clock** selects the sampling rate for this particular MADI output, 48kHz or 96kHz

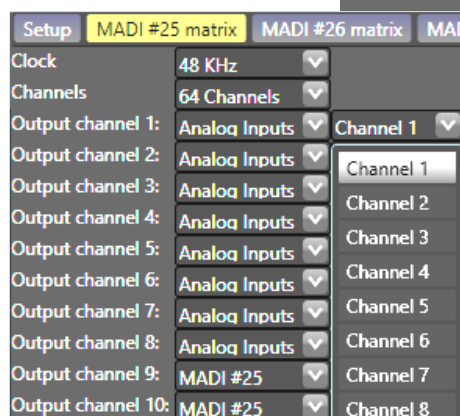
**Channels** selects whether the MADI is operating in 56 or 64 channel mode



For each single **Output channel** you can individually select the source (analog input or MADI#25 - #28)



After selecting the source for the output, you select one of the channels (1-64) of that source, which is routed to this particular output channel.



## SFPs

Monitor each SFP inside the BTF1-XX frame.

| Basic information |               |                  |              |                 |            |         |         |     |     |     |        |             | Network | Matrix | Inputs | Outputs | SFPs | Firmware Upgrade | Firmware Upload | Diagnostics | Auth database |
|-------------------|---------------|------------------|--------------|-----------------|------------|---------|---------|-----|-----|-----|--------|-------------|---------|--------|--------|---------|------|------------------|-----------------|-------------|---------------|
| PortName          | Vendor        | PartNumber       | SerialNumber | Production Date | WaveLength | Bitrate | SM      | OM1 | OM2 | OM3 | Copper | Connector   |         |        |        |         |      |                  |                 |             |               |
| SFP #1            | BarnFind Tech | BTSFP-LX-SM-3G02 | 607281240120 | 2016-8-8        | 1310       | 3 GHz   | 2000 m  | 0 m | 0 m | 0 m | 0 m    | LC          |         |        |        |         |      |                  |                 |             |               |
| SFP #2            | EMBRIONIX     | EB34TD1R-SM      | 114060300022 | 2015-5-7 CG     | 0          | 3 GHz   | 0 m     | 0 m | 0 m | 0 m | 4 m    | HDMI Type D |         |        |        |         |      |                  |                 |             |               |
| SFP #3            | EMBRIONIX     | EB34TD1R-SM      | 114060300017 | 2014-6-11 CG    | 0          | 3 GHz   | 0 m     | 0 m | 0 m | 0 m | 4 m    | HDMI Type D |         |        |        |         |      |                  |                 |             |               |
| SFP #4            |               |                  |              |                 | 0          | N/A     | 0 m     | 0 m | 0 m | 0 m | 0 m    |             |         |        |        |         |      |                  |                 |             |               |
| SFP #5            | BarnFind Tech | BT-CWDM-10-3G37  | 612131240115 | 2017-2-10       | 1370       | 3 GHz   | 10000 m | 0 m | 0 m | 0 m | 0 m    | LC          |         |        |        |         |      |                  |                 |             |               |
| SFP #6            | BarnFind Tech | BT-CWDM-10-3G38  | 702241240005 | 2017-3-15       | 1390       | 3 GHz   | 10000 m | 0 m | 0 m | 0 m | 0 m    | LC          |         |        |        |         |      |                  |                 |             |               |
| SFP #7            | BarnFind Tech | BT-CWDM-10-3G41  | 612131240172 | 2017-2-10       | 1410       | 3 GHz   | 10000 m | 0 m | 0 m | 0 m | 0 m    | LC          |         |        |        |         |      |                  |                 |             |               |
| SFP #8            | BarnFind Tech | BT-CWDM-10-3G43  | 612221240010 | 2017-2-7        | 1430       | 3 GHz   | 10000 m | 0 m | 0 m | 0 m | 0 m    | LC          |         |        |        |         |      |                  |                 |             |               |
| SFP #9            |               |                  |              |                 | 0          | N/A     | 0 m     | 0 m | 0 m | 0 m | 0 m    |             |         |        |        |         |      |                  |                 |             |               |
| SFP #10           |               |                  |              |                 | 0          | N/A     | 0 m     | 0 m | 0 m | 0 m | 0 m    |             |         |        |        |         |      |                  |                 |             |               |
| SFP #11           |               |                  |              |                 | 0          | N/A     | 0 m     | 0 m | 0 m | 0 m | 0 m    |             |         |        |        |         |      |                  |                 |             |               |
| SFP #12           |               |                  |              |                 | 0          | N/A     | 0 m     | 0 m | 0 m | 0 m | 0 m    |             |         |        |        |         |      |                  |                 |             |               |
| SFP #13           |               |                  |              |                 | 0          | N/A     | 0 m     | 0 m | 0 m | 0 m | 0 m    |             |         |        |        |         |      |                  |                 |             |               |
| SFP #14           |               |                  |              |                 | 0          | N/A     | 0 m     | 0 m | 0 m | 0 m | 0 m    |             |         |        |        |         |      |                  |                 |             |               |
| SFP #15           |               |                  |              |                 | 0          | N/A     | 0 m     | 0 m | 0 m | 0 m | 0 m    |             |         |        |        |         |      |                  |                 |             |               |
| SFP #16           | EMBRIONIX     | EB34TD1T-SM      | 115012900029 | 2015-2-2 CE     | 0          | 3 GHz   | 0 m     | 0 m | 0 m | 0 m | 3 m    | HDMI Type D |         |        |        |         |      |                  |                 |             |               |

**Port Name:** Name as given on the silk screen on the front of the BTF1-XX frame.

**Vendor:** The manufacturer brand for this SFP.

**Part Number:** the part number for this SFP.

**Serial Number:** The serial number for this SFP.

**Production Date:** The production date for this SFP.

**Wave Length:** This is the wave length of the TX (transmitter) if this is a fiber SFP if applicable. This is a good feature if you operate with CWDM or WDM (BiDi) SFPs.

**Bitrate:** The designed maximum bitrate for the SFP.

**SM:** The designed operation length for single-mode fiber.

**OM 1, OM 2 and OM 3:** The designed operation length for multi-mode fiber.

**Copper:** The designed operation length for copper cables.

**Connector:** Display the connector that the SFP has.

| Name         | Value                               |
|--------------|-------------------------------------|
| RX LOS       | <input checked="" type="checkbox"/> |
| RX Power dBm | -36,99 dBm                          |
| RX Power mW  | 0,0002 mW                           |
| Temperature  | 43 C                                |
| TX Bias      | 10,656 mA                           |
| TX Disable   | <input type="checkbox"/>            |
| TX Fault     | <input type="checkbox"/>            |
| TX Power     | 0,7063 mW                           |
| TX Power dBm | -1,51 dBm                           |
| Vcc          | 3,1344 V                            |

Depending on what SFP you have selected by clicking on any SFP in the overview, it will appear in the bottom table with more diagnostical information about that particular SFP.

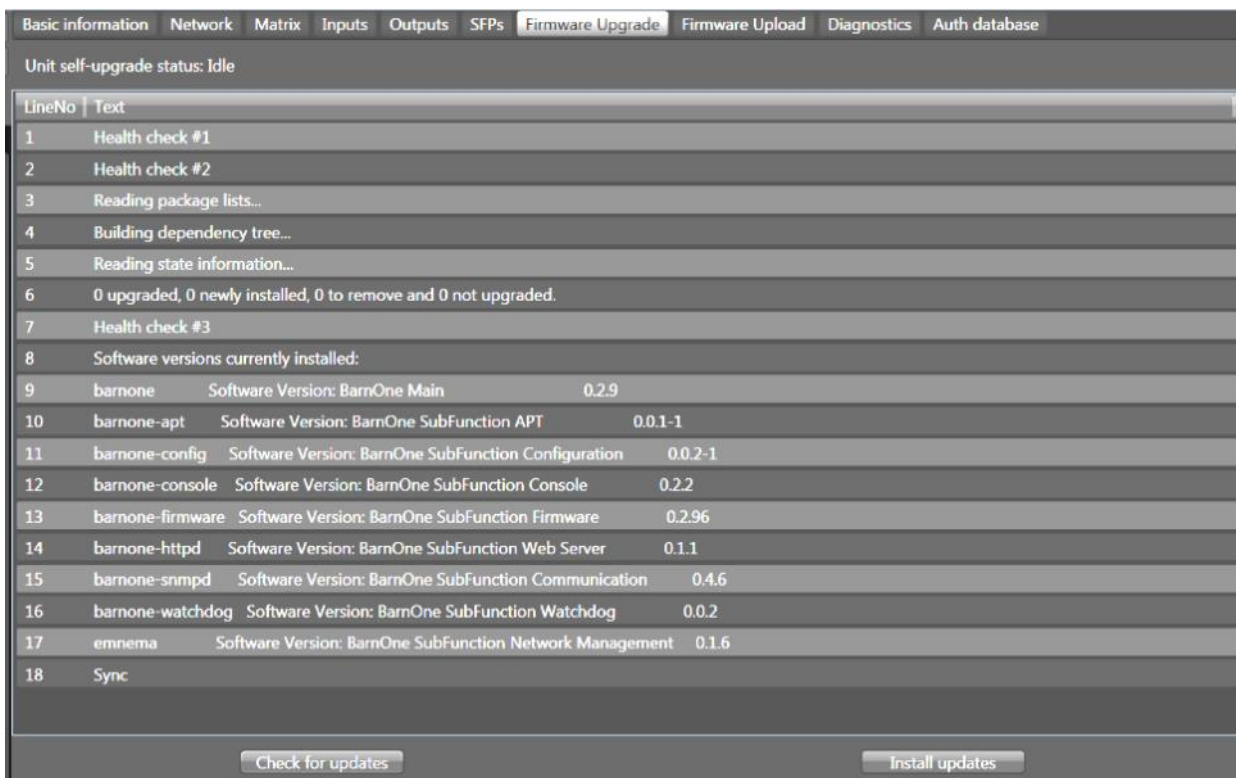
*Note1, this is an excellent tool to verify if the optical signal is within a valid range.*

*Note2, a value close to -40 dBm will appear (p.ex. -36,99dBm) if the optical signal is missing, or too high. Read the SFP data sheet to find the Rx overload limit (max power)*

| Name         | Value                               |
|--------------|-------------------------------------|
| RX LOS       | <input checked="" type="checkbox"/> |
| RX Power dBm | -36,99 dBm                          |
| RX Power mW  | 0,0002 mW                           |

## Firmware upgrade (online mode)

The purpose of this section is to see the versions of the firmware that is installed, check for new versions and to upgrade the firmware at your convenience. For this purpose the frame needs to connect to the internet.



Basic information Network Matrix Inputs Outputs SFPs **Firmware Upgrade** Firmware Upload Diagnostics Auth database

Unit self-upgrade status: Idle

| LineNo | Text   |
|--------|--|
| 1      | Health check #1  |
| 2      | Health check #2  |
| 3      | Reading package lists...   |
| 4      | Building dependency tree...  |
| 5      | Reading state information...   |
| 6      | 0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.             |
| 7      | Health check #3  |
| 8      | Software versions currently installed:                                     |
| 9      | barnone Software Version: BarnOne Main 0.2.9                               |
| 10     | barnone-apt Software Version: BarnOne SubFunction APT 0.0.1-1              |
| 11     | barnone-config Software Version: BarnOne SubFunction Configuration 0.0.2-1 |
| 12     | barnone-console Software Version: BarnOne SubFunction Console 0.2.2        |
| 13     | barnone-firmware Software Version: BarnOne SubFunction Firmware 0.2.96     |
| 14     | barnone-httpd Software Version: BarnOne SubFunction Web Server 0.1.1       |
| 15     | barnone-snmpd Software Version: BarnOne SubFunction Communication 0.4.6    |
| 16     | barnone-watchdog Software Version: BarnOne SubFunction Watchdog 0.0.2      |
| 17     | emnema Software Version: BarnOne SubFunction Network Management 0.1.6      |
| 18     | Sync   |

Check for updates Install updates

- **Check for Updates:** This button will trigger the frame BTF1-XX to connect to our server at Barnfind Technologies HQ in Norway and check for software updates. You can see the progress in the log and the status label.
- **Install Updates:** This button will trigger the frame BTF1-XX to download from Barnfind Technologies HQ in Norway and install the newest software updates. You can see the progress in the log and the status label.

## Firmware upload (offline mode)




Instead of connecting the frame via the internet to Barnfind's server, you can download the latest firmware from the Support/Download section at our website <https://www.barnfind.no/downloads/>

The screenshot shows a web interface with a navigation bar containing: Basic information, Network, Matrix, Inputs, Outputs, SFPs, Firmware Upgrade, **Firmware Upload**, Diagnostics, and Auth database. The main content area displays the following text:

```
Current upload status: Idle
Last upload execute log:
Removing 'diversion of /boot/overlays/spi0-hw-cs.dtbo to /usr/share/rpikernelhack/overlays/spi0-hw-cs.dtbo by rpikernelhack'
Removing 'diversion of /boot/overlays/spi1-1cs.dtbo to /usr/share/rpikernelhack/overlays/spi1-1cs.dtbo by rpikernelhack'
Removing 'diversion of /boot/overlays/spi1-2cs.dtbo to /usr/share/rpikernelhack/overlays/spi1-2cs.dtbo by rpikernelhack'
Removing 'diversion of /boot/overlays/spi1-3cs.dtbo to /usr/share/rpikernelhack/overlays/spi1-3cs.dtbo by rpikernelhack'
Removing 'diversion of /boot/overlays/spi2-1cs.dtbo to /usr/share/rpikernelhack/overlays/spi2-1cs.dtbo by rpikernelhack'
Removing 'diversion of /boot/overlays/spi2-2cs.dtbo to /usr/share/rpikernelhack/overlays/spi2-2cs.dtbo by rpikernelhack'
Removing 'diversion of /boot/overlays/spi2-3cs.dtbo to /usr/share/rpikernelhack/overlays/spi2-3cs.dtbo by rpikernelhack'
Removing 'diversion of /boot/overlays/tinylcd35.dtbo to /usr/share/rpikernelhack/overlays/tinylcd35.dtbo by rpikernelhack'
Removing 'diversion of /boot/overlays/uart1.dtbo to /usr/share/rpikernelhack/overlays/uart1.dtbo by rpikernelhack'
Removing 'diversion of /boot/overlays/vc4-fkms-v3d.dtbo to /usr/share/rpikernelhack/overlays/vc4-fkms-v3d.dtbo by rpikernelhack'
Removing 'diversion of /boot/overlays/vc4-kms-v3d.dtbo to /usr/share/rpikernelhack/overlays/vc4-kms-v3d.dtbo by rpikernelhack'
Removing 'diversion of /boot/overlays/vga666.dtbo to /usr/share/rpikernelhack/overlays/vga666.dtbo by rpikernelhack'
Removing 'diversion of /boot/overlays/w1-gpio-pullup.dtbo to /usr/share/rpikernelhack/overlays/w1-gpio-pullup.dtbo by rpikernelhack'
Removing 'diversion of /boot/overlays/w1-gpio.dtbo to /usr/share/rpikernelhack/overlays/w1-gpio.dtbo by rpikernelhack'
Removing 'diversion of /boot/overlays/wittypi.dtbo to /usr/share/rpikernelhack/overlays/wittypi.dtbo by rpikernelhack'
Processing triggers for ca-certificates ...
Updating certificates in /etc/ssl/certs... 171 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...done.
Complete

Upload file progress log:
Initiating upload of Z:\Dokumente\Arbeit\Barnfind\Software\firmware-2017-06-14-0.2.11\autorun.gpg
Sent 58045257 of 58045257 bytes
Waiting for last ACK
Complete
```

At the bottom of the interface, there are two buttons: "Upload file" and "Cancel upload".

|  |                  |
|--|------------------|
|  autorun.gpg                  | 14.06.2017 13:36 |
|  barnone-passwordreset-0.2.11 | 14.06.2017 13:44 |
|  README                       | 14.06.2017 13:44 |

«autorun.gpg» contains the firmware and has to be selected for upload to the frame

«barnone-passwordreset.zip» contains another autorun.gpg file, that can reset the password of the frame in case you lost/forgot the password.

