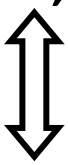
Bluebell OPTICOM LIMITED

OPERATIONS MANUAL

FOR

BC623, BN623, BN723

2 x Analog Audio,
RS232, RS422, RS485, GPI



Fibre

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Contents BC623 BN623 BN723

Conformances BC623 BN623 BN723

EMI/RFI	Complies with 89/336/EEC, EN55022B, 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.

E&OE January 2015, November 2016

Description BC623 BN623 BN723

The BC623 family are multi-format converters for use with broadcast analogue audio and control signals. Bi-directional control data and GPI signals are provided over 2 fibres. Two bi-directional analogue audio signals can also be sent over the same pair of fibres. The BC623 family is ideally suited to linking audio intercom panels remotely over fibre.

The electrical inputs are: 2x analogue audio, 2x RS232, 2x RS422/485, and 2x GPI
The electrical outputs are: 2x analogue audio, 2x RS232, 2x RS422/485, and 2x GPI

The units can be supplied in multimode, singlemode and CWDM variations to suit all applications and are a perfect complement to the BC323, BC550 and BC323-63 modules.

The product is available in 3 different formats:

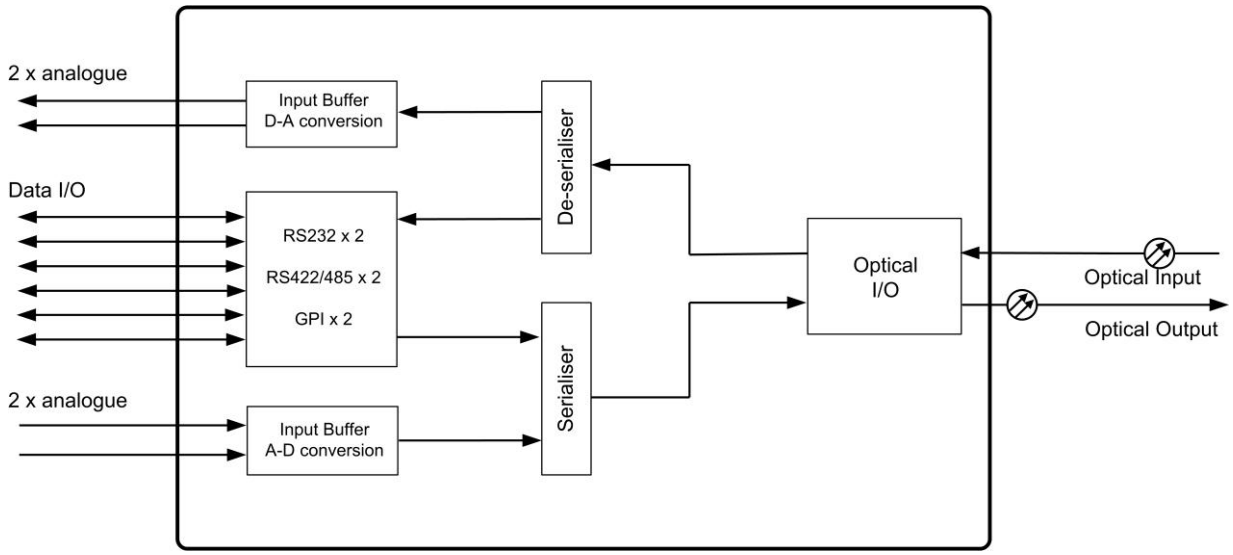
BC623 A module compatible with the BC Series 19" rack frames.

BN623 A compact stand-alone box version of the BC623.

BN723 A compact stand-alone box like the BN623 but without the Audio signals.

For the BN623 and BN723, power is provided by a DC source of 4.5 to 17V via a 4 pin XLR or the Bluebell PS12 inline power adapter.

