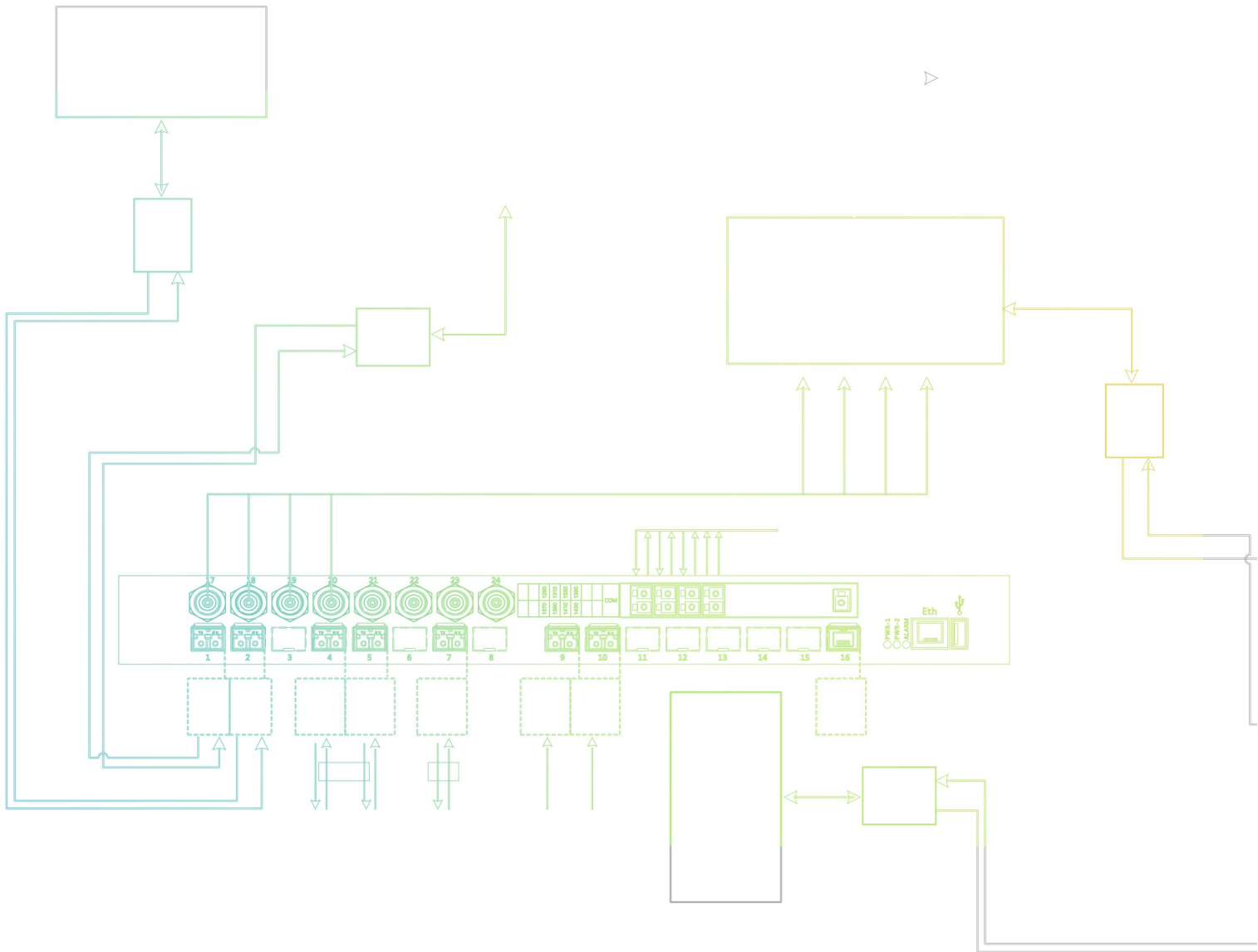


# BarnGuide

Version 2.7



**Barnfind**Technologies

*It's possible!*

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*It's possible!*

## 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.

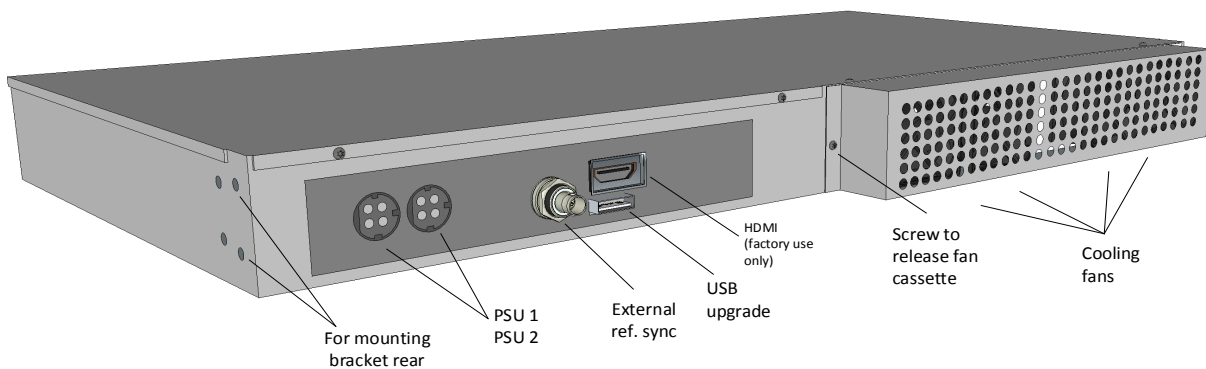


BarnOneSeries

## BarnOne - General Information



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



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

BarnOneSeries

BarnOne variations



BT-F1-01



BT-F1-02



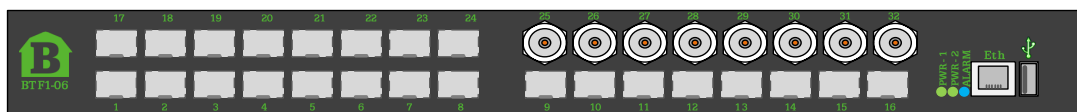
BT-F1-03



BT-F1-04



BT-F1-05



BT-F1-06



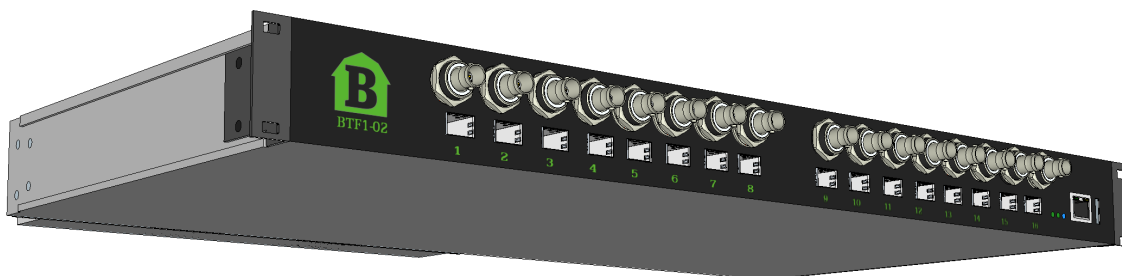
BT-F1-07



BT-F1-08

BarnOneSeries

## BarnOne - General Information



	BTF1-01	BTF1-02	BTF1-03	BTF1-04	BTF1-05	BTF1-06	BTF1-07	BTF1-08
SFP ports	16	16	16	32	16	24	16	24
Bi-directional BNC	-	16	-	-	-	8	8	-
CWDM channels	-	-	8/16	-	2x 8/16	-	8/16	8/16

## Technical Specifications

### Optical ports

SMPTE 259M, 292M, 372M, 424M, 297M, DVB-ASI  
 Hot pluggable/swappable  
 Singlemode and/or Multimode  
 18 CWDM wavelength selections – ITU-T G.694.2  
 Multirate reclocking of outputs 270Mbit/s – 3Gbit/s

### Electrical ports

75 OHM BNC connector  
 SMPTE 259M, 292M, 297M, 372M, 424M, DVB-ASI  
 Multirate reclocking of outputs 270Mbit/s – 3Gbit/s  
 Automatic cable EQ (Belden 1694A)  
 270Mbit/s-250m, 1.5Gbit/s-140m, 3Gbit/s-80m

### Power supply

12V DC 120W. Power supply included  
 PSU input: 100-240VAC 50/60Hz  
 PSU output: 12VDC 8,5A  
 Redundant power supply optional

### Physical size

445mm x 280mm x 43,5mm (17.5" x 11" x 1.7")  
 3.8 kg

### Temperature

Storage temperature:

Min -40°C Max +70°C

Temperatures in operational use:

Min -20°C Max +45°C \*

*\*internal temperatures 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 environments to ensure long lifetime and high performance.*

### Power consumption

A barnOne frame consume 28-30W in operational mode, without SFPs inserted. The total power consume is frame plus SFPs.

A standard optical SFP consume in average 1.5W. See data sheet for the specific SFP to calculate an accurate power consumption

*Example:*

1x BTF1-02

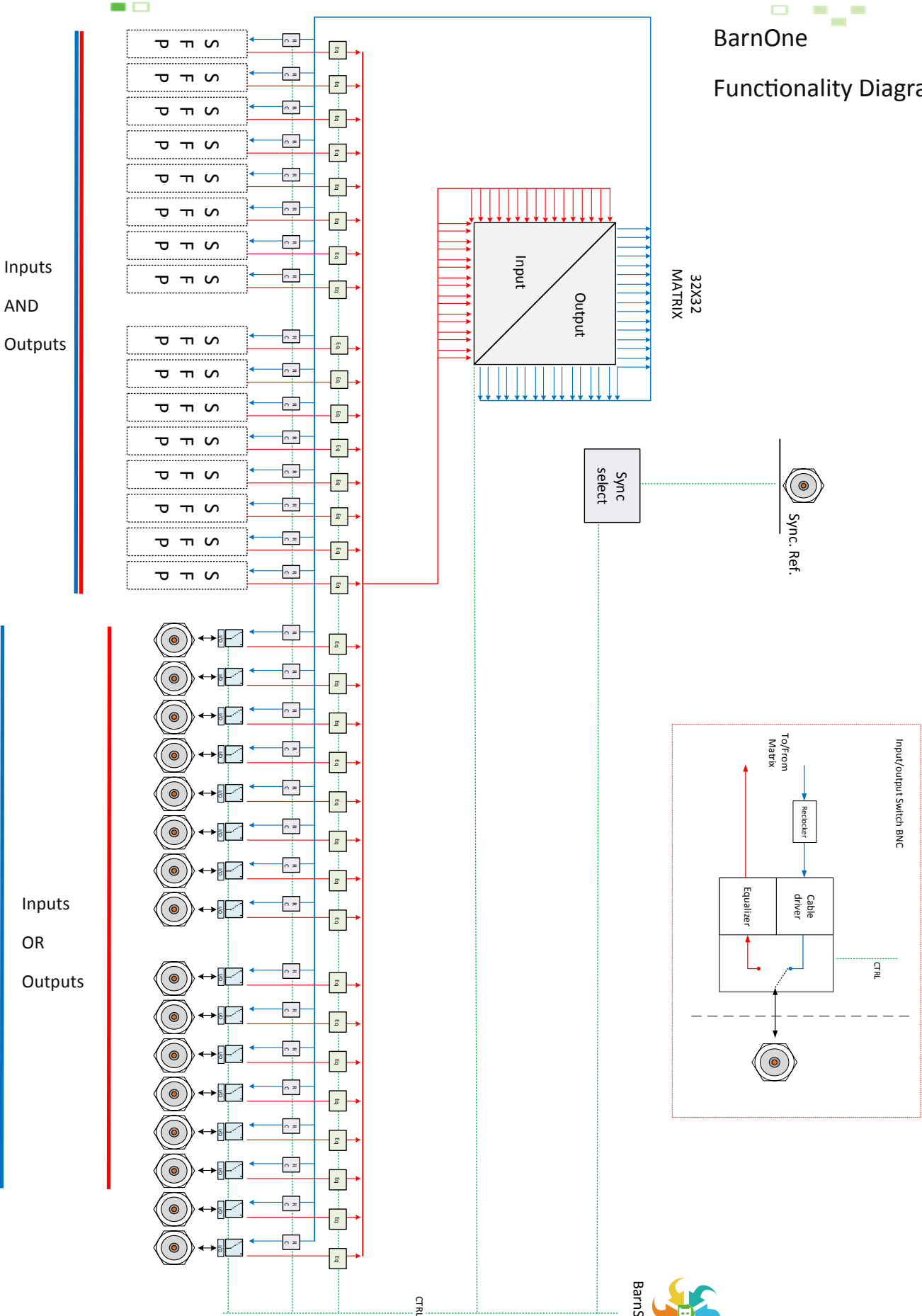
8x BTSFP-CWDM-10-3GXX (see data sheet page 28)

W= Voltage (V) X Current (A)

0.2A x 3.3V = 0.66W

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

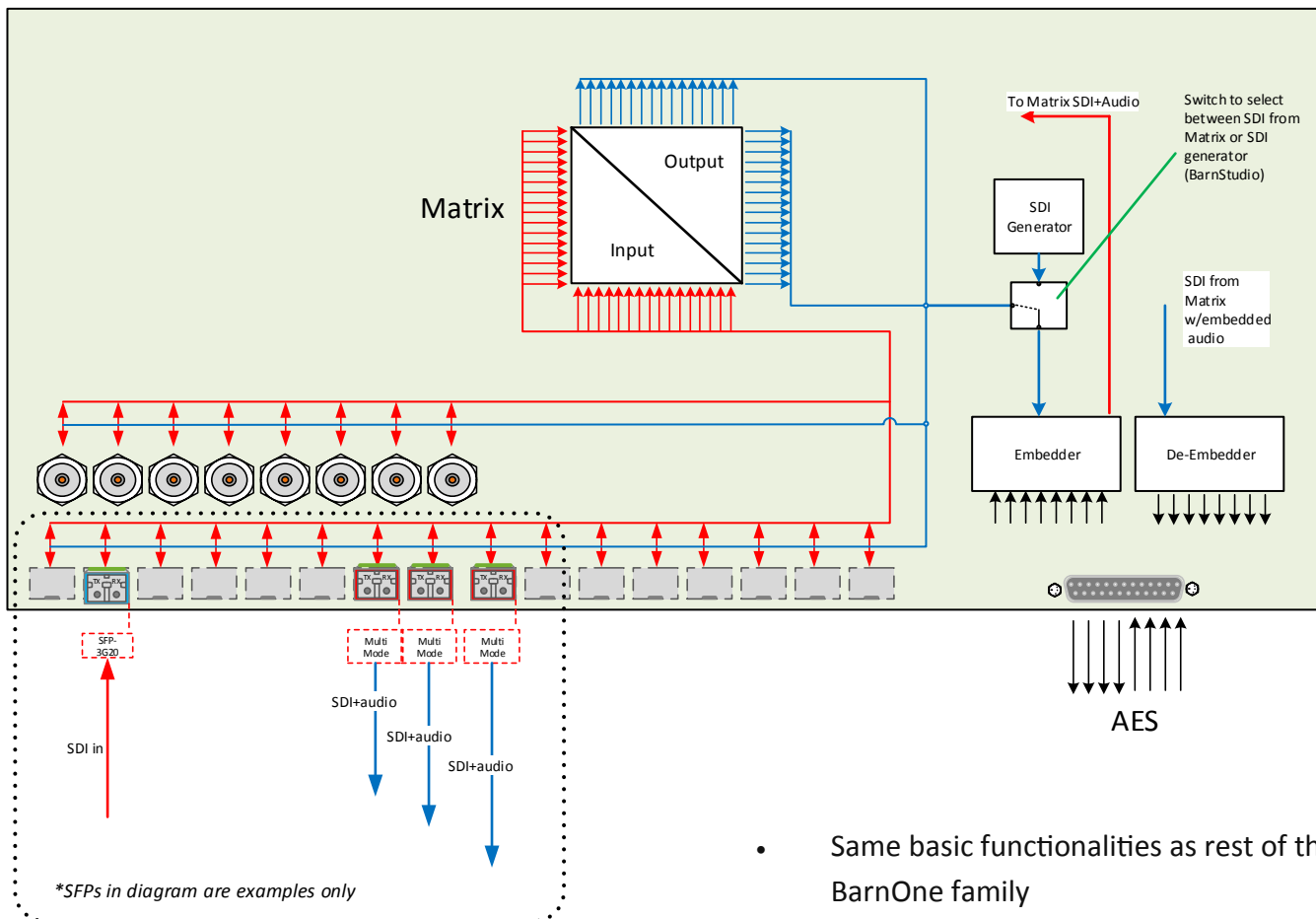
# BarnOne Functionality Diagram



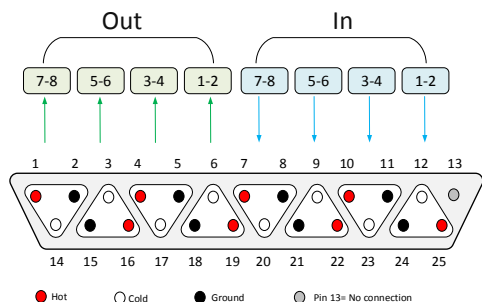
Frames with extended functionalities

# BTF1-10

BTF1-10 has Integrated embedder and de-embedder for AES digital audio (8channels). The embedder is connected to the matrix and allows you to select any of the incoming SDI signals as carrier. The built in SDI Generator can also be selected as carrier.