## Firmware upgrade with USB stick (offline mode)

After downloading the firmware upgrade package from our website <http://www.barnfind.no/downloads/> extract the `autorun.gpg` from the .zip file and copy this file onto a USB flash storage device (see Firmware Upload, you use the same file). This file must be named "autorun.gpg" (lower case).

To monitor the upgrade process, you can connect a HDMI display to the HDMI output at the rear of the BarnOne device and a keyboard to one of the USB ports (this is not essential for the upgrade process). If screen is blank, press any key to wake the display up from sleep. Insert the USB flash storage containing "autorun.gpg" into a USB port on the BarnOne device. In the next 10-20 seconds, the BarnOne device will copy the `autorun.gpg` and verify its content against a cryptographical key. If this goes ok, the software upgrade will start.

The LED lights will start to blink in a special pattern to show that it is performing the software upgrade. The USB flash storage should now be removed. If the USB flash storage is present after software upgrade is complete, the BarnOne device might start to copy the `autorun.gpg` file and perform the software upgrade again. When the LED lights stop blinking, the software upgrade is complete and device will return to normal operation.

*It is estimated that the software upgrade normally takes about 5 minutes if all of the software components are to be upgraded.*



USB for upgrade



## Diagnostics

The purpose of this section is to see the generic health and diagnostics of the BTF1-XX frame. Each individual diagnostic entry is represented with a line in the table.

| Basic information  |  |  | Network |  |  | Matrix |  |  | Inputs |  |  | Outputs  |  |  | SFPs                                |  |  | Firmware Upgrade |  |  | Firmware Upload |  |  | Diagnostics |  |  | Auth database |  |  |
|--|--|--|---------|--|--|--------|--|--|--------|--|--|----------|--|--|-------------------------------------|--|--|------------------|--|--|-----------------|--|--|-------------|--|--|---------------|--|--|
| Name   |  |  |         |  |  |        |  |  |        |  |  | Value    |  |  | Send to frontpanel LED              |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| Analog reference sync  |  |  |         |  |  |        |  |  |        |  |  | 0 FPS    |  |  | <input type="checkbox"/>            |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, left topboard BNC, U31: Reclocker port 01-04 PLL unlocked       |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, left topboard BNC, U31: Reclocker port 01-04 Reference missing  |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, left topboard BNC, U32: Reclocker port 05-08 PLL unlocked       |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, left topboard BNC, U32: Reclocker port 05-08 Reference missing  |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, mainboard, U30: Reclocker port 01-04 PLL unlocked               |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, mainboard, U30: Reclocker port 01-04 Reference missing          |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, mainboard, U31: Reclocker port 05-08 PLL unlocked               |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, mainboard, U31: Reclocker port 05-08 Reference missing          |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, mainboard, U33: Reclocker port 09-12 PLL unlocked               |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, mainboard, U33: Reclocker port 09-12 Reference missing          |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, mainboard, U34: Reclocker port 13-16 PLL unlocked               |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input type="checkbox"/>            |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, mainboard, U34: Reclocker port 13-16 Reference missing          |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, right topboard BNC, U31: Reclocker port 01-04 PLL unlocked      |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, right topboard BNC, U31: Reclocker port 01-04 Reference missing |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, right topboard BNC, U32: Reclocker port 05-08 PLL unlocked      |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| BIT, right topboard BNC, U32: Reclocker port 05-08 Reference missing |  |  |         |  |  |        |  |  |        |  |  | 0 / 1    |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| Cabinet fan #1   |  |  |         |  |  |        |  |  |        |  |  | 7741 RPM |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| Cabinet fan #2   |  |  |         |  |  |        |  |  |        |  |  | 7619 RPM |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| Cabinet fan #3   |  |  |         |  |  |        |  |  |        |  |  | 7868 RPM |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| Cabinet fan #4   |  |  |         |  |  |        |  |  |        |  |  | 7868 RPM |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| Fan controller temperature #1  |  |  |         |  |  |        |  |  |        |  |  | 40 C     |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| Fan controller temperature #2  |  |  |         |  |  |        |  |  |        |  |  | 39 C     |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| MCU temperature  |  |  |         |  |  |        |  |  |        |  |  | 25 C     |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| Power-1 input voltage  |  |  |         |  |  |        |  |  |        |  |  | 0 V      |  |  | <input type="checkbox"/>            |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |
| Power-2 input voltage  |  |  |         |  |  |        |  |  |        |  |  | 12,2 V   |  |  | <input checked="" type="checkbox"/> |  |  |                  |  |  |                 |  |  |             |  |  |               |  |  |

- A yellow frame will appear when the value is above the **warning** threshold.
- A red frame will appear when the value is above the **error** threshold.

|                       |        |                                     |
|-----------------------|--------|-------------------------------------|
| Power-1 input voltage | 0 V    | <input type="checkbox"/>            |
| Power-2 input voltage | 12,2 V | <input checked="" type="checkbox"/> |

**Send to front panel LED :** If this is checked; a warning or an error will activate the blue alarm-LED on the front of the BTF1-XX to flash.



## Authentication Database

User Right Management with three different user levels for future usage...

| Basic information |  |          |  |  |  | Network         |  |  |  |               |  | Matrix      |  |  |  |  |  | Inputs        |  |  |  |  |  | Outputs |  |  |  |  |  | SFPs |  |  |  |  |  |
|-------------------|--|----------|--|--|--|-----------------|--|--|--|---------------|--|-------------|--|--|--|--|--|---------------|--|--|--|--|--|---------|--|--|--|--|--|------|--|--|--|--|--|
| Firmware Upgrade  |  |          |  |  |  | Firmware Upload |  |  |  |               |  | Diagnostics |  |  |  |  |  | Auth database |  |  |  |  |  |         |  |  |  |  |  |      |  |  |  |  |  |
| Id                |  | Username |  |  |  | Real name       |  |  |  | AccessLevel   |  |             |  |  |  |  |  |               |  |  |  |  |  |         |  |  |  |  |  |      |  |  |  |  |  |
| 1                 |  | admin    |  |  |  |                 |  |  |  | Administrator |  |             |  |  |  |  |  |               |  |  |  |  |  |         |  |  |  |  |  |      |  |  |  |  |  |
| 2                 |  | per      |  |  |  |                 |  |  |  | Guest         |  |             |  |  |  |  |  |               |  |  |  |  |  |         |  |  |  |  |  |      |  |  |  |  |  |
| 3                 |  | stian    |  |  |  |                 |  |  |  | Guest         |  |             |  |  |  |  |  |               |  |  |  |  |  |         |  |  |  |  |  |      |  |  |  |  |  |
| 4                 |  | arild    |  |  |  |                 |  |  |  | Guest         |  |             |  |  |  |  |  |               |  |  |  |  |  |         |  |  |  |  |  |      |  |  |  |  |  |

## BarnMini-05

BarnMini-05 is the only software controlled device in the BarnMini product line. It supports TSL Tally and TSL UMD protocols and can be used to transport GPIO and RS422/RS485 control signals over fiber. It converts 1x RS422/RS485 and up to 4x GPI and up to 4x GPO to Ethernet. This Ethernet signal is available at the SFP port. The same SFP port is used for configuration of BarnMini-05. You need BTSFP-GBase-CU to connect BarnMini-05 to a Ethernet switch or directly to your PC. Once configured you can use any optical SFP in the slot to send the signals over fiber, or you can use the electrical SFP to connect BarnMini-05 to an Ethernet switch and cascade several BarnMini-05 devices to rise the channel count of GPIO or RS422/RS485 signals.

To connect to BarnMini-05 please follow the steps described in following pages. It will appear as a device in the device list of BarnStudio.

**Basic information** | Network | Serial UART | GPIO | UMD v4.0 Server | UMD V4.0 Clients | TSL Tally Server | TSL Tally Clients | Firmware Upload

Model: BARNMINI-05  
 SerialNumber:  
 NetworkID: D8-80-39-57-79-96  
 Firmware Version: 1.2.3

sysName: BarnMini-05  
 This is the designated name of this device as it appears in the browser.

sysLocation: BarnMini-05  
 This is the location of the device. Here you can type in the site where the device is rack-address.

sysContact: BarnMini-05  
 Who is

**Configuration** | Log

**Network Status**

IPConfig: 192.168.0.127/24 st /etc/resolv.conf:  
 fe80::da80:39ff:fe57:7996/64 st

Route: via 192.168.0.1 dev st  
 dst 192.168.0.0/24 dev st  
 dst fe80::/64 dev st

**Network Configuration**

**IPv4 configuration mode**

- DHCP/BOOTP
- Disabled
- LinkLocal (169.254.0.0/16)
- Static

**IPv6 configuration mode**

- LinkLocal + StateLess (Router Advertisement)
- LinkLocal + StateFull (DHCPv6)
- LinkLocal only
- LinkLocal + Static

**IPv4 static configuration**

IP addresses:   
 Default Gateway:   
 DNS servers:   
 DNS searches:

**IPv6 static configuration**

IP addresses:   
 Default Gateway:   
 DNS servers:   
 DNS searches:

Initiate download  
 Issuing a download from the device using the native driver  
 Downloaded network configuration successfully from the device



## Serial Control Data Settings

On the tab «Serial UART» you find all settings for the transport of RS422 or RS485 serial control data. Please check the manual of the device you want to control for *Baudrate*, *Parity*, *Stop Bits* and *Operation Mode*.

If you connect 2 BarnMini-05 units to transport serial control data, select one device to act as server and the other one to be the client. It does not matter which unit is the server and which one is the client. The client will connect to the server once you entered the server's IP address in the field *Host*.

The standard port is 2167

## GPIO Transport

The GPIO tab shows the status of the GPI and GPO ports.

You can manually switch the GPOs. If the GPOs are remotely controlled by a client, they will switch back to the status which is pushed by the client. If no client is pushing data to the BarnMini-05 GPO host, you can manually switch the GPOs with BarnStudio.

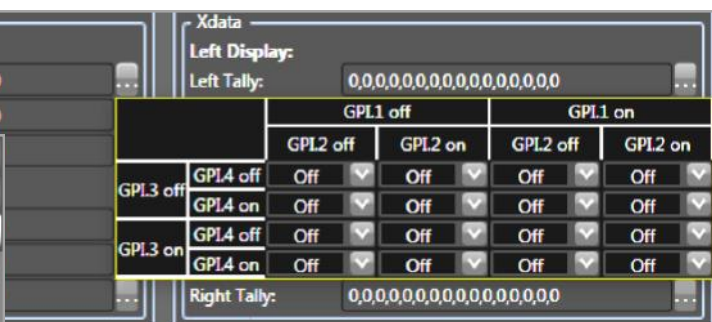
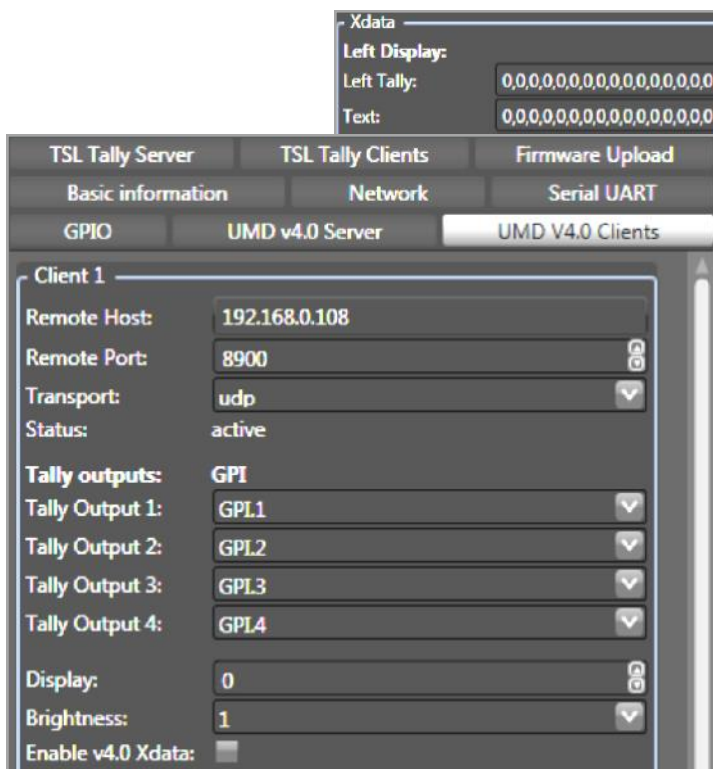
You can select, if the LEDs placed beside the RJ45 connectors show the status of GPIs or GPOs.

To transport GPI signals from one BarnMini-05 to GPO ports of another BarnMini-05 you can use TSL Tally protocol or TSL UMD protocol:

### GPIO via TSL UMD protocol

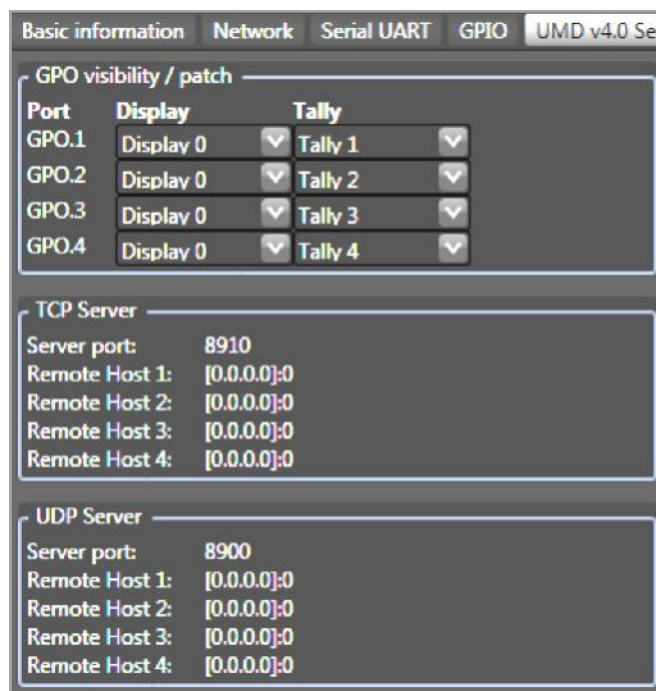
Select the tab *UMD v4.0 Clients* on the BarnMini-05 unit which receives the GPI signals at the RJ45 connector. You can configure 4 different clients, to push data to 4 different host/servers.

Enter the IP address of the BarnMini-05 unit which outputs the GPO signals at the RJ45 connector under *Remote Host*. You can select the transport protocol UDP or TCP. For UDP the standard port is 8900, for TCP it is port 8910. Now select which GPI signal from the RJ45 connector will be pushed to the network as *Tally Output1* to *Tally Output4*. The *Tally Outputs* can be assigned to a display number from 0-126 and the brightness can be set to values 0, 1/7, 1/2 and 1.



