

# BarnGuide

Version 2.0



**Barnfind**Technologies  
*It's possible!*

## BarnGuide contents

|  |    |
|--|----|
| • BarnCare.....                                      | 4  |
| • BarnOne series                                     |    |
| - General information.....                           | 5  |
| - BarnOne variations.....                            | 6  |
| - BarnOne specifications.....                        | 7  |
| - BarnOne functionality diagram.....                 | 8  |
| - Frames with extended functionalities.....          | 9  |
| - Measurements of frame.....                         | 10 |
| - BarnOne ordering information.....                  | 12 |
| • BarnMini series                                    |    |
| - BTF-MINI-16.....                                   | 13 |
| - BarnMini-01.....                                   | 14 |
| - BarnMini-02.....                                   | 15 |
| - BarnMini-03/04.....                                | 16 |
| - BarnMini ordering information.....                 | 17 |
| • Passive Optical Products                           |    |
| - BT-HOUS-LGX-1RU.....                               | 18 |
| - Splitters.....                                     | 19 |
| - CWDM multiplexers.....                             | 20 |
| - Optical Changeover Switch.....                     | 21 |
| - Passive Optical Products ordering information..... | 22 |
| • SFP  |    |
| - How to read the label.....                         | 23 |
| - SFP list with distance and signal compability..... | 24 |
| - Data sheet BTSFP-LX-SM-3G02.....                   | 26 |
| - Data sheet BTSFP-CWDM-10-3GXX.....                 | 28 |
| • How to calculate optical budget.....               | 30 |

- **BarnStudio**
  - How to get started ..... 33
  - Basic information ..... 35
  - Network settings ..... 36
  - Matrix..... 39
  - Inputs..... 40
  - Outputs..... 41
  - SFPs..... 42
  - Firmware upgrade..... 43
  - Diagnostics..... 44
  - Connecting 3rd party products ..... 45
- **Application examples**
  - Color converting..... 48
  - Signal distribution/contribution..... 49
  - CAM - CCU..... 50
  - Stagebox..... 51
  - BarnMini-02 examples..... 52
  - KVM transmission..... 53
  - Ethernet transmission..... 54

*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)** and **Standard Terms and Conditions** 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.

Barnfind has two major software releases each year. Those are free of charge when it comes to the standard control software, BarnStudio that are delivered with any Barnfind frames free of charge. For special software functions it will be a charge.

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.

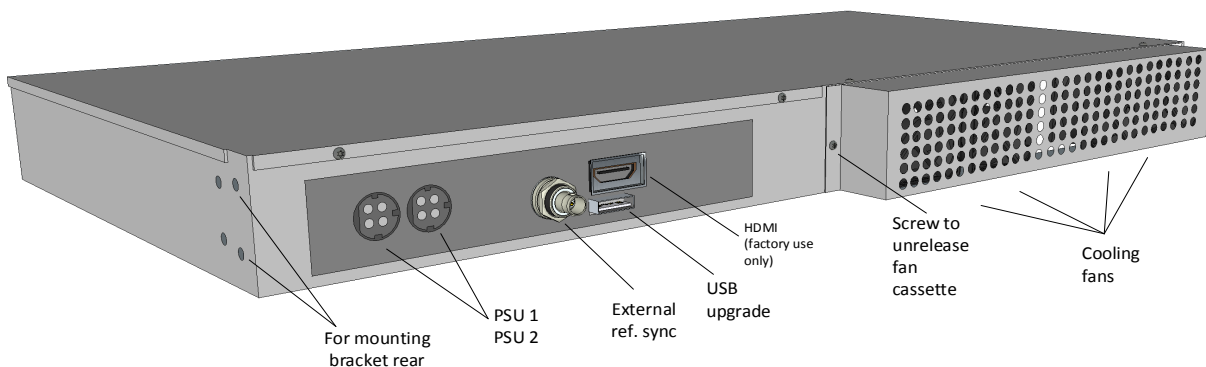
Please ask your local distributor or directly contact Barnfind HQ.

BarnOneSeries

## BarnOne - General Information



- 32x32 full crosspoint matrix
- All SFP ports are bi-directional
- All BNC ports are bi-directional
- 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



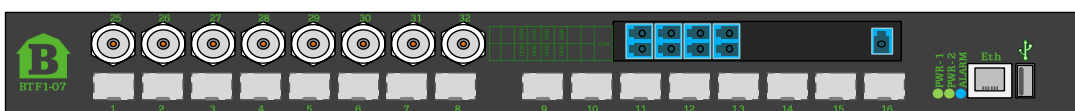
BT F1-04



BT F1-05



BT F1-06



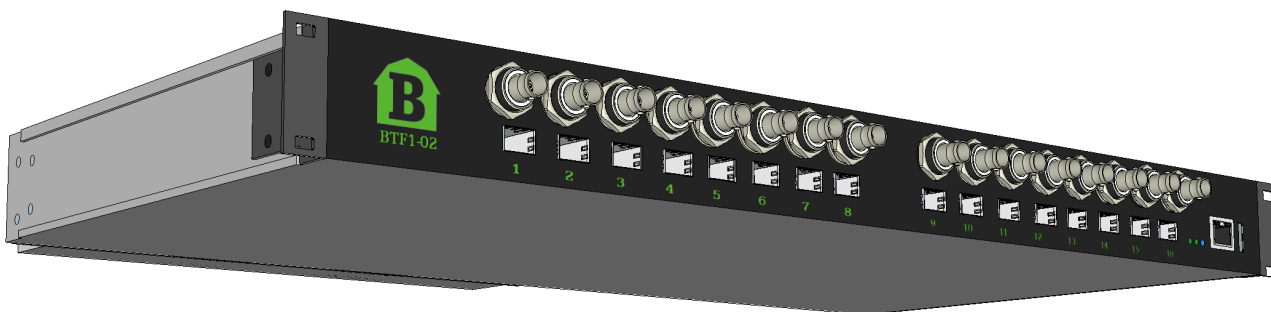
BT F1-07



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
- Redundant power supply optional

#### Physical size

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

#### 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:

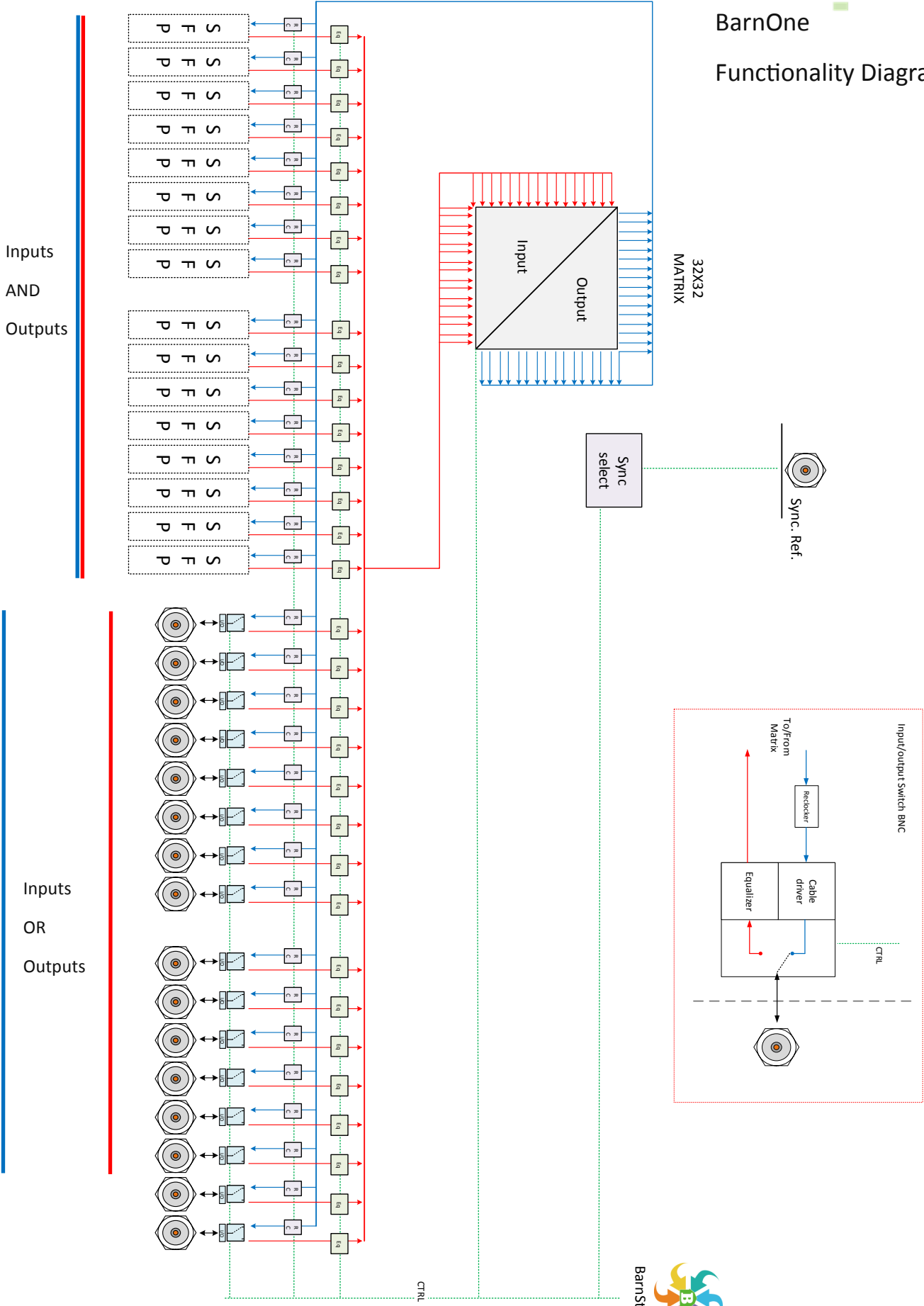
- 1x BTF1-02
- 8x BTSFP-CWDM-10-3GXX (see data sheet page 28)