- Same basic functionalities as rest of the BarnOne family
- Integrated embedder for AES digital Audio
- Integrated de-embedder for AES digital Audio
- Built-in SDI generator for test picture and audio transport (carrier)

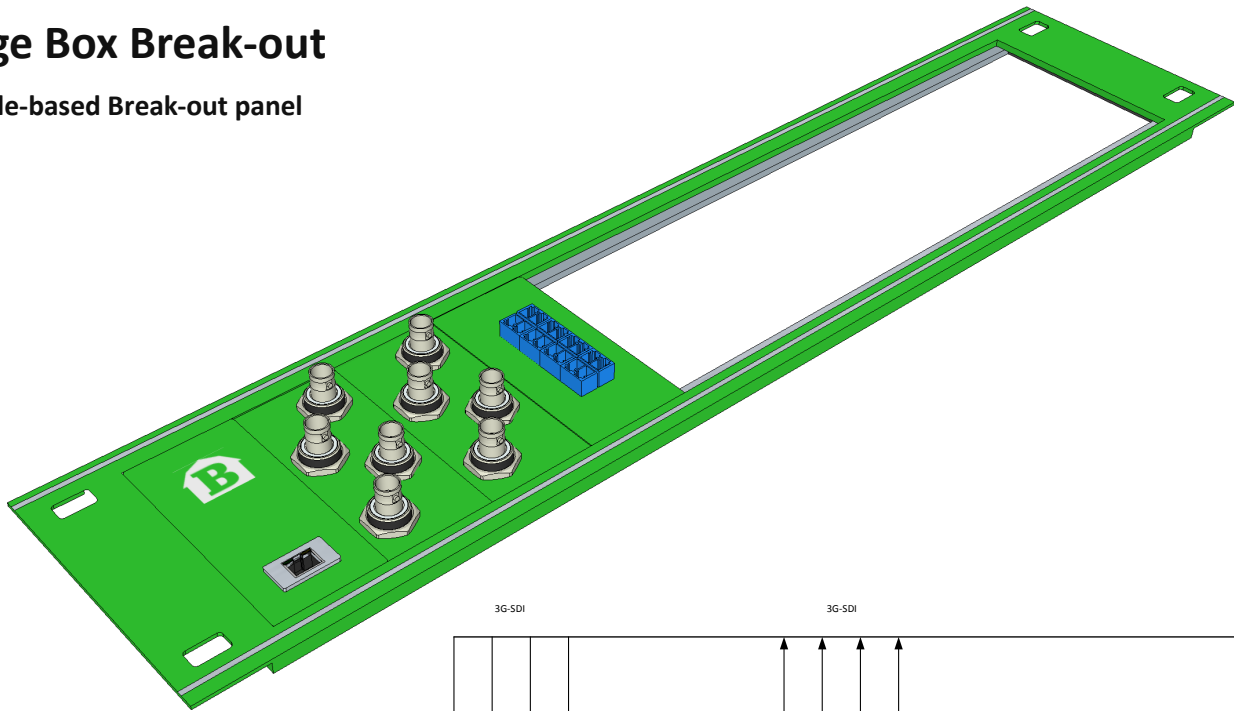


Pin-out for TASCAM DB25 8 Channel Balanced Connector

BarnOneSeries

# Stage Box Break-out

## Module-based Break-out panel

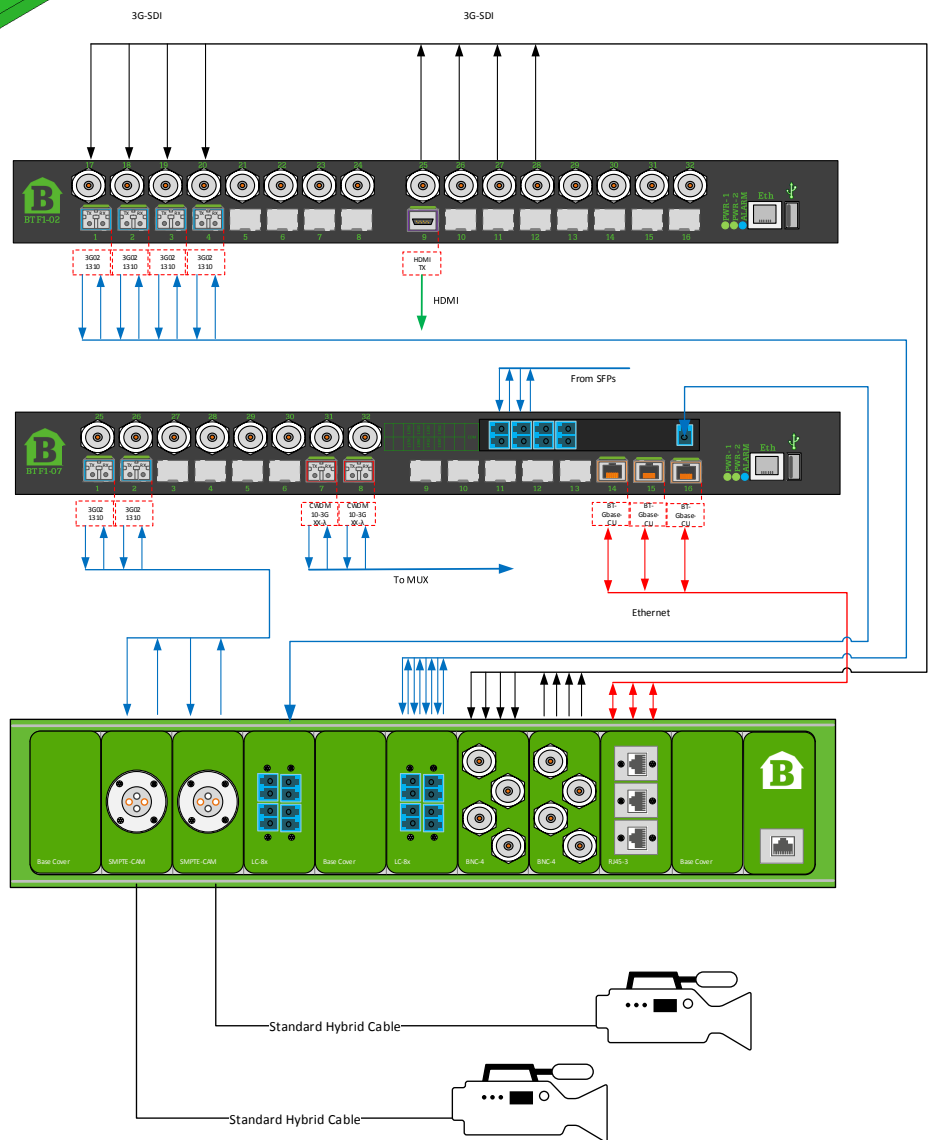


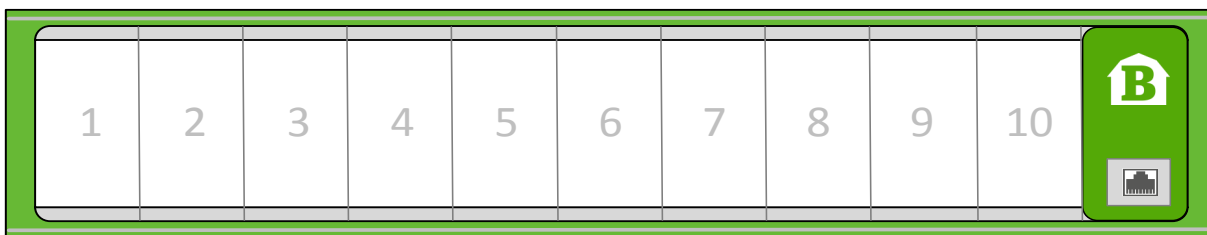
The Barnfind Stagebox Break-out panel allows you to customize your own front panel based on the required connectors. The various selection of modules will be the connection points to one or more frames.

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.
- The cables between Break-out panel and frames are not included.



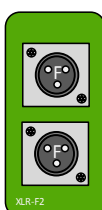


**BTSB-2RU**



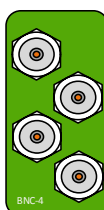
**BTSB-BASE**

Blind cover to fill up unused slots in BTSB-2RU. Note, can also be used to customize for a special preferred connector.



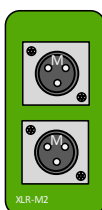
**BTSB-XLR-F2x**

Panel mounted XLR (female) connectors.



**BTSB-BNC-4x**

Panel mounted BNC connectors.



**BTSB-XLR-M2x**

Panel mounted XLR (male) connectors.



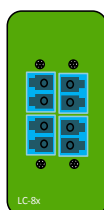
**BTSB-RJ45-3x**

Panel mounted RJ45 connectors.



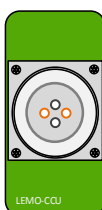
**BTSB-LEMO-CAM**

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

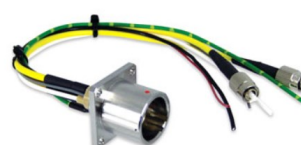


**BTSB-LEMO-CCU**

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

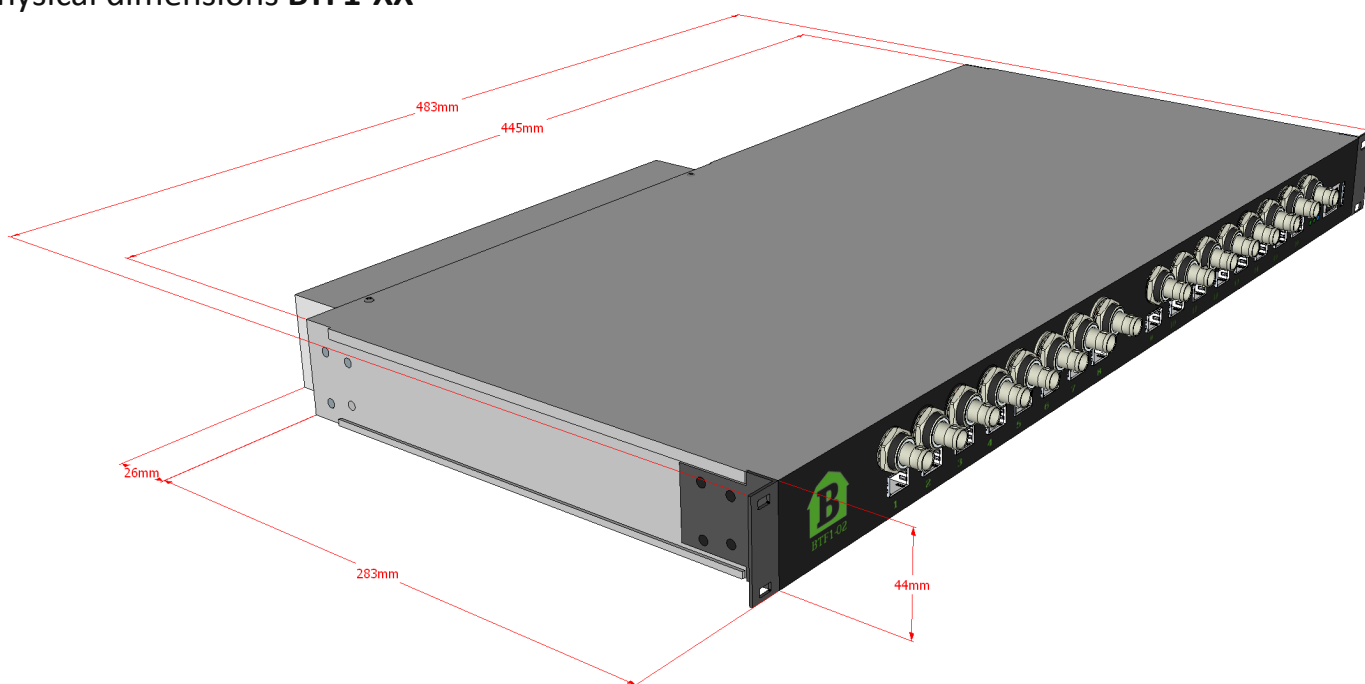
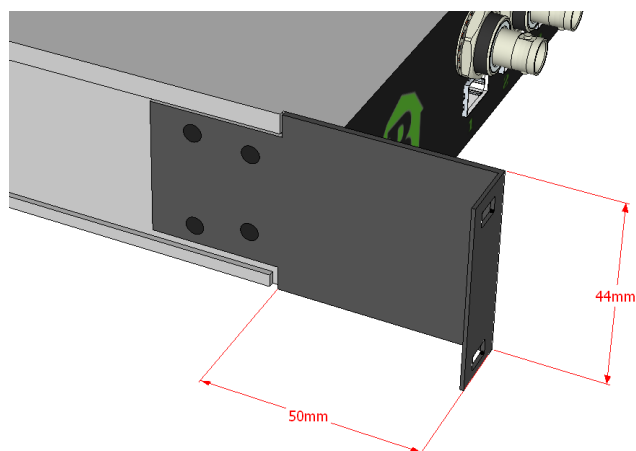


\* LEMO 3K.93C SMPTE PANEL PLG, FXW with LC fibre



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

## BarnOneSeries

Physical dimensions **BTF1-XX****Extension Brackets** (optional)Mod nr: **BT-EXT-EARS-5CM**

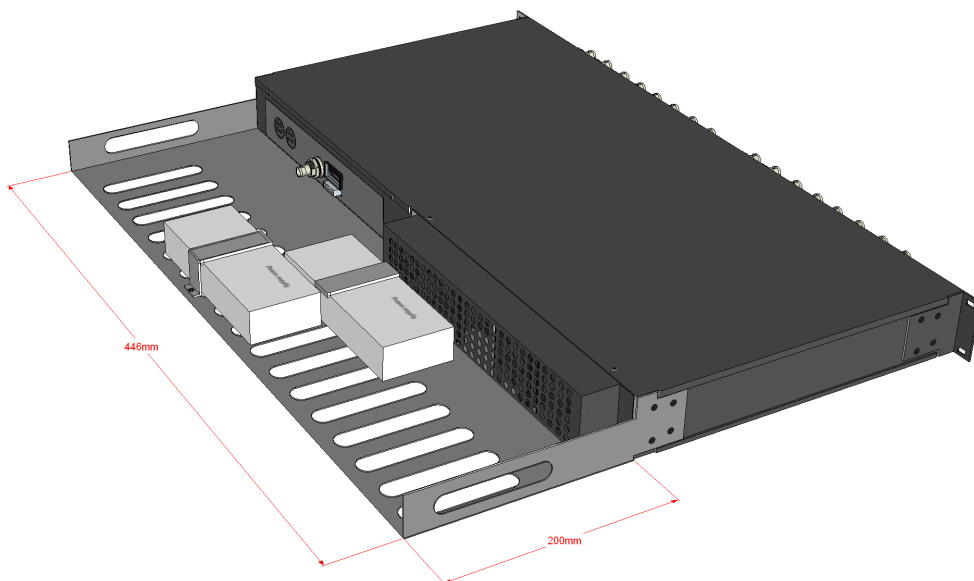
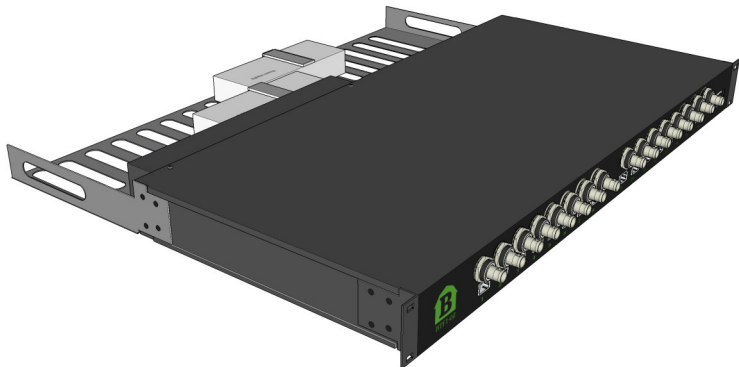


BarnOneSeries

**PSU-TRAY** (optional)

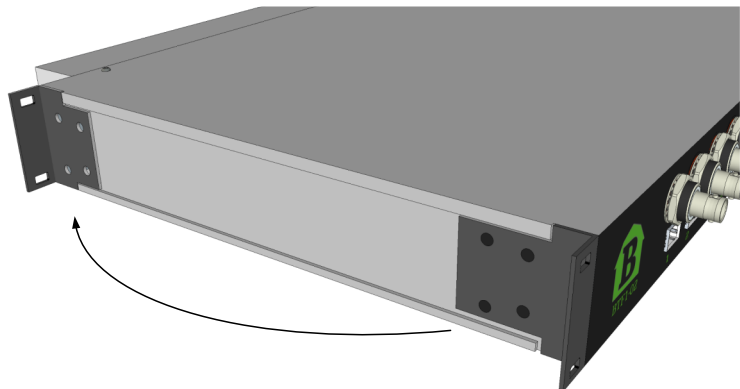
Mod nr: **BT-TRAY-PSU**

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.



## BarnOne Frames

Order Name	Description
BTF1-01	16 SFP ports
BTF1-02	16 SFP ports and 16 BNC
BTF1-03-08	16 SFP ports and a 8 or 16 channel CWDM mux/de-mux built in.
BTF1-03-16	
BTF1-04	32 SFP ports
BTF1-05-08	16 SFP ports and 2X 8 or 16 channel CWDM mux/de-mux built in.
BTF1-05-16	
BTF1-06	24 SFP ports, 8 BNC
BTF1-07-08	16 SFP ports, 8 BNC and a 8 or 16 channel CWDM mux/de-mux built in.
BTF1-07-16	
BTF1-08-08	24 SFP ports and a 8 or 16 channel CWDM mux/de-mux built in.
BTF1-08-16	
BTF1-10	16 SFP ports, 8 BNC and 8 ch. Digital audio embedding / de-embedding

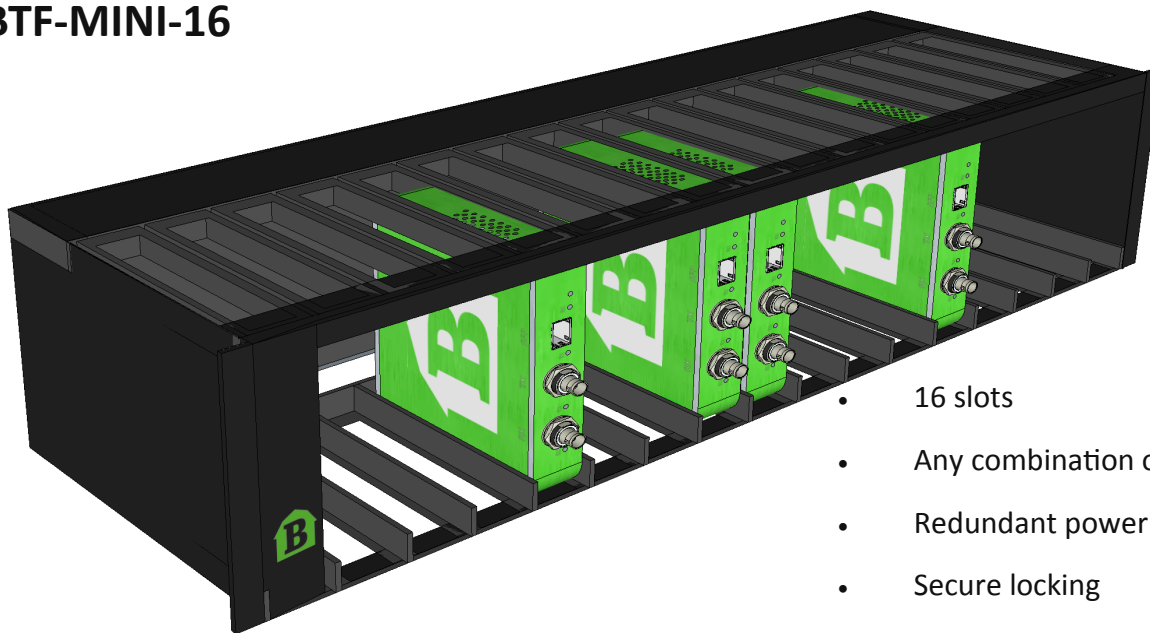
All base frames are 1RU-19". Price includes single PSU, control card and BarnStudio software for configuration and control.

