



---

## **OPERATIONS MANUAL**

**FOR**

**BC390T/R BN390T/R**

**4 x HD-12G**

**SDI**



**Fibre**

**2 x 3G-12G**

**© 2018 Bluebell Opticom Ltd**

Unit 2, The Quadrant, Howarth Road, Maidenhead, Berkshire, SL6 1AP, United Kingdom  
Tel: +44 (0)1628 510055 Email: [sales@bluebell.tv](mailto:sales@bluebell.tv) Website: [www.bluebell.tv](http://www.bluebell.tv)

# Safety Warning – Important Precautions

To reduce the risk of fire or electric shock, do not expose this equipment to rain, moisture, or wet conditions.

## General Safety Guidelines

- Always **disconnect the entire system from the AC mains** before cleaning or servicing.
- The following product frames – **BC100, BC100i, BC101, BC102, BC120, BC160i** – must be connected using a **three-conductor AC mains power cord with an earth ground**. All three conductors must be used at all times to prevent electric shock.
- Do **not** bypass or disable any fuse.
- Only replace fuses with those of the **specified type and rating**.
- Do **not** use flammable or combustible chemicals for cleaning.
- Do **not** pour or spill liquids directly onto the unit.
- Do **not** allow any liquid to enter the unit or wet the internal components.
- Do **not** operate the unit with any cover or panel removed.
- Do **not** obstruct the ventilation slots—**adequate airflow must be maintained**.
- Do **not** operate the unit in environments with **extreme temperatures**.
- Do **not** use or store the unit in **explosive atmospheres**.
- Do **not** attempt to repair the unit yourself. If servicing is required, please contact your local **Bluebell Opticom** distributor.
-  **Product Warranty**
- **Bluebell Opticom Ltd** provides warranty coverage as detailed in our general terms and conditions.  
Please note that warranty support is only valid **if product serial numbers remain intact and legible**. Tampering with or removing serial numbers may void your warranty.



EN60950  
EN55103-1: 1996  
EN55103-2: 1996

Safety  
Emission  
Immunity

## Bluebell Opticom Ltd



Tested To Comply  
With FCC Standards  
FOR HOME OR OFFICE USE

This device complies with part 15 of the FCC Rules  
Operation is subject to the following two condition:  
( 1 ) This device may cause harmful interference, and  
( 2 ) This device must accept any interference received,  
including, Interference that may cause undesired  
operation

© 2018 **Bluebell Opticom Ltd**

Unit 2, The Quadrant, Howarth Road, Maidenhead, Berkshire, SL6 1AP, United Kingdom  
Tel: +44 (0)1628 510055 Email: [sales@bluebell.tv](mailto:sales@bluebell.tv) Website: [www.bluebell.tv](http://www.bluebell.tv)

| Contents | BC390 BN390 |
|----------|-------------|
|----------|-------------|

|                      |               |    |
|----------------------|---------------|----|
| Contents             | BC390 BN390   | 3  |
| Conformances         | BC390 BN390   | 3  |
| Description          | BC390 BN390   | 4  |
| Block Diagram        | BC390 BN390   | 4  |
| Specifications       | BC390 BN390   | 5  |
| Connections          | BC390T BC390R | 7  |
| Connections          | BN390T BN390R | 8  |
| Mode UP Conversion   | BC390T BN390T | 9  |
| Mode DOWN Conversion | BC390R BN390R | 11 |
| Configuration        | BC390 BN390   | 13 |
| Monitoring           | BC390         | 14 |
| Monitoring           | BN390         | 15 |
| Ordering Information | BC390 BN390   | 21 |

| Conformances | BC390 BN390 |
|--------------|-------------|
|--------------|-------------|

|              |                                                                                                                   |
|--------------|-------------------------------------------------------------------------------------------------------------------|
| EMI/RFI      | Complies with 89/336/EEC, EN55032B, EN61000-4-2, EN61000-4-4-(Level 2), EN61000-4-4FTB, EN61000-4-5, EN61000-4-11 |
| Electrical   | Complies with EN 61000-6-1, EN61000-6-2 , EN61000-6-3, EN61000-6-4                                                |
| Laser Safety | Complies with Class 1 laser product. See specs for SFP fitted.                                                    |
| RoHS         | Complies with Directive 2002/95/EC                                                                                |



#### WEEE Directive & Product Disposal

At the end of its serviceable life, this product should not be treated as household or general waste. It should be handed over to the applicable collection point for the recycling of electrical and electronic equipment, or returned to the supplier for disposal.

Please note that all documentation herein is of a confidential nature and may not be reproduced without written confirmation from Bluebell Opticom Ltd. The technical descriptions and schematics are to aid service and repair only. Dissemination to a third party or parties will constitute breach of copyright. Information in this document is subject to change without notice and does not represent a commitment on the part of Bluebell Opticom Ltd.

E&OE August 2017

## Description

## BC390 BN390

Based around field proven technology the compact units provide the transport of 4 x 3G-SDI signals on a single Wavelength, allowing the outputs from up to four cameras to be transmitted over fibre.

With an option for ITU Grid CWDM Wavelengths, up to 18 x 12G-SDI channels or indeed 72 x 3G-SDI channels can be transported on a single Singlemode fibre.

The products are available in 2 different formats:

### BC390

This module is compatible with the BC Series 19" rack frames.

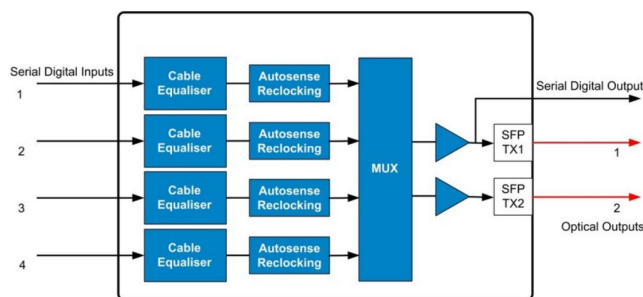
### BN390

Expanding upon the successful BlueNano range the BN390 is designed for the cost effective transport of 4K UHD signals over fibre. These units multiplex 4 x 3G-SDI onto one 12G-SDI Signal with Electrical and Optical Outputs.

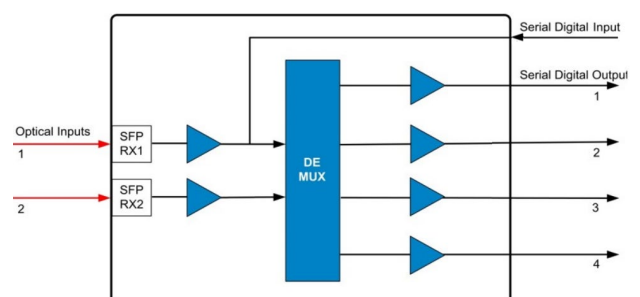
Power is provided via the compact PS12 unit. Each BN390 has a 4 pin XLR allowing power from a variety of external DC sources in the range 4.5 to 17 V.

## Block Diagram

## BC390 BN390



Tx Units: Bx390T



Rx Units: Bx390R

Note: Only the BN390T has the serial digital output, and BN390R had the serial digital input.