$$W = \text{Voltage (V)} \times \text{Current (A)}$$

$$0.2A \times 3.3V = 0.66W$$

$$28 + (0.66 \times 8) = 32.8 W_{tot}$$

# BarnOne Functionality Diagram

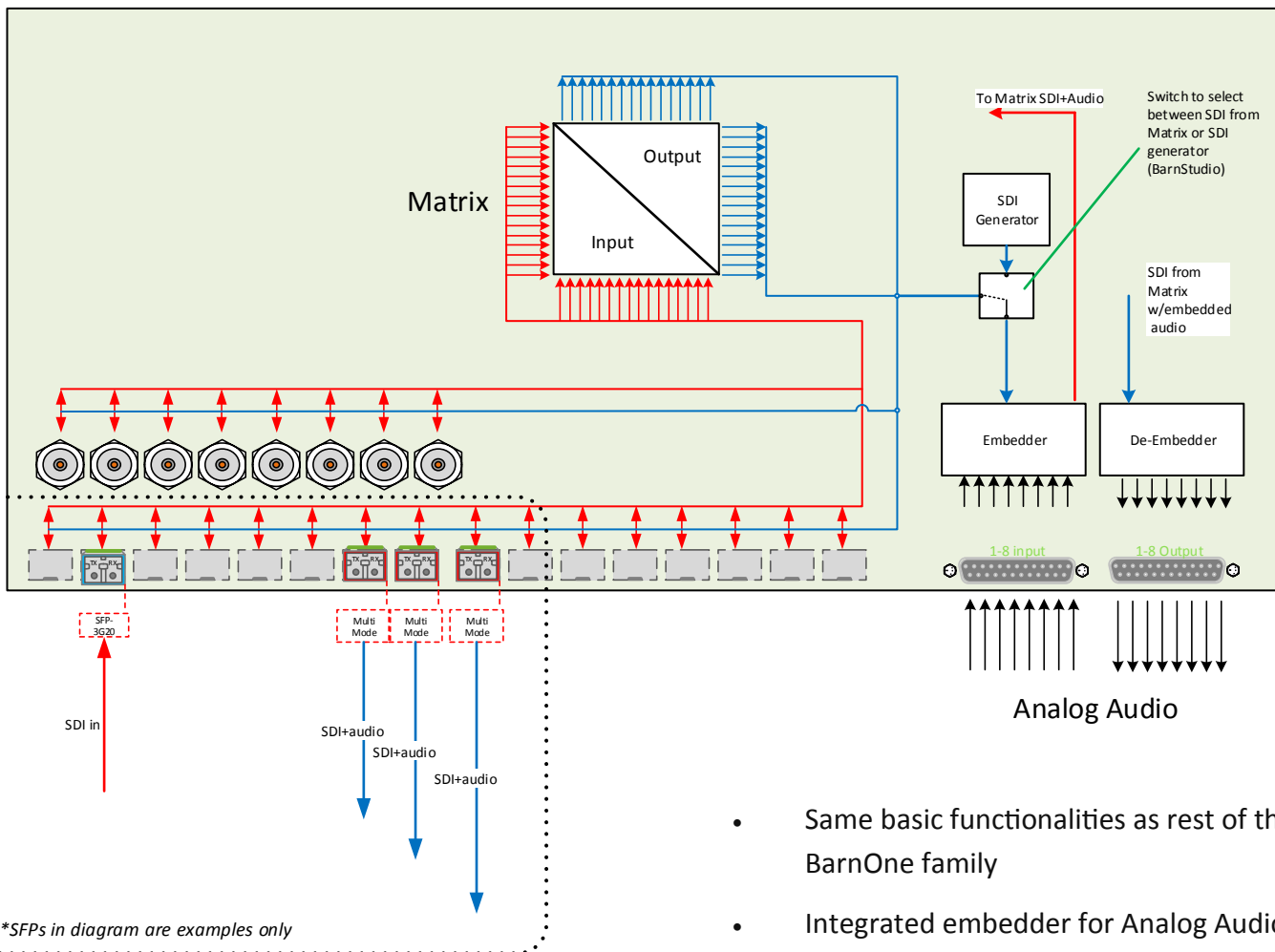




Frames with extended functionalities

**BTF1-10**

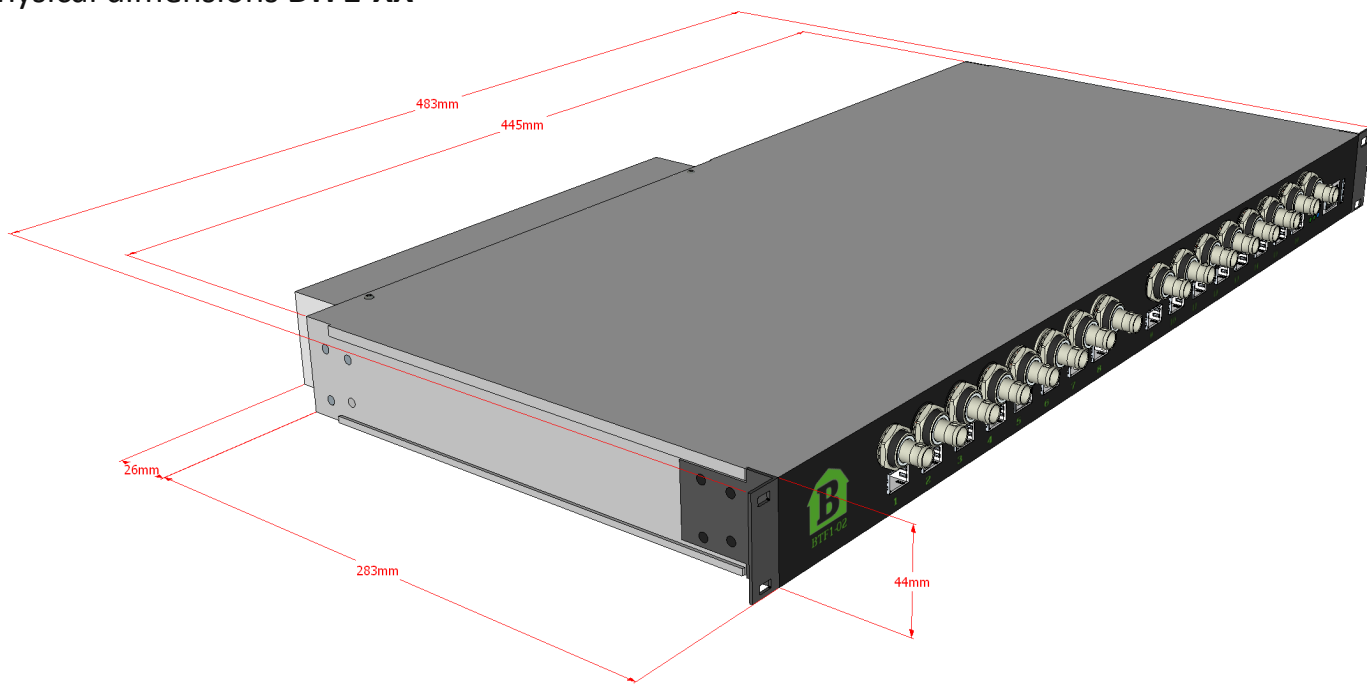
BTF1-10 has Integrated embedder and de-embedder for analog audio (8channels). The embedder is connected to the matrix and allows you to select any of the incoming SDI signals as carrier. The built.in SDI Generator can also be selected as carrier.



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

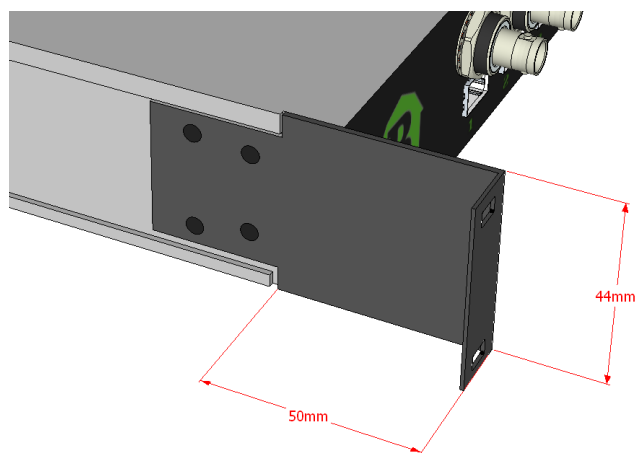
BarnOneSeries

Physical dimensions **BTF1-XX**



**Extension Brackets** (optional)

Mod nr: **BT-EXT-EARS-5CM**

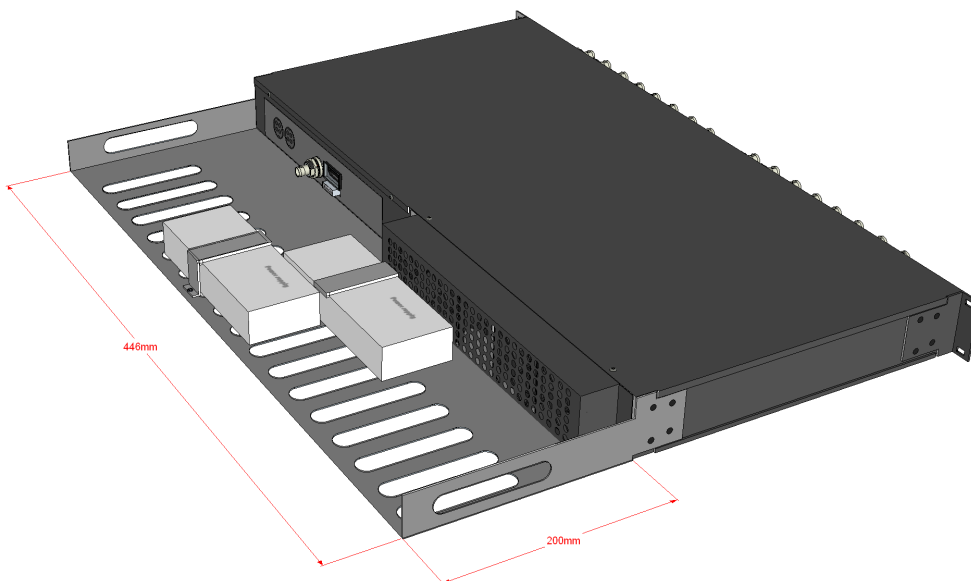
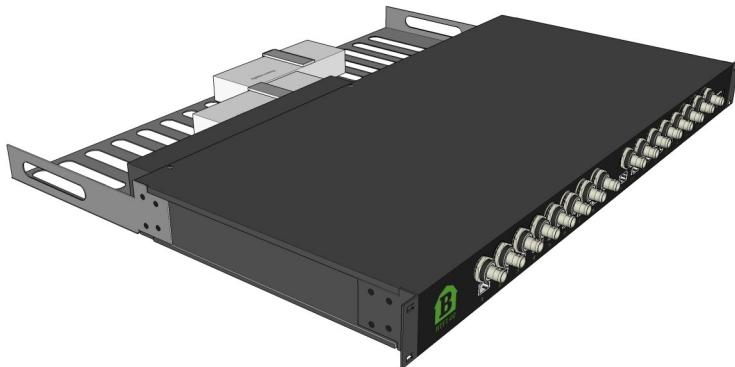


BarnOneSeries

**PSU-TRAY** (optional)

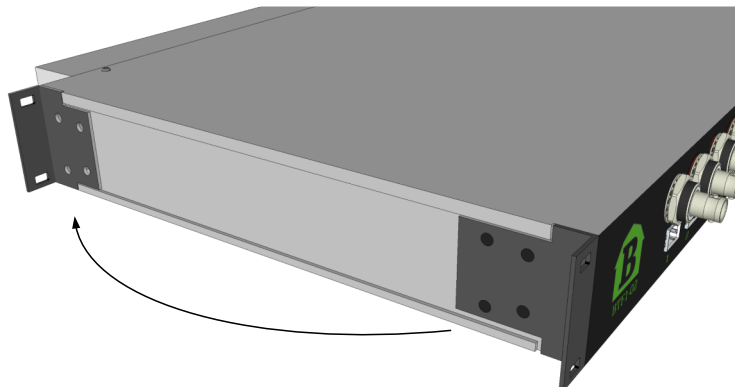
Mod nr: **BT-TRAY-PSU**

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



**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   |
|-------------------|---|
| <b>BTF1-01</b>    | 16 SFP ports  |
| <b>BTF1-02</b>    | 16 SFP ports and 16 BNC   |
| <b>BTF1-03-08</b> | 16 SFP ports and a 8 or 16 channel CWDM mux/de-mux built in.        |
| <b>BTF1-03-16</b> |   |
| <b>BTF1-04</b>    | 32 SFP ports  |
| <b>BTF1-05-08</b> | 16 SFP ports and 2X 8 or 16 channel CWDM mux/de-mux built in.       |
| <b>BTF1-05-16</b> |   |
| <b>BTF1-06</b>    | 24 SFP ports, 8 BNC   |
| <b>BTF1-07-08</b> | 16 SFP ports, 8 BNC and a 8 or 16 channel CWDM mux/de-mux built in. |
| <b>BTF1-07-16</b> |   |
| <b>BTF1-08-08</b> | 24 SFP ports and a 8 or 16 channel CWDM mux/de-mux built in.        |
| <b>BTF1-08-16</b> |   |
| <b>BTF1-09</b>    | 16 SFP ports, 8 BNC and 2 x (4 x IP - ASI)                          |
| <b>BTF1-10</b>    | 16 SFP ports, 8 BNC and 8 ch. Analog audio embedding / de-embedding |