## Accessories

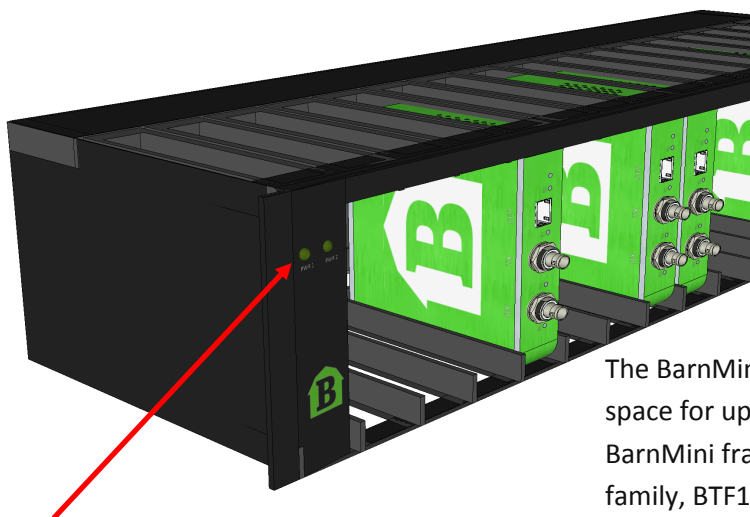
Order Name	Description
BT-PSU-100-240AC	110~240V to 12V, 120 W Redundant PSU for BarnOne / BTF-Mini-16
BT-PSU-36-72DC	48DC to 12V, 100 W Redundant PSU for BarnOne / BTF-Mini-16
BTF1-TRAY-PSU	Tray for PSU to be mounted on the rear side of BarnOne
BT-EXT-PAIR-5CM	Extention mounting brackets for BarnOne,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

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**)



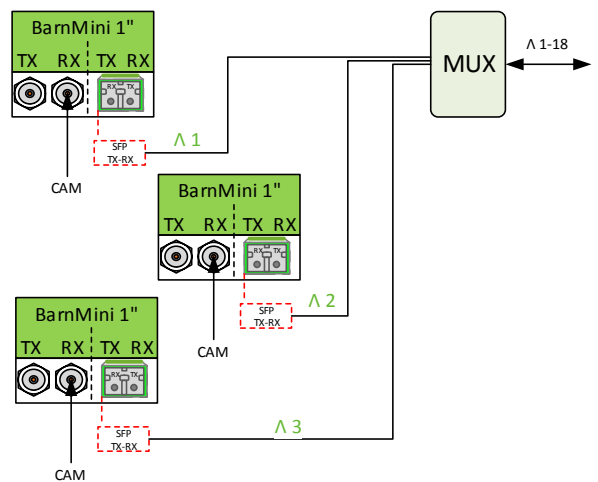
The **BarnMinis** can be secured and released with thumb screws

BarnMini Series

**BARNMINI-01**



*\*examples*



**Technical Specifications**

**Electrical ports**

- 1x TX BNC port
- 1x RX BNC port
- 75 OHM BNC connector
- SMPTE 258M, 292M, 372M, 424M, DVB-ASI
- Multirate reclocking of outputs 270Mbit/s - 3Gbit/s
- Automatic cable EQ (Belden 1694A)  
270Mbit/s-250m, 1,5Gbit/s140m, 3Gbit/s-80m

**Power supply**

12-24V DC. Power supply included

**Physical size**

92mm x 98mm x 22mm

200g

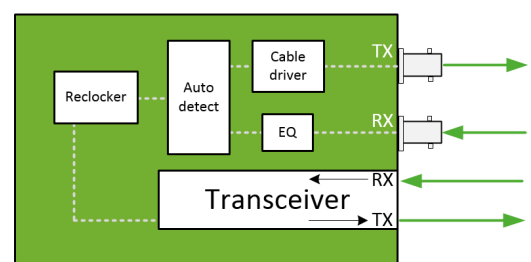
**Model name**

BM-01

**Optical port**

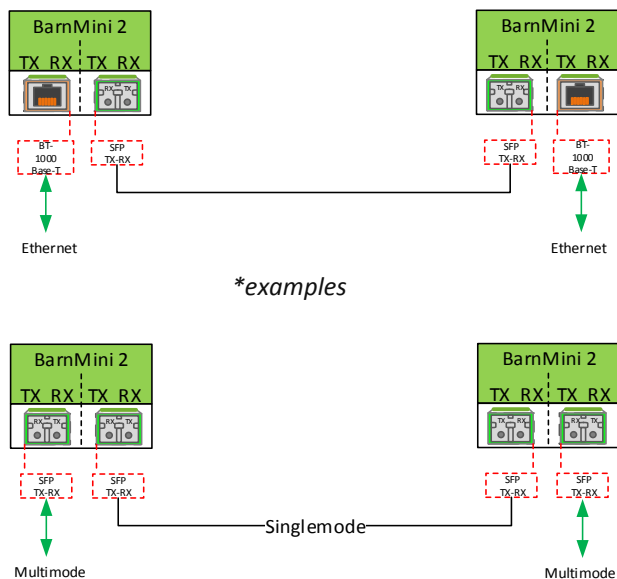
- 1x fiberoptical port (SFP) , Duplex transceivers , LC/PC connectors
- SMPTE 259M, 292M, 424M, 297M, 372M DVB-ASI
- Hot pluggable/swappable
- Singlemode and/or Multimode
- 16 CWDM wavelength selections - ITU-T G.694.2

**SFP ↔ BNC**



BarnMini Series

**BARNMINI-02**



**Technical Specifications**

**Optical ports**

2x Fiberoptical port (SFP), Duplex transceivers , LC/PC connectors (optional HDMI, HD-BNC, RJ45)

SMPTE 259M, 292M, 424M, 297M, 372M DVB-ASI

Multirate reclocking of outputs 270Mbit/s - 3Gbit/s

Hot pluggable/swappable

Singlemode and/or Multimode

18 CWDM wavelength selections - ITU-T G.694.2

**Power supply**

12-24V DC. Power supply included

**Physical size**

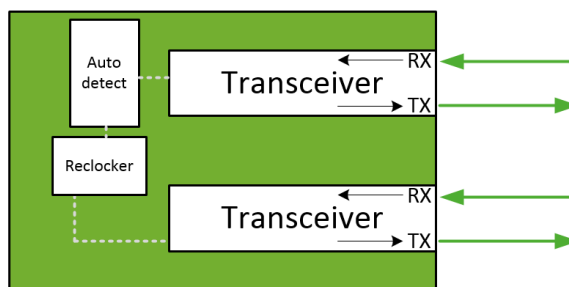
92mm x 98mm x 22mm

200g

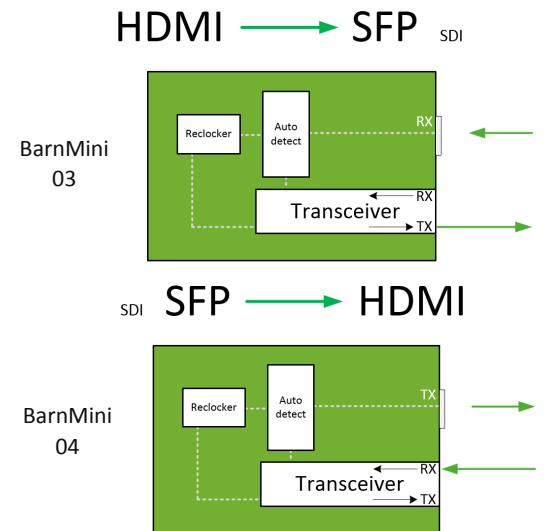
**Model name**

BM-02

SFP ↔ SFP



## BarnMini Series

**BARNMINI-03/04****Technical Specifications****Optical ports**

2x Fiberoptical port (SFP), Duplex transceivers, LC/PC connectors (optional HDMI, HD-BNC, RJ45)

SMPTE 259M, 292M, 424M, 297M, 372M DVB-ASI

Multirate reclocking of outputs 270Mbit/s - 3Gbit/s

Hot pluggable/swappable

Singlemode and/or Multimode

18 CWDM wavelength selections - ITU-T G.694.2

**Power supply**

12-24V DC. Power supply included

**Physical size**

92mm x 98mm x 22mm

200g

**Model name**

BM-03/04

BarnMini Series

**BARNMINI-05**

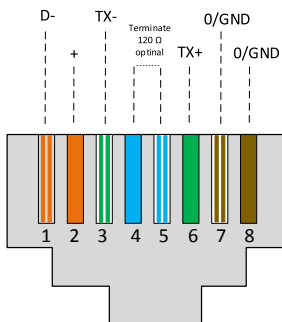


- RS422/485
- 4x GPI
- 4x GPO
- SFP port for optical or copper interface

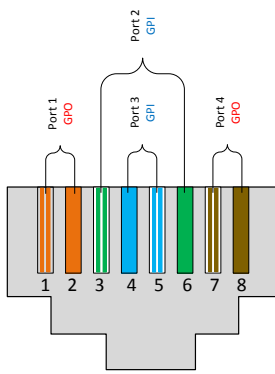
**Power supply**  
12-24V DC. Power supply included

**Physical size**  
92mm x 98mm x 22mm  
200g

**Model name**  
BM-05

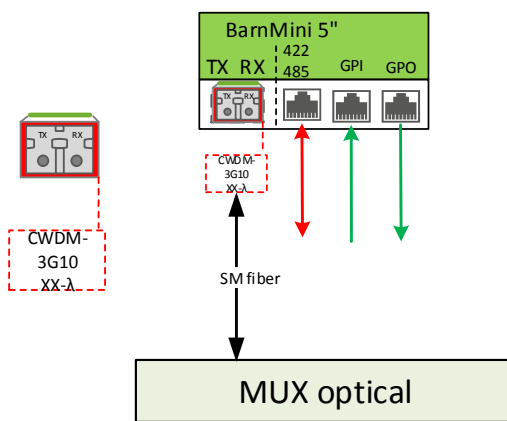
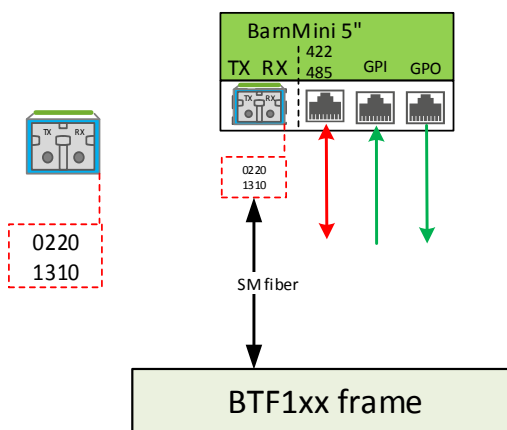
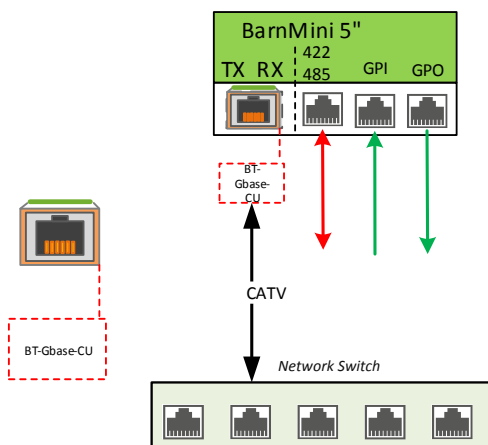


RS422/485 pinout (RJ45)



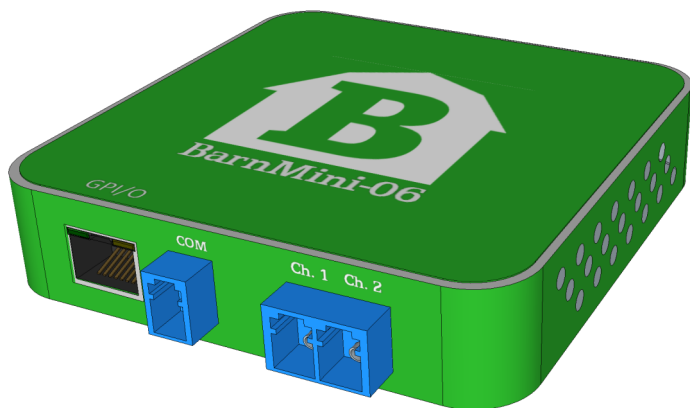
GPIO pinout (RJ45)

\*examples

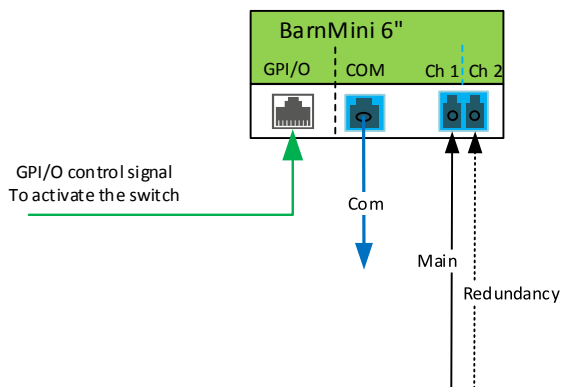


BarnMini Series

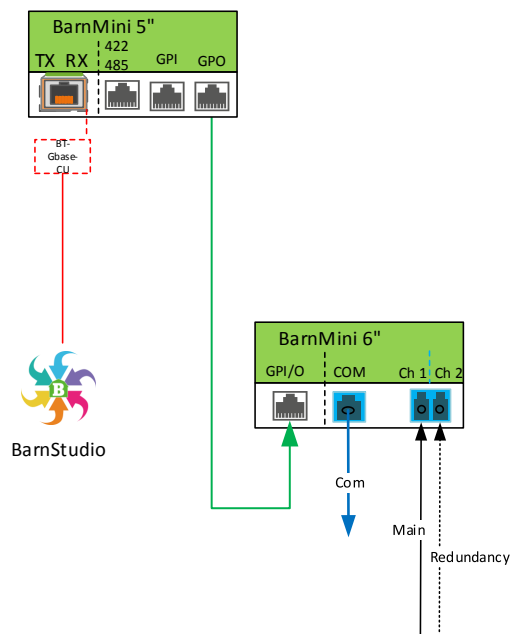
**BARNMINI-06** Optical changeover



\*examples



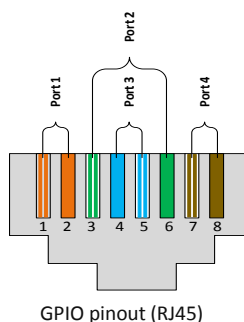
\*examples



**Power supply**  
12-24V DC. Power supply included

**Physical size**  
92mm x 98mm x 22mm  
200g

**Model name**  
BM-06





BarnMini Series

**BARNMINI-11****12G**

## Technical Specifications

### Electrical ports

- 1x TX BNC port
  - 1x RX BNC port
  - 75 OHM BNC connector
  - SMPTE 258M, 292M, 372M, 424M, DVB-ASI, SMPTE ST-2081, ST-2082
  - Multirate reclocking of outputs 270Mbit/s - 3Gbit/s
  - Automatic cable EQ (Belden 1694A)
- 270Mbit/s-250m, 1,5Gbit/s140m, 3Gbit/s-80m

### Optical port

- 1x fiberoptical port (SFP) , Duplex transceivers , LC/PC connectors
- SMPTE 259M, 292M, 372M 424M, 297M, DVB-ASI, SMPTE ST-2081, ST-2083
- Hot pluggable/swappable
- Singlemode and/or Multimode

### Power supply

12-24V DC. Power supply included

### Physical size

92mm x 98mm x 22mm

200g

### Model name

BM-11

BarnMini Series

**BARNMINI-12** 12G



## Technical Specifications

### Optical ports

2x Fiberoptical port (SFP), Duplex transceivers , LC/PC connectors (optional HDMI, HD-BNC, RJ45)

SMPTE 259M, 292M, 424M, 297M, 372M DVB-ASI, SMPTE ST-2081, ST-2082

Multirate reclocking of outputs 270Mbit/s - 3Gbit/s

Hot pluggable/swappable

Singlemode and/or Multimode

18 CWDM wavelength selections - ITU-T G.694.2

### Power supply

12-24V DC. Power supply included

### Physical size

92mm x 98mm x 22mm

200g

### Model name

BM-06

## 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	12 ports GPIO through ethernet / fiber, incl. PSU.
BarnMini-06	Optical changeover 1:2
BarnMini-11	BNC TX/RX, SFP port for transceiver (TX/RX), incl. PSU.
BarnMini-12	2xSFP port for transceiver (TX/RX), incl. PSU.
BTF-Mini-16	2.5RU frame for housing of up to 16 BarnMinis, incl. PSU.

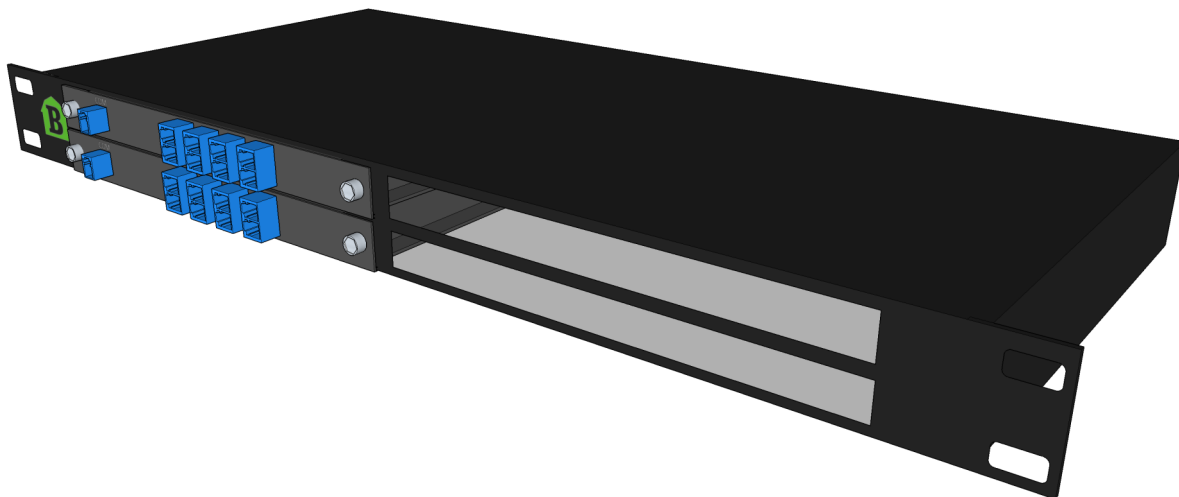
## Accessories

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

## 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



#### Passive Optical Products:

#### Splitter

- 1:2
- 1:4
- 1:8

#### CWDM Multiplexer/de-Multiplexer

- |                    |                |
|--------------------|----------------|
| · 2 channels (WDM) | 1310nm, 1550nm |
| · 8 channels       | 1290nm-1430nm  |
| · 16 channels      | 1290nm-1590nm  |
| · 18 channels      | 1270nm-1610nm  |

#### Optical Changeover Switch (OCS)

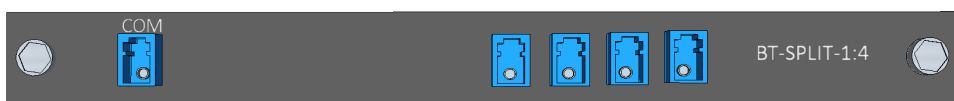
- 2:1

Passive Optical Products

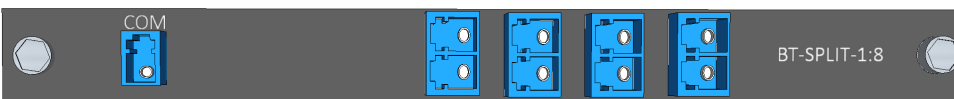
**BT-SPLIT-XX-LGX**



1:2



1:4



1:8



**How does optical splitting affect your optical attenuation**

If you split a 0dBm (1mW) signal to half, the signal will decrease with -3 dBm.

Note! You need 3 dBm to double the optical budget

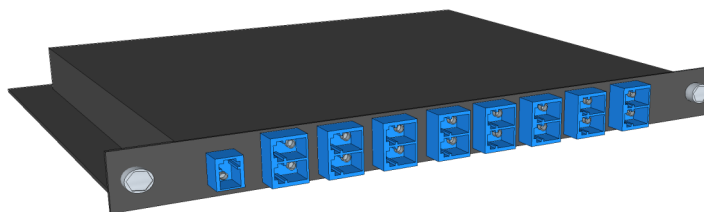
If you split a 0dBm (1mW) signal to 4, the signal will decrease with -6 dBm.

If you split a 0dBm (1mW) signal to 8, the signal will decrease with -9 dBm.....