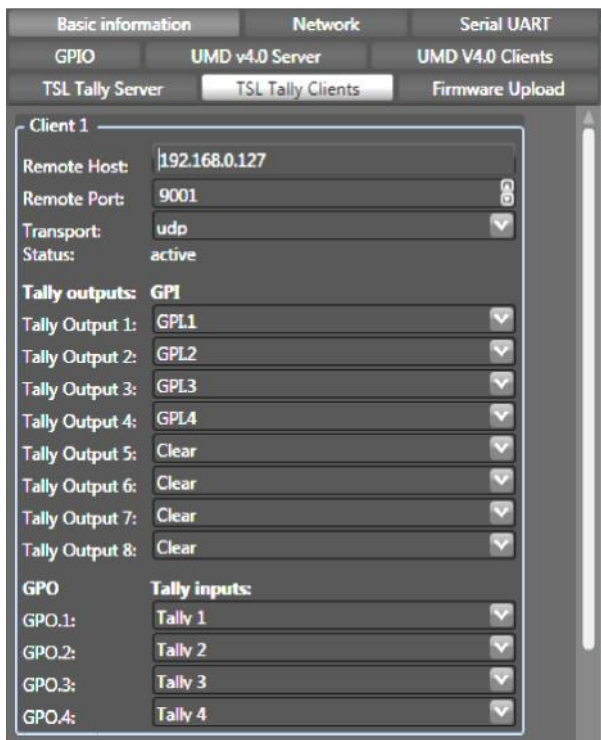
For the transport of just 4 GPI signals it is not necessary to assign the *Tally Outputs* to a *Display*, But if you run several BarnMini-05 units in the same network this is a very powerful tool. All TSL users will be familiar with the usage of Tally and Display numbers.

By enabling the *XData* check box it is possible to control the colours of Tallies and text in Under Monitor Displays.



To configure the output ports or the GPOs, select the *UMD v4.0 Server* tab of the BarnMini-05 unit which shall output the GPOs. Under *TCP Server* or *UDP Server* you can see the active client which is pushing Tally signals to this server/host. Select the *Display No.* and *Tally No.* for each GPO port.

BarnMini-05 can be configured to receive Tally signals from 8 different clients at the same time. 4 of the clients will have to use TCP protocol, the 4 other clients should use UDP protocol. You as a user can now play Ping Pong with the GPO outputs.



### GPIO via TSL Tally protocol

An easier way to configure GPI transport is via TSL Tally protocol.

Select one BarnMini-05 of a pair to be the client. Enter the IP address of the BarnMini-05 unit which you want to push the GPI to under *Remote Host*. The standard port for the transport via UDP protocol is 9001, for the transport via TCP is 8001. Once you entered the IP and the host/server is available on the network, the status will show «active»

Now you can select which GPI signal 1-4 from the RJ45 connectors is pushed to the network as *Tally Output 1-8*. Below you select which GPO port at the RJ45 connectors outputs which of the *Tallies 1-8*.



The tab *TSL Tally Server* shows you the connected TSL Tally clients and which protocol is used (UDP or TCP).

Select the *Tally Output 1-8* and assign it to the physical *GPO 1-4* at the RJ45 connector.

For each *Tally Input 1-8* which are pushed to the network you can select a physical input port *GPI 1-4*. It is possible to assign one physical *GPI* ports to several *Tally* channels

## Automatically trigger a change over switch (e.g. BarnMini-06)

You can configure BarnMini-05 to automatically trigger e.g. a BarnMini-06 to change over to the redundant fiber strand by GPO.

On the tab *Ping Clients* enter the IP address of any device which is physically located at the other end of the fiber but connected to the same network as Barnmini-05 into thne field *Remote Host*. BarnMini-05 immediately starts to ping the host and tells the *Status*, *Average Response Time* and *Error Count*.

Choose which GPO port you want to react to a loss of the remote host and how to react:

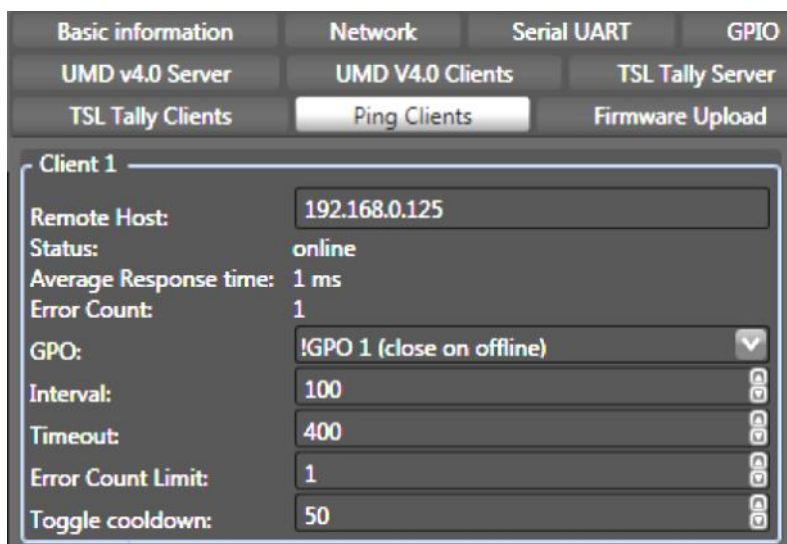
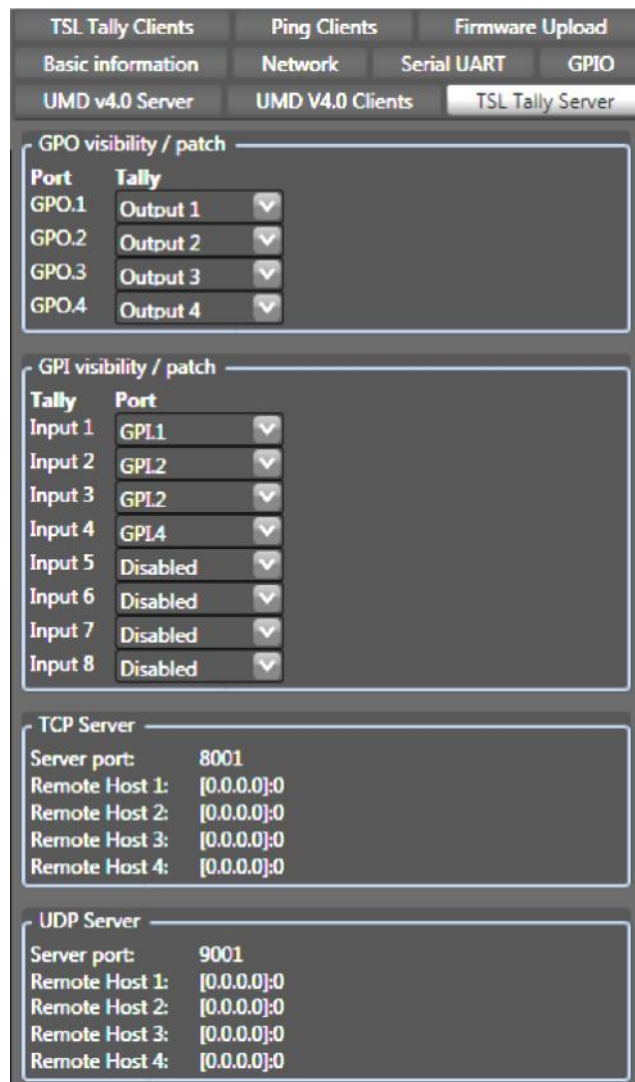
- *close on online*
- *close on offline*
- *toggle while offline detected*

Select the *Interval* between each ping (50-2000ms)

Select the *Timeout* for each ping (min. 5ms; max 4xvalue of *Interval*)

Select the *Error Count Limit* before *Status* is detected as *offline*

*Toggle cooldown*: If GPO is set to *toggle*, how long to wait in ms if the host went offline before the detection logic restarts. This is to avoid the relay to bounce fast if offline status is detected (min 50ms; max. 60000ms).



## Web User Interface

To give users access to single BarnOne frames in a bigger system without having to install BarnStudio on their PC, or for users who do not run Windows, you can manage all fuctions available in BarnStudio by a web server running on each BarnOne frame.

The work station which needs to connect to a BarnOne frame has to be configured to run in the same network as the BarnOne frame, and you need to know the IP address of the frame to connect.

With a **Username** and **Password** you can enter the frame.

- Default User: *admin*
- Default Password: (no password)

The screenshot displays the web user interface for a BarnOne frame. At the top, a browser window shows the URL 192.168.97.182. The main interface features a navigation menu with tabs for Basic information, Network, Inputs, Outputs, SFPS, Firmware Upgrade, Firmware Upload, and Diagnostics. A login form is visible with fields for Username (admin) and Password, and a Login button. Below the login form, the 'Basic information' tab is active, showing details for Model (BTF1-07-16), SerialNumber (ser12735), and NetworkID. The 'Configuration' tab is also visible, showing 'Current network status' with IP and route configurations, and 'Current network configuration file' with IPv4 and IPv6 settings. The IPv4 configuration includes operation mode (Static selected) and static configuration (IP addresses, Gateway, DNS servers, and DNS searches). The IPv6 configuration includes operation mode (LinkLocal + StateLess selected) and static configuration (IP addresses, Gateway, DNS servers, and DNS searches). Buttons for 'Submit changes' and 'Refresh page' are present at the bottom of the configuration section.

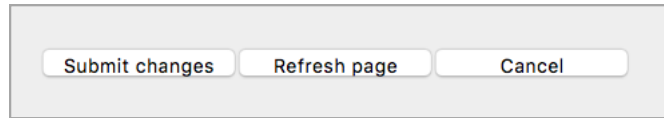
The Web UI offers the same fuctionality as BarnStudio.

This chapter only describes the differences between BarnStudio and the Web UI.

## Submit Changes

There is no Take List to confirm the changes. Instead you can find 3 buttons at the bottom of each page:

- Submit changes
- Refresh page
- Cancel



## Input/Output Ports

Selecting the Input or Output tab will show an overview of the ports. You can monitor the signal analyzer etc.

| Port name | Label         | Equalizer   | Signal analyzer   |
|-----------|---------------|---|---|
| SFP #1:   | Input port 1  | Enabled:  | Prescan: Result: Errors:                                      |
| SFP #2:   | Input port 2  | Enabled:  | Prescan: Result: Errors:                                      |
| SFP #3:   | Input port 3  |   |   |
| SFP #4:   | Input port 4  |   |   |
| SFP #5:   | Input port 5  |   |   |
| SFP #6:   | Input port 6  |   |   |
| SFP #7:   | Input port 7  |   |   |
| SFP #8:   | Input port 8  |   |   |
| SFP #9:   | Input port 9  |   |   |
| SFP #10:  | Input port 10 |   |   |
| SFP #11:  | Input port 11 |   |   |
| SFP #12:  | Input port 12 |   |   |
| SFP #13:  | Input port 13 |   |   |
| SFP #14:  | Input port 14 |   |   |
| SFP #15:  | Input port 15 |   |   |
| SFP #16:  | Input port 16 |   |   |
| BNC #17:  | Input port 17 | Direction: Output 3G ext. reach Coarse amplitude: 800mV p-p | Enabled: Prescan: Result: Errors:                             |
| BNC #18:  | Input port 18 | Direction: Output 3G ext. reach Coarse amplitude: 800mV p-p | Enabled: Prescan: Result: Errors:                             |
| BNC #19:  | Input port 19 | Direction: Output 3G ext. reach Coarse amplitude: 800mV p-p | Enabled: Prescan: Result: Errors:                             |
| BNC #20:  | Input port 20 | Direction: Output 3G ext. reach Coarse amplitude: 800mV p-p | Enabled: Prescan: Result: Errors:                             |
| BNC #21:  | Input port 21 | Direction: Input 3G ext. reach Coarse amplitude: 800mV p-p  | Enabled: Prescan: Result: Errors:                             |
| BNC #22:  | Input port 22 | Direction: Input 3G ext. reach Coarse amplitude: 800mV p-p  | Enabled: Prescan: Unknown Result: Unknown HD Errors: NOSIGNAL |
| BNC #23:  | Input port 24 | Direction: Input 3G ext. reach Coarse amplitude: 800mV p-p  | Enabled: Prescan: Unknown Result: Unknown HD Errors: NOSIGNAL |
| BNC #24:  | Input port 25 | Direction: Input 3G ext. reach Coarse amplitude: 800mV p-p  | Enabled: Prescan: Unknown Result: Unknown HD Errors: NOSIGNAL |
| BNC #25:  | Input port 25 | Direction: Input 3G ext. reach Coarse amplitude: 800mV p-p  | Enabled: Prescan: Unknown Result: Unknown HD Errors: NOSIGNAL |

To perform changes in the settings of the port, select the link of the port number which will lead you to an extra page.



Basic information | Network | **Inputs** | Outputs | SFPS | Firmware Upgrade | Firmware Upload | Diagnostics

[Prev .. Port SFP #3: .. Next](#)

| Port name | Label  | Equalizer | Signal analyzer   |
|-----------|--|-----------|---|
| SFP #3:   | <input type="text" value="Chance port label"/> |           | Enabled: <input checked="" type="checkbox"/> Prescan: Unknown Result: Unknown HD Errors: NOSIGNAL |

Select your changes, scroll down to the bottom of the page and confirm the changes. By selecting «Prev.» or «Next» you can navigate directly to the previous or next port without going back to the Input/Output page.

## Routing

Barnfind's Web UI does not have the «Matrix» tab which you are used to from Barnstudio. To change a cross point select the link of the port number in the Outputs Port settings by selecting the input from a drop down list and confirm the change.

Basic information Network Inputs Outputs SFPs Firmware Upgrade Firmware Upload Diagnostics

Prev .. Port SFP #3: .. Next

| Port name   | Signal source                             | Redundancy switch        | Switcher sync            |
|---|---|--------------------------|--------------------------|
| Operation mode: <input type="button" value="Enabled"/>      |   |                          |                          |
| Status: <input type="button" value="Normal"/>               |   |                          |                          |
| Timeout (ms): <input type="text" value="1000"/>             |   |                          |                          |
| Switchback to main: <input type="button" value="Disabled"/> |   |                          |                          |
| Switchback timeout (ms) <input type="text" value="30000"/>  |   |                          |                          |
| Active inputs   |   | Sensitive to             |                          |
|   |   | LOS                      | Analyzer lock            |
| SFP #1 - Input port 1                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #2 - Input port 2                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #3 - Input port 3                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #4 - Input port 4                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #5 - Input port 5                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #6 - Input port 6                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #7 - Input port 7                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #8 - Input port 8                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #9 - Input port 9                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #10 - Input port 10                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #11 - Input port 11                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #12 - Input port 12                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #13 - Input port 13                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #14 - Input port 14                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #15 - Input port 15                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #16 - Input port 16                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| BNC #17 - Input port 17                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| BNC #18 - Input port 18                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| BNC #19 - Input port 19                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| BNC #20 - Input port 20                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| BNC #21 - Input port 21                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| BNC #22 - Input port 22                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| BNC #23 - Input port 23                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| BNC #24 - Input port 24                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| BNC #25 - Input port 25                                     | <input type="button" value="(not used)"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SFP #3:

Basic information Network Inputs Outputs SFPs Firmware Upgrade Firmware Upload Diagnostics

Prev .. Port SFP #3: .. Next

| Port name   | Signal source                             | Redundancy switch        |
|---|---|--------------------------|
| Operation mode: <input type="button" value="Disabled"/>     |   |                          |
| Status: <input type="button" value="Enabled"/>              |   |                          |
| Timeout (ms): <input type="text" value="1000"/>             |   |                          |
| Switchback to main: <input type="button" value="Disabled"/> |   |                          |
| Switchback timeout (ms) <input type="text" value="30000"/>  |   |                          |
| Active inputs   |   | Sensitive to             |
|   |   | LOS                      |
| SFP #1 - Input port 1                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #2 - Input port 2                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #3 - Input port 3                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #4 - Input port 4                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #5 - Input port 5                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #6 - Input port 6                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #7 - Input port 7                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #8 - Input port 8                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #9 - Input port 9                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |

SFP #3:

## Redundancy Change Over

As well to be found under the Output port settings is the Redundancy Change Over, which is described in detail under BarnStudio.