**Bx390T**
**Electrical Inputs**

|              |                                                                                                                                                              |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standards    | SMPTE ST 2082, SMPTE ST 2081, SMPTE 424M, SMPTE 292M, SMPTE 259M, SMPTE 344M, and SMPTE 259M                                                                 |
| Data rates   | 12G, 6G, 3G, HD, SD, MADI                                                                                                                                    |
| Equalisation | Automatic to 70m @ 11.88Gb/s<br>Automatic to 95m @ 5.94Gb/s<br>Automatic to 180m @ 2.97Gb/s<br>Automatic to 240m @ 1.485Gb/s<br>Automatic to 300m @ 270 Mb/s |
| Return Loss  | < -15 dB @ 5Mb/s – 1.485Gb/s<br>< -10 dB @ 1.485Gb/s – 2.97 Gb/s<br>< -7 dB @ 2.974Gb/s – 5.94Gb/s<br>< -4 dB @ 5.94Gb/s – 11.88Gb/s                         |
| Connector:   | 75 Ohm BNC per IEC 60169-8 Amendment 2                                                                                                                       |
| Format:      | Re-clocked                                                                                                                                                   |

**Optical Outputs**

Most specs determined by SFP fitted. Typical values given here.

|                                                                               |                            |
|-------------------------------------------------------------------------------|----------------------------|
| Connector (BC390T)                                                            | 2 x female LC              |
| Connector (BN390T)                                                            | Neutrik Opticalcon Dual    |
| Wavelength                                                                    | 1270-1610 nm               |
| Optical power                                                                 | -3 dBm @ 1310 nm (typical) |
| See Ordering Information for the different multimode and single mode variants |                            |

**Bx390R**
**Optical Inputs**

Most specs determined by SFP fitted. Typical values given here.

|                                                                               |                              |
|-------------------------------------------------------------------------------|------------------------------|
| Connector (BC390R)                                                            | 2 x female LC                |
| Connector (BN390R)                                                            | Neutrik Opticalcon Dual      |
| Wavelength                                                                    | 1270-1610 nm                 |
| Sensitivity                                                                   | > -22 dBm @ 3 Gb/s (typical) |
| See Ordering Information for the different multimode and single mode variants |                              |

**Electrical Input (BN units only)**

Specifications as Bx390T Electrical Inputs above.

**Electrical Outputs**

|             |                                                                                              |
|-------------|----------------------------------------------------------------------------------------------|
| Standards   | SMPTE ST 2082, SMPTE ST 2081, SMPTE 424M, SMPTE 292M, SMPTE 259M, SMPTE 344M, and SMPTE 259M |
| Data rates  | 12G, 6G, 3G, HD, SD, MADI                                                                    |
| Connector   | 1 x 75 Ohm BNC to IEC 60169-8 Amendment 2 per channel                                        |
| Return Loss | < -17 dB @ 5Mb/s – 1.485Gb/s<br>< -12 dB @ 1.485Gb/s – 2.97 Gb/s                             |

|                  |                                   |
|------------------|-----------------------------------|
|                  | < -8 dB @ 2.974Gb/s – 5.94Gb/s    |
|                  | < -5 dB @ 5.94Gb/s – 11.88Gb/s    |
| Polarity         | Non-inverting                     |
| Signal Level     | 800 mV $\pm$ 10%                  |
| Alignment Jitter | 0.2 UI line equalised @ 270Mbps   |
|                  | 0.2 UI line equalised @ 1.485Gbps |
|                  | 0.3 UI line equalised @ 2.97Gbps  |
|                  | 0.3 UI line equalised @ 5.94Gbps  |
|                  | 0.3 UI line equalised @ 11.88Gbps |
| Timing Jitter    | 0.2 UI line equalised @ 270Mbps   |
|                  | 1 UI line equalised @ 1.485Gbps   |
|                  | 2 UI line equalised @ 2.97Gbps    |
|                  | 4 UI line equalised @ 5.94Gbps    |
|                  | 8 UI line equalised @ 11.88Gbps   |
| Format           | Re-clocked                        |

### **General specifications**

#### **Power**

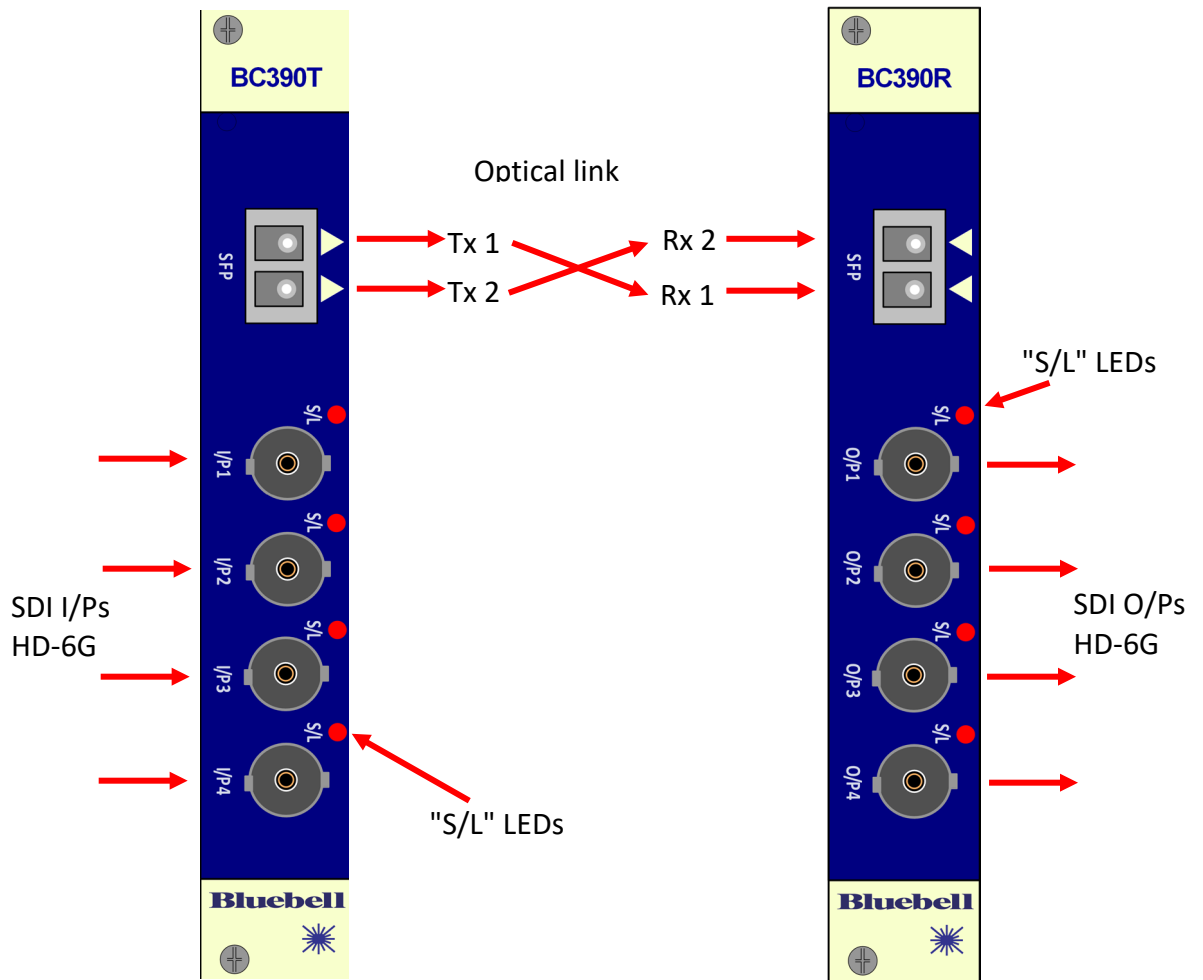
|                    |            |
|--------------------|------------|
| Input Voltage      | 6-18 Volts |
| Power consumption: | 9 Watts    |

#### **BC390**

|                 |                                   |
|-----------------|-----------------------------------|
| Depth           | 75mm (60 mm excluding connectors) |
| Width           | 20 mm (4HP)                       |
| Height          | 129 mm (3RU)                      |
| Weight          | 105 g (excluding SFP)             |
| Operating Temp: | -30 to +70 °C                     |