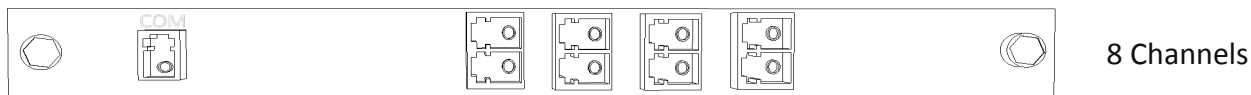
Passive Optical Products

**CWDM**

Multiplexer / de-Multiplexer

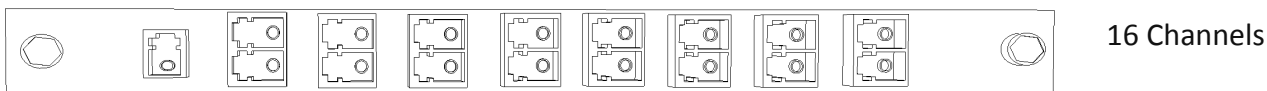


**Note!**  
 This is only for external multiplexers. See front label at BTF1-xx for configuration of internal multiplexers



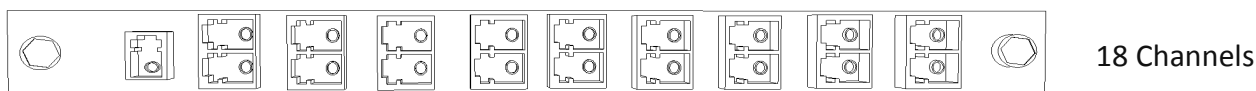
COM	1290	1330	1370	1410
	1310	1350	1390	1430

8 Channels



COM	1290	1330	1370	1410	1450	1490	1530	1570
	1310	1350	1390	1430	1470	1510	1550	1590

16 Channels



COM	1270	1310	1350	1390	1430	1470	1510	1550	1590
	1290	1330	1370	1410	1450	1490	1530	1570	1610

18 Channels

**Technical Specifications**

CWDM Mux/deMux

- 8/16/18 optical channels
- Center wavelenghts according to ITU-T G.694.2
- Channel center wavelength 1270~1610nm
- Channel clear passband ITU+/-7 nm
- Insertion loss 8ch-2.5dBm, 16ch-3.5dBm (max)
- Passband ripple 0.5dBm (max)
- Adjacent channel isolation 30dBm (min)
- Non-adjacent channel isolation 45dBm (min)
- Return loss 45dBm (min)
- Directivity 45dBm (min)
- Polarization dependent loss 0.1dBm (max)
- Operating temperature range 0 to +70C
- Maximum power handling 300mW



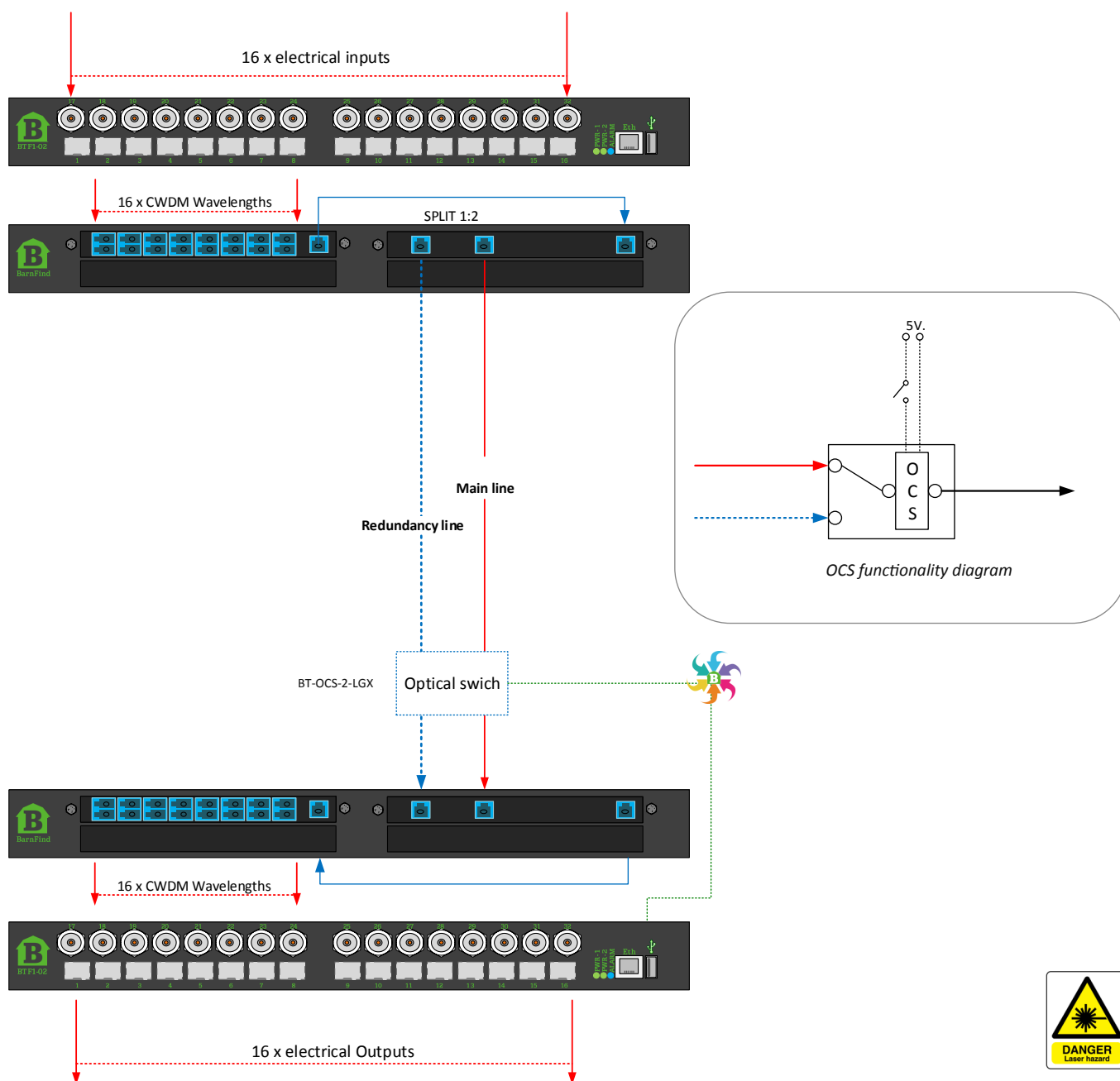
CWDM Channels	Wavelength
1	1270
2	1290
3	1310
4	1330
5	1350
6	1370
7	1390
8	1410
9	1430
10	1450
11	1470
12	1490
13	1510
14	1530
15	1550
16	1570
17	1590
18	1610

Passive Optical Products

# Optical Changeover Switch



BT-OCS-2-LGX



## Housing for Passive Optical Modules

Order Name	Description
BT-HOUS-LGX-1RU	Barnfind standard empty chassis for up to 4 LGX Boxes in 1RU

## CWDM Mux/Demux

Fit into BT-HOUS-LGX-1RU Chassis

Order Name	Description
BT-WDM-LGX	2 channels in LGX box stand-alone
BT-CWDM-MUX-08-LGX	8 channels in LGX box stand-alone
BT-CWDM-MUX-16-LGX	16 channels in LGX box stand-alone
BT-CWDM-MUX-18-LGX	18 channels in LGX box stand-alone

## Optical Splitters

Fit into BT-HOUS-LGX-1RU chassis

Order Name	Description
BT-SPLIT-2-LGX	Passive distribution of optical signals 1:2 out
BT-SPLIT-4-LGX	Passive distribution of optical signals 1:4 out
BT-SPLIT-8-LGX	Passive distribution of optical signals 1:8 out

## Optical Changeover Switch

Fit into BT-HOUS-LGX-1RU chassis

Order Name	Description
BT-OCS-2-LGX	Optical changeover 2:1, Non-latching

## Accessories

Order Name	Description
BT-ATT-LC-05	Attenuator for LC connectors, 5dBm
BT-PA-LC/LC-SM-SX-0.5M	Fiber patch cables LC-LC, Single Mode, Simplex
FAULT LOCATOR 8-10km	Visual fault locator optical tester
BT-POWER METER	Portable optical power meter
BARNCLEAN	Fiber optical connector cleaner
BARNCLEAN REFILL	Refill cassette for BarnClean



# SFP

## Small Form-factor Pluggable transceiver (SFP)

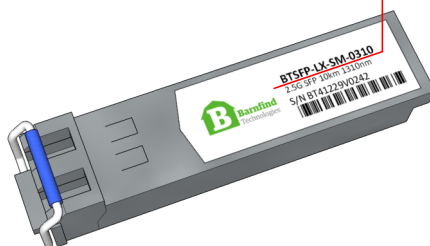
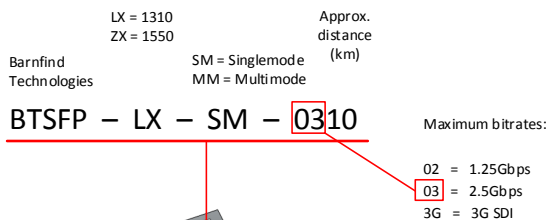
The **small form-factor pluggable (SFP)** is a compact, hot-pluggable transceiver used for both telecommunication and data communications applications. The form factor and electrical interface are specified by a multi-source agreement (MSA). It interfaces a network device motherboard (for a switch, router, 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

### Standard SFPs

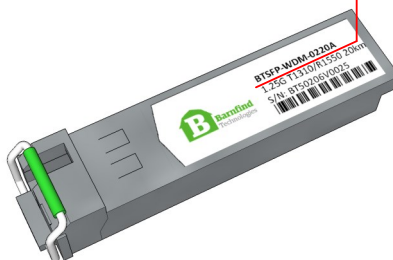
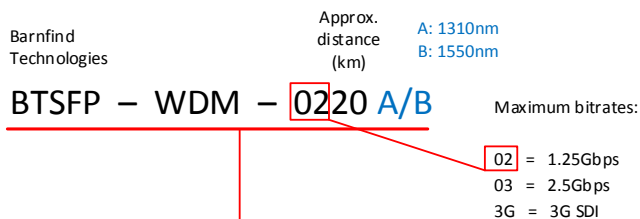
A transceiver SFP is normally used point to point over short, medium and long distances. The most significant information is; the maximum distance and the maximum data rate.

*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	
BT	10	3G	1270
		31	1290
			1310
			1330
			1350
			1370
			1390
			1410
			1430
			1450
			1470
			1490
			1510
			1530
			1550
			1570
			1590
			1610

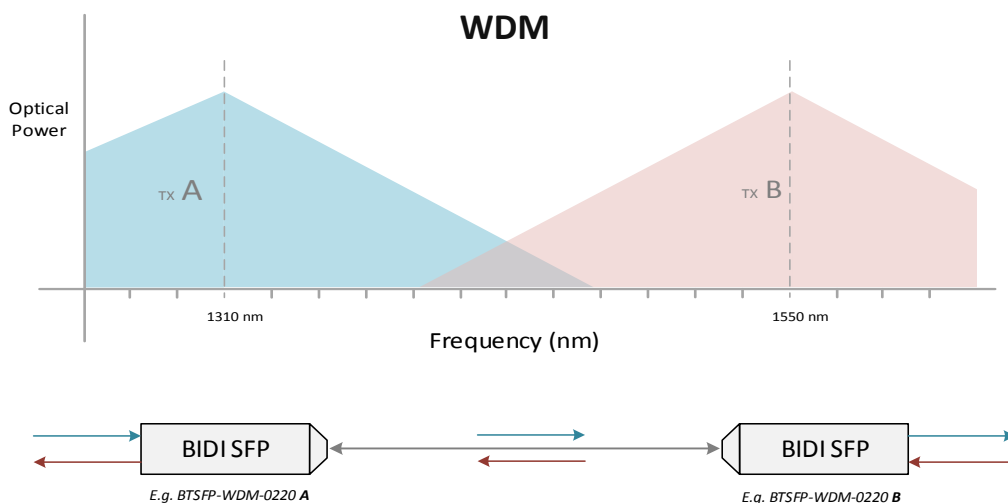
  

## HiLo SFPs

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.

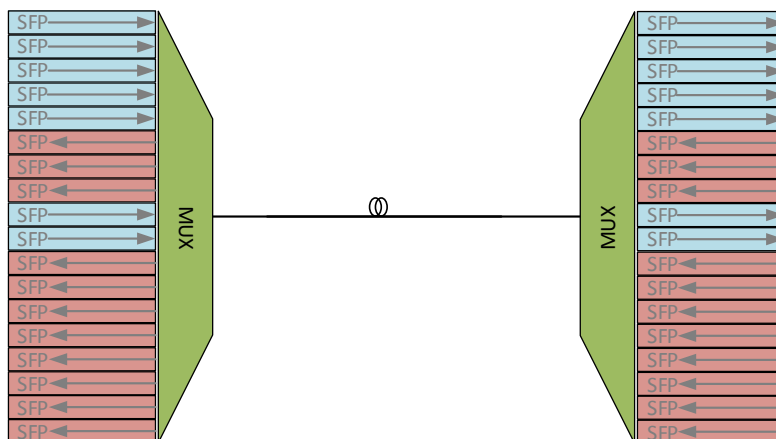
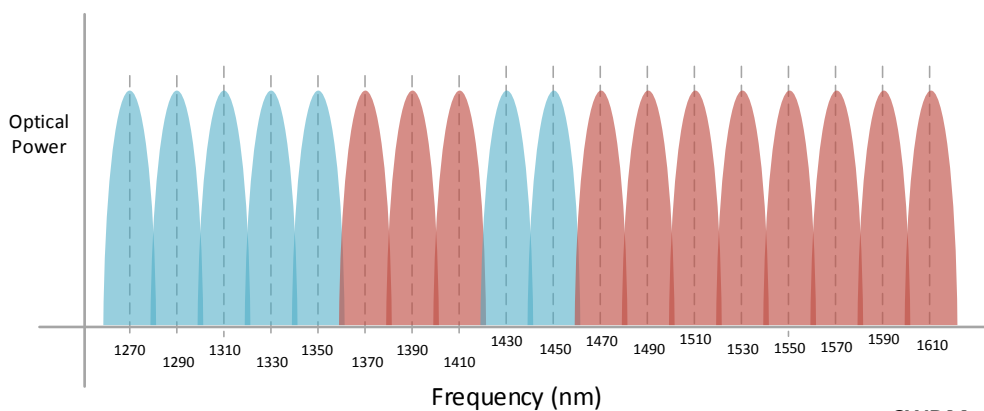
Barnfind Technologies	Max. bitrate	H: High L: Low	
BT	3G	49	1270
		H	1290
			1310
			1330
			1350
			1370
			1390
			1410
			1430
			1450
			1470
			1490
			1510
			1530
			1550
			1570
			1590
			1610

## Basic information about Multiplexing



**WDM-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. They are always working in pair (A/B), and they are using two different wavelengths (A:1310nm and B:1550nm). The Multiplexer is Integrated in the SFP.

## CWDM



**CWDM– CoarseWavelength Division Multiplexing**, allows any protocol transmission over the link, as long as it is a specific wavelength. (e.g. HD-SDI at 1570nm can be transported alongside 3G-SDI at 1590nm). This allows for longterm proofing of the infrastructure because the multiplexers simply refract light at any speed/ bitrate, regardless of the protocol being deployed.

## Basic information about Multiplexing

### HiLo

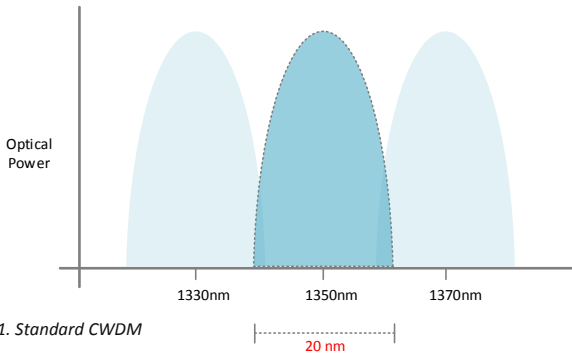


Fig 1. Standard CWDM

**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*

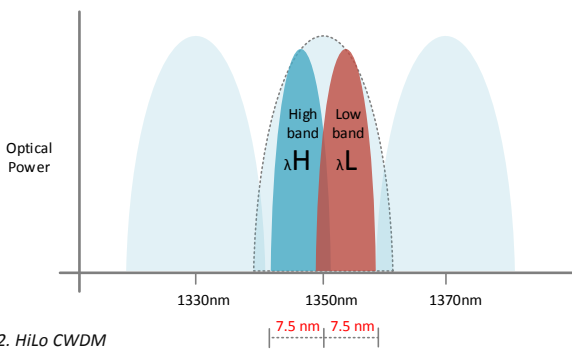


Fig 2. HiLo CWDM

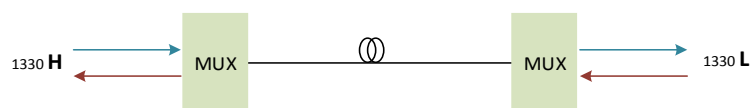
**Figure 2.** Barnfind HiLo SFPs are designed to meet a need for higher density of signals in one single fiber. By using half of the spacing in each wavelength, *the HiLo SFPs can double the capacity of the traditional CWDM bi-directional transmission.*

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

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

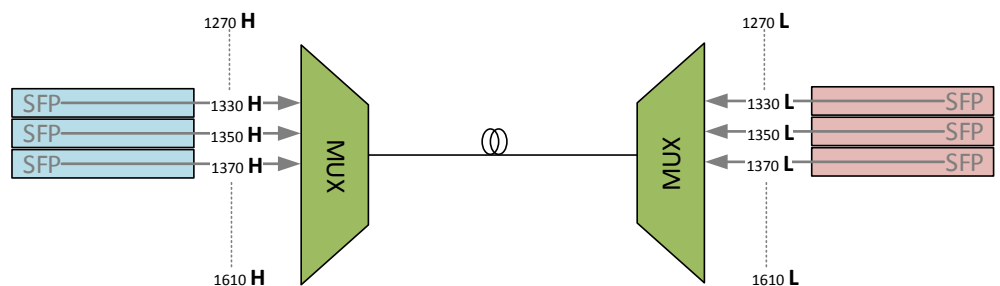
#### Benefits of using HiLo SFP:

- 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



# 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	tr / tf			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 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 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	tr / tf			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 InG-aAs 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	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	Vcc	3.13	3.3	3.47	V	
Operating Case Temperature	Tc	0		70	°C	
Baud Rate		50		3000	Mb/s	
Power Supply Current	Icc		200	300	mA	

Transmitter Specifications (0°C < Tc < 70°C, 3.13V < Vcc < 3.47V)						
Parameter	Symbol	Min	Typ	Max	Units	Notes
<b>Optical</b>						
Optical Transmit Power	Po	-8		-3	dBm	1
Output Center Wavelength	$\lambda$	$\lambda_c - 5.5$	$\lambda_c$	$\lambda_c + 7.5$	nm	2
Output Spectrum Width	$\Delta\lambda$	---		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	$V_{IH} - V_{IL}$	200		1200	mVp-p	AC coupled input
Disable Input Voltage -- Low	$V_{TDIS,L}$	0		0.8	V	TX Output Enabled
Disable Input Voltage -- High	$V_{TDIS,H}$	2.0		Vcc+0.3	V	TX Output Disabled
SCL, SDA	$V_{OH}$	2.5		Vcc+0.3	V	
	$V_{OL}$	0		0.5	V	

Receiver Specifications (0°C < Tc < 70°C, 3.13V < Vcc < 3.47V)						
Parameter	Symbol	Min	Typ	Max	Units	Notes
<b>Optical</b>						
Wavelength of Operation		1260	---	1620	nm	
Sensitivity for SMPTE 424M 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 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 - Single Mode

Order Number	Max. Data Rate	Distance	nm	
BTSFP-LX-SM-0220	1.25Gbps	20km	1310nm	Ethernet, SD-SDI, ASI, AES
BTSFP-LX-SM-0240	1.25Gbps	40km	1310nm	
BTSFP-ZX-SM-0280	1.25Gbps	80km	1550nm	
BTSFP-LX-SM-0310	2.125Gbps	10km	1310nm	HD-SDI
BTSFP-LX-SM-0340	2.125Gbps	40km	1310nm	Note! Does not support pathological signals
BTSFP-ZX-SM-0380	2.125Gbps	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 - BIDI Single Mode Transceiver modules

Order Number	Max. Data Rate	Distance	nm	
BTSFP-WDM-0220A/B	1.25Gbps	20km	1310/1550	Ethernet, SD-SDI, ASI, AES
BTSFP-WDM-0240A/B	1.25Gbps	40km	1310/1550	
BTSFP-WDM-0280A/B	1.25Gbps	80km	1310/1550	
BTSFP-WDM-0310A/B	2.5Gbps	10km	1310/1550	HD-SDI
BTSFP-WDM-0340A/B	2.5Gbps	40km	1310/1550	Note! Does not support pathological signals
BTSFP-WDM-0380A/B	2.5Gbps	80km	1310/1550	

## SFP - CWDM Single Mode Transceiver modules

Order Number	Max. Data Rate	Distance	nm	
BT-CWDM-40-02XX	1.25Gbps	40km	1270-1610nm	Ethernet, SD-SDI, ASI, AES
BT-CWDM-80-02XX	1.25Gbps	80km	1270-1610nm	
BT-CWDM-40-03XX	2.5Gbps	40km	1270-1610nm	
BT-CWDM-80-03XX	2.5Gbps	80km	1270-1610nm	HD-SDI
BT-CWDM-10-3GXX	3G	10km	1270-1610nm	SD,HD,3G-SDI
BT-CWDM-40-3GXX	3G	40km	1270-1610nm	
BT-CWDM-80-3GXX	3G	80km	1270-1610nm	

### SFP Transceiver modules - HiLo SFP

Order Number	Max. Data Rate	Distance	nm
BT-3G-xx-H	3Gbps	20km	1270-1610nm
BT-3G-xx-L	3Gbps	20km	1270-1610nm

### SFP Transceiver modules - Multi Mode

Order Number	Max. Data Rate	Distance	nm
BTSFP-MM-1G550	1Gbps	550m	850nm
BTSFP-MM-2G550	2Gbps	550m	850nm
BTSFP-MM-3G02	3Gbps	2km	1310nm