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

BarnMini Series

## BTF-MINI-16



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

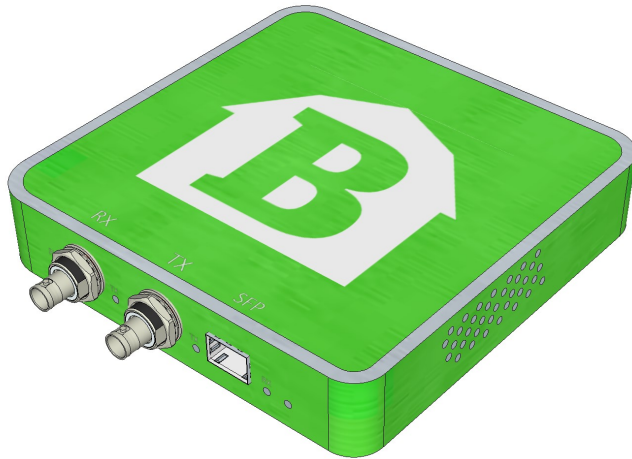
The BarnMini frame, **BTF-Mini-16**, is a housing with space for up to 16 x BarnMini modules of any kind. The BarnMini frame use the same PSU as the BarnOne family, BTF1-XX. Note that the **BTF-Mini-16** comes with one standard single PSU (redundant PSU is optional mod nr: **BT-PSU-100-240AC**)



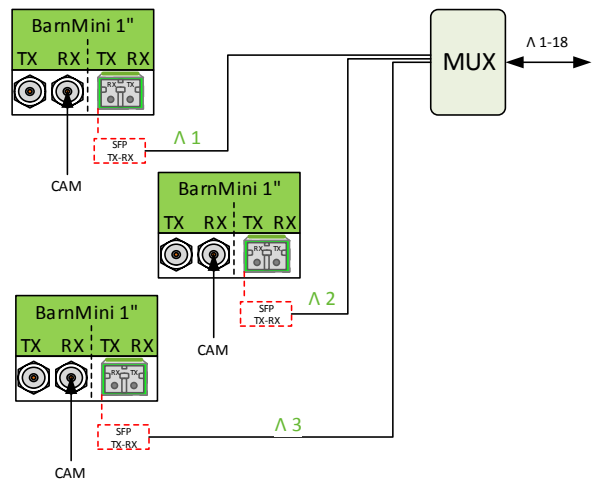
The **BTF-Mini-16** comes with 2 x LEDs in the front to indicate which PSU are connected

BarnMini Series

**BARNMINI-01**



*\*examples*



**Technical Specifications**

**Electrical ports**

- 1x TX BNC port
- 1x RX BNC port
- 75 OHM BNC connector
- SMPTE 259M, 292M, 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**

- 12-24V. Power supply included

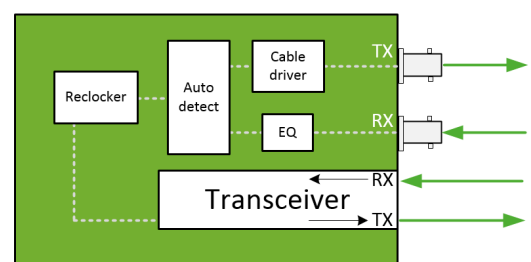
**Physical size**

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

**Optical port**

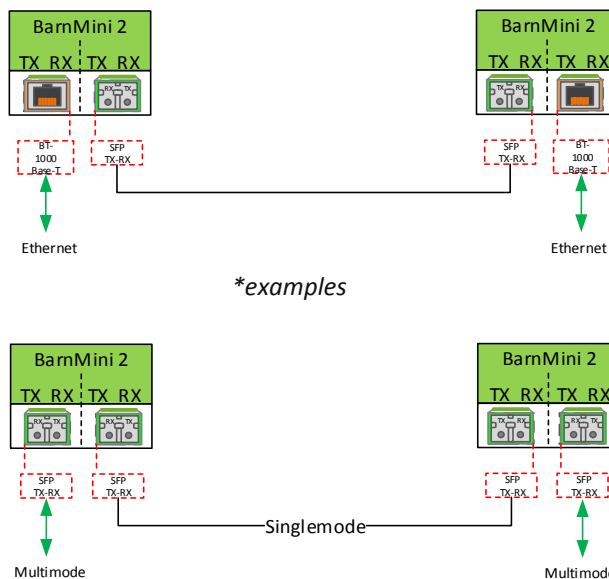
- 1x fiberoptical port (SFP) , Duplex transcievers , LC/PC connectors
- SMPTE 259M, 292M, 372M, 424M, 297M, DVB-ASI
- Hot pluggable/swappable
- Singlemode and/or Multimode
- 16 CWDM wavelength selections – ITU-T G.694.2

**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, 372M, 424M, 297M, 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**

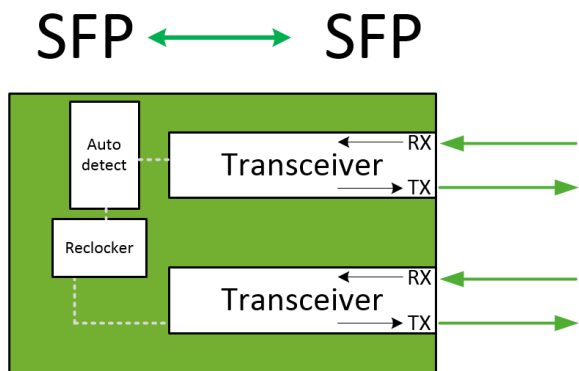
12-24V DC. Power supply included

**Physical size**

92mm x 98mm x 22mm  
 200g

**Model name**

BM-02



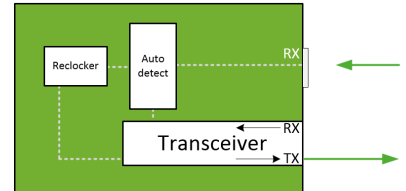
BarnMini Series

**BARNMINI-03/04**



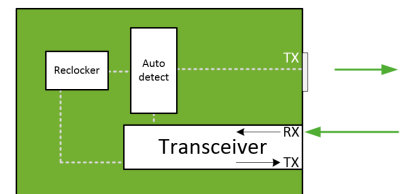
HDMI → SFP SDI

BarnMini 03



SDI SFP → HDMI

BarnMini 04



**Technical Specifications**

**Optical ports**

2x fiberoptical port (SFP) , Duplex transceivers , LC/PC connectors (optional HDMI, HD-BNC, RJ45)  
 SMPTE 259M, 292M, 372M, 424M, 297M, 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, BM-04



## 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.           |
| BTF-Mini-16  | 2.5RU frame for housing of up to 16 BarnMinis, incl. PSU.    |

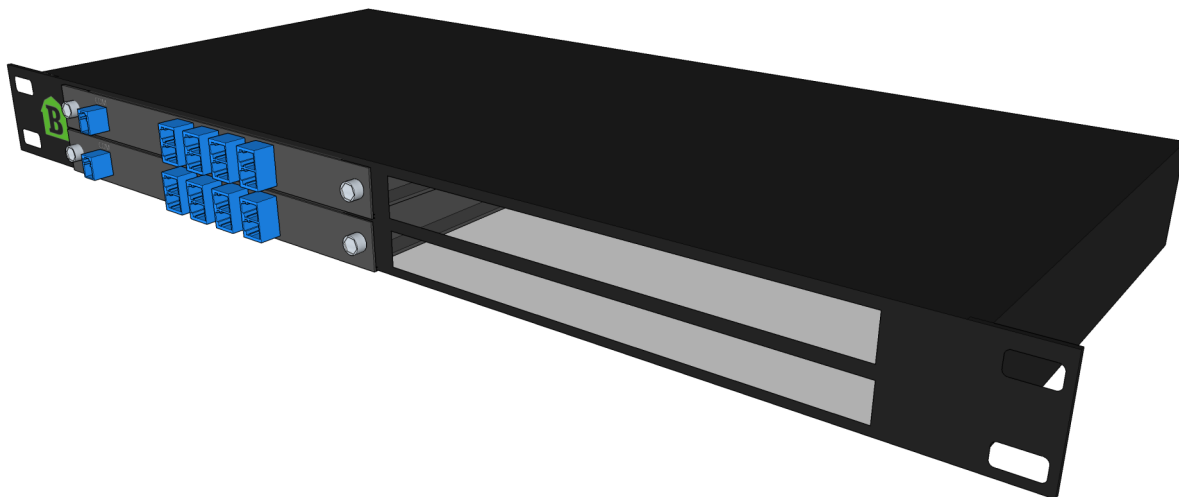
Any SFPs in our product list are compatible with the BarnMini series.

*\*see 'Accessories' in catalog for redundancy PSU, cables etc.*

## 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)

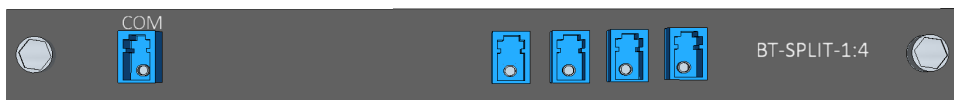
- 2:1

Passive Optical Products

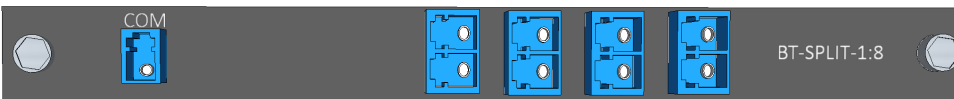
**BT-SPLIT-XX-LGX**



1:2



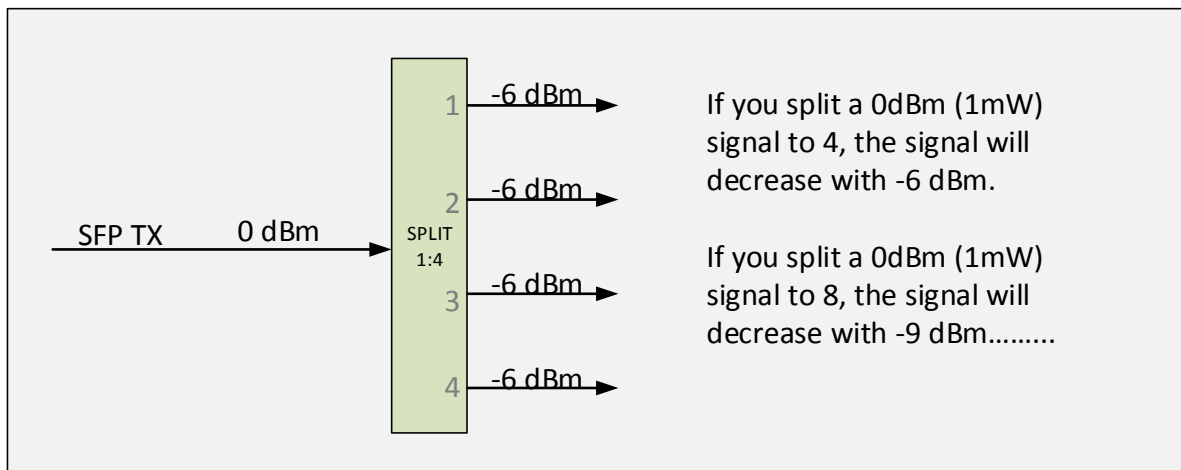
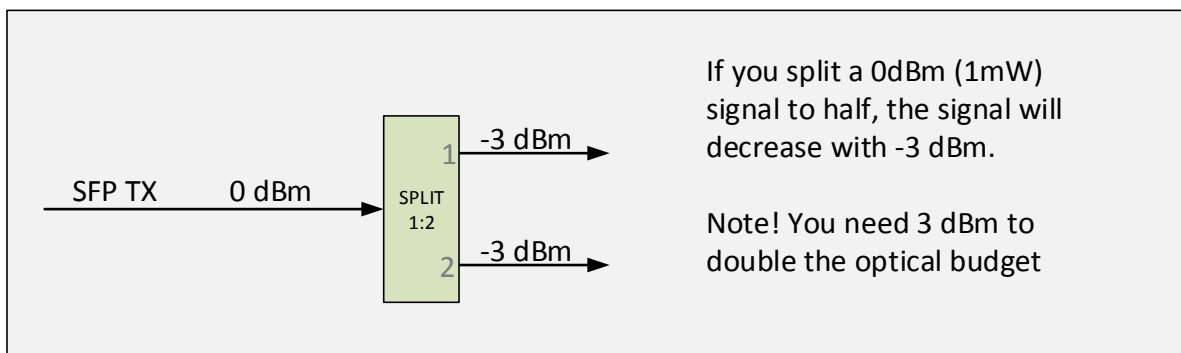
1:4