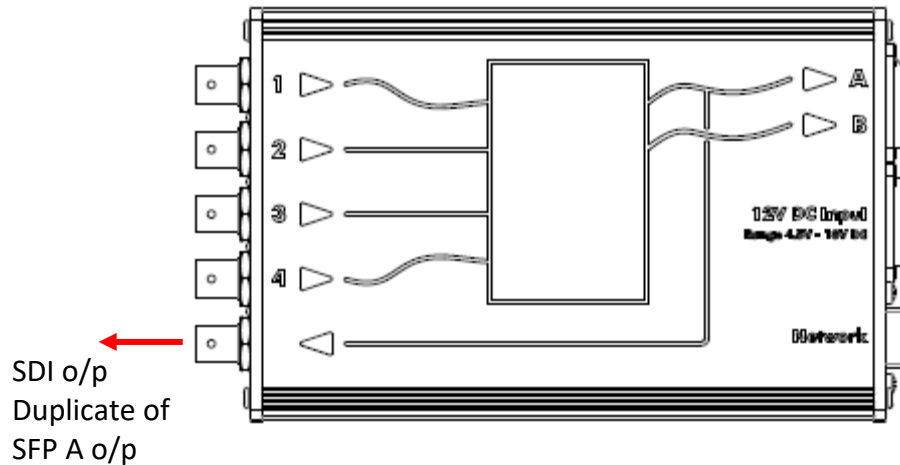
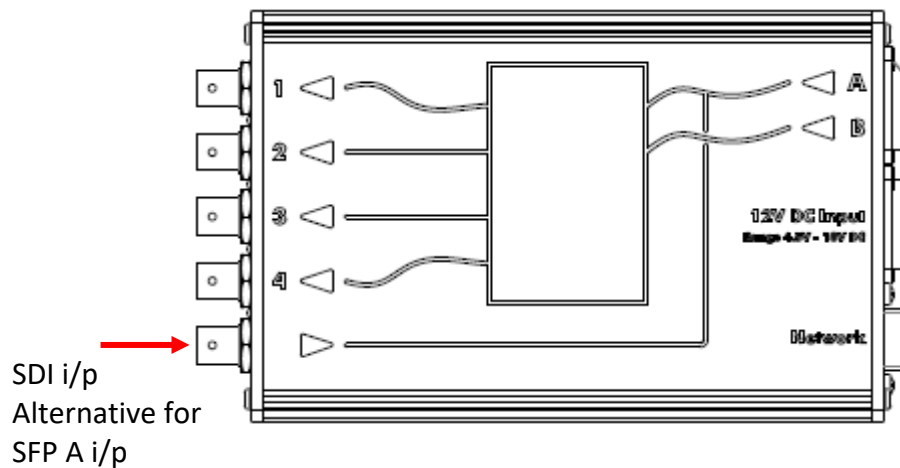
#### **BN390**

|                 |                                      |
|-----------------|--------------------------------------|
| Length          | 150 mm (134 mm excluding connectors) |
| Width           | 100 mm                               |
| Height          | 30 mm                                |
| Weight          | 500 g                                |
| Operating Temp: | -30 to +70 °C                        |

**Notes:**

"S/L" LED green = Unit is successfully locking to its SDI signal.

"S/L" LED red = Unit is not locked to an SDI signal.

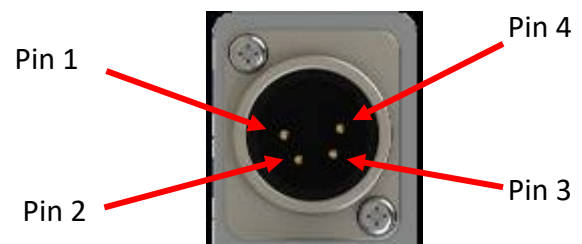
**BN390T****BN390R****Auto input Selection**

The BN390R will automatically select the BNC or Fibre input according to which has a valid signal. If both have a valid signal it will select the input that has had the valid signal for the longest. To force input selection, remove the signal from the other input (in Auto I/P 1 Selection) or control the parameters via the internal webpage or SNMP for Manual selection (see Monitoring section below).

**BN390T/R power connections**

4 pin XLR male

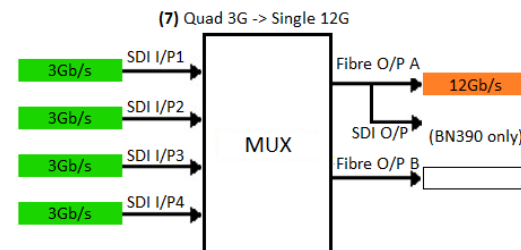
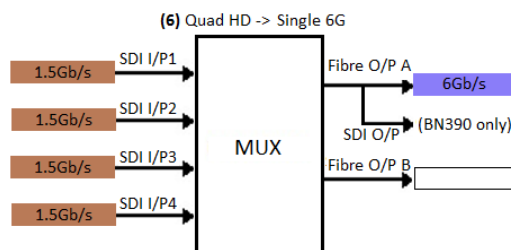
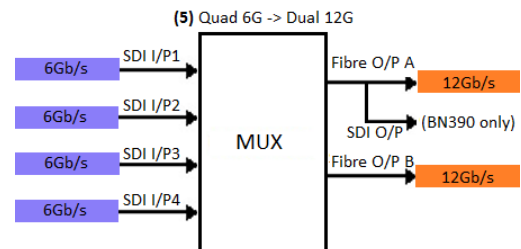
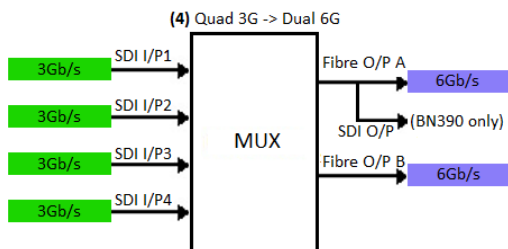
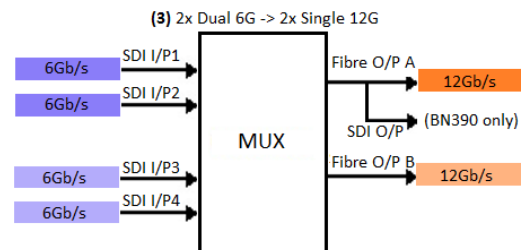
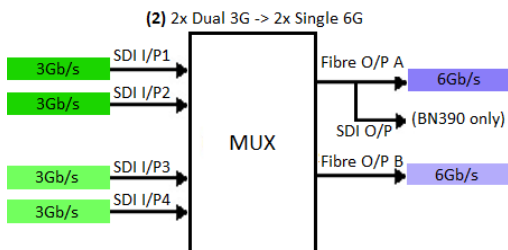
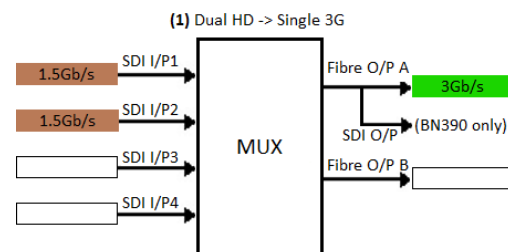
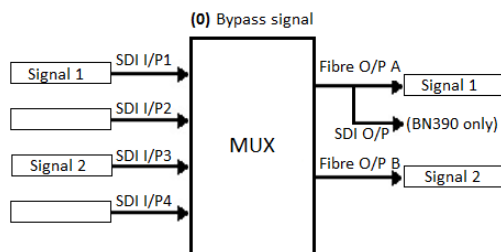
|       |               |
|-------|---------------|
| Pin 1 | Supply ground |
| Pin 2 | NC            |
| Pin 3 | NC            |
| Pin 4 | DC in         |