### Other SFPs

Order Number	Description
<b>Video HDBNC Coaxial SFP</b>	
EB30HDRT-MM	SDI SFP (emSFP) Coaxial transceiver, medium reach, MSA, HD-BNC
<b>Video DIN Coaxial SFP</b>	
EB30CSRT-MM	SDI SFP (emSFP) Coaxial ransceiver medium reach, MSA, DIN 1.0/2.3
<b>HDMI/DVI emSFP</b>	
EB34TD1R-SM	HDMI to 3Gbps SDI Converter
EB34TD1T-SM	SDI to HDMI/DVI SFP Transmitter (emSFP), MSA, Type D with retention clip
<b>CVBS emSFP</b>	
EB30CSRT-AM	CVBS SFP (emSFP) Coaxial transceiver, MSA, DIN1.0/2.3
EB30HDRT-AM	CVBS SFP (emSFP) Coaxial transceiver, MSA, HD-BNC
<b>Ethernet SFP</b>	
BTSFP-Gbase-CU	10/100/1000 Mbit/s
<b>Singel Receiver SFP</b>	
BTSFP-RX-HS-3G	3G-SDI Single mode receiver, High Sensitivity

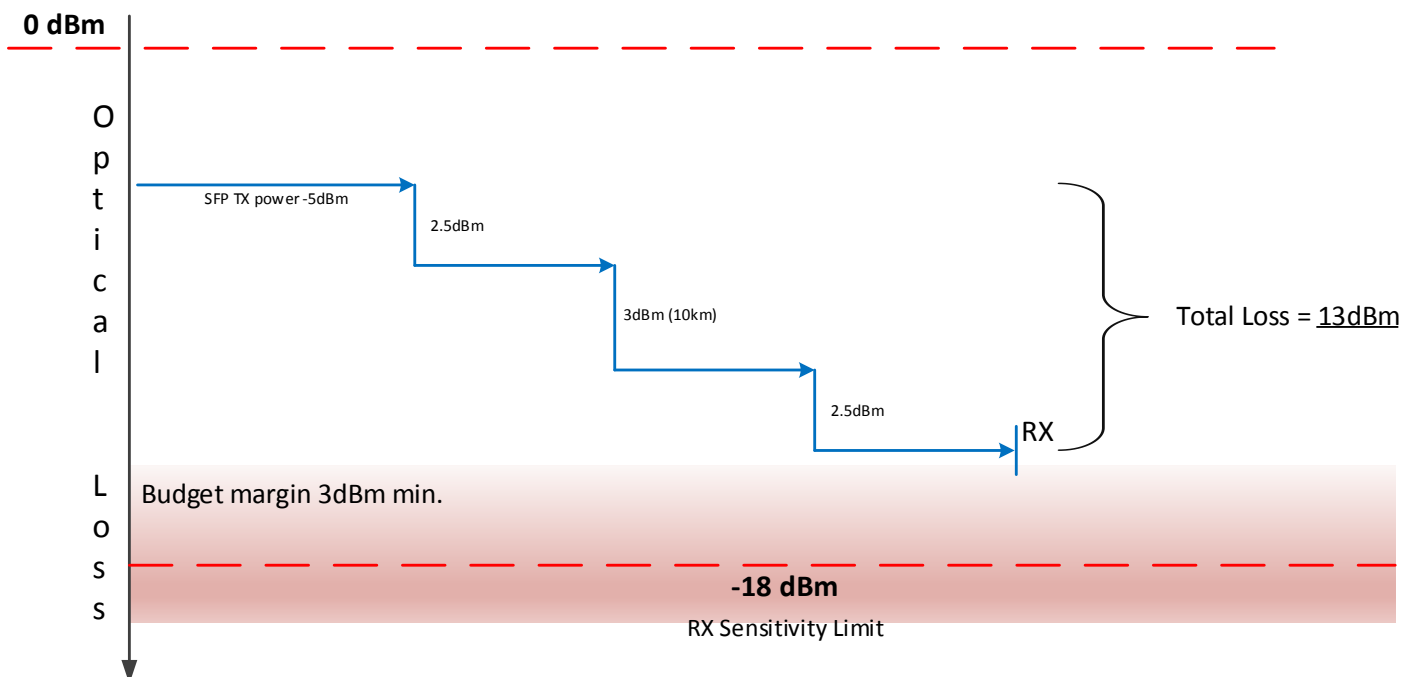
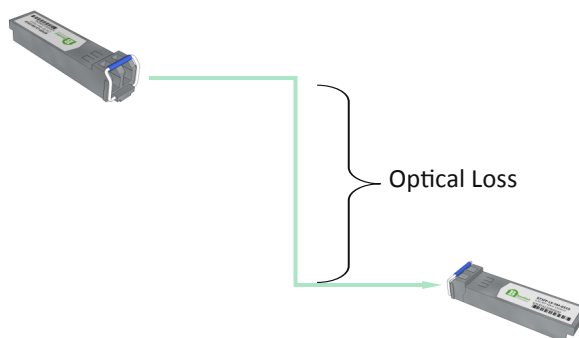
See Barnfind catalog for full overview of SFPs

## 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.

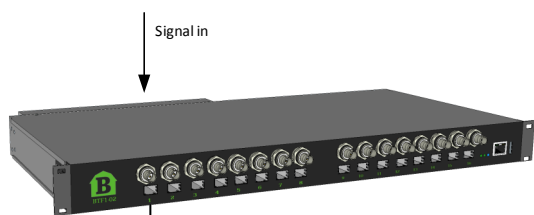
Example:

- 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**

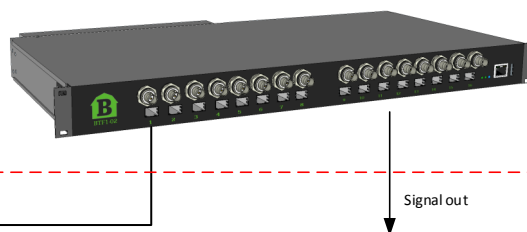


**CWDM Multiplexer:**  
Insertion loss:  
- **8ch: 2.5dBm** (max)  
- **16ch: 3.5dBm** (max)



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

**CWDM Multiplexer:**  
Insertion loss:  
- **8ch: 2.5dBm** (max)  
- **16ch: 3.5dBm** (max)



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



# BarnStudio

## Install BarnStudio on your computer

Download latest version of BarnStudio for free, directly from our website.

<http://www.barnfind.no/control/>

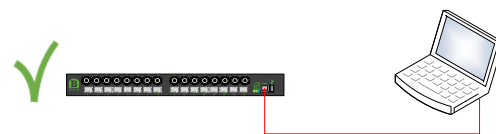
**BarnStudio** is first of all a management and configuration tool to be used for BarnOne frames. Further it is a great tool for general monitoring of signal flow and diagnostic of SFPs, BNCs, many different optical parameters, fans, reclockers, equalizers etc.

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



## How to get started with BarnStudio

### Discover the frames



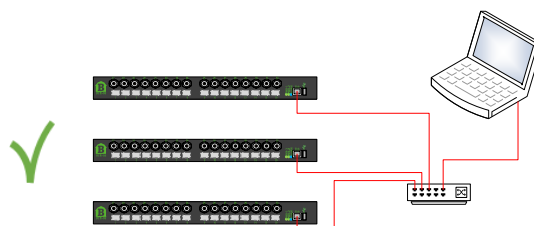
Note: The BTF1-XX is shipped standard with no IP address set, but with DHCP enabled.

Barnfind use multicast for discovering and configuring network parameters for any BTF1-XX frames. The reason for this is that multicast always work regardless of what the current IP address/status may be.

Multicast search scope			
Scope	Trådløs nettverkstilkobling 2	Trådløs nettverkstilkobling	Bluetooth-nettverkstilkobling
IPv4 local	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IPv4 site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IPv4 org	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IPv6 local	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IPv6 site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IPv6 org	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Multicast search scope:

You can select of which network interfaces you want to search for frames on. Each network interface represent one column. *Note! text appears in your local language.* The Multicast search scope offer 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.



### 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 remote connect, it might appear as red or grey even if you have a valid connection.*

Device	NetConf	Protocol
fgdfg	<span style="color: grey;">●</span>	
noname #2	<span style="color: green;">●</span>	
▲ Test1		
Kjellern	<span style="color: green;">●</span>	SNMP IPv4
Stian	<span style="color: grey;">●</span>	

#### 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.

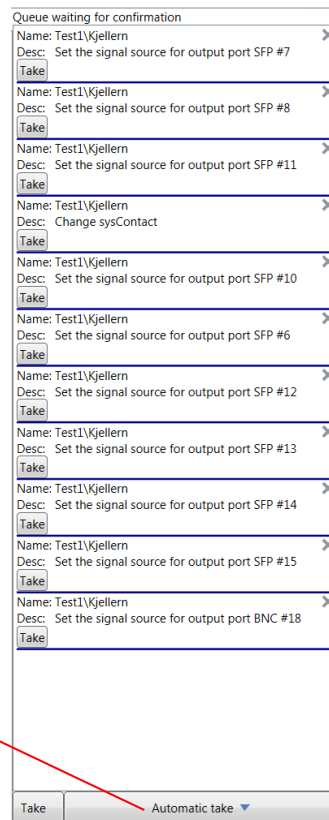
## Acknowledgement (Take) of configuration changes

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.

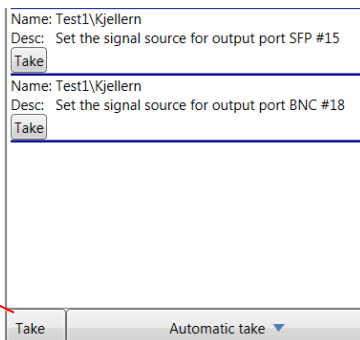
### Automatic Take:

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



## 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	Diagnostics	SNMP traps
Model: BTF1-02 SerialNumber: 12435 NetworkID: B8-27-EB-EA-D1-63								
sysName: <input type="text" value="Test1\Kjellern"/> This is the designated name of this device as it appears in the browser.								
sysLocation: <input type="text" value="Basement"/> 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.								
sysContact: <input type="text" value="wer"/> Who is the contact person responsible for this device?								

## SNMP Connection properties:

This section can be used if you want to connect 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.

SNMP connection properties	
Connection Status:	Device online to host 192.168.0.95 port 161
Force Host/Port:	<input type="checkbox"/>
Host:	<input type="text"/>
Port:	<input type="text" value="161"/>
SNMP Write Community:	<input type="text" value="private"/>
DetectionStatus:	Initiate detection to (last successfull host) [192.168.0.95]:161 Initiate detection to (last successfull host) [192.168.0.95]:161 Detection successfull. Installing [192.168.0.95]:161 Installation complete



## 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 displays the 'Network Status' section of the BarnStudio interface. It features a navigation bar with tabs for 'Basic information', 'Network', 'Matrix', 'Inputs', 'Outputs', 'SFPs', 'Firmware Upgrade', 'Diagnostics', and 'SNMP traps'. Below the navigation bar, there are sub-tabs for 'Configuration' and 'Log'. The main content area is titled 'Network Status' and contains three sections:

- IPConfig:** Lists the currently assigned IP addresses:
  - 192.168.0.95/24 eth0
  - 127.0.0.1/8 lo
  - fe80::ba27:ebff:feea:d163/64 eth0
  - ::1/128 lo
- Route:** Shows the currently active routing table:
  - 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:** Displays the current DNS resolving configuration file content:
  - nameserver 8.8.8.8

### 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.

The screenshot shows a web-based configuration interface for network settings. It is divided into two main columns: IPv4 configuration and IPv6 configuration. Each column has a 'configuration mode' section with radio button options and a 'static configuration' section with input fields for IP addresses, default gateway, DNS servers, and DNS searches. At the bottom, there are two buttons: 'Download configuration from device' and 'Upload configuration to device'. A red arrow on the left points to the 'Network Configuration' header, and a red arrow on the right points to the 'Upload configuration to device' button.

**Network Configuration**

**IPv4 configuration mode**

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

**IPv4 static configuration**

IP addresses:

Default Gateway:

DNS servers:

DNS searches:

**IPv6 configuration mode**

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

**IPv6 static configuration**

IP addresses:

Default Gateway:

DNS servers:

DNS searches:

**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.

<p>IPv4 static configuration</p> <p>IP addresses: <input type="text"/></p> <p>Default Gateway: <input type="text"/></p> <p>DNS servers: <input type="text"/></p> <p>DNS searches: <input type="text"/></p>	<p>IPv6 static configuration</p> <p>IP addresses: <input type="text"/></p> <p>Default Gateway: <input type="text"/></p> <p>DNS servers: <input type="text"/></p> <p>DNS searches: <input type="text"/></p>
<p>Download configuration from device</p>	<p>Upload configuration to device</p>

**Download Configuration from Device – button**

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

**Upload Configuration to Device – button**

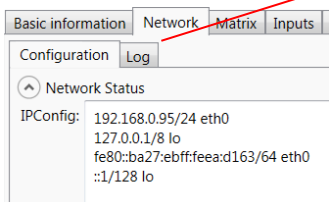
Click this button to upload the configuration from BarnStudio into the device.

*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 SNMP 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.

The screenshot shows a configuration window with tabs for 'Basic information', 'Network', and 'Matrix'. The 'Matrix' tab is active, displaying a grid of routing options. The columns are labeled 'Inputs', 'Outputs', 'SFPs', 'Firmware Upgrade', 'Diagnostics', and 'SNMP traps'. The rows are grouped into 'No group', 'My group', and 'No group'. The 'My group' section includes SFP #5 (Input port 5), SFP #6 (Input port 6), SFP #4 (HDMI RX), SFP #1 (Input port 1), SFP #2 (Input port 2), and SFP #3 (Input port 3). The 'No group' sections include SFP #7-14 (Input ports 7-14) and BNC #15-18 (Input ports 15-18). The grid cells contain colored squares indicating signal detection status: black for no signal, red for loss of signal, and green for signal detected. A red arrow points from the 'Setup' button in the adjacent screenshot to the 'SFP #2' row in the matrix.

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

The 'Setup' dialog box has 'Add' and 'Setup' buttons. Below is a table with columns 'Device' and 'NetConf Protocol':

Device	NetConf Protocol
fgdfg	<input type="radio"/>
noname #2	<input checked="" type="radio"/>
Test1	
Kjellern	<input checked="" type="radio"/> SNMP IPv4
Stian	<input type="radio"/>

Groups can be defined using the input and output tabs.

# Inputs

The purpose of this section is to configure the signal input ports on the BTF1-XX frame.

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

Basic information		Network	Matrix	Inputs	Outputs	SFPs	Firmware Upgrade	Diagnostics	SNMP traps		
Name	Label	Port Equalizer			Signal Analyzer						
SFP #1	My group\input port 1 My				Enabled <input checked="" type="checkbox"/>	Prescan	unknown	Result	Unknown HD	Errors	NOSIGNAL
SFP #2	My group\input port 2				Enabled <input checked="" type="checkbox"/>	Prescan	unknown	Result	Unknown HD	Errors	NOSIGNAL
SFP #3	My group\input port 3				Enabled <input checked="" type="checkbox"/>	Prescan	unknown	Result	Unknown HD	Errors	NOSIGNAL
SFP #4	My group\HDMI RX				Enabled <input checked="" type="checkbox"/>	Prescan	3G-SDI 1920x1080p	Result	1920x1080/60 (1:1), 425M (3G Level A) 4:2:2	Errors	none
SFP #5	a\input port 5				Enabled <input checked="" type="checkbox"/>	Prescan	unknown	Result	Unknown HD	Errors	NOSIGNAL
SFP #6	a\input port 6				Enabled <input checked="" type="checkbox"/>	Prescan	unknown	Result	Unknown HD	Errors	NOSIGNAL

- **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 \.

Examples:

My group\input port 1

My group \input port 2

My group \HDMI RX

Name	Label	
SFP #1	My group\input port 1 My	
SFP #2	My group\input port 2	
SFP #3	My group\input port 3	
SFP #4	My group\HDMI RX	

My group

SFP #4: HDMI RX

SFP #1: Input port 1 My channel

SFP #2: Input port 2

SFP #3: Input port 3

BNC #23 Input port 23	Direction Output	3G ext. reach <input type="checkbox"/>	Coarse amplitude 800mV p-p	Enabled <input type="checkbox"/>	Prescan	Result	Errors
BNC #24 Input port 24	Direction Input	3G ext. reach <input type="checkbox"/>	Coarse amplitude 800mV p-p	Enabled <input type="checkbox"/>	Prescan	Result	Errors
BNC #25 Input port 25	Direction Output	3G ext. reach <input type="checkbox"/>	Coarse amplitude 800mV p-p	Enabled <input type="checkbox"/>	Prescan	Result	Errors

- **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 #3	My group\input port 3	Enabled <input checked="" type="checkbox"/>	Prescan	unknown	Result	Unknown HD	Errors	NOSIGNAL
SFP #4	My group\HDMI RX	Enabled <input checked="" type="checkbox"/>	Prescan	3G-SDI 1920x1080p	Result	1920x1080/60 (1:1), 425M (3G Level A) 4:2:2	Errors	none
SFP #5	a\input port 5	Enabled <input checked="" type="checkbox"/>	Prescan	unknown	Result	Unknown HD	Errors	NOSIGNAL

- **Signal analyzer:** Internally in the BTF1-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

The purpose of this section is to configure the signal output ports on the BTF1-XX frame.

Each output port represent one row in the table.

Name	Label	Port Reclocker		Port Cable Driver		Sync Source
SFP #1	Monitor\BigScreen	Rate	Auto	unlocked	SFP present <input type="checkbox"/>	No sync -
SFP #2	Monitor\SmallScreen	Rate	Auto	unlocked	SFP present <input checked="" type="checkbox"/> TX disable <input type="checkbox"/>	No sync -
SFP #3	Output port 3	Rate	Auto	unlocked	SFP present <input type="checkbox"/>	No sync -
SFP #4	Output port 4	Rate	Auto	unlocked	SFP present <input checked="" type="checkbox"/> TX disable <input type="checkbox"/>	No sync -
SFP #5	Output port 5	Rate	Auto	unlocked	SFP present <input type="checkbox"/>	No sync -
SFP #6	Output port 6	Rate	Auto	unlocked	SFP present <input checked="" type="checkbox"/> TX disable <input type="checkbox"/>	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 \.

Examples:

Monitor\BigScreen

Monitor\SmallScreen

Name	Label
SFP #1	Monitor\BigScreen
SFP #2	Monitor\SmallScreen
SFP #3	Output port 3
SFP #4	Output 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.

## SFPs

The purpose of this section is to monitor each SFP in the BTF1-XX frame.

Basic information	Network	Matrix	Inputs	Outputs	SFPs	Firmware Upgrade	Diagnostics	SNMP traps					
PortName	Vendor	PartNumber	SerialNumber	Production Date	WaveLength	Bitrate	SM	OM1	OM2	OM3	Copper	Connector	
SFP #1	BarnFind Tech	BTSFP-Gbase-CU	BT50210V0006	2015-2-11	65535	N/A	0 m	0 m	0 m	0 m	100 m	RJ45	
SFP #2	BarnFind Tech	BTSFP-Gbase-CU	BT50210V0005	2015-2-11	65535	N/A	0 m	0 m	0 m	0 m	100 m	RJ45	
SFP #3	BarnFind Tech	BTSFP-Gbase-CU	BT50210V0004	2015-2-11	65535	N/A	0 m	0 m	0 m	0 m	100 m	RJ45	
SFP #4	BarnFind Tech	BTSFP-Gbase-CU	BT50210V0003	2015-2-11	65535	N/A	0 m	0 m	0 m	0 m	100 m	RJ45	
SFP #5					0	N/A	0 m	0 m	0 m	0 m	0 m		
SFP #6					0	N/A	0 m	0 m	0 m	0 m	0 m		
SFP #7					0	N/A	0 m	0 m	0 m	0 m	0 m		
SFP #8					0	N/A	0 m	0 m	0 m	0 m	0 m		
SFP #9	BarnFind Tech	BT-CWDM-40-0237	FS40212J0222	2014-2-24	1370	1,3 GHz	40000 m	0 m	0 m	0 m	0 m	LC	
SFP #10	BarnFind Tech	BT-CWDM-40-0239	FS40212J0229	2014-2-20	1390	1,3 GHz	40000 m	0 m	0 m	0 m	0 m	LC	
SFP #11	BarnFind Tech	BT-CWDM-40-0241	FS40212J0233	2014-2-20	1410	1,3 GHz	40000 m	0 m	0 m	0 m	0 m	LC	
SFP #12	BarnFind Tech	BT-CWDM-40-0243	FS40212J0239	2014-2-24	1430	1,3 GHz	40000 m	0 m	0 m	0 m	0 m	LC	
SFP #13	BarnFind Tech	BT-CWDM-40-0351	BT40730V0036	2014-8-12	1510	2,5 GHz	40000 m	0 m	0 m	320 m	0 m	LC	
SFP #14	BarnFind Tech	BT-CWDM-40-0353	BT40730V0042	2014-8-12	1530	2,5 GHz	40000 m	0 m	0 m	320 m	0 m	LC	
SFP #15	BarnFind Tech	BT-CWDM-40-0355	BT40730V0058	2014-8-12	1550	2,5 GHz	40000 m	0 m	0 m	320 m	0 m	LC	
SFP #16					0	N/A	0 m	0 m	0 m	0 m	0 m		

**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 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	-40 dBm
RX Power mW	0 mW
Temperature	37,844 C
TX Bias	21,104 mA
TX Power	1,4424 mW
TX Power dBm	1,59 dBm
Vcc	3,1792 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, the value -40 dBm will appear 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	-11,84 dBm
RX Power mW	0,0654 mW

## Firmware Upgrade

The purpose of this section is to see the versions of the firmware that you is installed, check for new versions and to upgrade the firmware at your convenience.