1:8



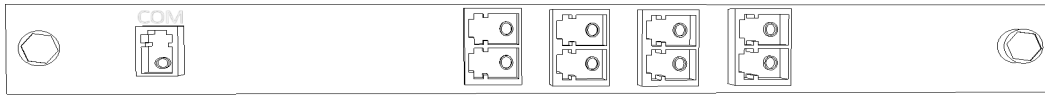
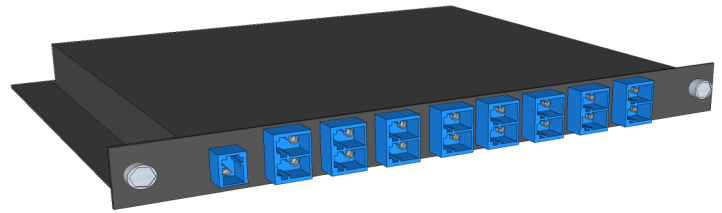
**How does optical splitting infect your optical attenuation**



Passive Optical Products

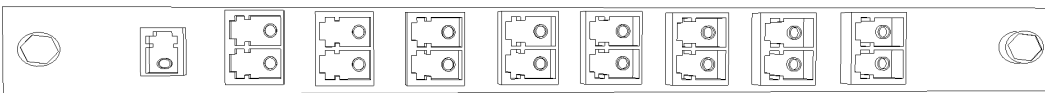
**CWDM**

Multiplexer / de-Multiplexer



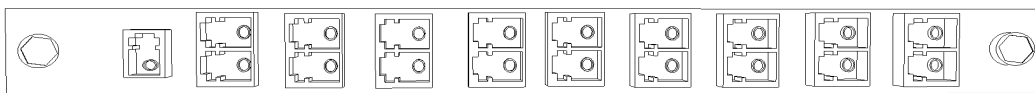
8 Channels

|     |      |      |      |      |  |
|-----|------|------|------|------|--|
| COM | 1290 | 1330 | 1370 | 1410 |  |
|     | 1310 | 1350 | 1390 | 1430 |  |



16 Channels

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



18 Channels

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

**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



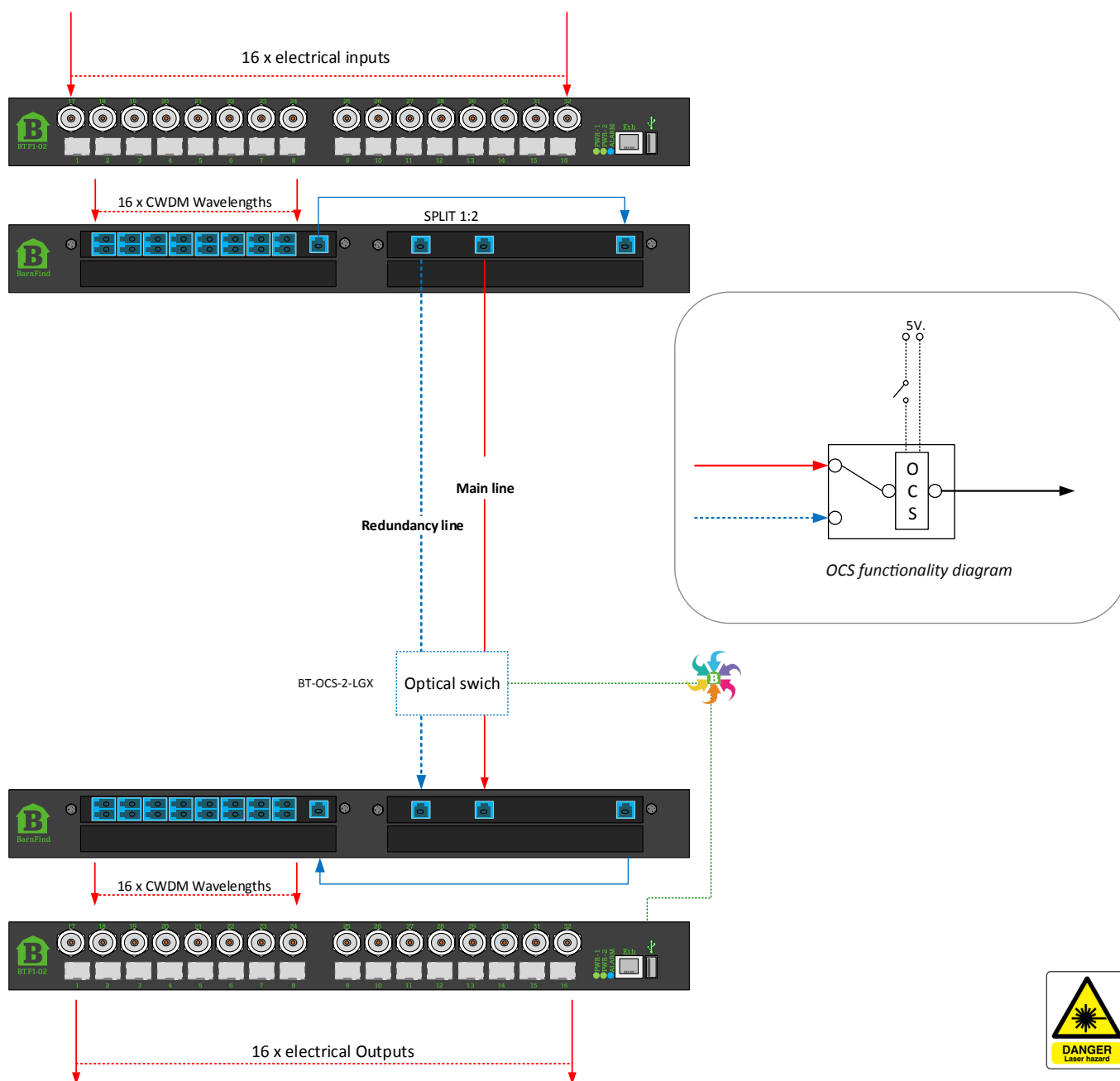
| CWDM Channels | Wavelength |
|---------------|------------|
| 8 CH.         | 1 1270     |
|               | 2 1290     |
|               | 3 1310     |
|               | 4 1330     |
|               | 5 1350     |
|               | 6 1370     |
|               | 7 1390     |
|               | 8 1410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

Passive Optical Products

# Optical Changeover Switch



BT-OCS-2-LGX



## Housing for Passive Optical Modules

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

## CWDM Mux/Demux

Fit into BT-HOUS-LGX-1RU Chassis

| Order Name                             | Description                              |
|--|--|
| <b>BT-WDM-LGX</b>                      | <b>2 channels in LGX box stand-alone</b> |
| 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       |
| * Other CWDM configuration on request. |  |

## Optical Splitters

Fit into BT-HOUS-LGX-1RU chassis

| Order Name                            | Description  |
|---------------------------------------|--|
| <b>BT-SPLIT-2-LGX</b>                 | <b>Passive distribution of optical signals 1:2 out</b> |
| BT-SPLIT-4-LGX                        | Passive distribution of optical signals 1:4 out        |
| BT-SPLIT-8-LGX                        | Passive distribution of optical signals 1:8 out        |
| * Other optical splitters on request. |  |

## Optical Changeover Switch

Fit into BT-HOUS-LGX-1RU chassis

| Order Name          | Description                                 |
|---------------------|---|
| <b>BT-OCS-2-LGX</b> | <b>Optical changeover 2:1, Non-latching</b> |

# 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

### 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*

|                              |                       |              |   |
|------------------------------|-----------------------|--------------|---|
| Barnfind Technologies        | Approx. distance (km) | Max. bitrate |   |
| <b>BT - CWDM - 10 - 3G31</b> | 10                    | 3G           | <ul style="list-style-type: none"> <li>• 1270</li> <li>• 1290</li> <li>• <b>1310</b></li> <li>• 1330</li> <li>• 1350</li> <li>• 1370</li> <li>• 1390</li> <li>• 1410</li> <li>• 1430</li> <li>• 1450</li> <li>• 1470</li> <li>• 1490</li> <li>• 1510</li> <li>• 1530</li> <li>• 1550</li> <li>• 1570</li> <li>• 1590</li> <li>• 1610</li> </ul> |

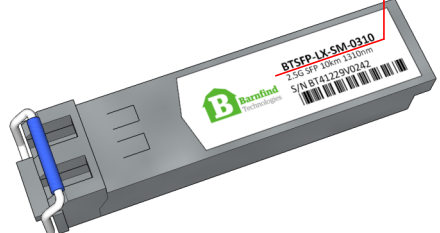


### Standard SFPs

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'*

|                               |                        |                                   |                       |   |
|-------------------------------|------------------------|-----------------------------------|-----------------------|---|
| Barnfind Technologies         | LX = 1310<br>ZX = 1550 | SM = Singlemode<br>MM = Multimode | Approx. distance (km) |   |
| <b>BTSFP - LX - SM - 0310</b> |                        |                                   | 10                    | <p>Maximum bitrates:</p> <ul style="list-style-type: none"> <li>02 = 1.25Mbps</li> <li>03 = 2.5Mbps</li> <li>3G = 3G SDI</li> </ul> |




See Barnfind catalog for full overview of SFPs

## 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 | HD-SDI                     |
| BT-CWDM-80-03XX | 2.5Gbps        | 80km     | 1270-1610nm |                            |
| 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 - 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 transceiver 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

# 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<br>2.97 Gb/s  | Sen    | 0    | --- | -18  | dBm   | Pathological                       |
|  |        | 0    | --- | -20  | dBm   | PRBS 2 <sup>23</sup> -1, BER=1E-12 |
| Sensitivity for SMPTE 292M<br>1.485 Gb/s   | Sen    | 0    | --- | -20  | dBm   | Pathological                       |
|  |        | 0    | --- | -21  | dBm   | PRBS 2 <sup>23</sup> -1, BER=1E-12 |
| Signal Detect -- Asserted  | Pa     | ---  | --- | -20  | dBm   | Transition: low to high            |
| Signal Detect -- Deasserted  | Pd     | -29  | --- | ---  | dBm   | Transition: high to low            |
| Signal detect -- Hysteresis  |        | 1    |     | 6    | dB    |                                    |
| Optical Return Loss  |        |      | -27 |      | dB    |                                    |
| <b>Electrical</b>  |        |      |     |      |       |                                    |
| CML Output (Differential)  |        | 550  | 660 | 850  | mVp-p | AC coupled output                  |

|                               |                 |     |  |                      |    |  |
|-------------------------------|-----------------|-----|--|----------------------|----|--|
| Optical Rise Time / Fall Time | 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                                      | $V_{TDSL}$        | 0                 |             | 0.8               | V     | TX Output Enabled  |
| Disable Input Voltage -- High                                     | $V_{TDSH}$        | 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<br>2.97 Gb/s                        | Sen    | 0    | --- | -18  | dBm   | Pathological                       |
|  |        | 0    | --- | -20  | dBm   | PRBS 2 <sup>23</sup> -1, BER=1E-12 |
| Sensitivity for SMPTE 292M<br>1.485 Gb/s                       | Sen    | 0    | --- | -20  | dBm   | Pathological                       |
|  |        | 0    | --- | -21  | dBm   | PRBS 2 <sup>23</sup> -1, BER=1E-12 |
| Signal Detect -- Asserted                                      | Pa     | ---  | --- | -20  | dBm   | Transition: low to high            |
| Signal Detect -- Deasserted                                    | Pd     | -29  | --- | ---  | dBm   | Transition: high to low            |
| Signal detect -- Hysteresis                                    |        | 1    |     | 6    | dB    |                                    |
| Optical Return Loss  |        |      | -27 |      | dB    |                                    |