Basic information Network Inputs Outputs SFPs Firmware Upgrade Firmware Upload Diagnostics

Prev .. Port SFP #3: .. Next

| Port name   | Signal source                             | Redundancy switch        |
|---|---|--------------------------|
| Operation mode: <input type="button" value="Disabled"/>     |   |                          |
| Status: <input type="button" value="Enabled"/>              |   |                          |
| Timeout (ms): <input type="text" value="1000"/>             |   |                          |
| Switchback to main: <input type="button" value="Disabled"/> |   |                          |
| Switchback timeout (ms) <input type="text" value="30000"/>  |   |                          |
| Active inputs   |   | Sensitive to             |
|   |   | LOS                      |
| SFP #1 - Input port 1                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #2 - Input port 2                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #3 - Input port 3                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #4 - Input port 4                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #5 - Input port 5                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #6 - Input port 6                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #7 - Input port 7                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #8 - Input port 8                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |
| SFP #9 - Input port 9                                       | <input type="button" value="(not used)"/> | <input type="checkbox"/> |

SFP #3:



## 3rd party control for BarnOne

### Telnet

External control of BarnOne frames and BarnMini-05 can be realised by Telnet protocol. A detailed description can be found in the download section of the Barnfind website.

<https://media.barnfind.no/BTF1%20Telnet%20Documentation%20revision%201.0.pdf>

### SNMP

BarnStudio and some few 3<sup>rd</sup> party integrators can connect to BTF1-XX frames using the SNMP protocol. This is a binary protocol that uses external meta information (MIB) to map parameters to human readable names. This meta information (MIB) can be downloaded from the download section on our website (together with documentation and command line examples if using the net-snmp software, a command line based SNMP tool). SNMP gives you full access to all parameters. For read-only access the community name “public” can be used. For read/write access the community name “private” must be used.

<https://media.barnfind.no/20171201%20Barnfind%20MIB.zip>

### SW-P-08

SW-P-08 is an old versatile protocol that gives you access to only configure and view the status of the matrix, and also gives direct feedback about matrix changes. This protocol is very commonly used by panels and 3<sup>rd</sup> party control software due to its relative simple design and widely spread device support range. The specification must be retrieved from Snell Advanced Media. The BTF1-XX frames listen for SW-P-08 connections on TCP port 1096. The support was added in firmware version 0.1.7.

### BlackMagic VideoHub

BlackMagic VideoHub is an open protocol used by BlackMagic products documented in the “BlackMagic Videohub SDK”. The protocol is text based with new lines made by using the \n character only. BTF1-XX implementation allows 3<sup>rd</sup> party to control the matrix component only, and makes it possible to control the router using “BlackMagic Smart Control” panel and “BlackMagic VideoHub” software. The BTF1-XX frames listens for connection on TCP port 9990. The support was added in firmware version 0.2.4.

### Ember+

The latest implementation of 3rd party control protocols is Ember+, enabling full control functionality and seamless integration into existing environment with SFP readout, redundancy change over etc. for control systems mentioned below.

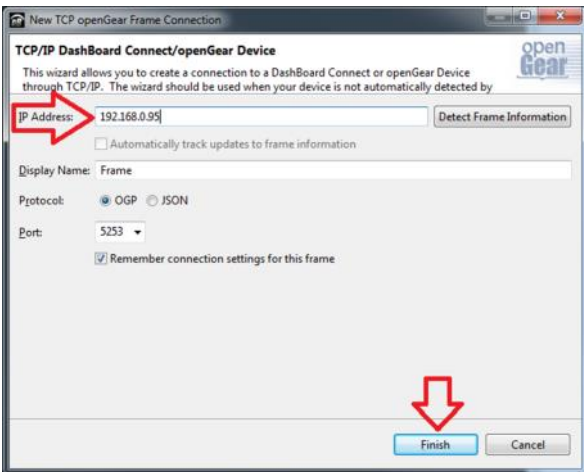
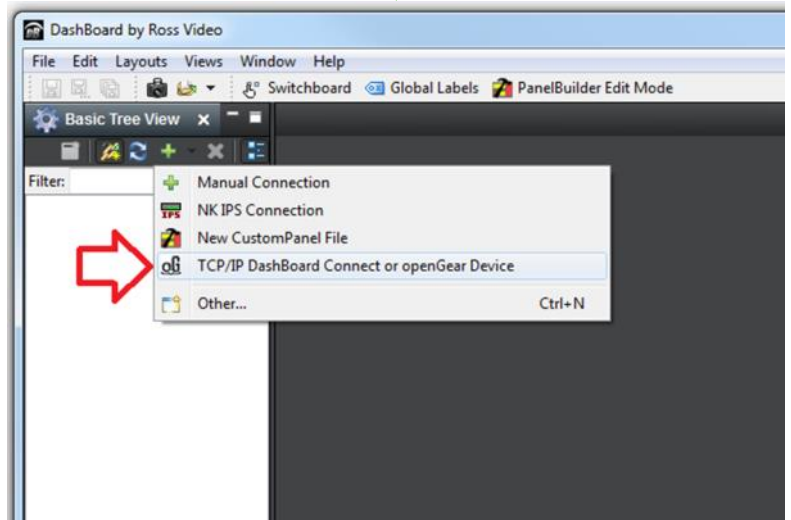
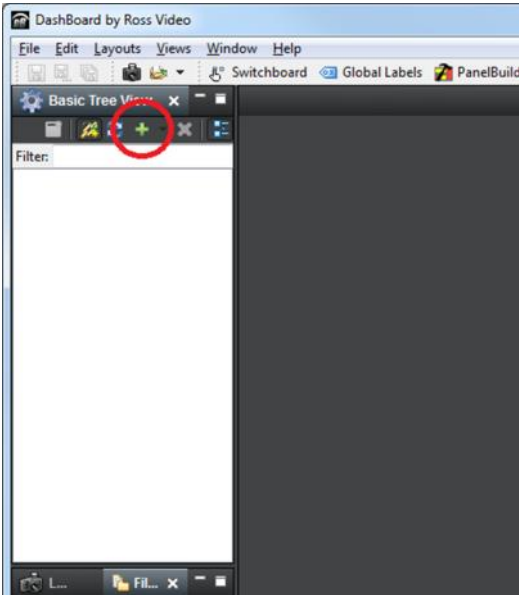
### Other

BTF1-XX can control and be controlled by many software/hardware panels. Displayed below are some few manufacturers.



## openGear protocol

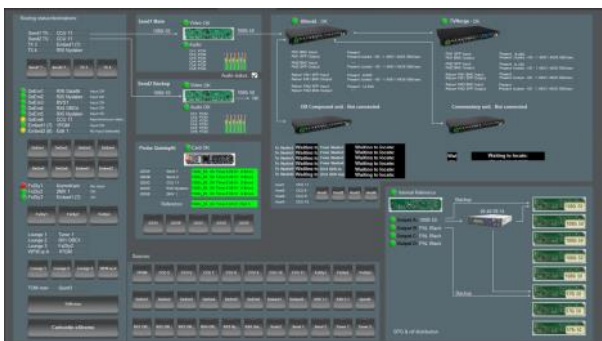
The openGear protocol (also known as OGP) is an open protocol developed by Ross (who must be contacted if the specifications are needed). The support for OGP was added in firmware version 0.1.7. The BTF1-XX frames does not broadcast its openGear connection details, so it has to be added manually in dashboard using the follow dialog.



openGear gives you access to all parameters except viewing the network status and changing the network configuration. The protocol is in general more responsive than SNMP, since it feeds back changes on the already existing same TCP/IP connection.

Download free version of DashBoard:

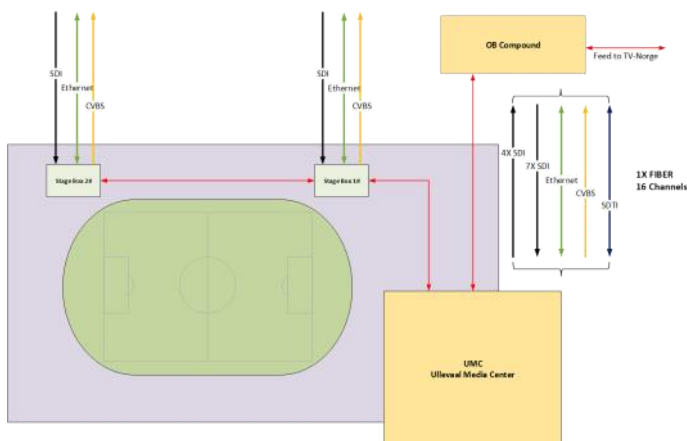
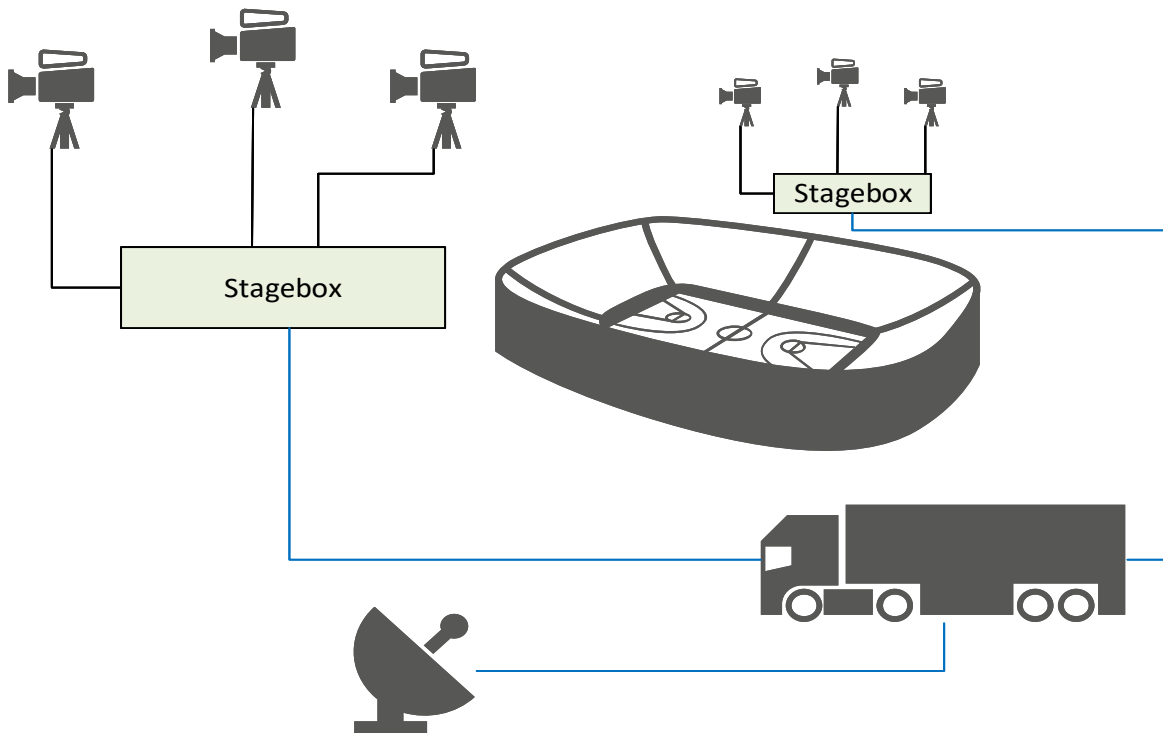
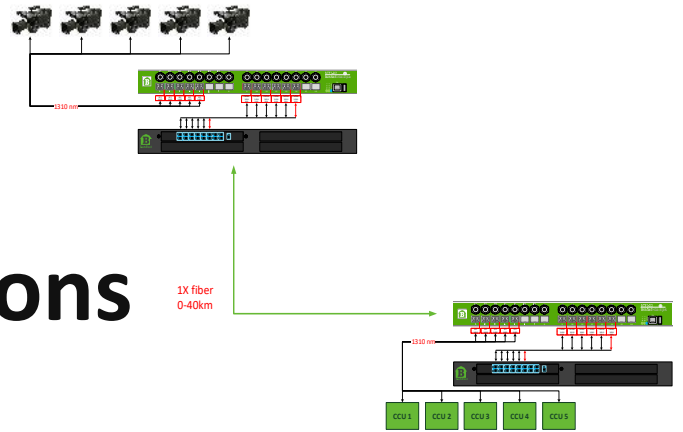
<http://www.rossvideo.com/control-systems/dashboard/products/dashboard.html>



Example of panel using Barnfind frames.



# Applications

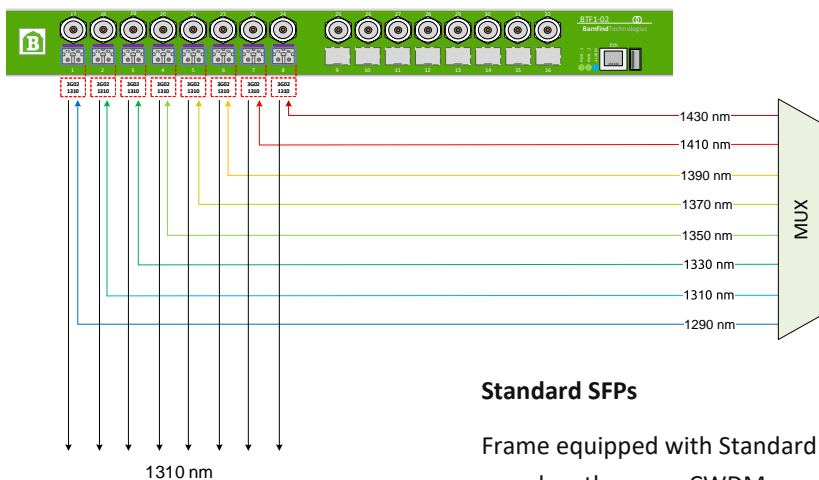
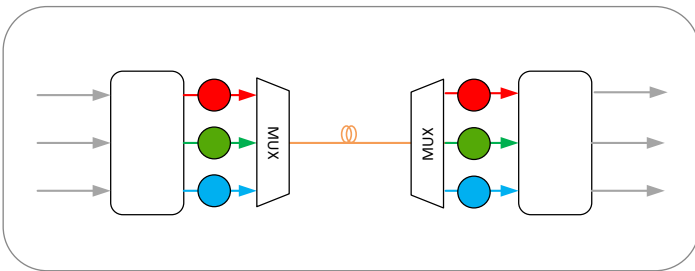
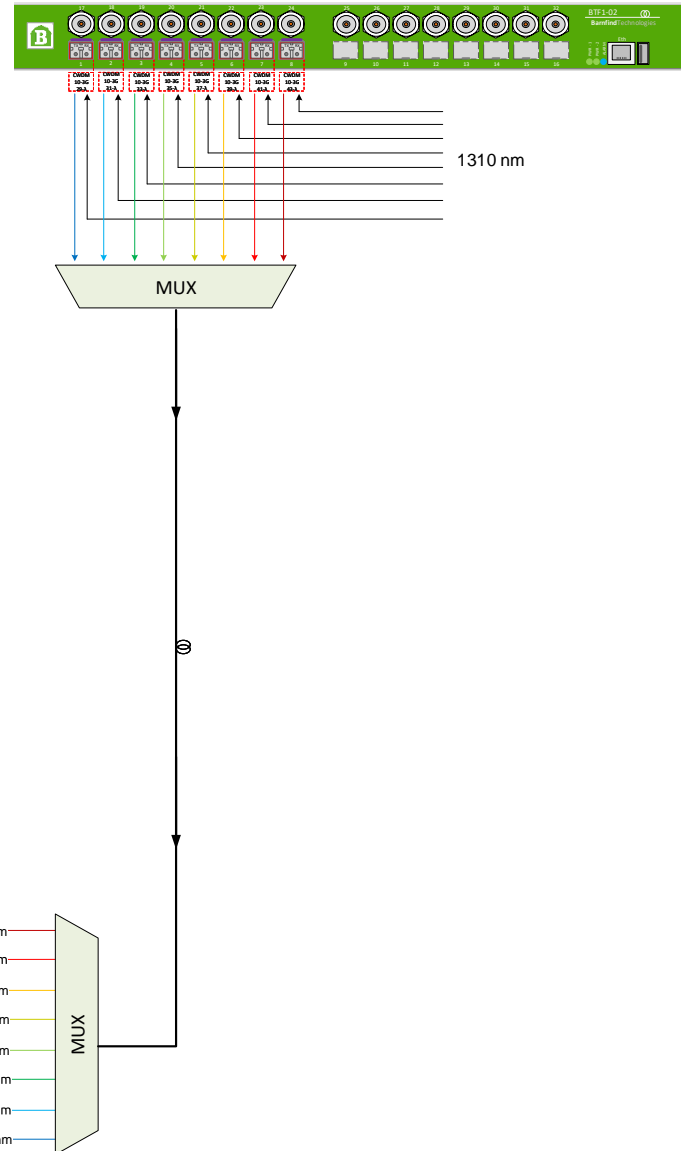


## Colour conversion

1310nm, and sometimes 1550nm are common used wavelengths on equipment with fixed (not SFP) transmitter and receiver. You will find it on RS-protocols to fiber converters, Intercom systems, HDMI extenders, optical routers and many more. The example below describe how we can convert 1310, 1550 or any other wavelengths into CWDM.