Basic information Network Matrix Inputs Outputs SFPs Firmware Upgrade Diagnostics SNMP traps

Status: Idle

Check for updates Install updates

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 2 not upgraded.
7	Health check #3
8	Software versions currently installed:
9	barnone Software Version: BarnOne Main 0.2.3
10	barnone-apt Software Version: BarnOne SubFunction APT 0.0.1-1
11	barnone-firmware Software Version: BarnOne SubFunction Firmware 0.2.0
12	barnone-snmpd Software Version: BarnOne SubFunction Communcation 0.2.5
13	barnone-watchdog Software Version: BarnOne SubFunction Watchdog 0.0.1
14	barnone-config Software Version: BarnOne SubFunction Configuration 0.0.2-1
15	barnone-console Software Version: BarnOne SubFunction Console 0.2.1
16	emnema Software Version: BarnOne SubFunction Network Management 0.0.5
17	Sync

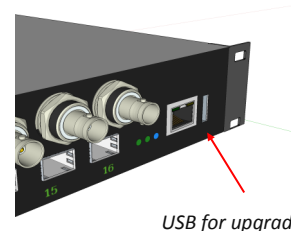
- **Check for Updates:** This button will trigger the frame BTF1-XX to connect to our server at Barnfind Technologies HQ in Norway and check for software updates. You can see the progress in the log and the status label.
- **Install Updates:** This button will trigger the frame BTF1-XX to download from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

### Upgrade with USB (offline mode)

First you need to download the firmware upgrade package from our web server <http://www.barnfind.no/downloads/>. Then extract the autorun.gpg from the .zip file and copy this file onto a USB flash storage device. This file must be named "autorun.gpg" (lower case).

For diagnostics, you can optionally connect a HDMI monitor to the HDMI output at the rear of the BarnOne device and keyboard into one of the USB port. 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.*





## 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			Diagnostics			SNMP traps		
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 checked="" 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	7868 RPM	<input checked="" type="checkbox"/>																								
Cabinet fan #3	7619 RPM	<input checked="" type="checkbox"/>																								
Cabinet fan #4	7741 RPM	<input checked="" type="checkbox"/>																								
Fan controller temperature #1	36 C	<input checked="" type="checkbox"/>																								
Fan controller temperature #2	34 C	<input checked="" type="checkbox"/>																								
MCU temperature	23 C	<input checked="" type="checkbox"/>																								
Power-1 input voltage	0 V	<input type="checkbox"/>																								
Power-2 input voltage	12,1 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	12,1 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.

## Connecting 3rd party products to BTF1-XX frames

### SNMP

BarnStudio and some few 3<sup>rd</sup> party integrators 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 our download section on our webpage (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.

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

### 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 it 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.

### Other

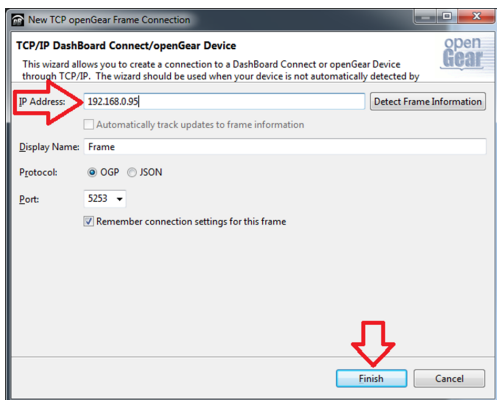
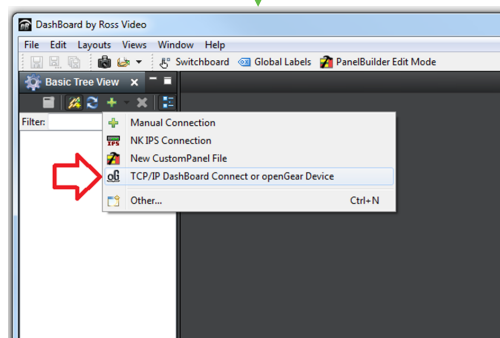
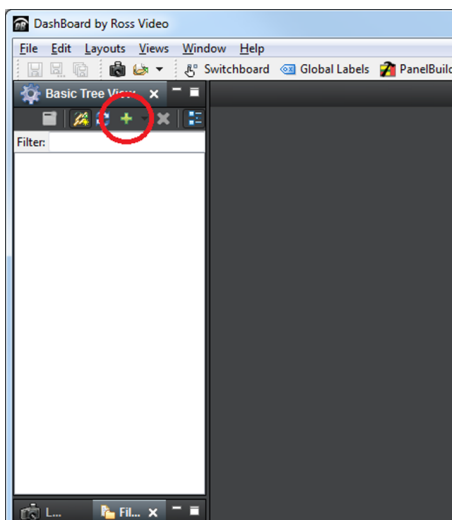
BTF1-XX can control and be controlled by many software/hardware panels. Displayed below are some few manufacturers.





### openGear protocol

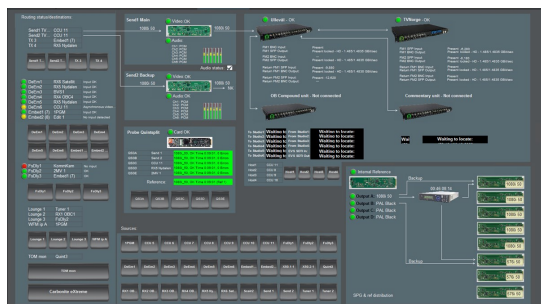
The openGear protocol (also known as OGP) is an open protocol developed by Ross (who must be contacted if the specifications are needed). The support was added in firmware version 0.1.7. The BTF1-XX frames does not broadcast its openGear connection details, so it has to be added manually in dashboard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

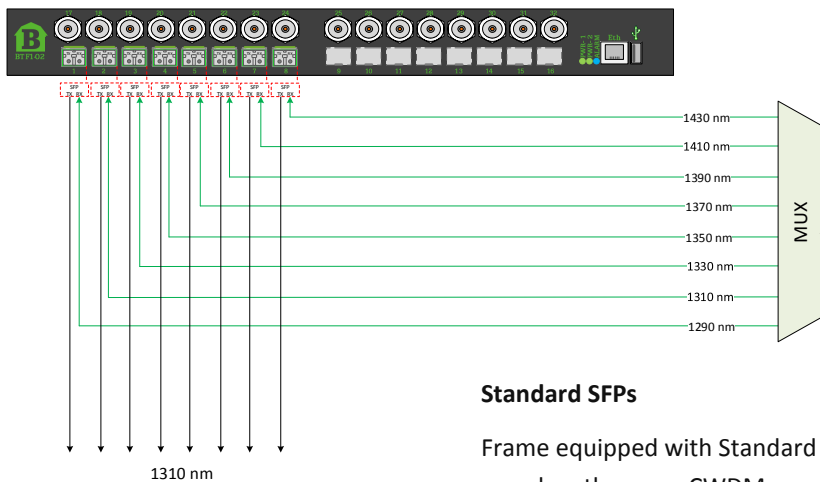
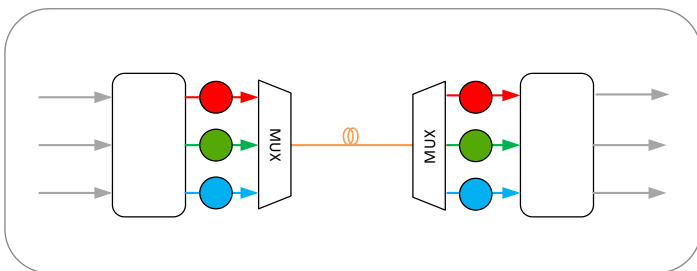
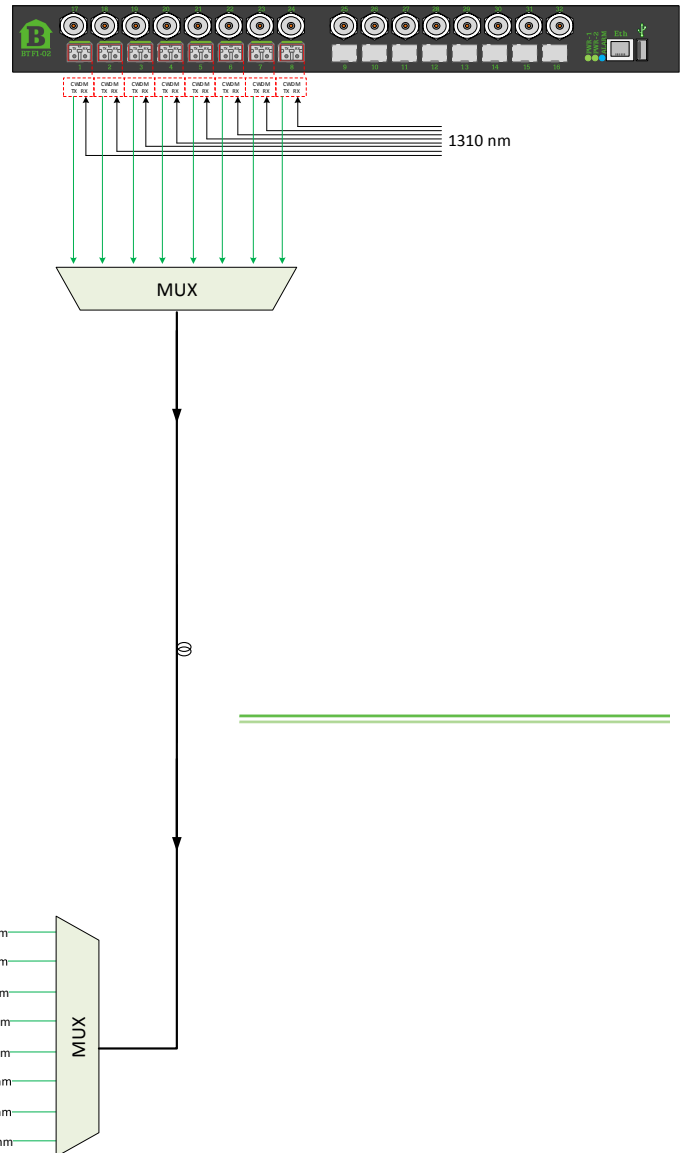
## Application Example

# Color converting

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

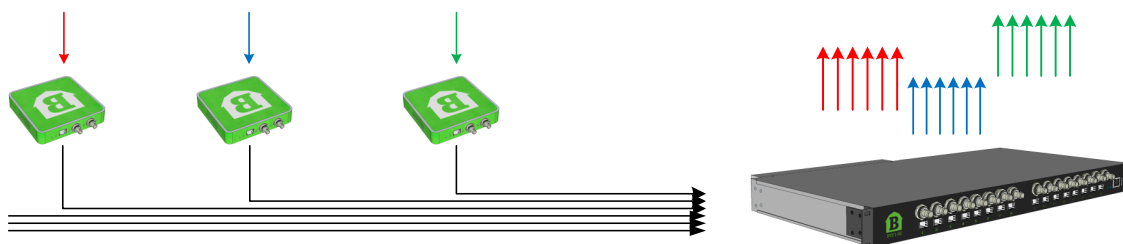
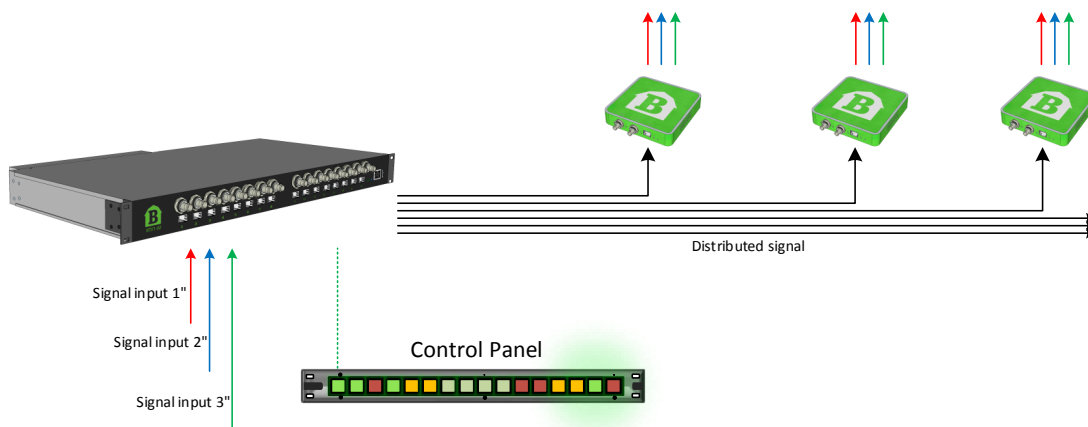
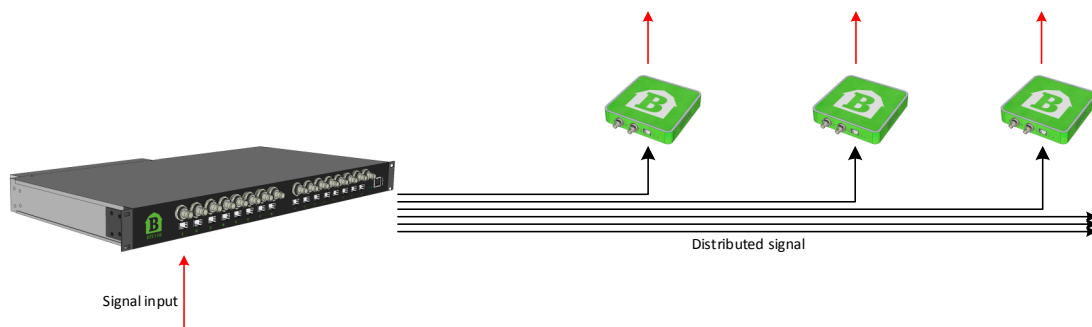


### Standard SFPs

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

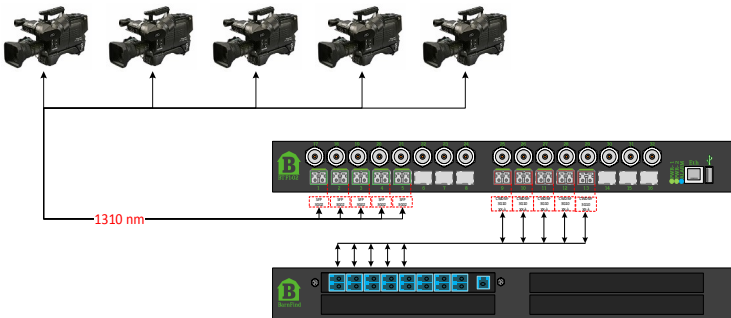
Application Example

# Signal Distribution/Contribution



## Application Example

# Camera to CCU

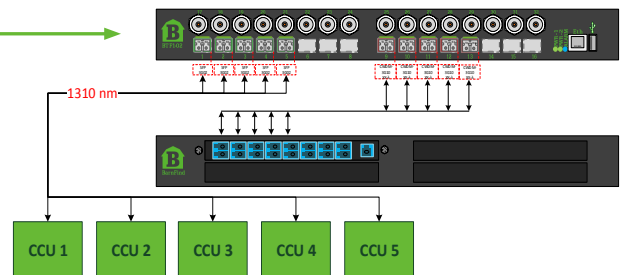


1X fiber  
0-60km

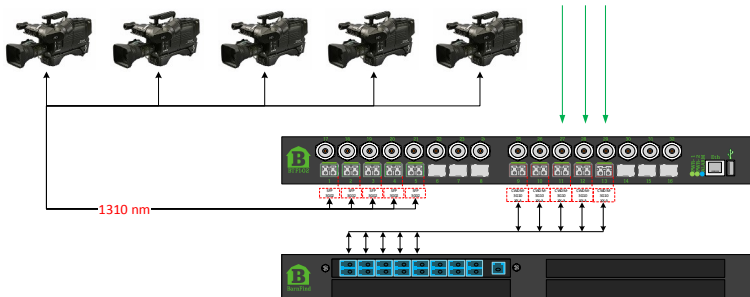
<b>BOM list</b>	
<b>Product Name</b>	<b>Quantity</b>
BT-CWDM-10-3Gxx	10
BT-CWDM-16	2
BT-HOUS	2
BT-LX-SM-3G02	10
BTF1-02	2

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.