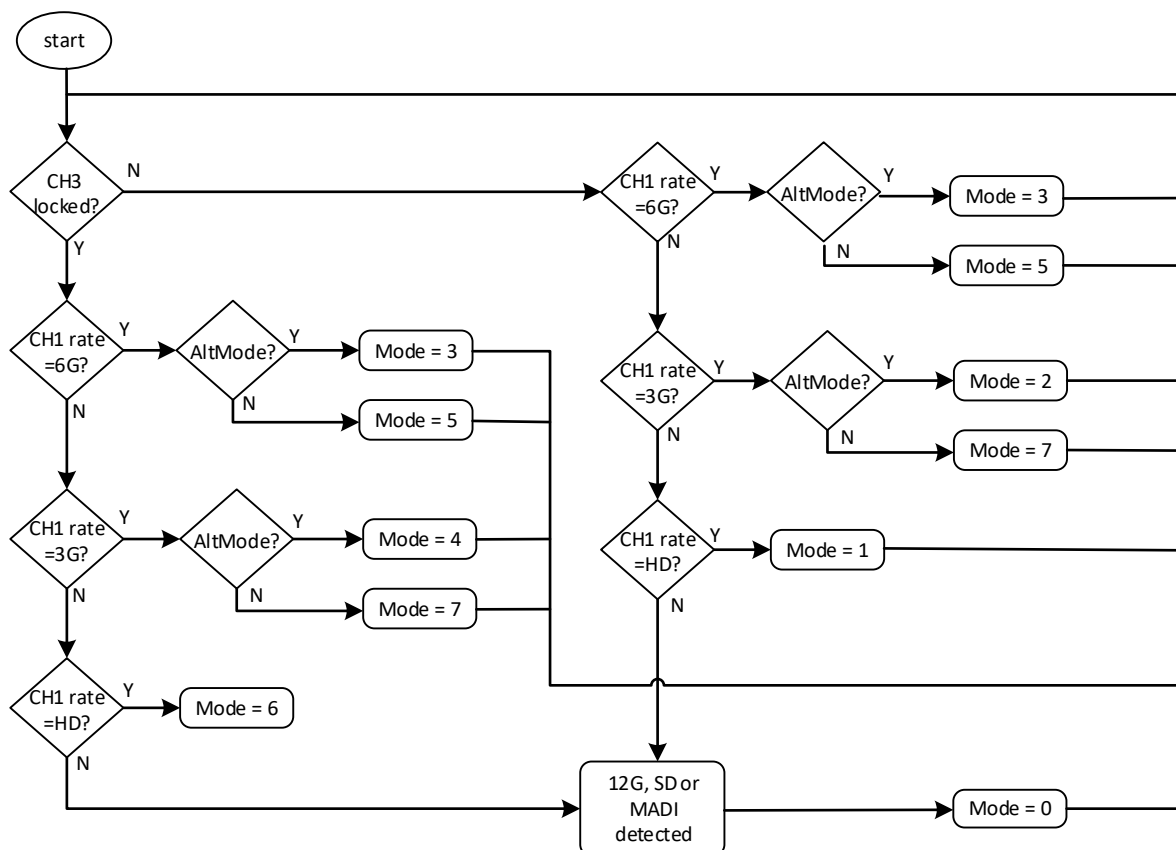


| Multiplex Conversion Modes | Input                  | Output                                                                |
|----------------------------|------------------------|-----------------------------------------------------------------------|
| 0                          | SDI I/P 1<br>SDI I/P 3 | Fibre O/P A, (and SDI O/P for BN390) (Bypass)<br>Fibre O/P B (Bypass) |
| 1**                        | Dual 1.5Gb/s           | Single 3Gb/s                                                          |
| 2*, **                     | Dual 3Gb/s             | Single 6Gb/s                                                          |
| 3*, **                     | Dual 6Gb/s             | Single 12Gb/s                                                         |
| 4*                         | Quad 3Gb/s             | Dual 6Gb/s                                                            |
| 5**                        | Quad 6Gb/s             | Dual 12Gb/s                                                           |
| 6**                        | Quad 1.5Gb/s           | Single 6Gb/s                                                          |
| 7**                        | Quad 3Gb/s             | Single 12Gb/s                                                         |

**Notes:** \* In Auto mode selection, these modes will only be used if alternative modes are enabled (BC cards: Not available in auto mode; BN units: J10 linked; See page 12 below).

\*\* In these modes, O/P 1 can not be duplicated to O/P 2.





**NOTE: In auto mode selection, alternative mode (AltMode) is only available for the BN390 units.**

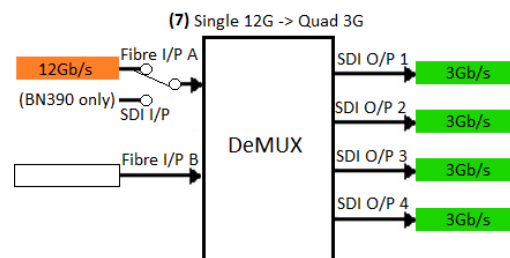
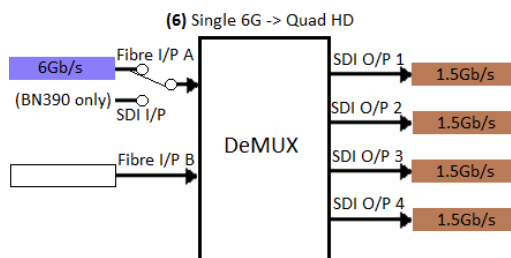
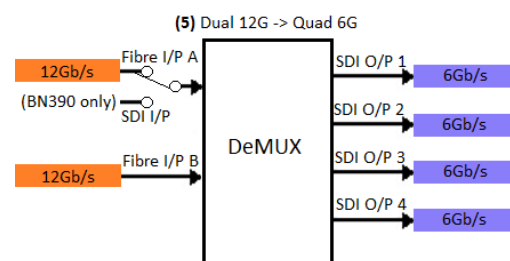
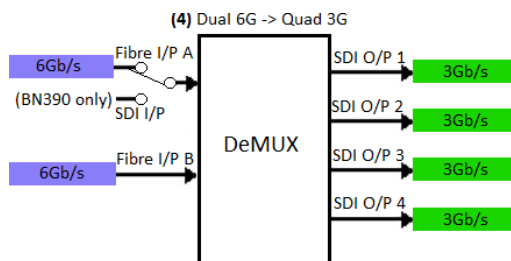
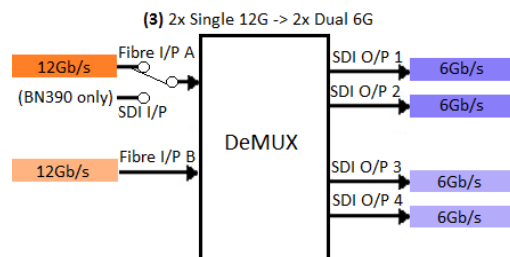
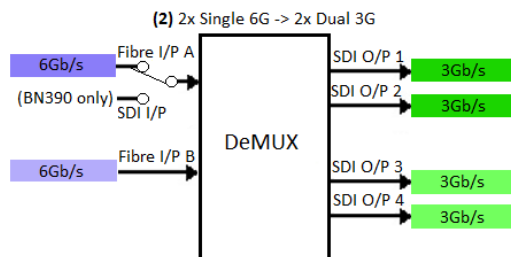
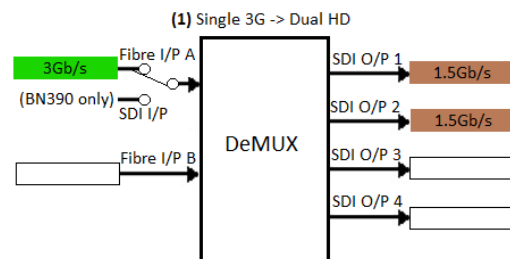
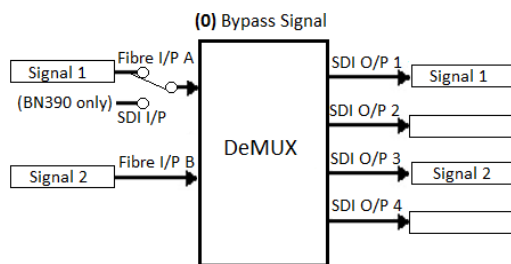
The logic of the auto mode selection for the Bx390T is shown in the flowchart above, where “CH3” is I/P 3 and “CH1” is I/P1.