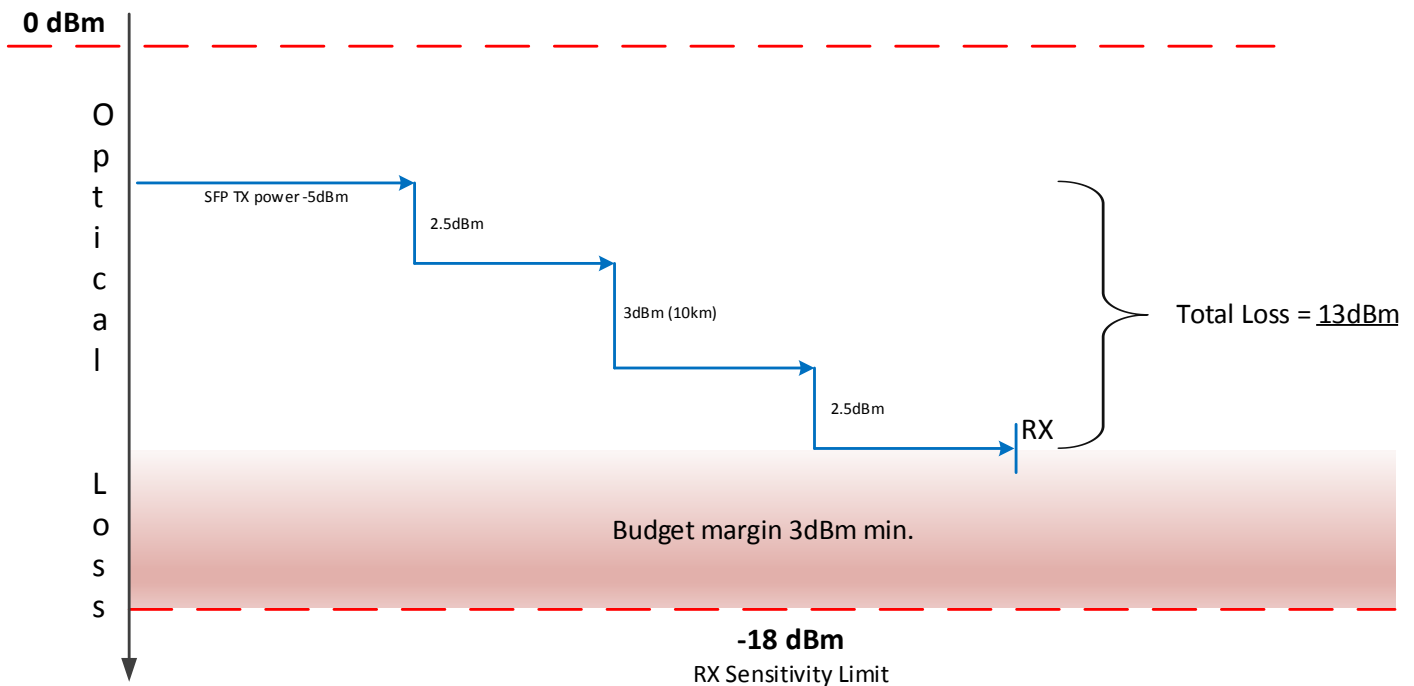
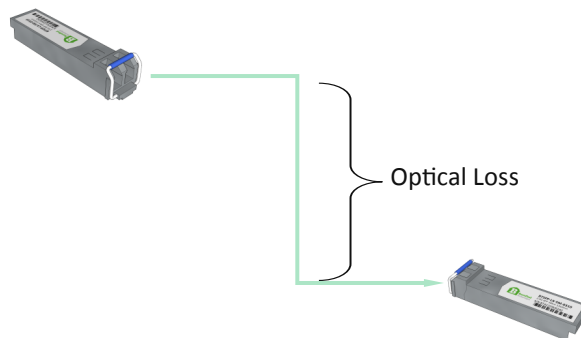
All statements, technical information, and recommendations related to the products herein are based upon information believed to be reliable or accurate. However, the accuracy or completeness thereof is not guaranteed, and no responsibility is assumed for any inaccuracies. Please contact Barnfind Technologies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

## 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.

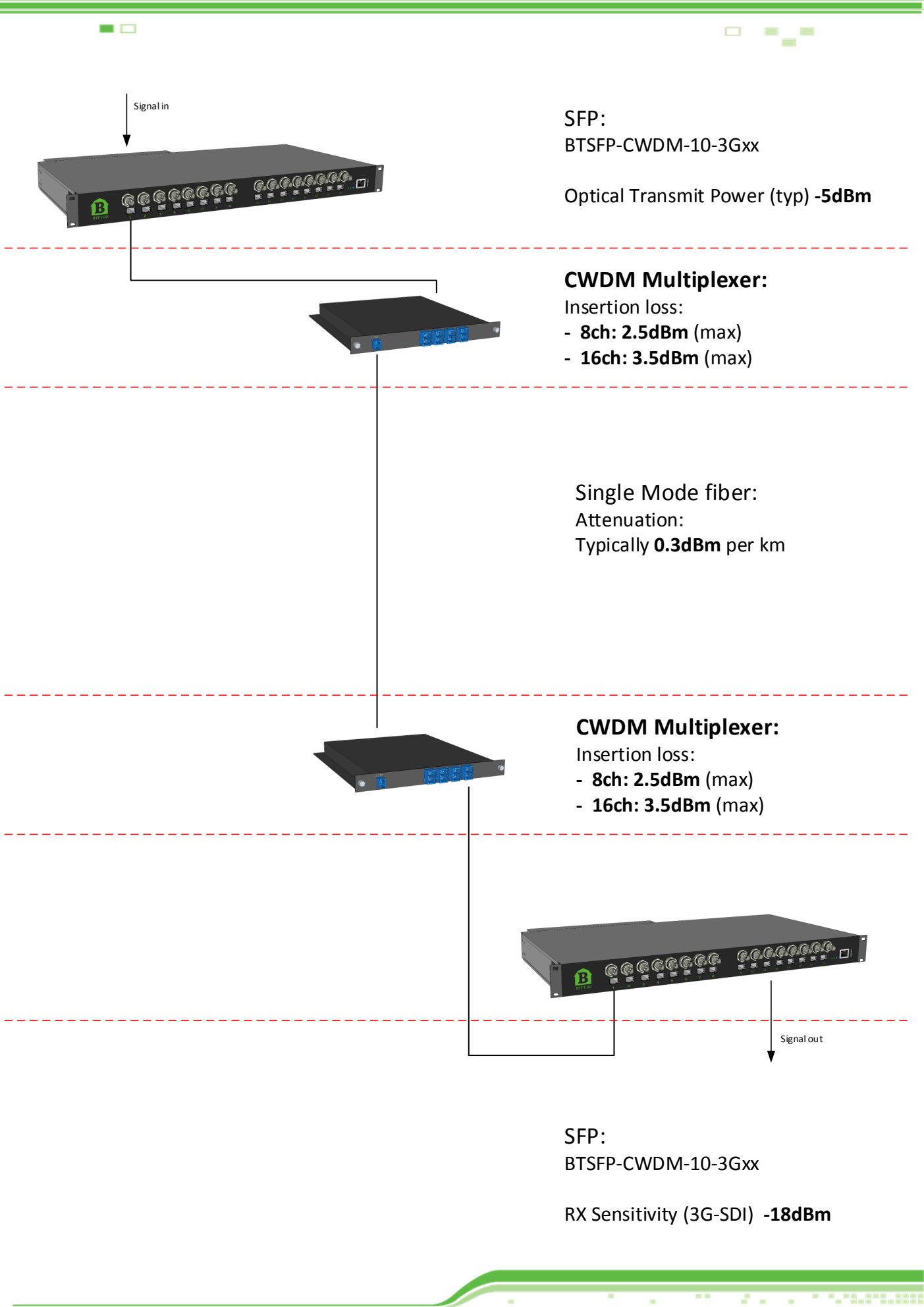
Example:

- 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.

Following figure shows the same scenario with Barnfind products



Signal in

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)

Signal out

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

The screenshot displays the BarnStudio configuration interface. On the right, a list of BNC ports is shown with their respective settings:

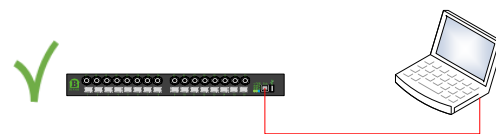
| BNC #   | Input port    | Direction | 3G ext. reach            | Coarse amplitude |
|---------|---------------|-----------|--------------------------|------------------|
| BNC #17 | Input port 17 | Output    | <input type="checkbox"/> | 800mV p-p        |
| BNC #18 | Input port 18 | Output    | <input type="checkbox"/> | 800mV p-p        |
| BNC #19 | Input port 19 | Output    | <input type="checkbox"/> | 800mV p-p        |
| BNC #20 | Input port 20 | Output    | <input type="checkbox"/> | 800mV p-p        |
| BNC #21 | Input port 21 | Output    | <input type="checkbox"/> | 800mV p-p        |
| BNC #22 | Input port 22 | Output    | <input type="checkbox"/> | 800mV p-p        |
| BNC #23 | Input port 23 | Output    | <input type="checkbox"/> | 800mV p-p        |
| BNC #24 | Input port 24 | Input     | <input type="checkbox"/> | 800mV p-p        |
| BNC #25 | Input port 25 | Output    | <input type="checkbox"/> | 800mV p-p        |

On the left, a signal matrix is visible, showing connections between various ports. The matrix includes columns for SFP #1-12 and BNC #17-32. The BNC #24 row is highlighted in red, corresponding to its 'Input' direction setting.



## How to get started with BarnStudio

### Discover the frames



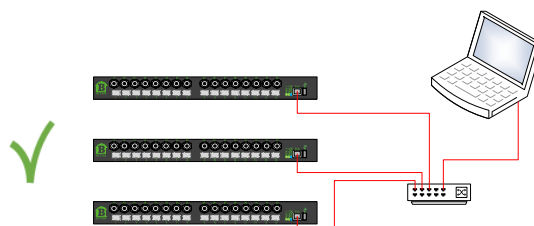
Note: The BTF1-XX is shipped standard with no IP address set, but with DHCP enabled.

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.*

#### 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.

| 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>  |           |

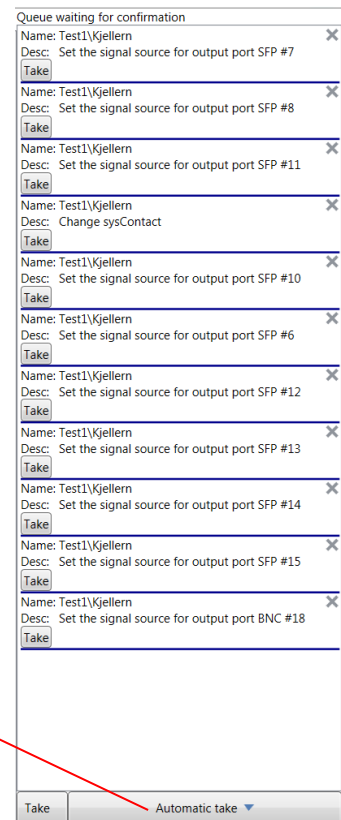
## Acknowledgement (Take) of configuration changes

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.

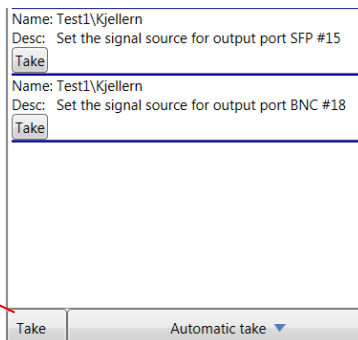
### Automatic Take:

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<br>SerialNumber: 12435<br>NetworkID: B8-27-EB-EA-D1-63  |         |        |        |         |      |                  |             |            |
| sysName: <input type="text" value="Test1\Kjellern"/><br>This is the designated name of this device as it appears in the browser.   |         |        |        |         |      |                  |             |            |
| sysLocation: <input type="text" value="Basement"/><br>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"/><br>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<br>Initiate detection to (last successfull host) [192.168.0.95]:161<br>Detection successfull. Installing [192.168.0.95]:161<br>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 IP addresses for interfaces: 192.168.0.95/24 eth0, 127.0.0.1/8 lo, and fe80::ba27:ebff:feea:d163/64 eth0. A secondary address ::1/128 lo is also listed.
- Route:** Shows routing information: via 192.168.0.1 dev eth0, dst 192.168.0.0/24 dev eth0, dst ff00::/8 dev eth0, and dst fe80::/64 dev eth0.
- /etc/resolv.conf:** Contains the DNS configuration: 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 interface for network configuration. At the top, there is a 'Network Configuration' section with an expand/collapse arrow. Below this, there are two main columns for IPv4 and IPv6 configuration. Each column has a 'configuration mode' section with radio buttons 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 points from the text above to the 'Static' option in the IPv4 configuration mode section.