### CWDM SFPs

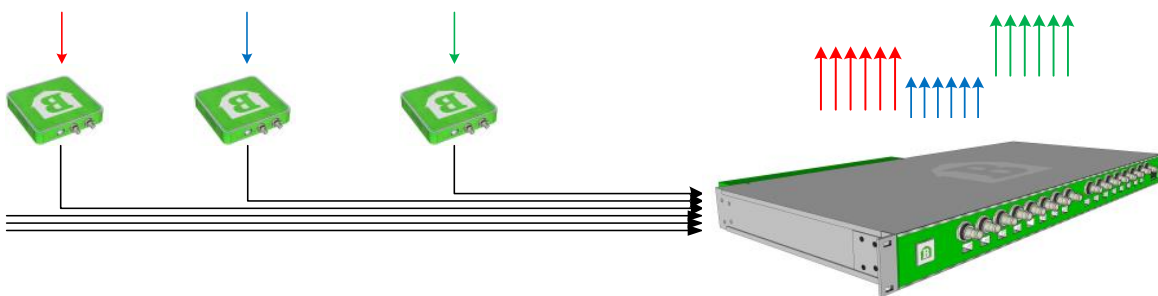
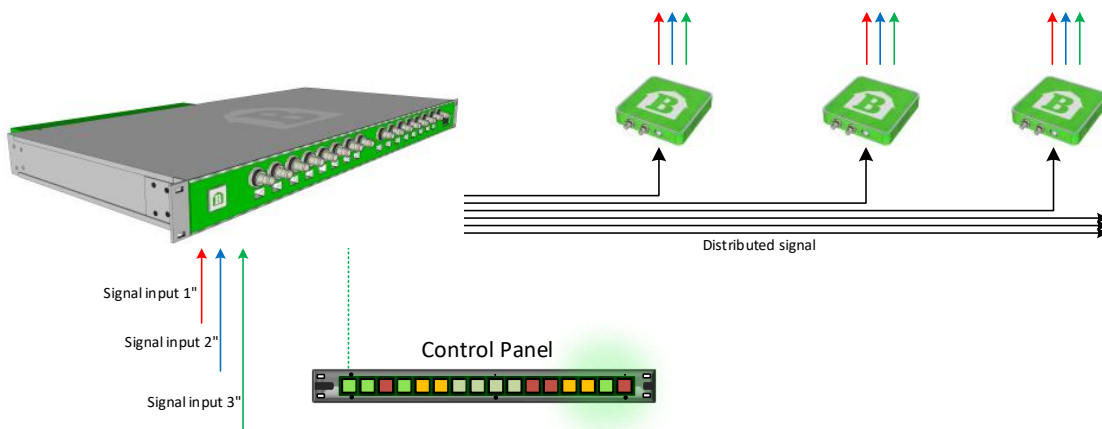
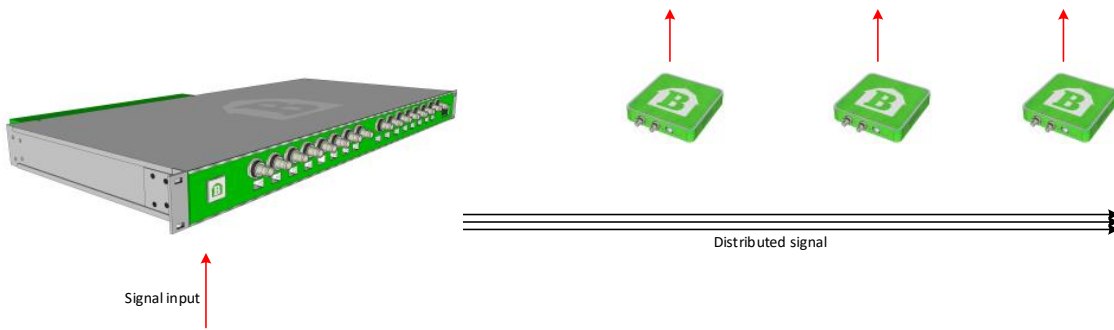
Frame equipped with CWDM SFPs. The incoming optical signal is 1310 nm on all channels. The signals are routed to an output with colored light, CWDM



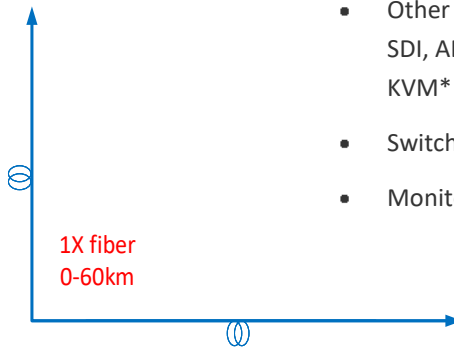
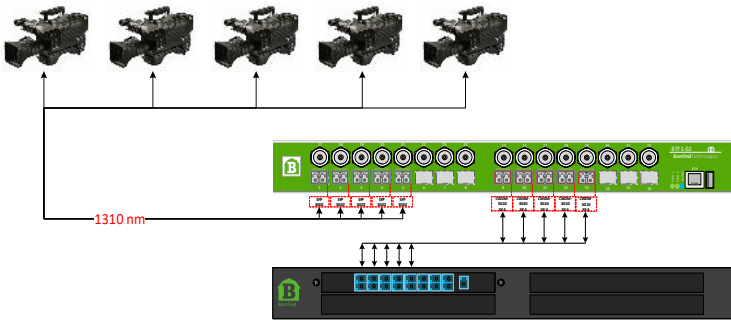
### Standard SFPs

Frame equipped with Standard SFPs. Note!, the RX (receiver) can read all wavelengths, even CWDM wavelengths. The output is 1310 nm.

# Signal distribution/contribution



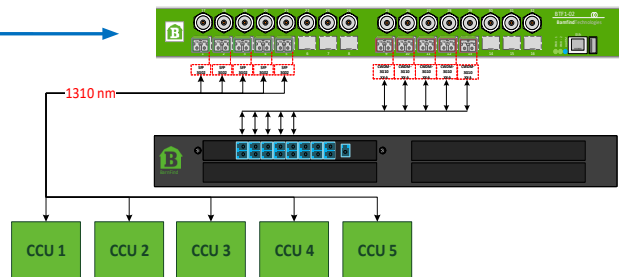
## Camera to CCU I



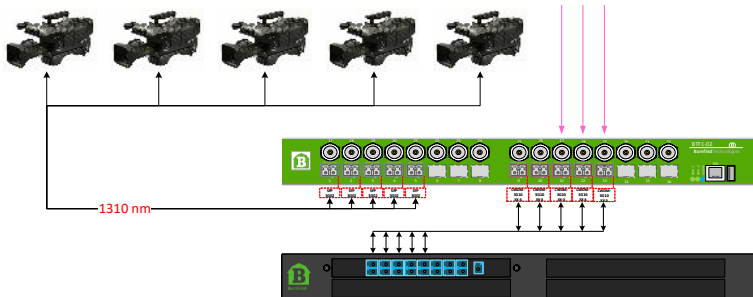
Figures shows the bidirectional signal transport between a camera from any supplier to a camera control unit (CCU). Up to 18 cameras/CCU can be multiplexed into 1 fiber for transport over long distances. The internal matrix in BarnOne frame allows the user to switch any camera to any CCU.

- Up to 18 CAM/CCU in 1 single mode fiber.
- Includes transmission of video, audio, tally, inter-com and RCP.
- Other signal can be multiplexed into same fiber. SDI, AES, ASI, HDMI, Ethernet, CVBS, SDTI, MADI, KVM\*
- Switching functionalities between CAM and CCU.
- Monitoring of the signal flow.

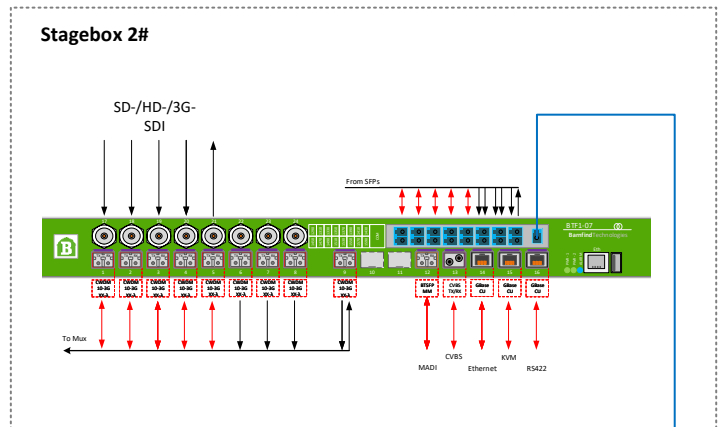
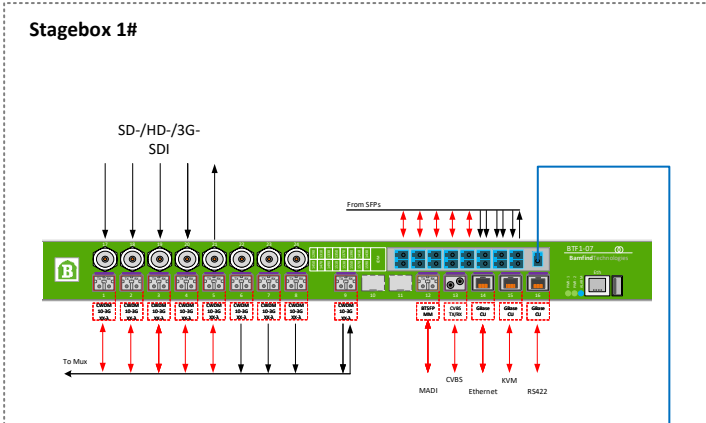
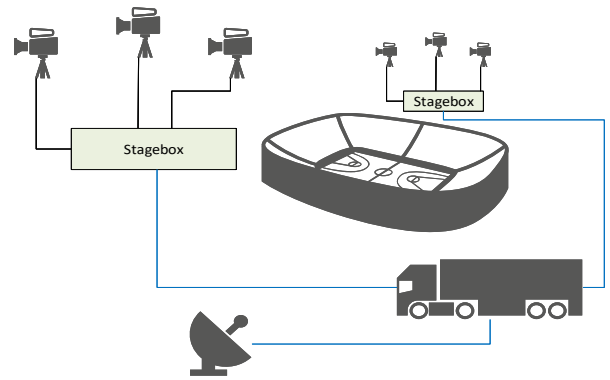
| <b>BOM list</b> |          |
|-----------------|----------|
| Product Name    | Quantity |
| BT-CWDM-10-3Gxx | 10       |
| BT-CWDM-16      | 2        |
| BT-HOUS         | 2        |
| BT-LX-SM-3G02   | 10       |
| BTF1-02         | 2        |



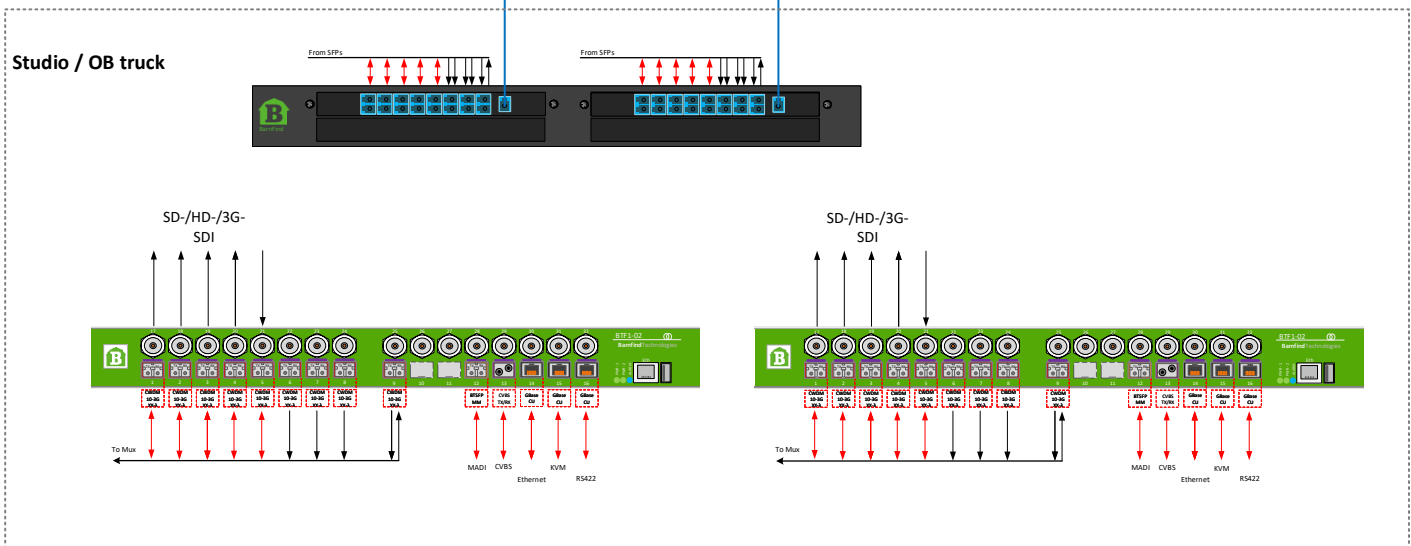
\*Other signal can be multiplexed into same fiber. SDI, AES, ASI, HDMI, Ethernet, CVBS, SDTI, MADI, KVM



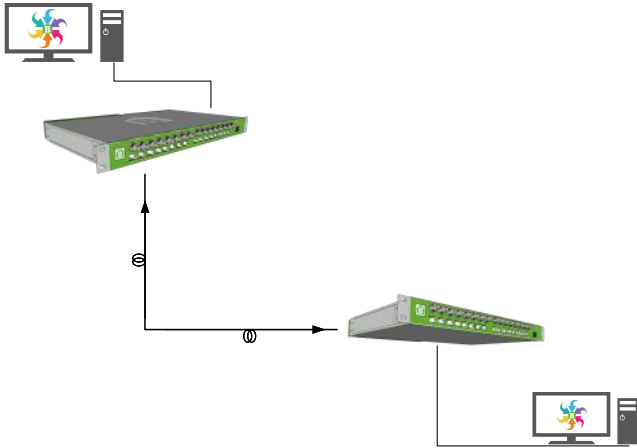
# Stage box



| BOM list           |          |
|--------------------|----------|
| Product Name       | Quantity |
| BT-CWDM-10-3G      | 36       |
| BT-CWDM-MUX-16-LGX | 2        |
| BT-HOUS-LGX-1RU    | 1        |
| BTF1-02            | 2        |
| BTF1-07-16         | 2        |
| BTSFP-GBaser-CU    | 12       |
| BTSFP-MM-1G        | 4        |
| EB30HDRT-AM        | 4        |