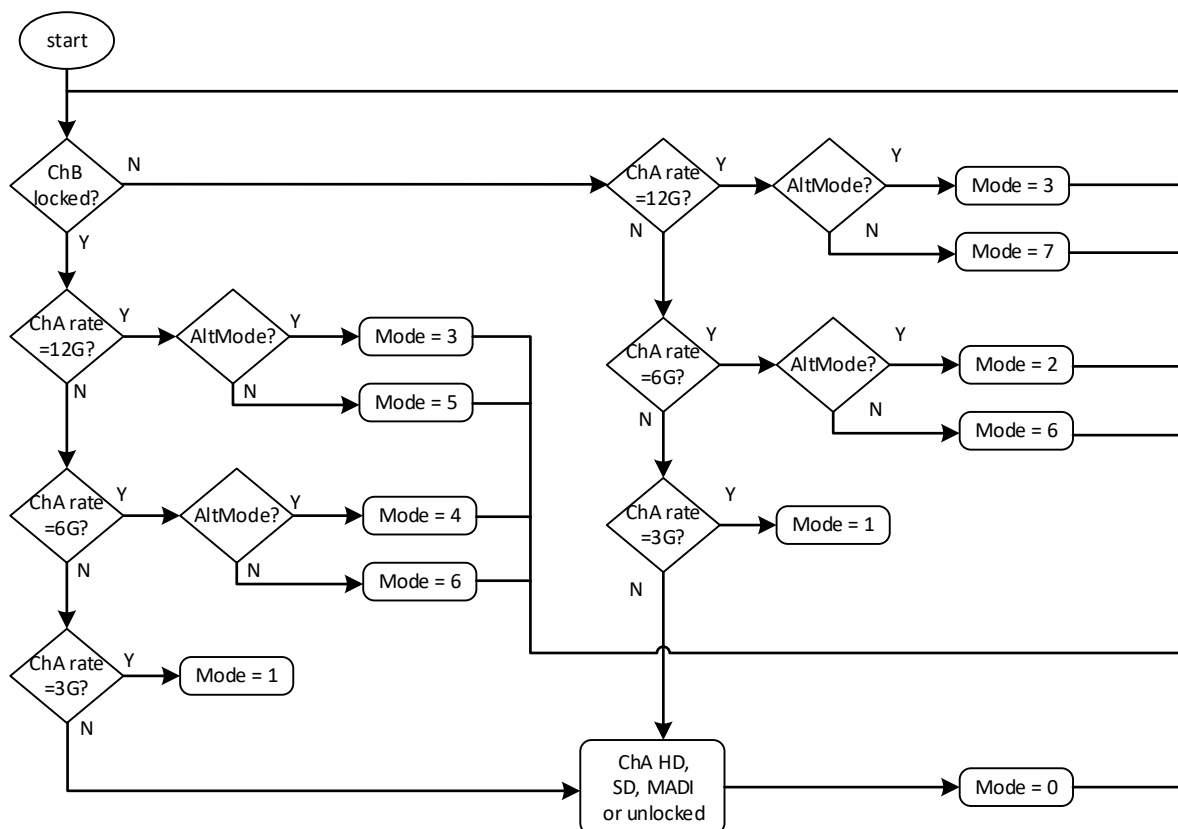
For BN-units, auto mode selection can be turned off and set to any user selected mode using the external webpage or through SNMP.

For BC-cards, auto mode selection can be turned off using the on-card switches (SW2) – see page 12.

| Demultiplex Conversion Modes | Input                                              | Output                                   |
|------------------------------|----------------------------------------------------|------------------------------------------|
| 0                            | Fibre I/P A, (or SDI I/P for BN390)<br>Fibre I/P B | SDI O/P 1 (Bypass)<br>SDI O/P 3 (Bypass) |
| 1                            | Single 3Gb/s                                       | Dual 1.5Gb/s                             |
| 2*                           | Single 6Gb/s                                       | Dual 3Gb/s                               |
| 3*                           | Single 12Gb/s                                      | Dual 6Gb/s                               |
| 4*                           | Dual 6Gb/s                                         | Quad 3Gb/s                               |
| 5                            | Dual 12Gb/s                                        | Quad 6Gb/s                               |
| 6                            | Single 6Gb/s                                       | Quad 1.5Gb/s                             |
| 7                            | Single 12Gb/s                                      | Quad 3Gb/s                               |

**Notes:** \* In auto mode selection, these modes will only be used if alternative modes are enabled (BC cards: Not available in auto mode; BN units: J10 linked; See page 12 below).





**NOTE: In auto mode selection, alternative mode (AltMode) is only available for the BN390 units.**

The logic of the auto mode selection for the Bx390R is shown in the flowchart above, where “ChB” is I/P B and “ChA” is I/P A.

For BN-units, auto mode selection can be turned off and set to any user selected mode using the external webpage or through SNMP.

For BC-cards, auto mode selection can be turned off using the on-card switches (SW2) – see page 12.

**Configuration****BC390 BN390**

The I2C EEPROM write enable (BC390 only) (Factory use only)

|           |                                                                       |
|-----------|-----------------------------------------------------------------------|
| BC390: J6 | Link pins 1 to 2 to disable writes to eeprom (Do not use).            |
|           | Link pins 2 to 3 to enable writes to eeprom. (Leave in this position) |
|           | No link has the same effect as linking pins 1 to 2 (Do not use).      |

Selection of modes (BC390)

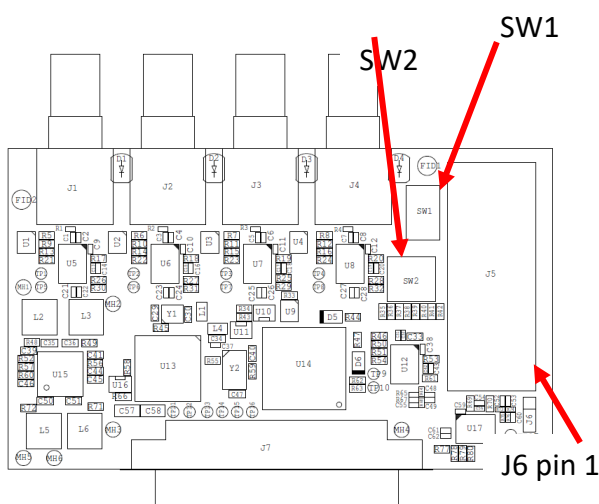
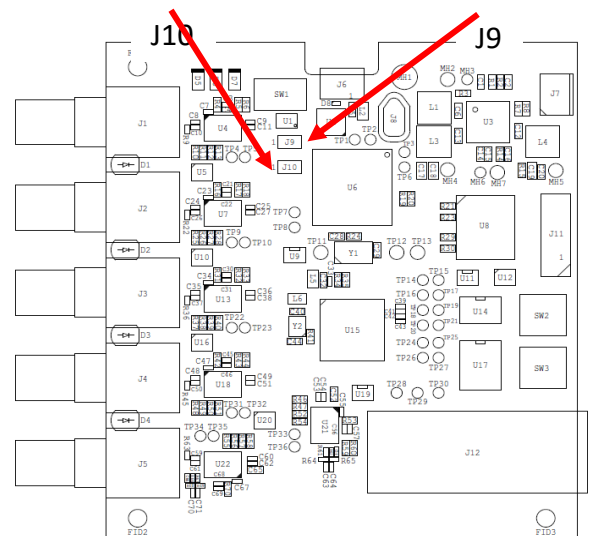
|            |                                                                |                                                                                                                              |
|------------|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| BC390: SW2 | #6 Off: Switches have no affect on conversion mode             |                                                                                                                              |
|            | #6 On: Switches to control conversion mode                     |                                                                                                                              |
|            | #5 Off: Disable duplicate O/P 1 to O/P 2 (Tx card only)        |                                                                                                                              |
|            | #5 On: Duplicate O/P 1 to O/P 2 (Tx card only)                 |                                                                                                                              |
|            | #4 On = Manual mode selection. Off = Auto sense mode selection |                                                                                                                              |
|            | #3 Mode selection – bit2 (on=1, off=0)                         | 000 – Mode 0<br>001 – Mode 1<br>010 – Mode 2<br>011 – Mode 3<br>100 – Mode 4<br>101 – Mode 5<br>110 – Mode 6<br>111 – Mode 7 |
|            | #2 Mode selection – bit1 (on=1, off=0)                         |                                                                                                                              |
|            | #1 Mode selection – bit0 (on=1, off=0)                         |                                                                                                                              |

Selection of alternative modes (BN390)

|            |                                                 |
|------------|-------------------------------------------------|
| BN390: J10 | Leave pins 1 to 2 unlinked to select main modes |
|            | Link pins 1 to 2 to select alternative modes    |

Restoring card's non-volatile configuration to Factory Defaults

|           |                                                                      |
|-----------|----------------------------------------------------------------------|
| BN390: J9 | Leave pins 1 to 2 unlinked to use non-volatile settings (default)    |
|           | Link pins 1 to 2 to restore card's configuration to factory settings |

**BC390****BN390**

Note: For both BC and BN cards the 'Tx' (shown here) and 'Rx' cards have the same controls in the same positions.

Selection of SFP type for monitoring purposes (BC390 & BN390)

The SFPs are factory configured for SFPs with non-MSA pinout. Changing requires removing and re-fitting a resistor.

**Card panel Indicators**

Each unit has a dual-colour LED located next to each BNC socket.