**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**

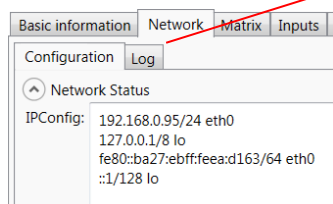
Click this button to upload the configuration from BarnStudio into the device.

*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 ports. On the left, there are three groups of ports: 'No group' (SFP #5-6), 'My group' (SFP #1-3), and 'No group' (SFP #7-18). The grid columns are labeled 'Inputs', 'Outputs', 'SFPs', 'Firmware Upgrade', 'Diagnostics', and 'SNMP traps'. The grid rows are labeled 'Output port 1-24' and 'BNC #17-24'. Colored squares in the grid indicate signal status: black for no signal, red for loss of signal, and green for detected signal. For example, SFP #1 is connected to Output port 1 (green), and SFP #15 is connected to Output port 15 (green).

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

The screenshot shows a table with columns 'Device' and 'NetConf Protocol'. Above the table are 'Add' and 'Setup' buttons. A red arrow points from the text above to the 'Setup' button. The table contains the following data:

| 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 |
| 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

|        |                       |   |         |                   |        |   |        |          |
|--------|-----------------------|---|---------|-------------------|--------|---|--------|----------|
| 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   |

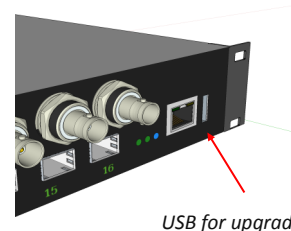
- **Check for Updates:** This button will trigger the frame BTF1-XX to connect to our server at Barnfind Technologies HQ in Norway and check for software updates. You can see the progress in the log and the status label.
- **Install Updates:** This button will trigger the frame BTF1-XX to download from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

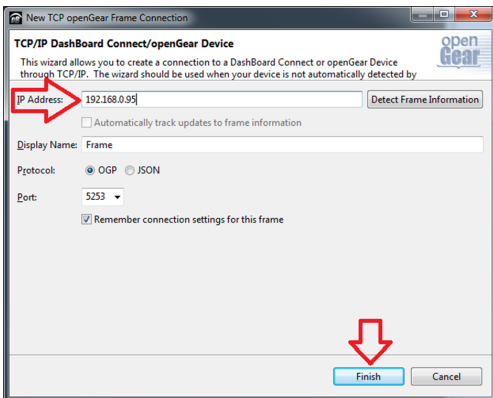
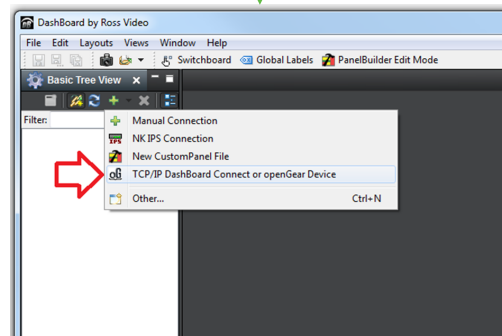
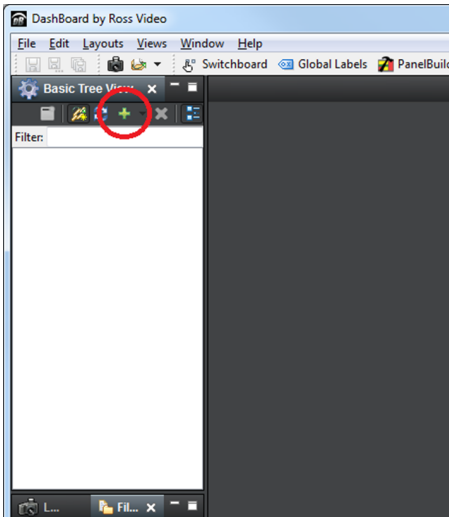
BTF1-XX can control and be controlled by many other software/hardware panels.





### openGear protocol

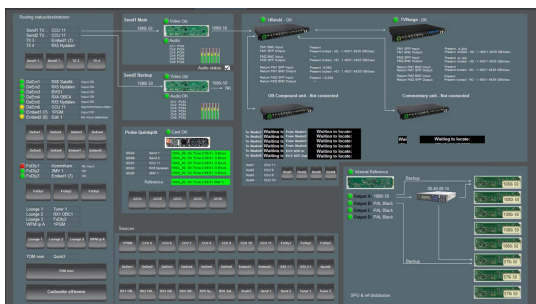
The openGear protocol (also known as OGP) is an open protocol developed by Ross (who must be contacted if the specifications are needed). The support was added in firmware version 0.1.7. The BTF1-XX frames does not broadcast its openGear connection details, so it has to be added manually in dashboard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

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



Example of Barnfind frame in DashBoard view



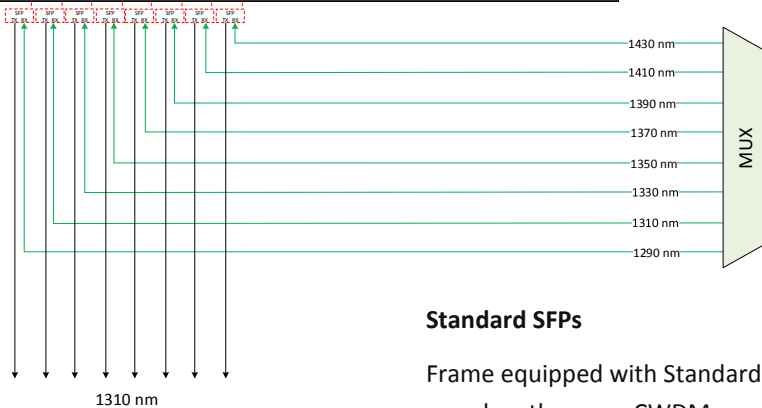
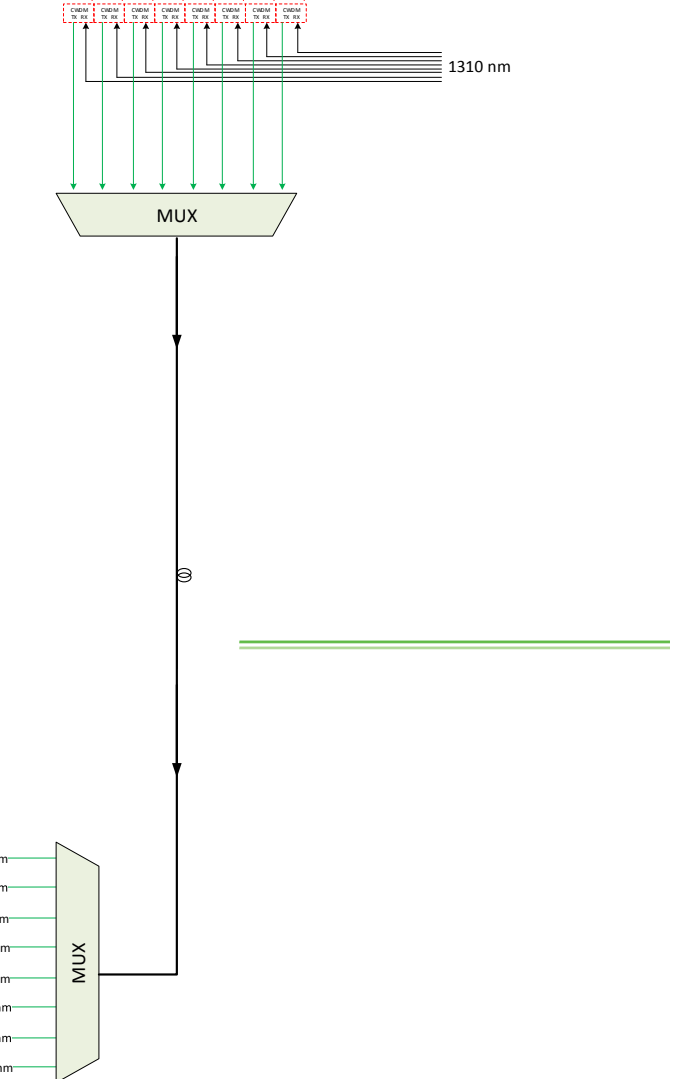
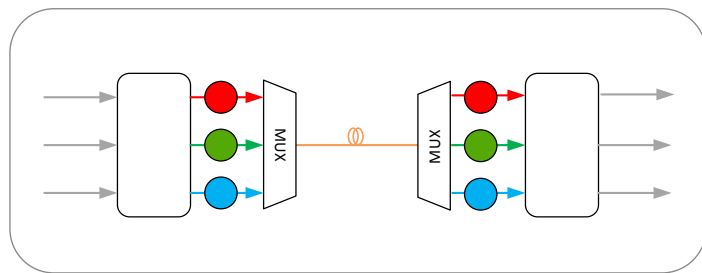
## Application Example

# 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



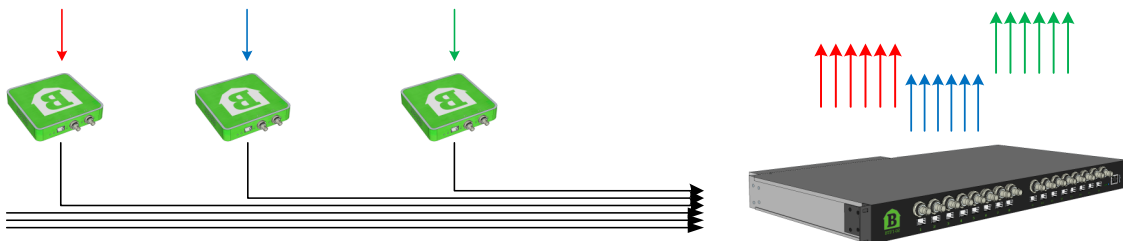
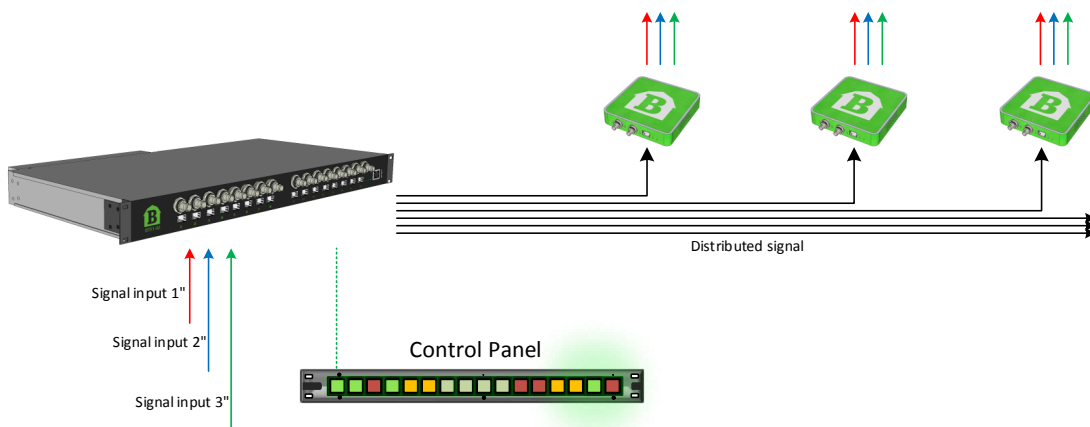
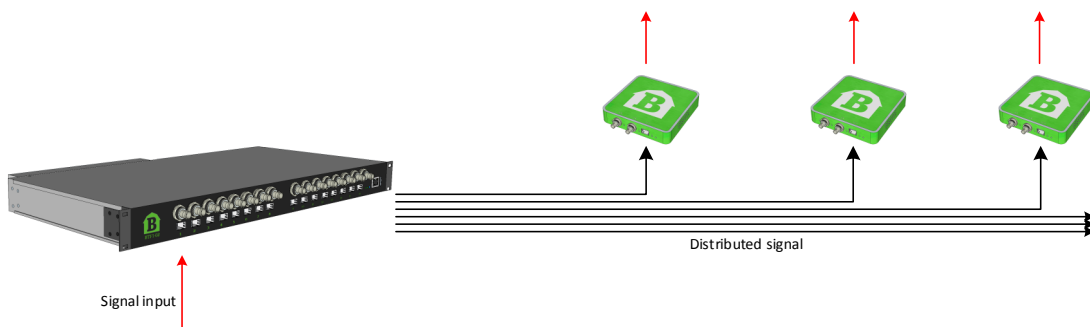
### Standard SFPs