## Ethernet transmission I



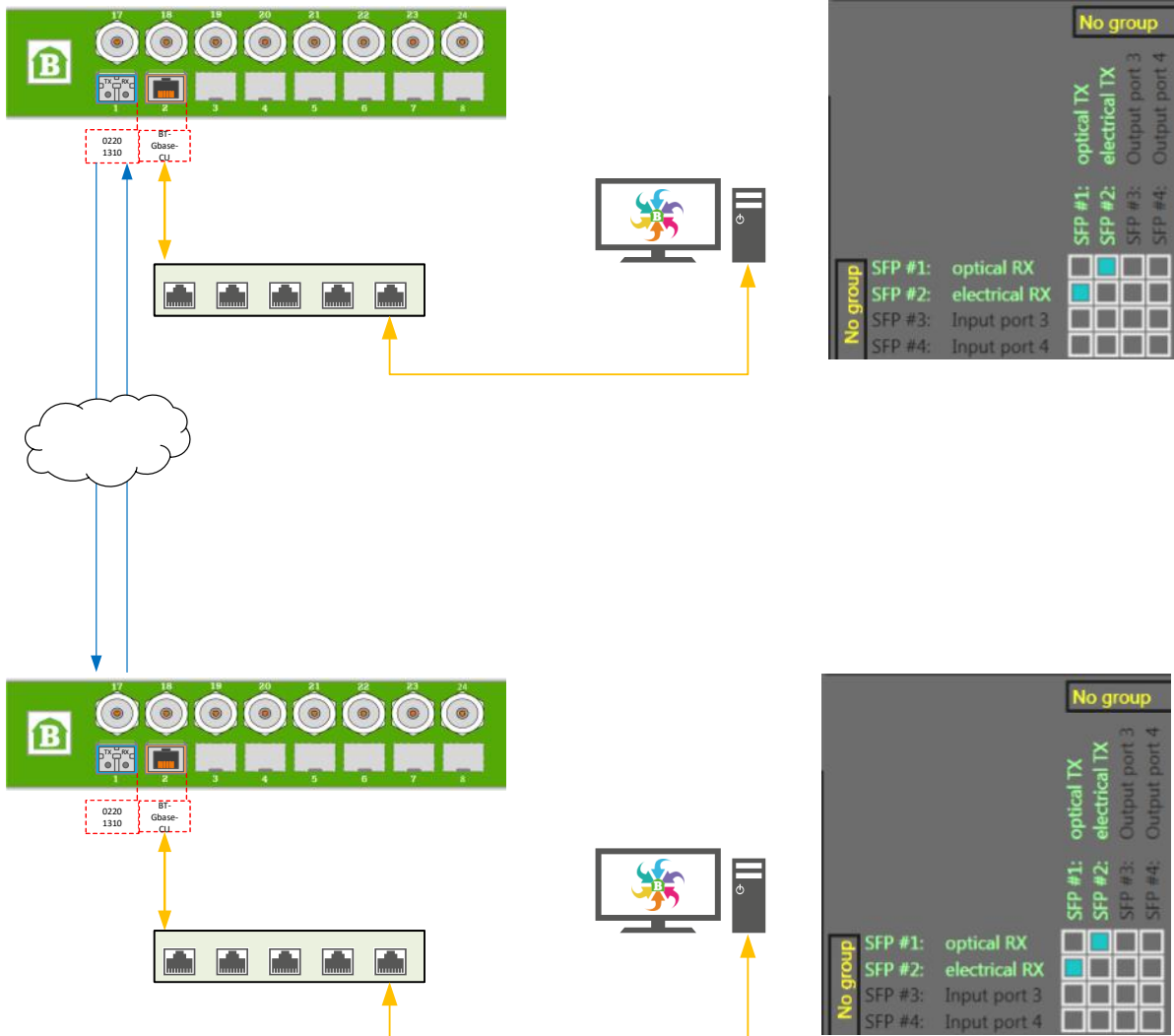
To establish an Ethernet connection over fiber by using Barnfind products, configure your setup as picture below describes.

Shown examples are using a point to point connection with 2x fiber cables. Alternative setup could be WDM, CWDM or DWDM technology.

Regardless of point to point or multiplexed connection, the user must ensure the RX is connected to TX and vice versa.

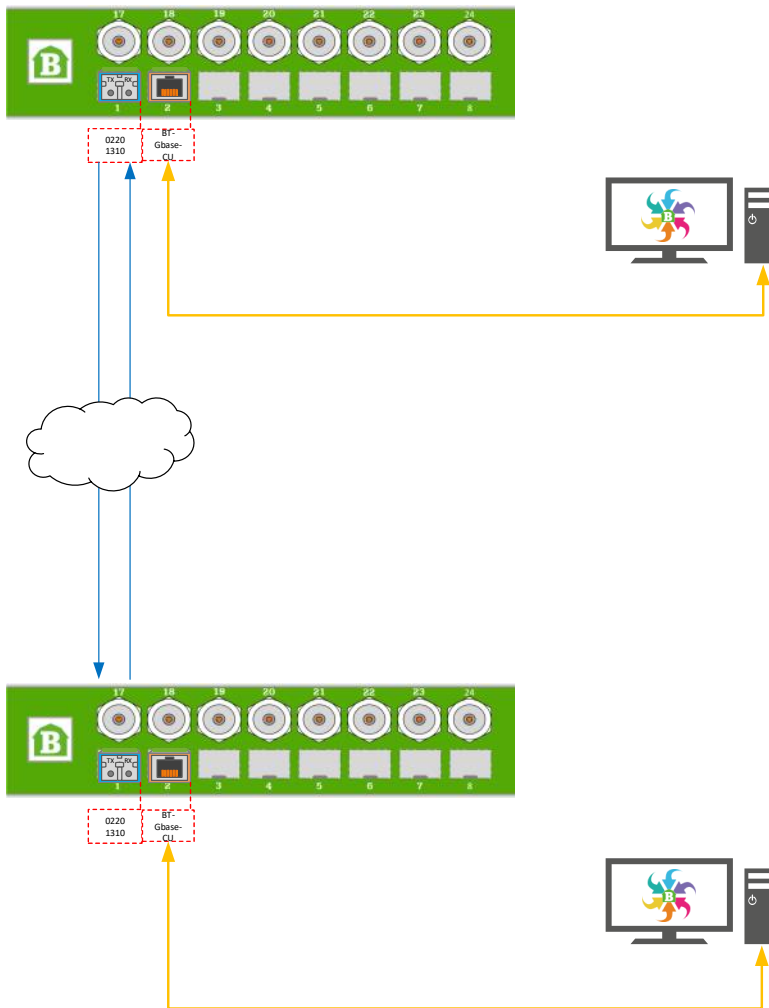
 **Use an Ethernet switch in both ends to ensure same link speed.**

Example 1





Example 2



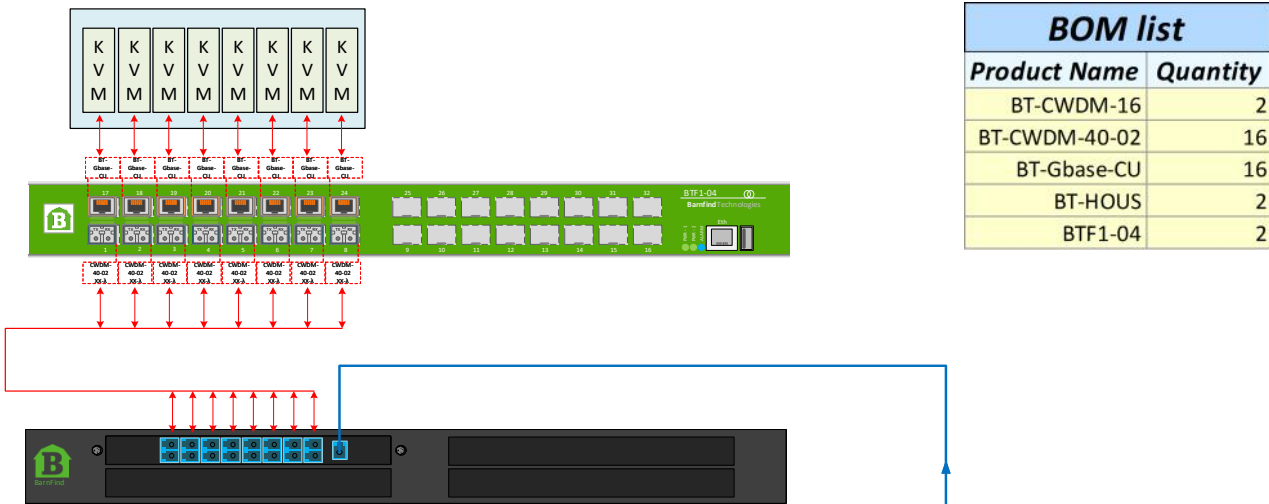
Basic information Network Matrix Inputs Outputs SFPs Firmware Upgrade Firmware Upload Diagnostics Auth database

| Name                       | Value               |
|----------------------------|---------------------|
| Link duplex                | Half Duplex         |
| Link MDI                   | MDI                 |
| Link speed                 | 100Mbps             |
| Link status                | Link up             |
| Operating mode             | SGMII(default)      |
| User selectable link speed | 100Mbps Half Duplex |
|                            | Auto(default)       |
|                            | 1Gbps Full Duplex   |
|                            | 1Gbps Half Duplex   |
|                            | 100Mbps Full Duplex |
|                            | 100Mbps Half Duplex |
|                            | 10Mbps Full Duplex  |
|                            | 10Mbps Half Duplex  |

The link speed must be the same in both ends. You can enforce this using BarnStudio.

**With this setup, you will not need the network switch in between.**

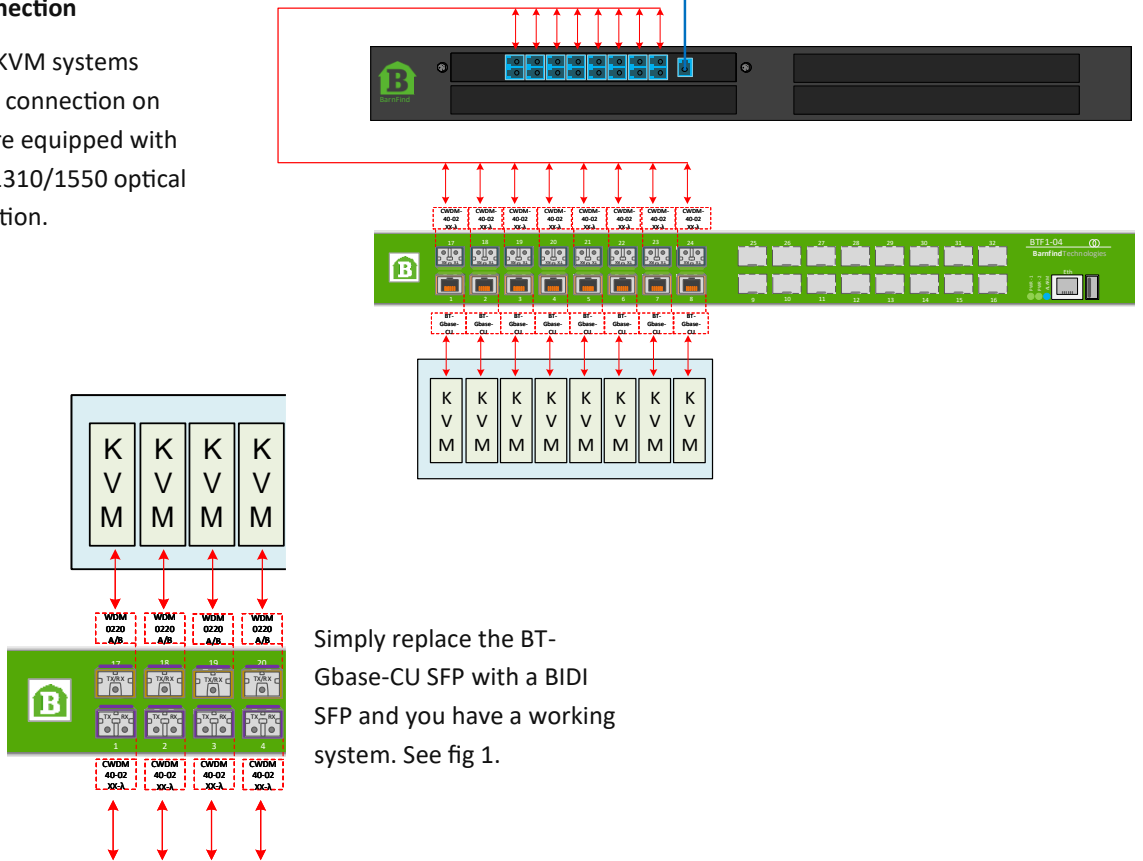
# KVM transmission



| BOM list      |          |
|---------------|----------|
| Product Name  | Quantity |
| BT-CWDM-16    | 2        |
| BT-CWDM-40-02 | 16       |
| BT-Gbase-CU   | 16       |
| BT-HOUS       | 2        |
| BTF1-04       | 2        |

## KVM with optical connection

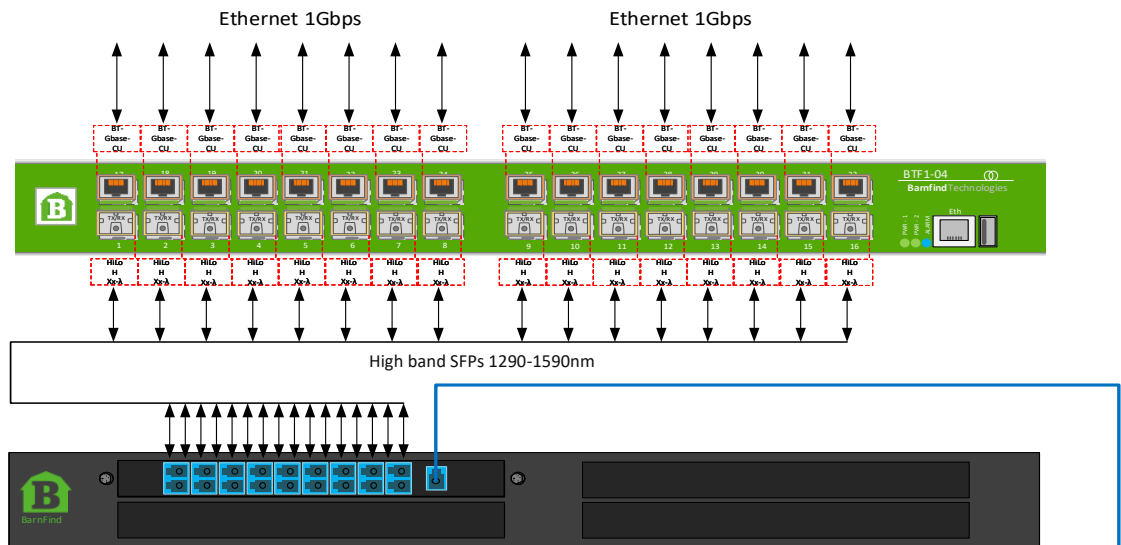
The example shows a KVM systems equipped with electric connection on RJ45. Some systems are equipped with optical ports and use 1310/1550 optical signals for communication.



Simply replace the BT-Gbase-CU SFP with a BIDI SFP and you have a working system. See fig 1.