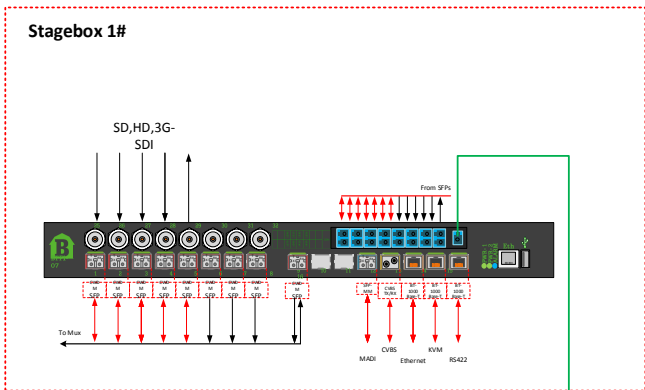
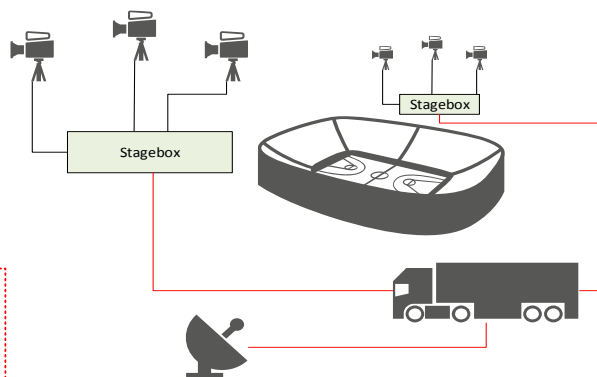


\*Other signal can be multiplexed into same fiber. SDI, AES, ASI, HDMI, Ethernet, CVBS, SDTI, MADI, KVM

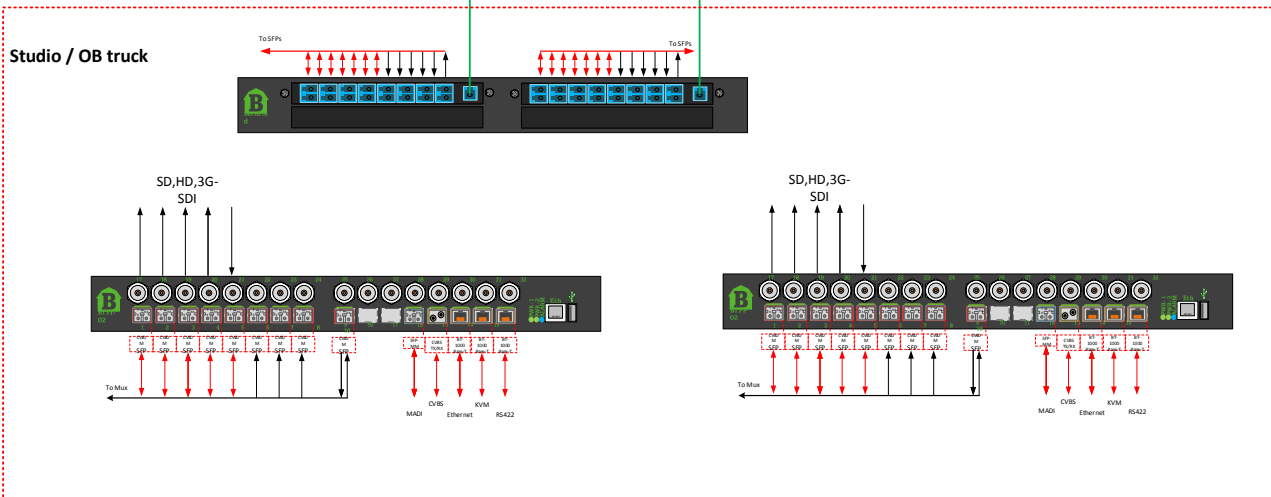
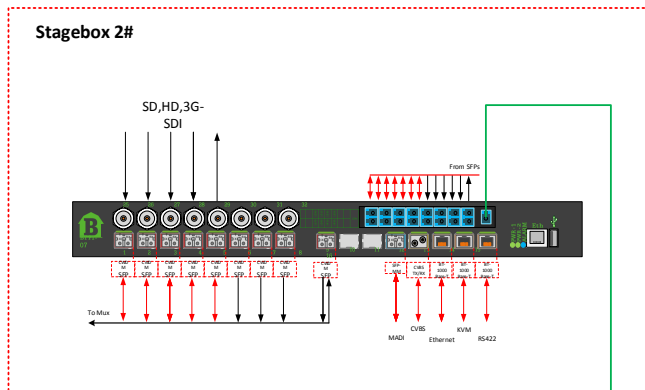


# Application Example

## Stagebox

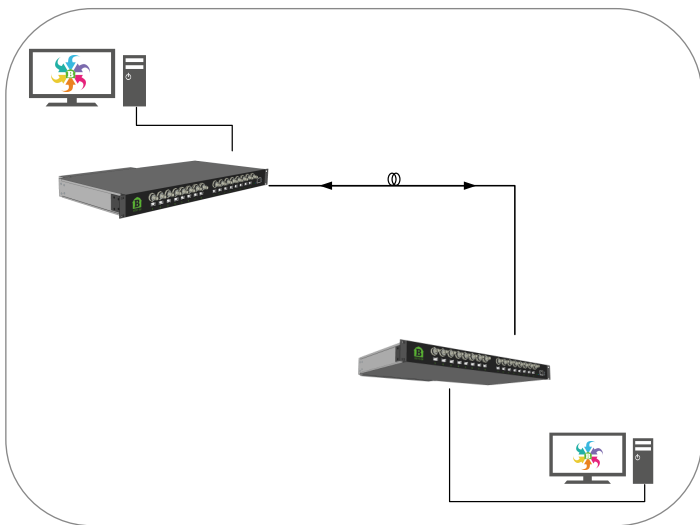


BOM list	
Product Name	Quantity
BT-CWDM-10-3Gxx	14
BT-CWDM-16	2
BT-CWDM-40-02	20
BT-Gbase-CU	6
BT-HOUS	1
BTF1-02	1
BTF1-07-16	2
BTSFP-MM-xG550	2
EB30HDRT-AM	2



## Application Example

# Ethernet transmission



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

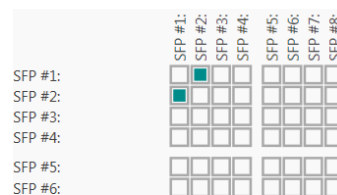
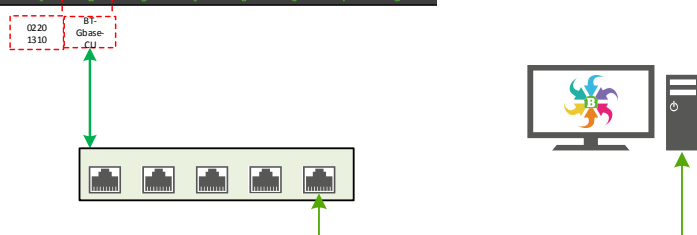
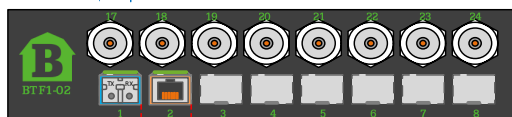
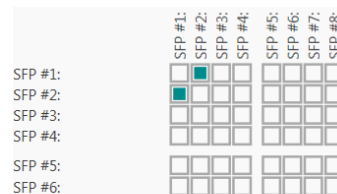
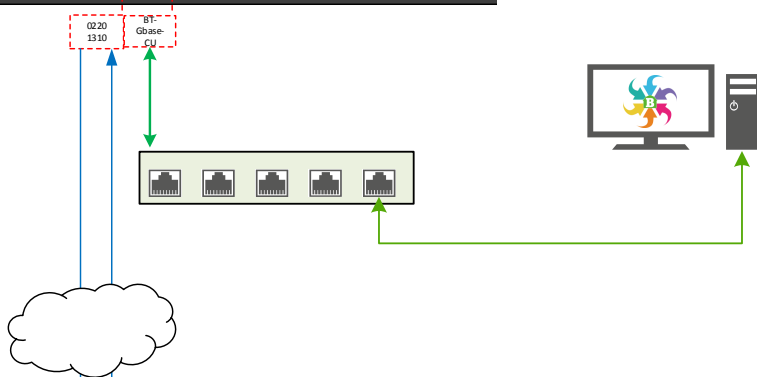
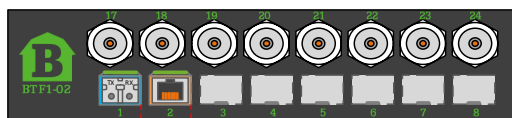
Shown examples are using a point to point connection with 2x fiber cables. Alternative setup could be WDM, CWDM or DWDM technology.

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



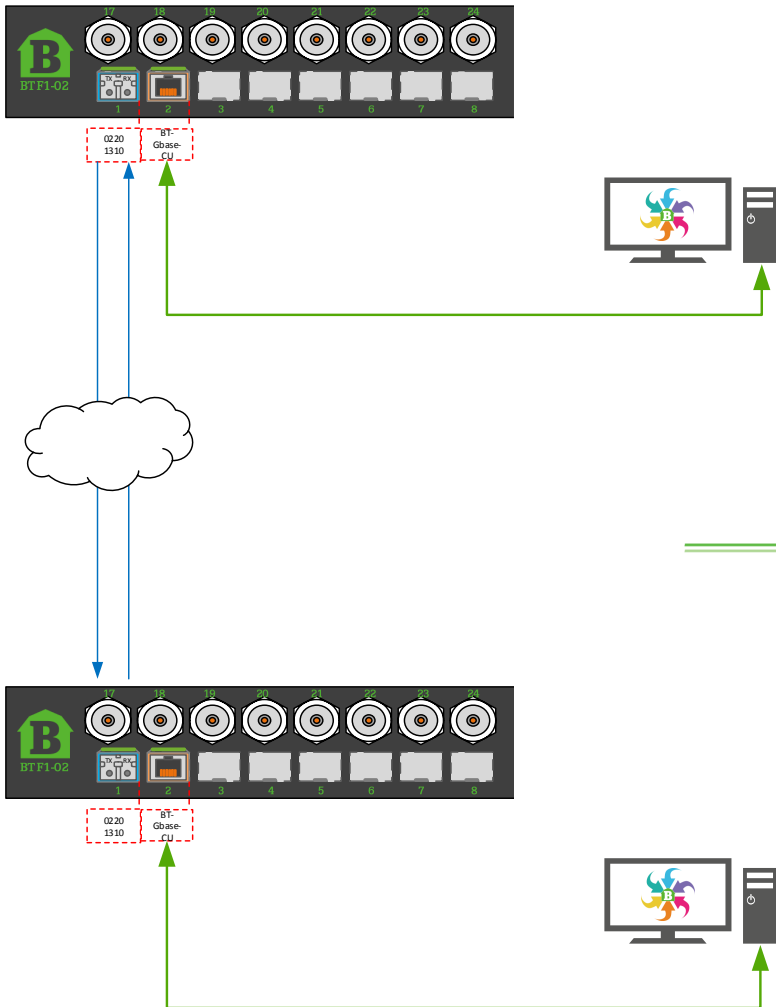
**Use an Ethernet switch in both ends to ensure same link speed.**

Example 1





Example 2



Basic information Network Matrix Inputs Outputs SFPs Firmware Upgrade Diagnostics SNMP traps

Name	Value
Link duplex	Unavailable
Link MDI	Unavailable
Link speed	Unavailable
Link status	Link down
Operating mode	SGMII(default)
User selectable link speed	Auto(default)

- 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.**

Application Example

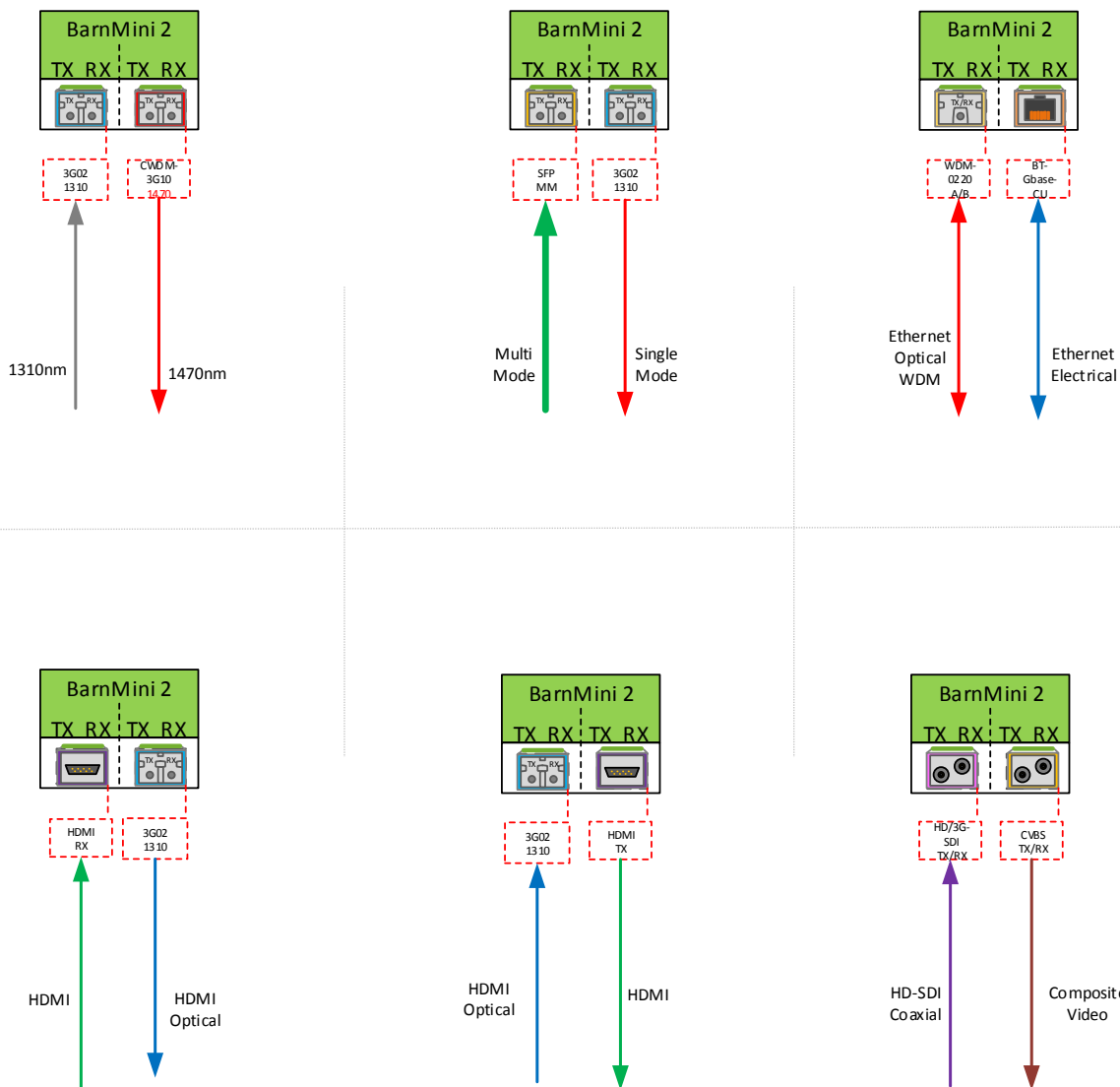
# BarnMini-02



BarnMini-02 is equipped with 2x SFP cage with interconnection TX to RX and RX to TX. The functionality will depend of what kind of SFPs are inserted. The examples below only shows a selection of typical user setup.

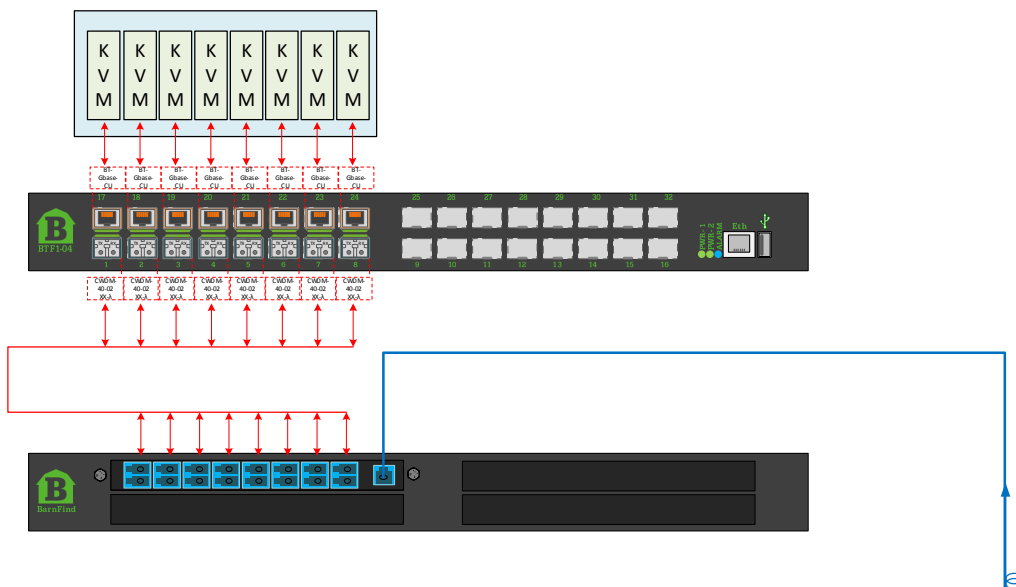
BarnMini-02 can house any combination of SFPs from Barnfind or other MSA compliant vendors.

Examples



## Application Example

# KVM transmission



<b>BOM list</b>	
<b>Product Name</b>	<b>Quantity</b>
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.

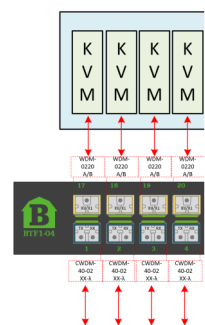
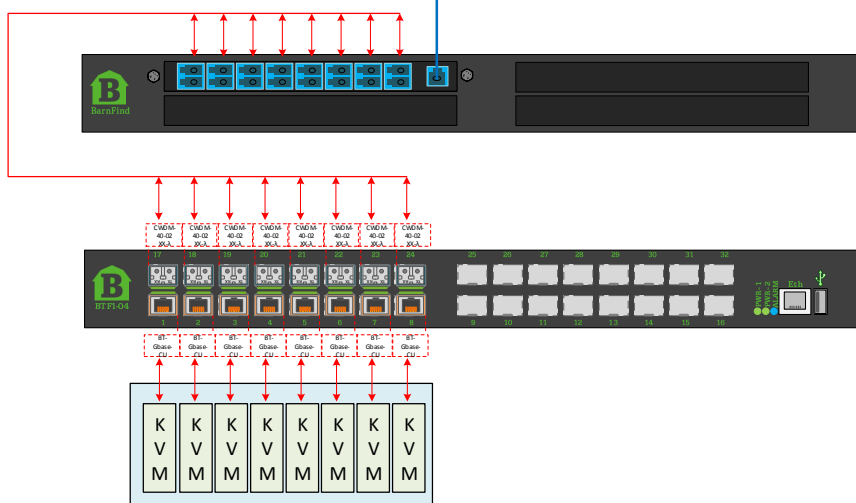
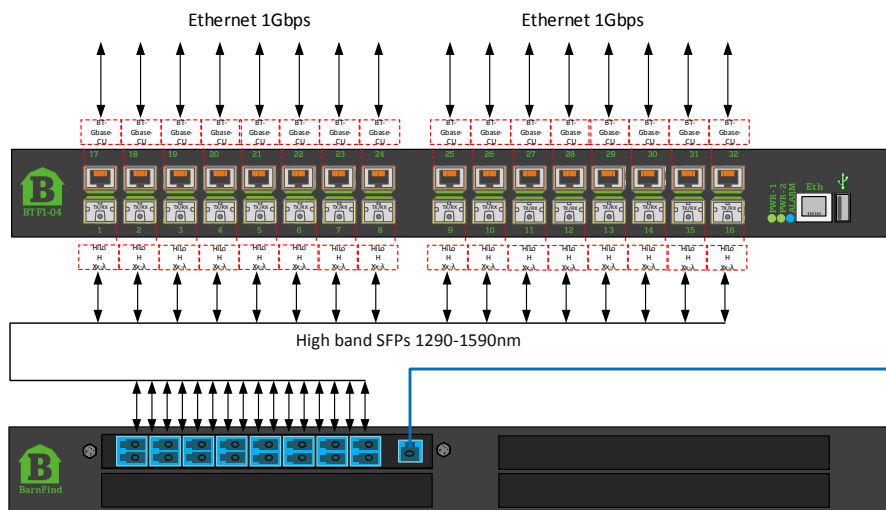


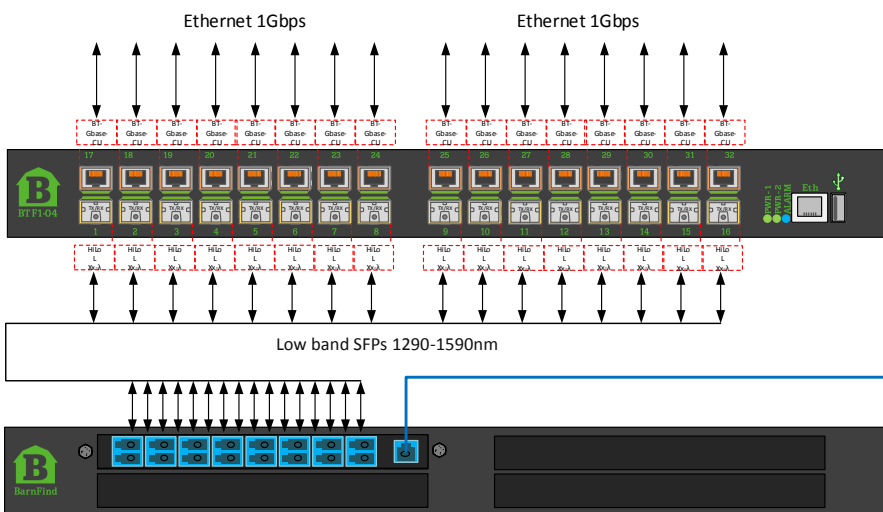
Fig. 1

# Application Example

## Ethernet Transmission

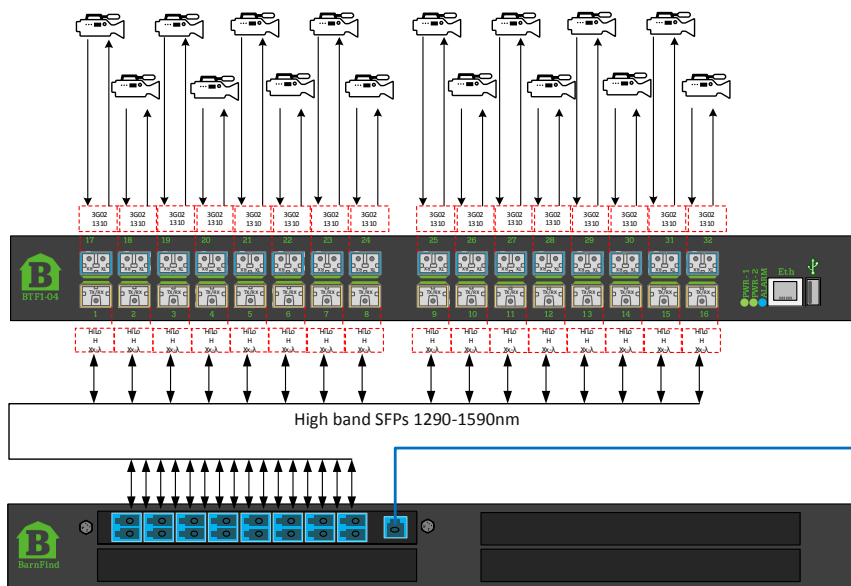


- 16X 1Gbps Ethernet
- Only 1 Single Mode fiber when using HiLo technology
- Only 2RU each side
- Optional redundancy line
- Up to 20km distance