On the Panel, the LEDs are labelled "S/L" for Signal Loss.

These LEDs indicate the state of the signal on the BNC as follows:

green = the BNC carries a successfully locked signal.

red = the BNC is not locked to a valid signal.

**Internal Indicators**

These green LEDs can not normally be seen when a card is inserted in a frame.

D5 - Comes on when card is being read by BM102 card in BC100 frame.

D6 - Toggles on and off every half second.

**External monitoring**

When fitted in a BC100 or BC160 frame, the BC390 reports its status as follows.

**BC100/BC160 Frame Panel LEDs:**

|      | BC390T                       | BC390R                          |
|------|------------------------------|---------------------------------|
| Ch A | green = BNC I/P1 is locked   | green = Fibre i/p A is locked   |
|      | red = BNC I/P1 is not locked | red = Fibre i/p A is not locked |
| Ch B | green = BNC I/P3 is locked   | green = Fibre i/p B is locked   |
|      | red = BNC I/P3 is not locked | red = Fibre i/p B is not locked |

**Monitoring via webpages:** (if frame has a BM102 card fitted)

"Overview" webpage:

|          | BC390T                       | BC390R                          |
|----------|------------------------------|---------------------------------|
| CH A LED | green = BNC I/P1 is locked   | green = Fibre i/p A is locked   |
|          | red = BNC I/P1 is not locked | red = Fibre i/p A is not locked |
| CH B LED | green = BNC I/P3 is locked   | green = Fibre i/p B is locked   |
|          | red = BNC I/P3 is not locked | red = Fibre i/p B is not locked |

"Frame Information" webpage:

|             | BC390T                        | BC390R                           |
|-------------|-------------------------------|----------------------------------|
| ch A signal | good = BNC I/P1 is locked     | good = Fibre i/p A is locked     |
|             | fail = BNC I/P1 is not locked | fail = Fibre i/p A is not locked |
| ch B signal | good = BNC I/P3 is locked     | good = Fibre i/p B is locked     |
|             | fail = BNC I/P3 is not locked | fail = Fibre i/p B is not locked |

**Monitoring via SNMP:** (if frame has a BM102 card fitted)

|          | BC390T                        | BC390R                           |
|----------|-------------------------------|----------------------------------|
| CH A Sig | good = BNC I/P1 is locked     | good = Fibre i/p A is locked     |
|          | fail = BNC I/P1 is not locked | fail = Fibre i/p A is not locked |
| CH B Sig | good = BNC I/P3 is locked     | good = Fibre i/p B is locked     |
|          | fail = BNC I/P3 is not locked | fail = Fibre i/p B is not locked |

**Indicators on units**

BN390T units have a dual-colour LED located next to each BNC input socket.

BN390R units have a dual-colour LED located next to each BNC output socket.

These LEDs indicate the state of the signal on the BNC as follows:

green = BNC carries a successfully locked signal.

red = BNC is not locked to a signal.

The RJ45 connector has 2 LEDs to indicate signal activity when an ethernet cable is fitted.

**External monitoring**

The unit has internal webpages giving a lot more information about the unit's status.

This can be achieved by connecting the BN unit to a network either by a straight ethernet cable connected to a router or switcher, or a crossover cable connected directly to a PC.

From the factory, the card's default settings are as follows:

|                              |                |             |
|------------------------------|----------------|-------------|
| Host name:                   | BN390T         | [or BN390R] |
| Static IP address:           | 192.168.16.200 |             |
| Static gateway address:      | 192.168.16.2   |             |
| Static subnet mask:          | 255.255.255.0  |             |
| Static primary DNS server:   | 192.168.16.2   |             |
| Static secondary DNS server: | 0.0.0.0        |             |
| DHCP is                      | enabled        |             |

When first sent from the factory, units have the default IP address: 192.168.16.200

Since, by default, DHCP is enabled, if the unit is connected to a network with a DHCP server, the unit will be assigned a new IP address by the server. Your network administrator should be able to determine the new IP address.

The BN390's internal web page should be accessible via a standard web browser on your network, by typing its IP address in the browser's URL line: for example with its default IP address (if not changed by DHCP):

<http://192.168.16.200/>

The unit's internal web page may also be accessible by its default NetBIOS host name:

<http://bn390t/>

or <http://bn390r/>

From the home page you should then be able to select the "Network Configuration" page which is password protected. When the prompt comes up,

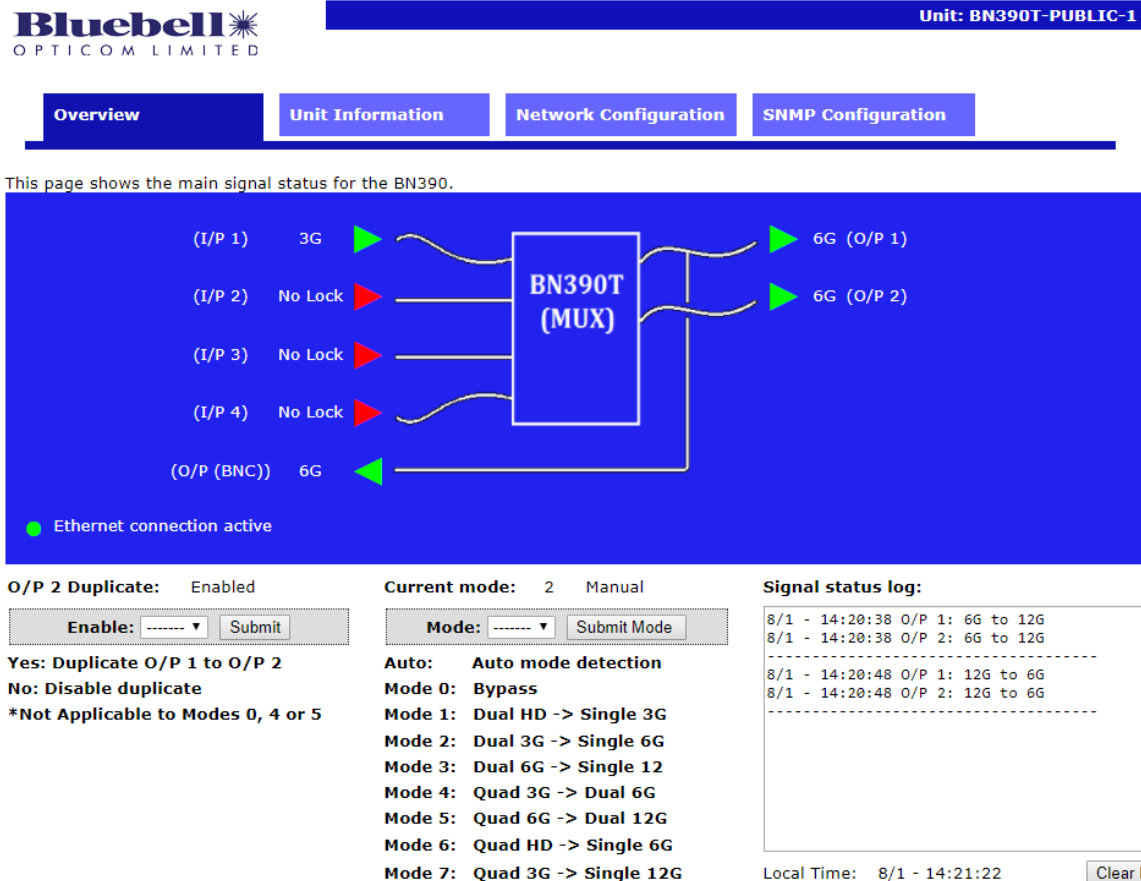
enter the User name: as the 5-letter word: admin

and the Password: as the 8-letter word: settings

The Network Configuration page will allow you to see the IP addresses assigned by DHCP, or to change the IP addresses, the DHCP status, and the card's Host name to suit your network. If you access this page, please make a note of the MAC address in case it gets reset to default, and needs to be re-instated later.

## Webpage monitoring

"Overview" webpage:



This page should be self-explanatory with green LEDs indicating a locked signal present and red indicating an absence of locked signal. The signal data rates are also shown. Control features are included to set the main operating Mode (Auto or Manual) and the I/P 1 source in Rx units, or enable O/P 2 copying O/P 1 in Tx units. Any changes to these parameters will be remembered after a power down.