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



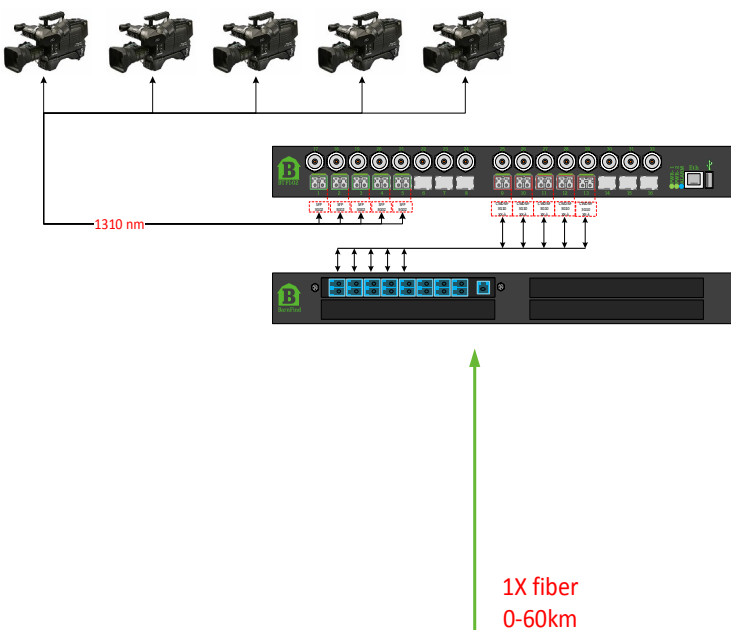
Application Example

# Signal Distribution/Contribution



## Application Example

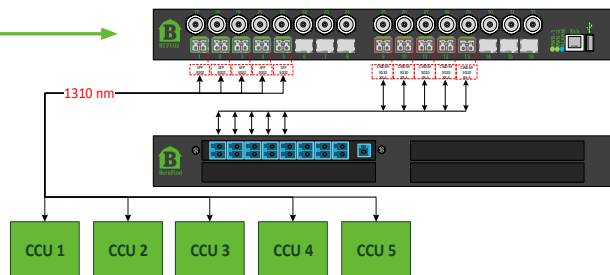
# Camera to CCU



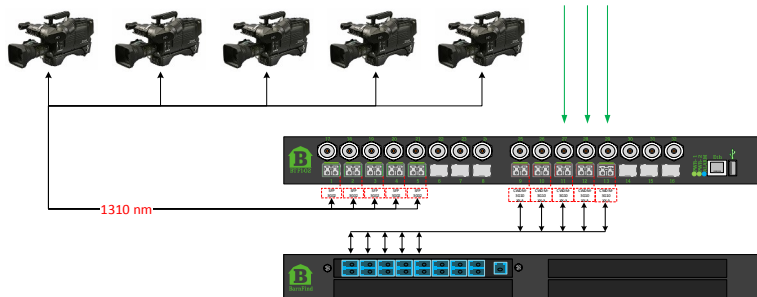
Figures shows the bidirectional signal transport between a camera from any supplier to a camera control unit (CCU). Up to 18 cameras/CCU can be multiplexed into 1 fiber for transport over long distances. The internal matrix in BarnOne frame allows the user to switch any camera to any CCU.

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

| <b>BOM list</b>     |                 |
|---------------------|-----------------|
| <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               |

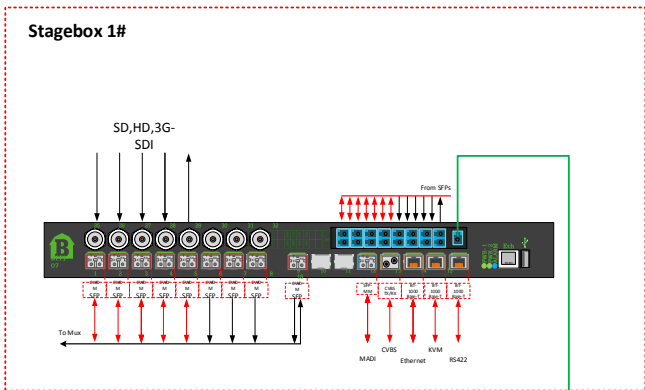
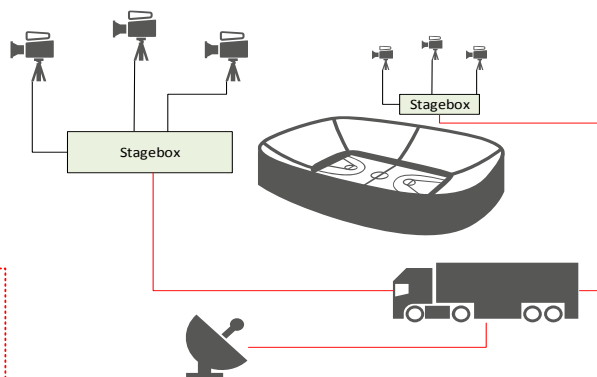


Other signal can be multiplexed into same fiber. SDI, AES, ASI, HDMI, Ethernet, CVBS, SDTI, MADI, KVM

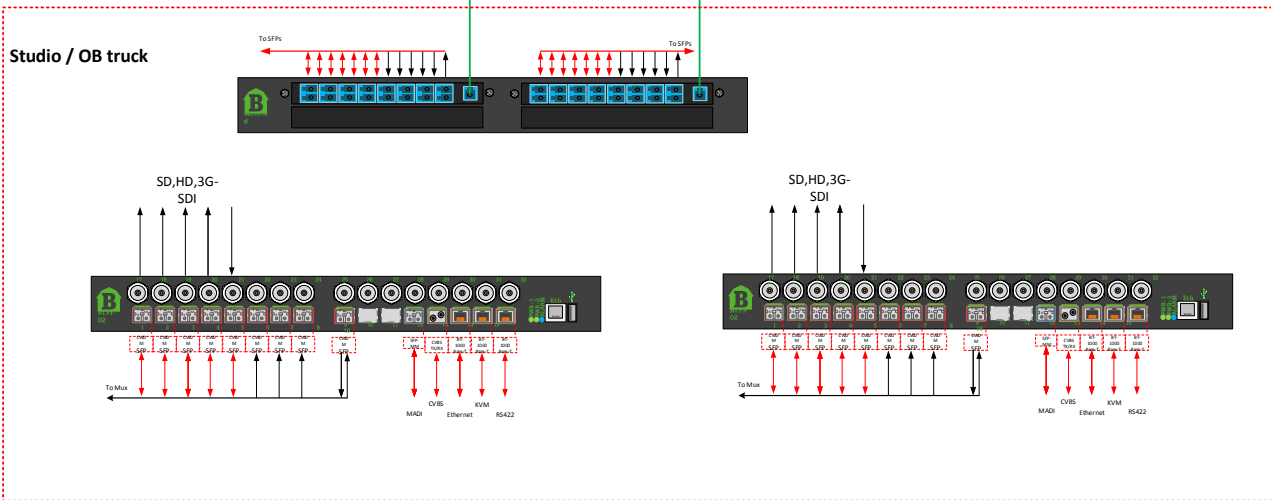
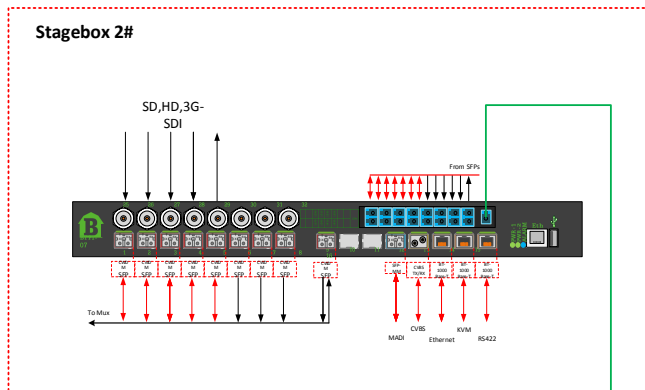


# Application Example

## 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

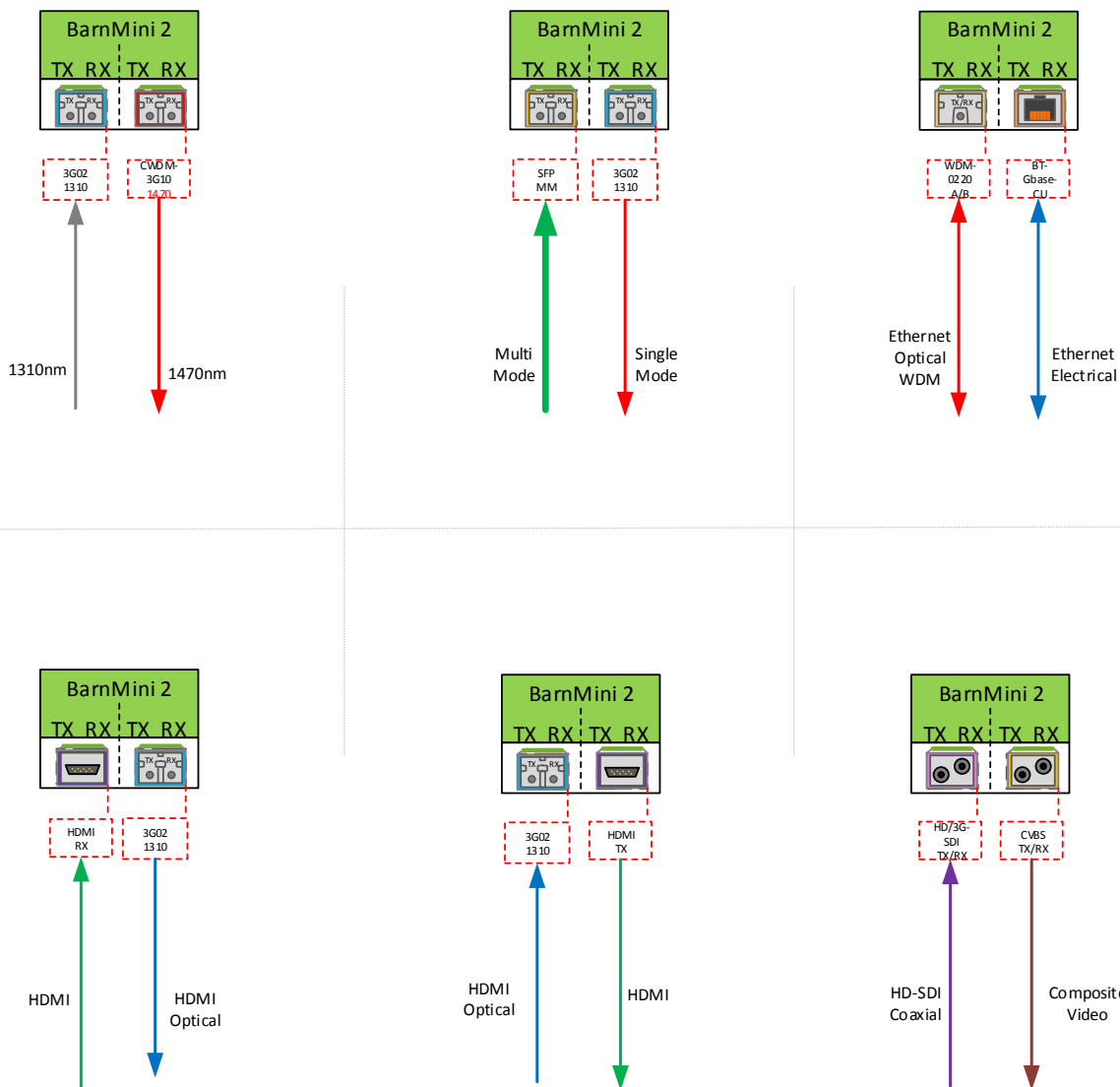
# BarnMini-02



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 typical user setup.