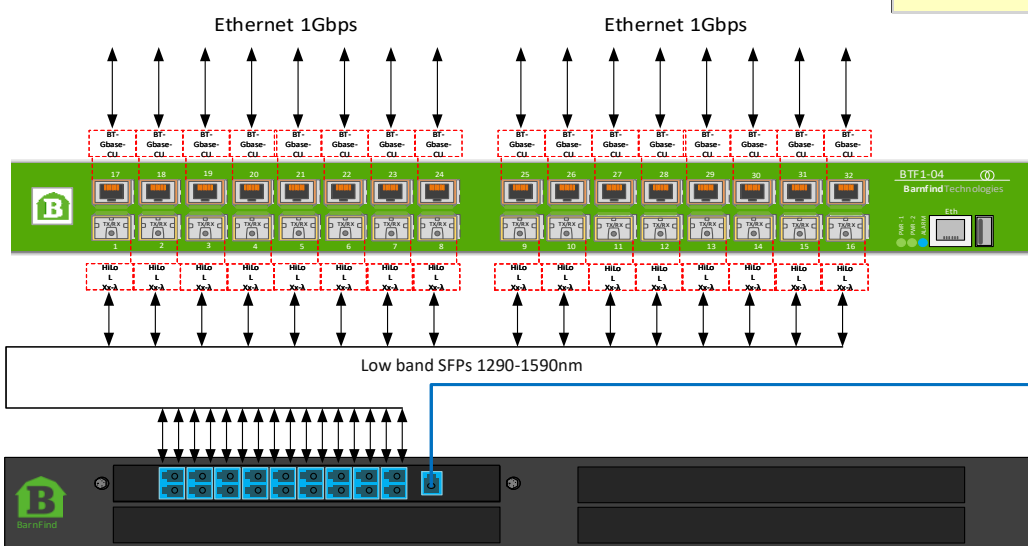
Fig. 1

## Ethernet transmission II

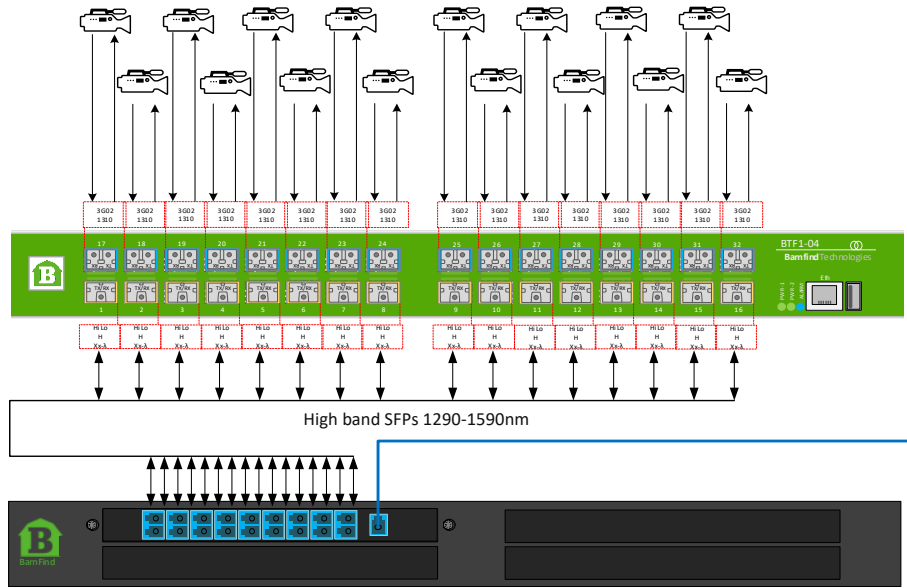


- 16X 1Gbps Ethernet
- Only 1 Single Mode fiber when using HiLo technology
- Only 2RU each side
- Optional redundancy line
- Up to 20km distance

| <b>BOM list</b>     |                 |
|---------------------|-----------------|
| <i>Product Name</i> | <i>Quantity</i> |
| BT-CWDM-16          | 2               |
| BT-Gbase-CU         | 32              |
| BT-HOUS             | 2               |
| BTF1-04             | 2               |
| BT-3G-xx-H/L        | 32              |
|                     |                 |
|                     |                 |

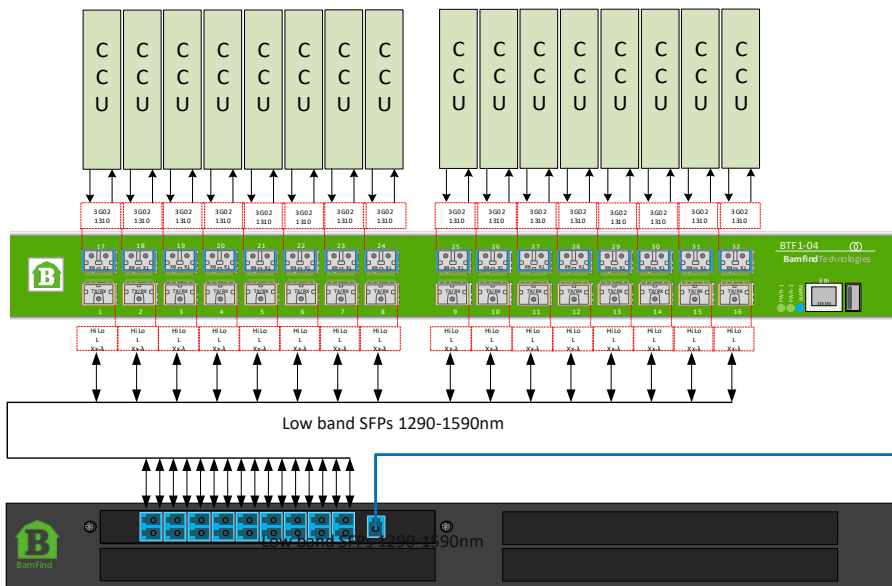


## Camera to CCU II



- 16X CAM-CCU
- Only 1 Single Mode fiber when using HiLo technology
- Only 2RU each side
- Optional redundancy line
- Up to 20km distance

| BOM list         |          |
|------------------|----------|
| Product Name     | Quantity |
| BT-CWDM-16       | 2        |
| BTSFP-LX-SM-3G02 | 32       |
| BT-HOUS          | 2        |
| BTF1-04          | 2        |
| BT-3G-xx-H/L     | 32       |

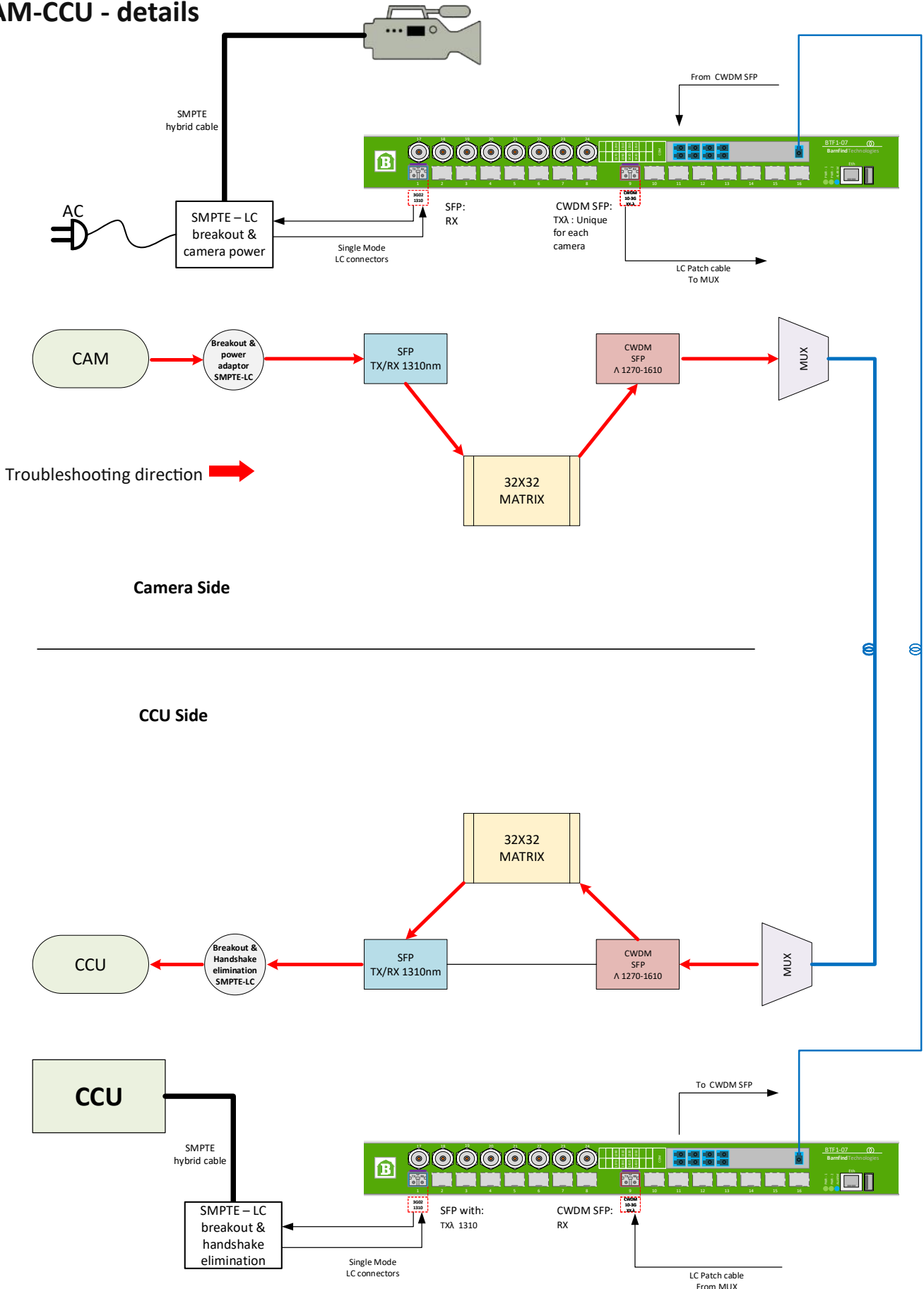




# TroubleShooting



### CAM-CCU - details



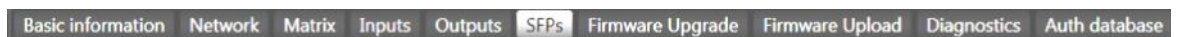
## CAM-CCU - troubleshooting workflow

This workflow troubleshooting refer to the previous page with a single CAM– CCU transmission. Note, you can set up the system to handle up to 18 cameras and 18 CCU (see example of 16 camera link on page 59). A more detailed checklist will follow to ensure a smooth installation.

**CAM** → Camera from any of the most commonly used professional camera manufacturers e.g. Ikegami, Sony, Hitachi, Panasonic etc.  
**Camera and CCU have to be in «Single Fiber Mode»**, you will find this option in the camera system menu or you can utilise a SMPTE hybrid elimination device (SHED/SHACK/HUT etc.) depending on the type of camera.

**Breakout & power adaptor SMPTE-LC** → You will need a device powering the camera through a SMPTE hybrid cable and extracting the fibers from the SMPTE hybrid cable to LC connectors, which you connect to the SFP in BarnOne.  
 Alternatively, you can power the camera locally and connect it with a SMPTE—LC adaptor cable to BarnOne. a breakout panel with SMPTE connector to LC connector.

**SFP TX/RX 1310nm** → The purpose of this SFP is to receive the signals from camera (1310nm) and to transmit the signals from CCU (1310nm)  
 Some installation advices:  
 - Use BarnStudio to verify if you have the correct optical power on the RX connector. The LC connectors at the breakout cable is ‘normally’ not labeled, and it is impossible to visually see the difference of TX and RX. **DO NOT TRY TO LOOK INTO THE FIBER CONNECTOR!**

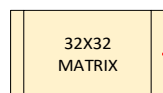


| Name         | Value                               |
|--------------|-------------------------------------|
| RX LOS       | <input checked="" type="checkbox"/> |
| RX Power dBm | -40 dBm                             |
| RX Power mW  | 0,0001 mW                           |
| Temperature  | 46,5 C                              |
| TX Bias      | 10,464 mA                           |
| TX Disable   | <input type="checkbox"/>            |
| TX Fault     | <input type="checkbox"/>            |
| TX Power     | 0,7255 mW                           |
| TX Power dBm | -1,39 dBm                           |
| Vcc          | 3,1216 V                            |

The value ‘-40 dBm’ will appear if the optical signal is not present or if the optical signal is too high.

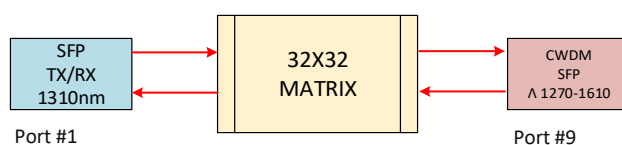
- Try to swap the LC connectors
- Insert an attenuator

BarnStudio will take about 5 seconds to update the value.  
 A perfect signal is between -5dBm to -20dBm.

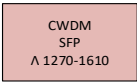


The crosspoint switch (Matrix) must be set up correctly to ensure a link between input (camera) and output (optical signal with CWDM wavelength). From example on previous page, the configuration is:

Input port 1 -> Output port 9  
 Input port 9 -> Output port 1



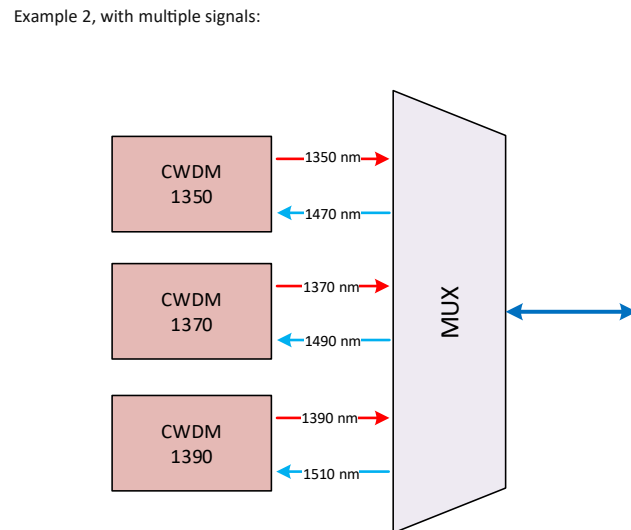
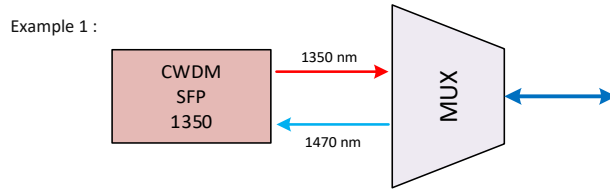
|                        | SFP #1: Output port 1               | SFP #2: Output port 2    | SFP #3: Output port 3    | SFP #4: Output port 4    | SFP #5: Output port 5    | SFP #6: Output port 6    | SFP #7: Output port 7    | SFP #8: Output port 8    | SFP #9: Output port 9               | SFP #10: Output port 10  | SFP #11: Output port 11  | SFP #12: Output port 12  |
|------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|
| SFP #1: Input port 1   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #2: Input port 2   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #3: Input port 3   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #4: Input port 4   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #5: Input port 5   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #6: Input port 6   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #7: Input port 7   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #8: Input port 8   | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #9: Input port 9   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #10: Input port 10 | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #11: Input port 11 | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SFP #12: Input port 12 | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |



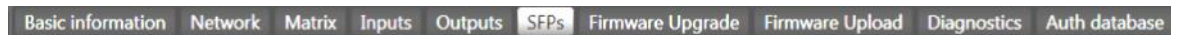
The purpose of this SFP is to transmit the camera signal to the multiplexer.