A textbox is also included to log time and information about any signal changed. The log is written on the webpage and will be erased once the page is refreshed.

"Unit Information" webpage:

This page gives a lot more information about the unit, its signals, and the SFP fitted within the unit. Control features are included to set the operating Mode, I/P 1 source in Rx cards, and the "O/P 2 copying O/P 1" feature in Tx units.

"Network Configuration " webpage:

This password-protected page allows the network IP addresses to be set up. See above for more information.

"SNMP Configuration " webpage:

This password-protected page (same password as the "Network Configuration " page) allows the SNMP community names to be set.

## SNMP

In SNMP terminology, the BN390 acts as an Agent, to be monitored by a Network Management System (NMS). The NMS is likely to be a PC running an SNMP browser or other SNMP control system, connected by a network to the ethernet port of one or more BN390 units. The BN390 uses SNMP version v2c and will accept either v1 or v2c commands. It is also capable of issuing v1 traps.

The NMS needs to know what values it can read from and write to the card, and this information is provided in a "Management Information Base" or MIB file. Such a file might have a filename like:-

Bluebell-BN390-01.mib

Where the '01' is the revision of the MIB file.

For the appropriate mib file for your card, please email: [support@bluebell.tv](mailto:support@bluebell.tv) quoting the serial number of your card, and the Firmware and Image Dates shown at the bottom of the Overview webpage.

The NMS can issue 'Get', 'GetNext', and 'Set' commands to access the parameters of the card. The various parameters that the BN390 can deal with are each assigned an Object Identifier number (OID) and these are listed in the tables below. In these tables, 'E' represents the 'enterprise' OID: 1.3.6.1.4.1.29054

The parameters are listed in 1 group (Basic), they are listed in the table below.

The read-write values (except cspValue) in the table are non-volatile and will survive card power-downs.

| NAME                  | OID             | ACCESS     | DESCRIPTION / TYPICAL VALUE                                  |
|-----------------------|-----------------|------------|--------------------------------------------------------------|
| sysDescr              | 1.3.6.1.2.1.1.1 | read-only  | BN390                                                        |
| sysObjectID           | 1.3.6.1.2.1.1.2 | read-only  | E.1.2.1                                                      |
| sysUpTime             | 1.3.6.1.2.1.1.3 | read-only  | Time since reset (units = 10ms)                              |
| sysContact            | 1.3.6.1.2.1.1.4 | read-write | <a href="mailto:support@company.com">support@company.com</a> |
| sysName               | 1.3.6.1.2.1.1.5 | read-write | BN Unit                                                      |
| sysLocation           | 1.3.6.1.2.1.1.6 | read-write | Conference Room                                              |
| sysServices           | 1.3.6.1.2.1.1.7 | read-only  | 7                                                            |
| name                  | E.1.2.1.1.1     | read-only  | Bluebell BN390                                               |
| version               | E.1.2.1.1.2     | read-only  | v3.00                                                        |
| date                  | E.1.2.1.1.3     | read-only  | Oct 31 2013 16:03:20                                         |
| trapReceiverNumber    | E.1.2.1.2.1.1.1 | N/A        | Index of trap receiver                                       |
| trapEnabled           | E.1.2.1.2.1.1.2 | read-write | Is this trap entry enabled or not.                           |
| trapReceiverIPAddress | E.1.2.1.2.1.1.3 | read-write | Trap receiver IP address                                     |
| trapCommunity         | E.1.2.1.2.1.1.4 | read-write | community name for trap messages                             |
| sig1A                 | E.1.2.1.3.1.1   | read-only  | good (0) / fail (1)                                          |
| sig1B                 | E.1.2.1.3.1.2   | read-only  | good (0) / fail (1)                                          |
| sigIP1                | E.1.2.1.3.1.3   | read-only  | good (0) / fail (1)                                          |
| sigIP2                | E.1.2.1.3.1.4   | read-only  | good (0) / fail (1)                                          |
| sigIP3 **             | E.1.2.1.3.1.5   | read-only  | good (0) / fail (1)                                          |
| sigIP4 **             | E.1.2.1.3.1.6   | read-only  | good (0) / fail (1)                                          |
| sigOP1                | E.1.2.1.3.1.7   | read-only  | good (0) / fail (1)                                          |

|                 |                |           |                                           |
|-----------------|----------------|-----------|-------------------------------------------|
| sigOP2          | E.1.2.1.3.1.8  | read-only | good (0) / fail (1)                       |
| sigOP3 *        | E.1.2.1.3.1.9  | read-only | good (0) / fail (1)                       |
| sigOP4 *        | E.1.2.1.3.1.10 | read-only | good (0) / fail (1)                       |
| sigFO *         | E.1.2.1.3.1.11 | read-only | Fibre (0) / BNC (1)                       |
| cardType        | E.1.2.1.3.1.12 | read-only | Unit Model e.g. "BN390R"                  |
| cardSerNo       | E.1.2.1.3.1.13 | read-only | Serial number of BN-unit                  |
| cardHwRev       | E.1.2.1.3.1.14 | read-only | Normally PCB issue number.                |
| cardFwRev       | E.1.2.1.3.1.15 | read-only | Revision of the main firmware on unit     |
| cardFunc        | E.1.2.1.3.1.16 | read-only | Brief description of unit function        |
| cardSigChA      | E.1.2.1.3.1.17 | read-only | fail (1) / good (2)                       |
| cardSigChB      | E.1.2.1.3.1.18 | read-only | fail (1) / good (2)                       |
| sfpMfr          | E.1.2.1.3.1.19 | read-only | Name of manufacturer of SFP fitted        |
| sfpType         | E.1.2.1.3.1.20 | read-only | SFP model name                            |
| sfpTemp         | E.1.2.1.3.1.21 | read-only | temperature read from SFP in degrees C.   |
| sfpTempStat     | E.1.2.1.3.1.22 | read-only | 0-5 = n/a, tooLow, low, ok, high, tooHigh |
| sfpVolt         | E.1.2.1.3.1.23 | read-only | SFP supply voltage in mV, typically 3300  |
| sfpVoltStat     | E.1.2.1.3.1.24 | read-only | 0-5 = n/a, tooLow, low, ok, high, tooHigh |
| sfpDirCh1       | E.1.2.1.3.1.25 | read-only | Ch1 sig dir: unknown(0), tx (1), rx (2)   |
| sfpDirCh2       | E.1.2.1.3.1.26 | read-only | Ch2 "                                     |
| sfpWlCh1        | E.1.2.1.3.1.27 | read-only | Ch1 wavelength (if transmitter) in nm     |
| sfpWlCh2        | E.1.2.1.3.1.28 | read-only | Ch2 "                                     |
| sfpBiasCh1      | E.1.2.1.3.1.29 | read-only | Ch1 bias current (if transmitter) in mA   |
| sfpBiasCh2      | E.1.2.1.3.1.30 | read-only | Ch2 "                                     |
| sfpBiasStatCh1  | E.1.2.1.3.1.31 | read-only | 0-5 = n/a, tooLow, low, ok, high, tooHigh |
| sfpBiasStatCh2  | E.1.2.1.3.1.32 | read-only | "                                         |
| sfpPowerCh1     | E.1.2.1.3.1.33 | read-only | Ch1 optical power in uW                   |
| sfpPowerCh2     | E.1.2.1.3.1.34 | read-only | Ch2 "                                     |
| sfpPowerStatCh1 | E.1.2.1.3.1.35 | read-only | 0-5 = n/a, tooLow, low, ok, high, tooHigh |
| sfpPowerStatCh2 | E.1.2.1.3.1.36 | read-only | "                                         |
| cspCount        | E.1.2.1.3.1.37 | read-only |                                           |
| cspDesc1        | E.1.2.1.3.1.38 | read-only | "I/P 1"                                   |
| cspDesc2        | E.1.2.1.3.1.39 | read-only | "O/P 1"                                   |
| cspDesc3        | E.1.2.1.3.1.40 | read-only | "I/P 2"                                   |
| cspDesc4        | E.1.2.1.3.1.41 | read-only | "O/P 2"                                   |
| cspDesc5 **     | E.1.2.1.3.1.42 | read-only | "I/P 3"                                   |
| cspDesc6 *      | E.1.2.1.3.1.43 | read-only | "O/P 3"                                   |
| cspDesc7 **     | E.1.2.1.3.1.44 | read-only | "I/P 4"                                   |
| cspDesc8 *      | E.1.2.1.3.1.45 | read-only | "O/P 4"                                   |
| cspDesc9 *      | E.1.2.1.3.1.46 | read-only | "I/P 1 Src"                               |
| cspDesc10       | E.1.2.1.3.1.47 | read-only | "Mode"                                    |
| cspDesc11       | E.1.2.1.3.1.48 | read-only | Rx: "I/P 1 Seln" Tx: "O/P 2 copies 1"     |
| cspDesc12       | E.1.2.1.3.1.49 | read-only | "Mode Seln"                               |
| cspDesc13       | E.1.2.1.3.1.50 | read-only |                                           |
| cspDesc14       | E.1.2.1.3.1.51 | read-only |                                           |
| cspDesc15       | E.1.2.1.3.1.52 | read-only |                                           |
| cspDesc16       | E.1.2.1.3.1.53 | read-only |                                           |
| cspValue1       | E.1.2.1.3.1.54 | read-only | N/A, MADI, SD, HD, 3G, 6G, 12G, No Lock   |
| cspValue2       | E.1.2.1.3.1.55 | read-only | "                                         |
| cspValue3       | E.1.2.1.3.1.56 | read-only | "                                         |
| cspValue4       | E.1.2.1.3.1.57 | read-only | "                                         |
| cspValue5 **    | E.1.2.1.3.1.58 | read-only | "                                         |