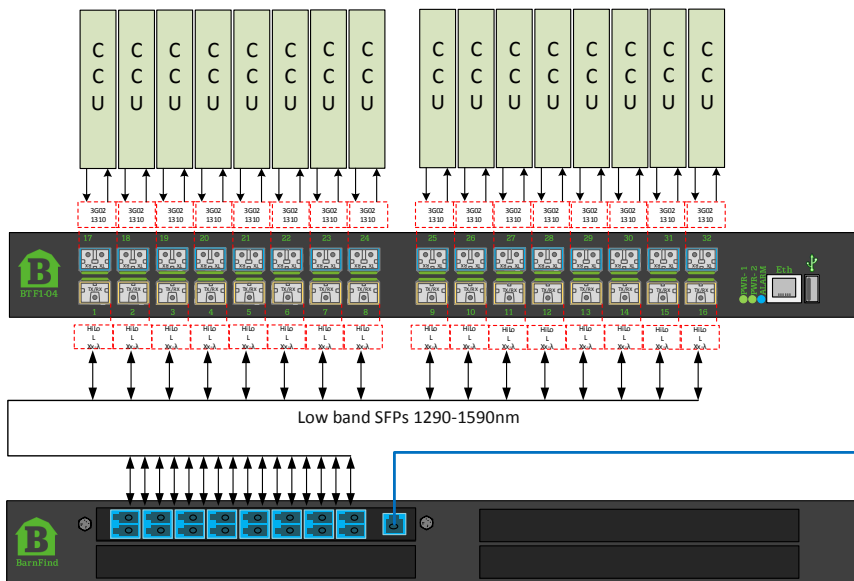


BOM list	
Product Name	Quantity
BT-CWDM-16	2
BT-Gbase-CU	32
BT-HOUS	2
BTF1-04	2
BT-3G-xx-H/L	32

# Application Example CAM-CCU



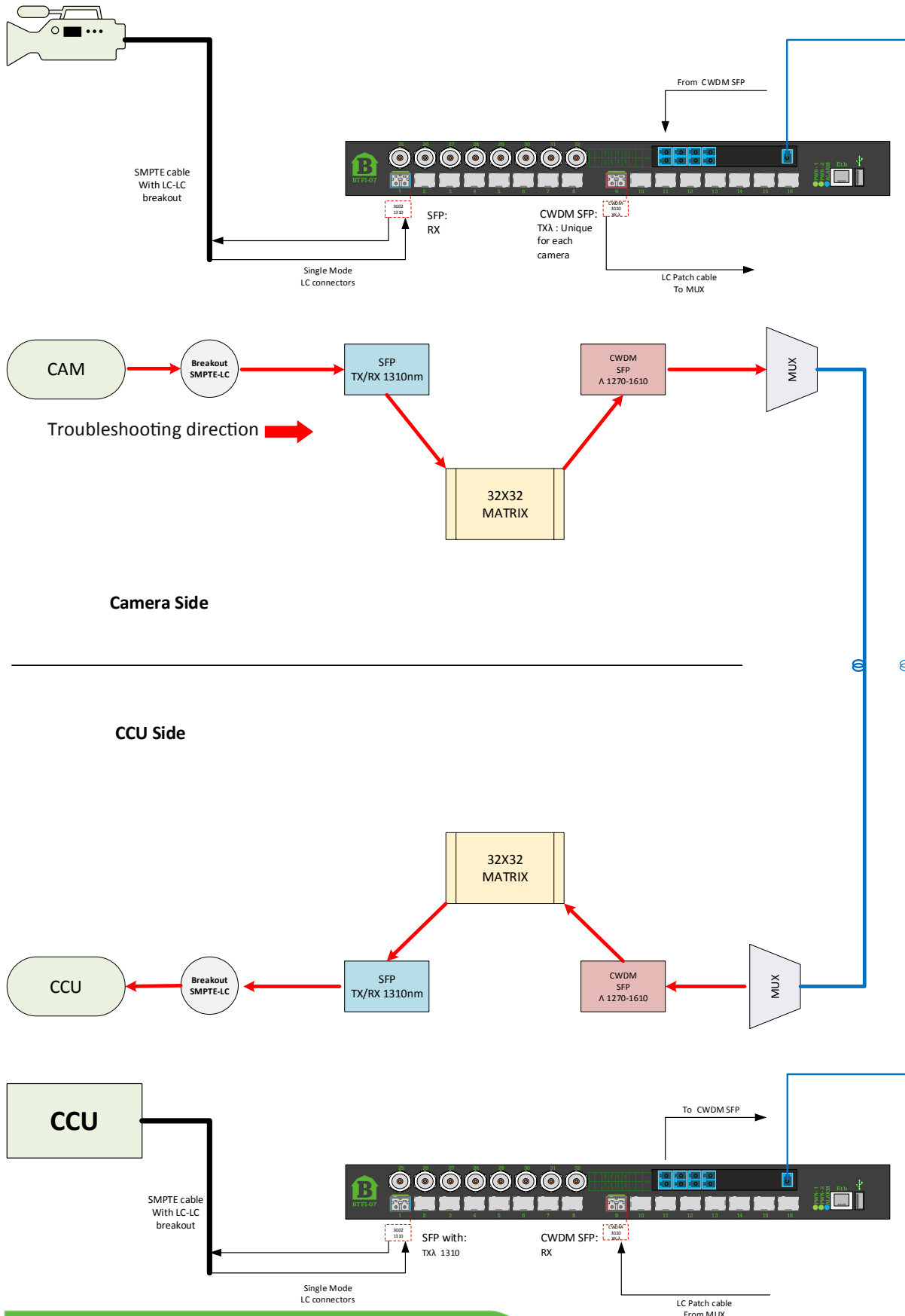
- 16X CAM-CCU
- Only 1 Single Mode fiber when using HiLo technology
- Only 2RU each side
- Optional redundancy line
- Up to 20km distance



BOM list	
Product Name	Quantity
BT-CWDM-16	2
BTSFP-LX-SM-3G02	32
BT-HOUS	2
BT-F1-04	2
BT-3G-xx-H/L	32

Application Example

# CAM-CCU in details



## Application Example

# Workflow troubleshooting

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.

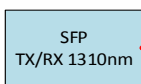


Camera from any of the most commonly used professional camera manufacturers e.g. Ikegami, Sony, Hitachi and GVG.

**Camera and CCU has to be in «Single Fiber Mode».** You will find this option in the camera system menu.



You will need an adapter cable between camera and the BarnOne frame (SFP) Alternatively, a breakout panel with SMPTE connector to LC connector



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!**

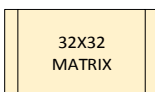
Basic information	Network	Matrix	Inputs	Outputs	SFPs	Firmware Upgrade	Diagnostics	SNMP traps
-------------------	---------	--------	--------	---------	------	------------------	-------------	------------

Name	Value
RX LOS	<input checked="" type="checkbox"/>
RX Power dBm	-40 dBm
RX Power mW	0 mW
Temperature	35,844 C
TX Bias	15,664 mA
TX Power	0,5424 mW
TX Power dBm	-2,66 dBm
Vcc	3,2432 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.

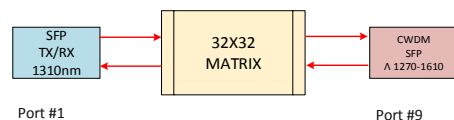


Basic information	Network	Matrix	Inputs	Outputs	SFPs	Firmware Upgrade	Diagnostics	SNMP traps
-------------------	---------	--------	--------	---------	------	------------------	-------------	------------

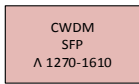
The crosspoint switch (Matrix) must be set up correctly to ensure a link between input (camera) and output (optical signal with CWDM wavelength). From example on previous page, the configuration is:

Input port 1 -> Output port 9

Input port 9 -> Output port 1



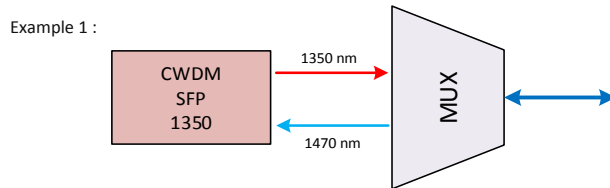
	SFP #1: Output port 1	SFP #2: Output port 2	SFP #3: Output port 3	SFP #4: Output port 4	SFP #5: Output port 5	SFP #6: Output port 6	SFP #7: Output port 7	SFP #8: Output port 8	SFP #9: Output port 9	SFP #10: Output port 10	SFP #11: Output port 11	SFP #12: Output port 12
SFP #1: Input port 1												
SFP #2: Input port 2												
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												



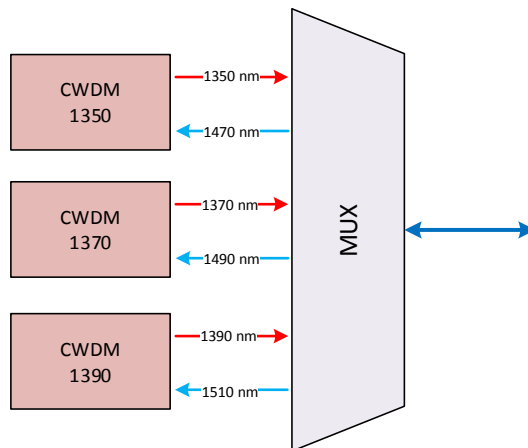
The purpose of this SFP is to transmit the camera signal to the multiplexer.

Note! You must use a unique wavelength for each signal. There are 18 different selections of wavelengths 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.



Example 2, with multiple signals:



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

Basic information	Network	Matrix	Inputs	Outputs	SFPs	Firmware Upgrade	Diagnostics	SNMP traps
-------------------	---------	--------	--------	---------	------	------------------	-------------	------------

Name	Value
RX LOS	<input checked="" type="checkbox"/>
RX Power dBm	-40 dBm
RX Power mW	0 mW
Temperature	35,844 C
TX Bias	15,664 mA
TX Power	0,5424 mW
TX Power dBm	-2,66 dBm
Vcc	3,2432 V

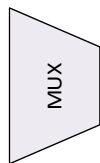
The value '-40 dBm' will appear if the optical signal is not present or if the optical signal is too high.

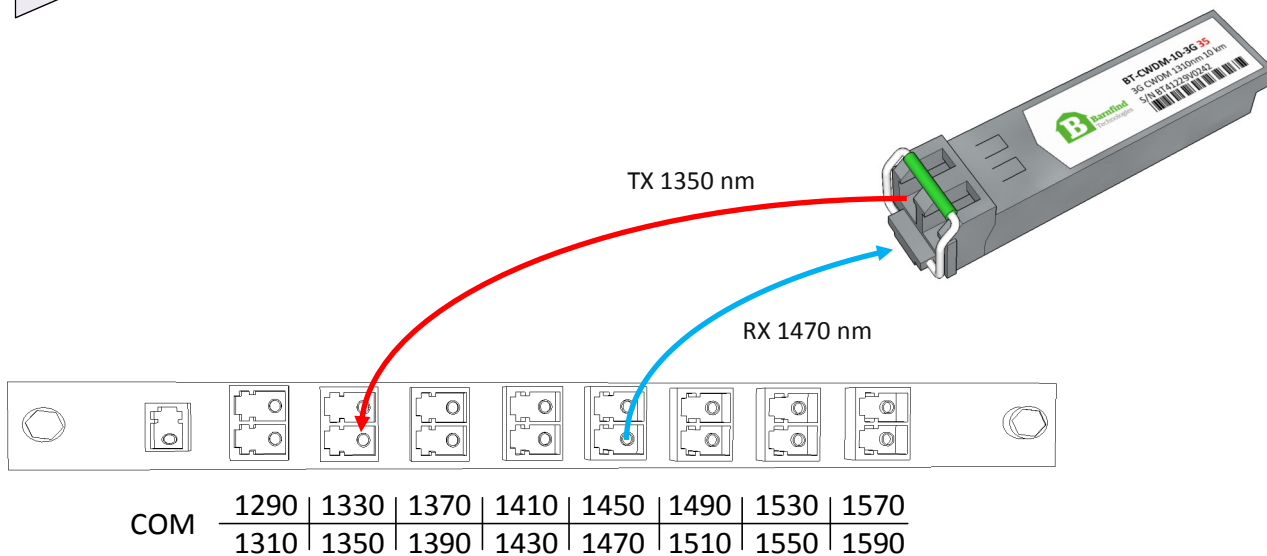
- Add in an attenuator

BarnStudio will take about 5 seconds to update the value.

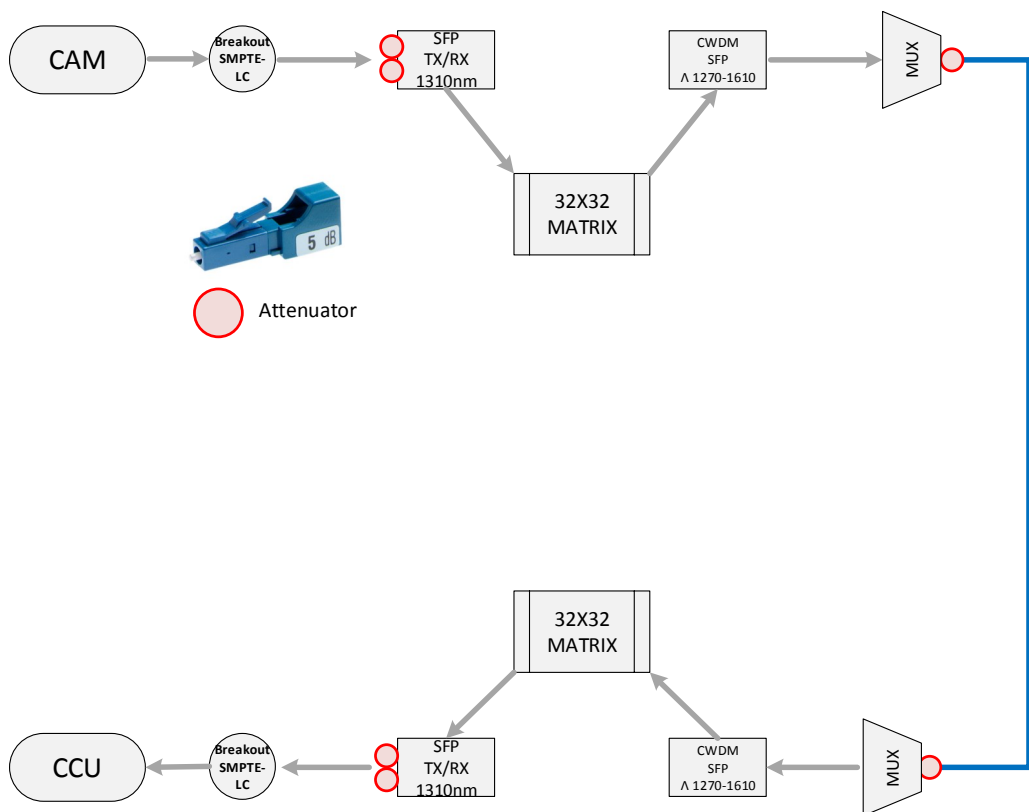
A perfect signal is between -5dBm to -15dBm.



 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:**

**$-5\text{dBm}$  to  $-20\text{dBm}$**

Name	Value
RX Power dBm	$-7,34\text{ dBm}$
RX Power mW	0,1846 mW
Temperature	63,094 C
TX Bias	5,048 mA
TX Power	0,5664 mW
TX Power dBm	$-2,47\text{ dBm}$
Vcc	3,1736 V



## Trouble Shooting

### 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)

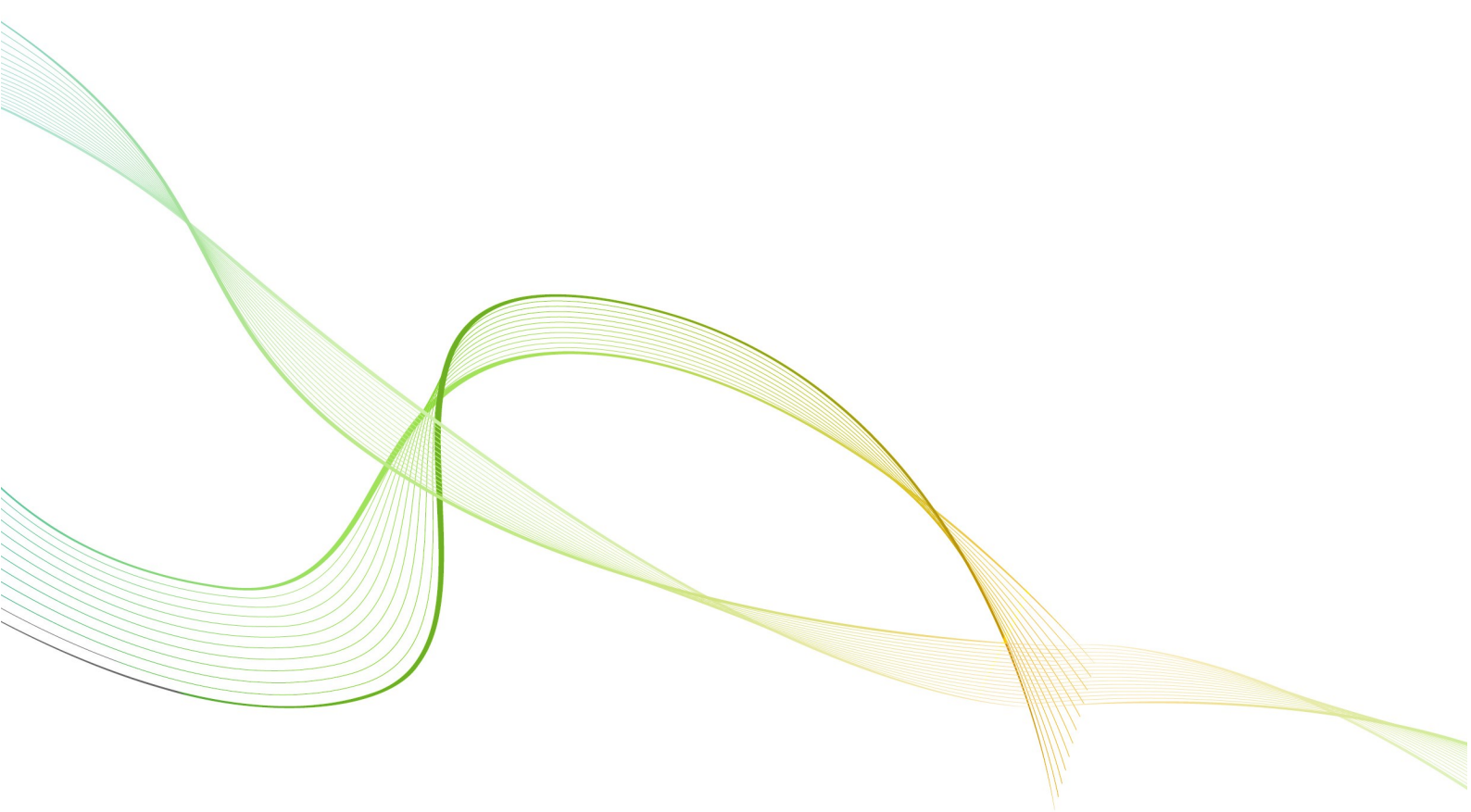
## Contact:

*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)

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**BarnGuide**

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