Note! You must use a unique wavelength for each signal. There are 18 different selections of wavelegths in the CWDM range.

It is also important to keep in mind that a CWDM SFP transmit on one specific wavelength, but can receive any wavelength in the CWDM range.



Use BarnStudio to verify if you have the correct optical power on the RX connector.



| Name         | Value                               |
|--------------|-------------------------------------|
| RX LOS       | <input checked="" type="checkbox"/> |
| RX Power dBm | -40 dBm                             |
| RX Power mW  | 0,0001 mW                           |
| Temperature  | 46.5 C                              |
| TX Bias      | 10,464 mA                           |
| TX Disable   | <input type="checkbox"/>            |
| TX Fault     | <input type="checkbox"/>            |
| TX Power     | 0,7255 mW                           |
| TX Power dBm | -1,39 dBm                           |
| Vcc          | 3,1216 V                            |

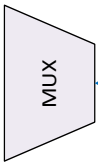
The value '-40 dBm' will appear if the optical signal is not present or if the optical signal is too high.

- Add in an attenuator

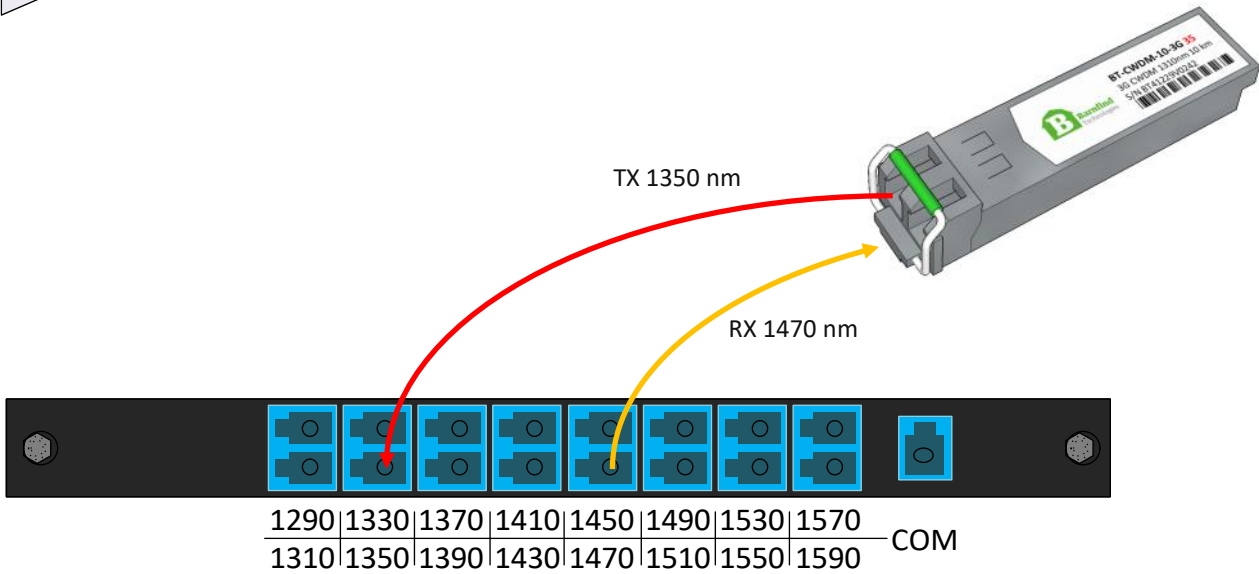
BarnStudio will take about 5 seconds to update the value.

A perfect signal is between -5dBm to -15dBm.

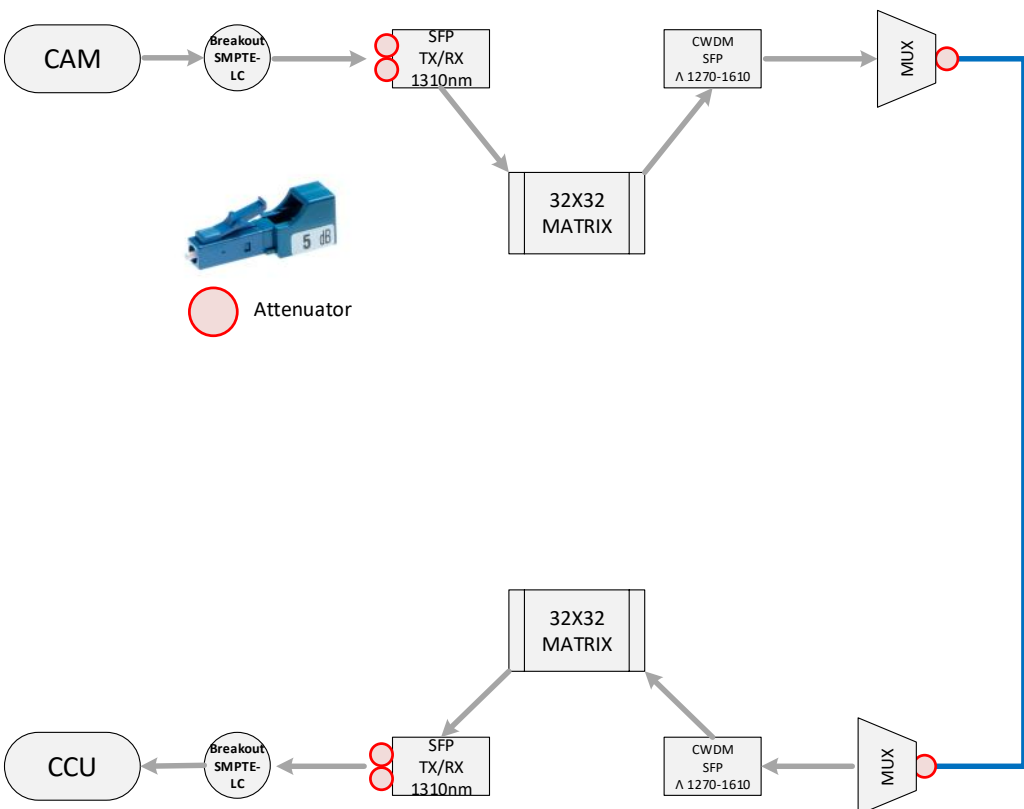




This is the final step on the transmitter side. All wavelengths from CWDM SFPs are collected in the optical multiplexer and can be transmitted as one combined signal, in one fiber.



### Attenuators



An optical receiver e.g. in camera, CCU or SFP will automatically shut down when the optical power is too high. In BarnStudio, this will be indicated as  $-40\text{dBm}$ .

To ensure a correct optical level, you must use attenuators. **Typically the optical level should be within the range:**

**-5dBm to -20dBm**

| Name         | Value                               |
|--------------|-------------------------------------|
| RX LOS       | <input checked="" type="checkbox"/> |
| RX Power dBm | -6,05 dBm                           |
| RX Power mW  | 0,2482 mW                           |
| Temperature  | 43,25 C                             |
| TX Bias      | 8,64 mA                             |
| TX Disable   | <input type="checkbox"/>            |
| TX Fault     | <input type="checkbox"/>            |
| TX Power     | 0,5696 mW                           |
| TX Power dBm | -2,44 dBm                           |
| Vcc          | 3,1008 V                            |



## Troubleshooting

### BTF1-XX frames and connection

| Problem  | Possible Cause   | Suggested Correction  |
|--|--|---|
| <b>Frame does not appear in BarnStudio Device list</b> | Network cable(s)   | Change cable(s)   |
|  | Network switch broken/unplugged  | Change Network switch (connect directly from computer to frame to verify)   |
|  | Wrong/no settings in [Multicast Search Scope] see page 36.                                     | Change settings according to BarnGuide page 36  |
|  | Wrong/no matching IP network see page 40   | Change settings according to BarnGuide page 40  |
|  | Frame is not powered up  | Power up frame. At least one green LED in front should be illuminated.  |
| <b>Blue LED in front is flashing (Alarm)</b>           | A critical component, fan speed, temperature or PSU has reached a level outside 'normal' range | Use BarnStudio [Diagnostics] to read information about the error. Uncheck to turn off the LED indication. See page 47 |
| <b>Frame or SFP is overheating (Alarm)</b>             | Minor cooling airflow, hot or dusty environment  | If fans are not running, open cassette to check connector   |
|  |  | make sure fan speed is running at +7000rpm  |
|  |  | Add filter if dusty environment/Clean filter  |
| <b>Missing functionalities</b>                         | Frame has old firmware   | Upgrade frame to latest firmware. See page 46   |
|  | BarnStudio is old version  | Download latest BarnStudio <a href="http://www.barnfind.no/downloads">http://www.barnfind.no/downloads</a>            |

## Input and output ports

| Problem                                  | Possible Cause   | Suggested Correction   |
|--|--|--|
| <b>Can not receive signal (Optical)</b>  | Verify if the input is connected to the correct output(s)                | Check and correct crosspoint in BarnStudio [Matrix]                  |
|  | Optical signal in is too strong  | BarnStudio will indicate -40dBm. Add attenuator. See page 63.        |
|  | Optical signal in is too weak/missing                                    | Verify incoming signal with an optical power meter.                  |
|  | Signal format is outside SFP range e.g 3G-SDI->1.25Gbps SFP              | Replace SFP  |
|  | Wrong connection to SFP. Note, RX is rightside connector seen from front | Swap connectors (fiber connectors)                                   |
| <b>Can not transmit signal (Optical)</b> | Verify if the output is connected to the correct input                   | Check and correct crosspoint in BarnStudio [Matrix]                  |
|  | Signal format is outside SFP range e.g 3G-SDI->1.25Gbps SFP              | Replace SFP  |
|  | TX turned off  | Enable TX in BarnStudio [Output]. Default ON                         |
|  | Reclocker Bypassed   | Change reclocker status to AUTO (default)                            |
| <b>Can not receive signal (BNC)</b>      | Verify if the input is connected to the correct output(s)                | Check and correct crosspoint in BarnStudio [Matrix]                  |
|  | The port (BNC) is configured as output                                   | Change the direction in BarnStudio [Input or Output] see page 43, 44 |
|  | Signal format is outside range   | Maximum datarate is 3.2Gbps  |
| <b>Can not transmit signal (BNC)</b>     | Verify if the output is connected to the correct input                   | Check and correct crosspoint in BarnStudio [Matrix]                  |
|  | The port (BNC) is configured as input                                    | Change the direction in BarnStudio [Input or Output] see page 43, 44 |
|  | Reclocker Bypassed   | Change reclocker status to AUTO (default)                            |

## Questionnaire for fiber optical transmission

1 **System Name** (please give a name we can use for communication)

\_\_\_\_\_

2 **How many locations?**

\_\_\_\_\_

3 **Is the fiber cable in place/installed already?**

\_\_\_\_\_

3.1 If YES, how many fiber strands are available between the locations?

\_\_\_\_\_

3.2 If YES, what kind of fiber is installed, single mode or multimode?

\_\_\_\_\_

3.3 If NO, how many fiber strands shall be installed?

\_\_\_\_\_

4 **What is the distance between the single locations?**

\_\_\_\_\_

5 **Is multiplexing an option to reduce the fiber count?**

\_\_\_\_\_

6 **Do you wish optical redundancy?**

\_\_\_\_\_

7 **Comments** (please feel free to give as much information as you would like to)

\_\_\_\_\_

**8 Signal list for each location, please list how many signals of each type**

8.1 Loc A:

|        |   | <i>Please insert quantity</i> |
|--------|---|-------------------------------|
| 8.1.1  | SD-, HD-, 3G-SDI In:                            |                               |
| 8.1.2  | SD-, HD-, 3G-SDI Out:                           |                               |
| 8.1.3  | 6G/12G SDI In:                                  |                               |
| 8.1.4  | 6G/12G SDI Out:                                 |                               |
| 8.1.5  | HDMI In:  |                               |
| 8.1.6  | HDMI Out:                                       |                               |
| 8.1.7  | 1Gbps Ethernet (specify electr./ opt., SM/MM):  |                               |
| 8.1.8  | 10Gbps Ethernet (specify electr./ opt., SM/MM): |                               |
| 8.1.9  | GPI:  |                               |
| 8.1.10 | GPO:  |                               |
| 8.1.11 | RS422/485 (specify)                             |                               |
| 8.1.12 | ASI/MADI/AES In electr.:                        |                               |
| 8.1.13 | ASI/MADI/AES In opt.:                           |                               |
| 8.1.14 | Analog Audio In:                                |                               |
| 8.1.15 | Analog Audio Out:                               |                               |
| 8.1.16 | Other opt. In (e.g. CAM-CCU/proprietary):       |                               |
| 8.1.17 | Other opt. Out (e.g. CAM-CCU/proprietary):      |                               |
| 8.1.18 | Comments:                                       |                               |

8.2 Loc B:

|        |   | <i>Please insert quantity</i> |
|--------|---|-------------------------------|
| 8.2.1  | SD-, HD-, 3G-SDI In:                            |                               |
| 8.2.2  | SD-, HD-, 3G-SDI Out:                           |                               |
| 8.2.3  | 6G/12G SDI In:                                  |                               |
| 8.2.4  | 6G/12G SDI Out:                                 |                               |
| 8.2.5  | HDMI In:  |                               |
| 8.2.6  | HDMI Out:                                       |                               |
| 8.2.7  | 1Gbps Ethernet (specify electr./ opt., SM/MM):  |                               |
| 8.2.8  | 10Gbps Ethernet (specify electr./ opt., SM/MM): |                               |
| 8.2.9  | GPI:  |                               |
| 8.2.10 | GPO:  |                               |
| 8.2.11 | RS422/485 (specify)                             |                               |
| 8.2.12 | ASI/MADI/AES In electr.:                        |                               |
| 8.2.13 | ASI/MADI/AES In opt.:                           |                               |
| 8.2.14 | Analog Audio In:                                |                               |
| 8.2.15 | Analog Audio Out:                               |                               |
| 8.2.16 | Other opt. In (e.g. CAM-CCU/proprietary):       |                               |
| 8.2.17 | Other opt. Out (e.g. CAM-CCU/proprietary):      |                               |
| 8.2.18 | Comments:                                       |                               |

8.3 Loc C:

|        |   | <i>Please insert quantity</i> |
|--------|---|-------------------------------|
| 8.3.1  | SD-, HD-, 3G-SDI In:                            |                               |
| 8.3.2  | SD-, HD-, 3G-SDI Out:                           |                               |
| 8.3.3  | 6G/12G SDI In:                                  |                               |
| 8.3.4  | 6G/12G SDI Out:                                 |                               |
| 8.3.5  | HDMI In:  |                               |
| 8.3.6  | HDMI Out:                                       |                               |
| 8.3.7  | 1Gbps Ethernet (specify electr./ opt., SM/MM):  |                               |
| 8.3.8  | 10Gbps Ethernet (specify electr./ opt., SM/MM): |                               |
| 8.3.9  | GPI:  |                               |
| 8.3.10 | GPO:  |                               |
| 8.3.11 | RS422/485 (specify)                             |                               |
| 8.3.12 | ASI/MADI/AES In electr.:                        |                               |
| 8.3.13 | ASI/MADI/AES In opt.:                           |                               |
| 8.3.14 | Analog Audio In:                                |                               |
| 8.3.15 | Analog Audio Out:                               |                               |
| 8.3.16 | Other opt. In (e.g. CAM-CCU/proprietary):       |                               |
| 8.3.17 | Other opt. Out (e.g. CAM-CCU/proprietary):      |                               |
| 8.3.18 | Comments:                                       |                               |

Contact your local Barnfind partner for  
more information about Barnfind products.

Visit our web page for  
application examples and downloads.

[www.barnfind.no](http://www.barnfind.no)



a network of functions

**BarnGuide** Version 2.9



**Barnfind Technologies AS**

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