|              |                |            |                                                |
|--------------|----------------|------------|------------------------------------------------|
| cspValue6 *  | E.1.2.1.3.1.59 | read-only  | "                                              |
| cspValue7 ** | E.1.2.1.3.1.60 | read-only  | "                                              |
| cspValue8 *  | E.1.2.1.3.1.61 | read-only  | "                                              |
| cspValue9 *  | E.1.2.1.3.1.62 | read-write | Fibre, BNC                                     |
| cspValue10   | E.1.2.1.3.1.63 | read-write | 0, 1, 2, 3, 4, 5, 6, 7                         |
| cspValue11   | E.1.2.1.3.1.64 | read-write | Rx: Manual, Auto    Tx: Enabled, Disabled, N/A |
| cspValue12   | E.1.2.1.3.1.65 | read-write | Manual, Auto                                   |
| cspValue13   | E.1.2.1.3.1.66 | read-only  |                                                |
| cspValue14   | E.1.2.1.3.1.67 | read-only  |                                                |
| cspValue15   | E.1.2.1.3.1.68 | read-only  |                                                |
| cspValue16   | E.1.2.1.3.1.69 | read-only  |                                                |

NOTE:

\* – Rx units only

\*\* – Tx units only

In the table above "version" refers to the internal structure of the mib parameters, and "date" refers to the revision of the Image file installed (web pages and mib structure). For the firmware version, see the cardFwRev.

The "trap..." parameters are part of a table with two entries, so each parameter can have two values.

The signal name "sigIP2", for example, means second input of the unit (either Rx or Tx unit). In many cases, this status is the same as that reported by an LED on the side panels of the unit. The channel status values are reported as "0" or "good" for signal present and "1" or "fail" for a fault (e.g. signal missing). "sigFO" also report as "0" for Fibre and "1" for BNC as the Rx input 1 source.

After the 'sig...' parameters are the 'card...' parameters, including fixed information from each card, such as its part number and serial number, etc. Also, from any SFP module fitted to the card the 'sfp...' parameters provide both fixed information such as its manufacturer and part number and variable information such as its temperature, signal power etc. Finally there are the card-specific parameters ('csp...') giving variable information such as the data rate of signals, conversion Mode, and auto/manual Mode selection.

cspValue9-12 have read-write access, where

cspValue9 - Set the I/P 1 source to BNC or fibre (Rx units only),

cspValue10 - Set to any conversion mode, see "Mode - Conversion" sections above.

cspValue11 - Rx units - Set the I/P 1 source detection to auto/manual .

- Tx units - Enable O/P 2 to copy O/P 1 signal.

cspValue12 - Set the conversion mode detection to auto/manual.

## Traps

Normally, the Network Management System (NMS) issues requests for information and the BN390 provides the appropriate responses. However, to get quicker notification of a fault condition, the BN390 can be set up to initiate a message, called a Trap, to one or two NMS computers.

When traps are enabled, they are generated for a change of state (on or off) for any of the I/P, O/P and FO signals.

### Configuring Traps

The settings for configuring traps are controlled via SNMP, and they are non-volatile. Traps are set up by issuing SNMP 'Set' commands to the relevant 'trap...' parameters in the 'Basic' table above. The two trap generators can be individually enabled or disabled, and for each trap generator, a destination IP address and an SNMP 'community' name can be specified. The parameters are listed here:

trapReceiverNumber (1.3.6.1.4.1.29054.1.2.1.2.1.1.1)

This parameter is not accessed directly but is the index (0 or 1) to select the required trap generator when accessing the remaining 3 parameters.

For example, for the next parameter, trapEnabled,

1.3.6.1.4.1.29054.1.2.1.2.1.1.2.0 controls trap generator 0, and

1.3.6.1.4.1.29054.1.2.1.2.1.1.2.1 controls trap generator 1.

trapEnabled (1.3.6.1.4.1.29054.1.2.1.2.1.1.2)

This parameter can be set to '0' to disable that trap generator or '1' to enable it.

The other parameters are still remembered when the generator is disabled.

trapReceiverIPAddress (1.3.6.1.4.1.29054.1.2.1.2.1.1.3)

This parameter is the destination address for the trap and should be set to the IP address of the computer running the Network Management System that will display and log the traps.

trapCommunity (1.3.6.1.4.1.29054.1.2.1.2.1.1.4)

This parameter should be set with a text string that will be used as the community name in any traps that are sent. The text can be no more than 31 characters.

### Generating Traps

When traps are enabled, they are generated by a change of state (on or off) for any of the following 9 signals:

sigIP1, sigIP2, sigIP3, sigIP4,  
sigOP1, sigOP2, sigOP3, sigOP4,  
sigFO.

### Note

Whilst the SNMP version is v2c, traps are currently v1.

**BC390**

|          |                                                                                                                                                                         |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BC390T/M | Multimode Fibre Optic Transmitter Card.<br>Converts up to four HD-6G signals on BNC inputs over 2 fibres.                                                               |
| BC390T   | Fibre Optic Transmitter <b>Base Card</b> .<br>Converts up to four HD-6G signals on BNC inputs over 2 fibres.<br><b>Supplied with No Optics Fitted.</b>                  |
|          |                                                                                                                                                                         |
| BC390R/M | Multimode Fibre Optic Receiver Card.<br>Converts one or two 3G-12G fibre input signals to up to four HD-6G signals on BNC.                                              |
| BC390R   | Fibre Optic Receiver <b>Base Card</b> .<br>Converts one or two 3G-12G fibre input signals to up to four HD-6G signals on BNC.<br><b>Supplied with No Optics Fitted.</b> |

**BN390**

|          |                                                                                                                            |
|----------|----------------------------------------------------------------------------------------------------------------------------|
| BN390T/M | Multimode Fibre Optic Transmitter Unit.<br>Converts up to four HD-6G signals on BNC inputs over 2 fibres.                  |
|          |                                                                                                                            |
| BN390R/M | Multimode Fibre Optic Receiver Unit.<br>Converts one or two 3G-12G fibre input signals to up to four HD-6G signals on BNC. |

**SFP Options**

BN390 units are fitted with an appropriate internal SFP when built.

BC390 cards have SFPs that can be removed from the front panel.

SFPs fitted to these modules must have the following characteristics:

- BC390T cards must have dual transmitters; BC390R cards must have dual receivers.
- SFPs must have non-MSA pinout.

A list of categorized SFPs can be found at: <http://bluebellcomms.co.uk/sfps/>

Customers choosing their own SFPs do so at their own risk.