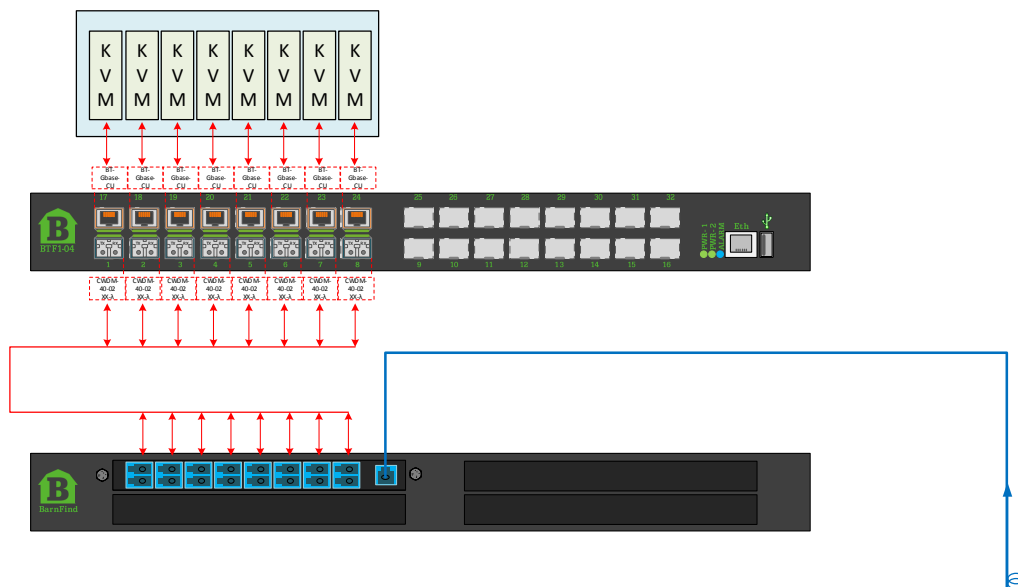
BarnMini-02 can house any combination of SFPs from Barnfind or other MSA vendors.

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.

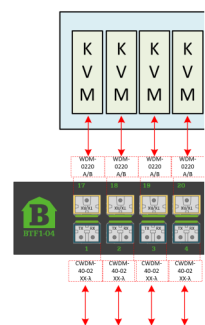
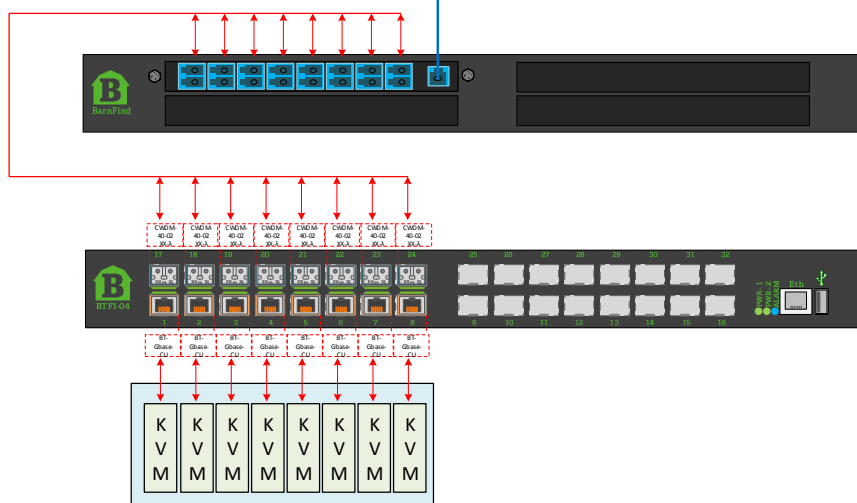
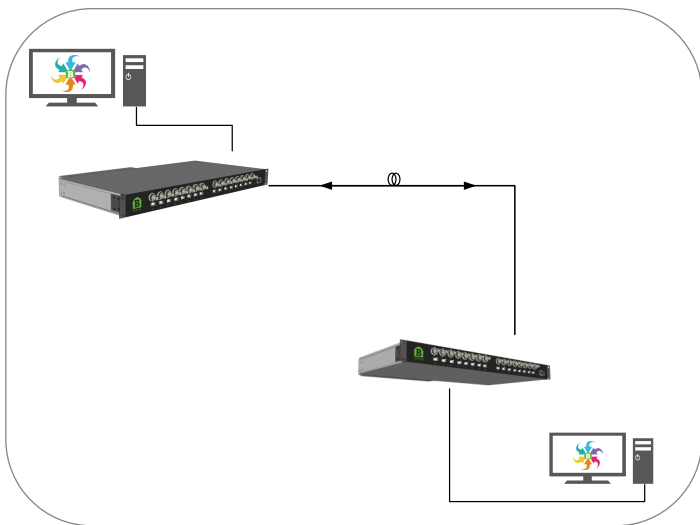


Fig. 1

Application Example


# Ethernet transmission



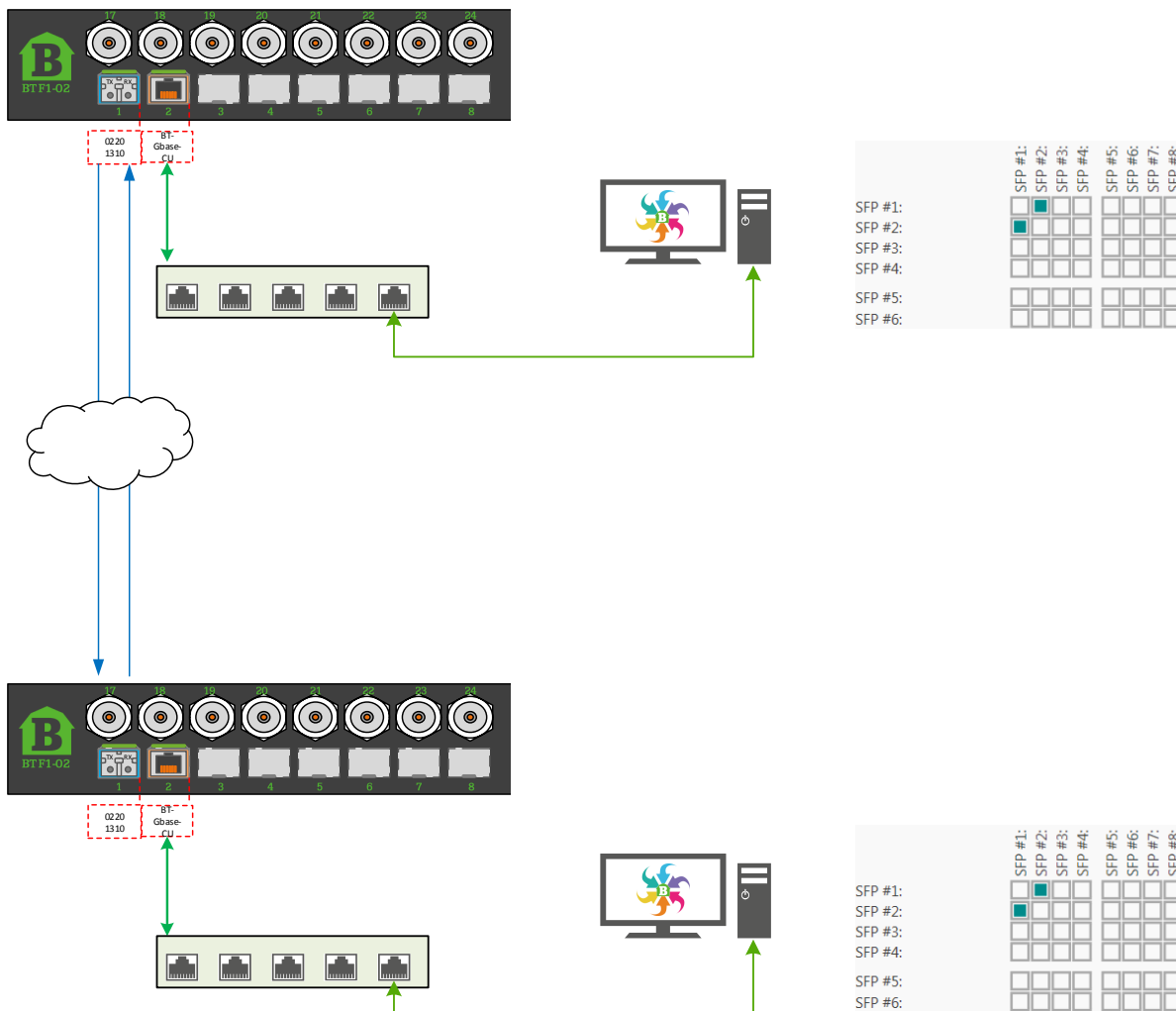
To establish an Ethernet connection over fiber by using Barnfind products, configure your setup as picture below describes.

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

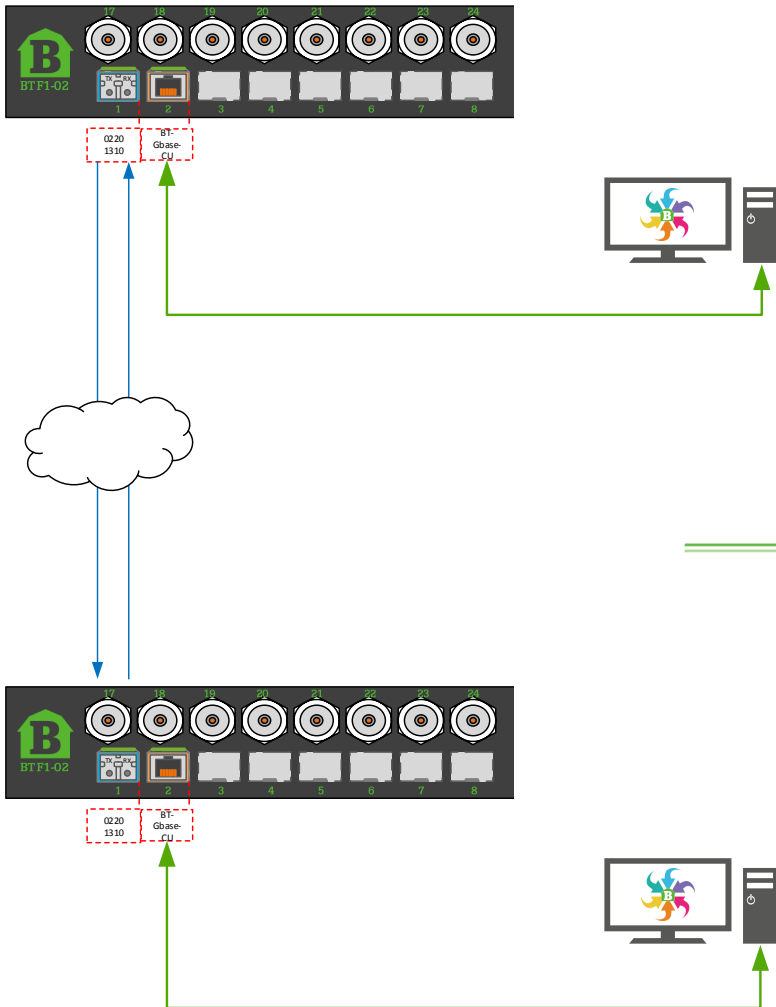
Regardless of point to point or multiplexed connection, the user must ensure the RX is connected to TX and vice versa.

 **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.**

## 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)

Barnfind Technologies AS

Ranvik Brygge 7 | 3212 Sandefjord | Norway

Telephone: + 47 33 45 06 13



**BarnGuide**

Version 2.0