Block Diagram BC623 BN623 BN723

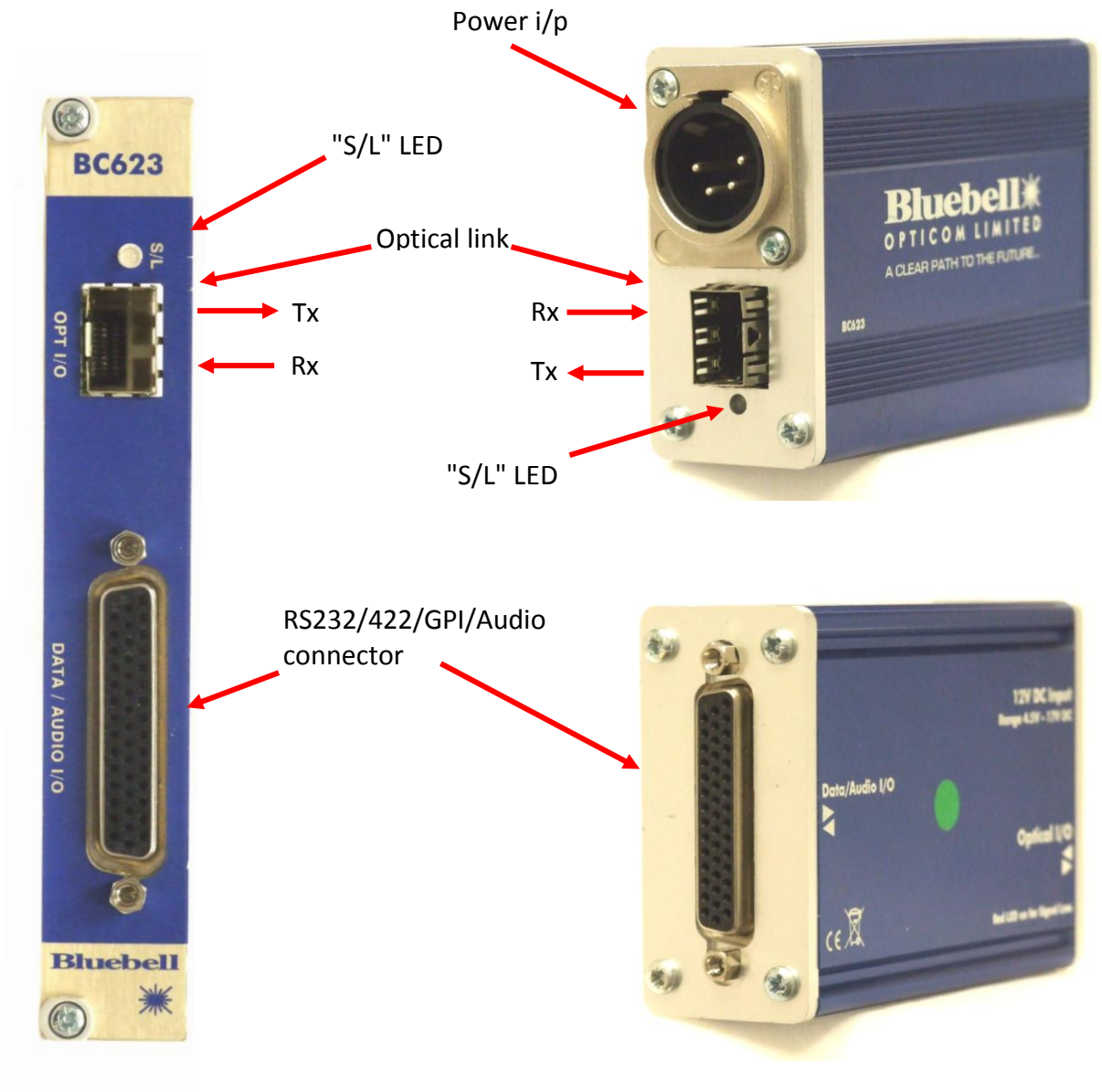


Note: the BN723 doesn't have the analogue audio inputs or outputs.

Product photos	BC623 BN623

BC623
Rack mounted unit
connections

BN623
Stand-alone box
connections



Notes:
"S/L" LED green = Unit is successfully locking to its fibre-optic input signal.
"S/L" LED red = Unit is not locked to a fibre-optic input signal.

The **BN723** will look identical to the **BN623** apart from some of the printing on the casing.

Specifications	BC623

Data Signals

Connector	44 way High Density D sub-connector
Max data rate RS232	250 kb/s
Max data rate RS422/485	10 Mb/s
Number of Inputs	2 x RS232 level Inputs
	2 x RS422/RS485 level differential Inputs
	2 x GPI (through 100R resistors to 74LVC inputs)
GPI Input voltage low	-0.5V to +0.8V
GPI Input voltage high	+2.0V to +5.5V
Number of Outputs	2 x RS232 level Outputs
	2 x RS422/RS485 level differential Outputs
	2 x GPI (74LVC open-drain o/ps with 10R in series)
GPI Output voltage low	+0.6V max sinking 16mA
	+0.8V max sinking 24mA
GPI Output voltage high	+5.5V max

Audio Signals

Connector	44 way High Density D sub-connector
Format	Analog audio sampled at 48 KHz.
Level	+6 dBu max (talkback)
Bandwidth	20 Hz to 20 kHz $\pm$ 0.2 dB
THD + Noise	< -90 dB
Number of Inputs	2 x Balanced Analog audio signals
Input impedance	14 kohm
Number of Outputs	2 x Balanced Analog audio signals
Output impedance	100 ohm
Latency	
(In -> BC623 -> fibre -> BC623 -> Out)	< 2 uS

Optical Input/output Specs determined by SFP fitted. Some typical values are given here

Connector	2 x female LC
RX Wavelength	1200-1610 nm
RX Sensitivity	> -24 dBm @ 1.25 Gb/s
RX power max	> -1 dBm
TX Power	-2 dBm @ 1310/1510 nm
	0 dBm @ CWDM

See Ordering Information for the different multimode and single mode variants

Physical specifications

Depth	75 mm (including connectors, excluding SFP)
Width	20 mm (4HP)
Height	129 mm (3RU)
Weight	100 g
Operating Temp	-30 to +70 dgC
Power	2.5 W

Specifications	BN623 BN723

Data Signals

Connector	44 way High Density D sub-connector
Max data rate RS232	250 kb/s
Max data rate RS422/485	10 Mb/s
Number of Inputs	2 x RS232 level Inputs
	2 x RS422/RS485 level differential Inputs
	2 x GPI (through 100R resistors to 74LVC inputs)
GPI Input voltage low	-0.5V to +0.8V
GPI Input voltage high	+2.0V to +5.5V
Number of Outputs	2 x RS232 level Outputs
	2 x RS422/RS485 level differential Outputs
	2 x GPI (74LVC open-drain o/ps with 10R in series)
GPI Output voltage low	+0.6V max sinking 16mA
	+0.8V max sinking 24mA
GPI Output voltage high	+5.5V max

Audio Signals (BN623 only)

Connector	44 way High Density D sub-connector
Format	Analog audio sampled at 48 KHz.
Level	+6 dBu max (talkback)
Bandwidth	20 Hz to 20 kHz $\pm$ 0.2 dB
THD + Noise	< -90 dB
Number of Inputs	2 x Balanced Analog audio signals
Input impedance	14 kohm
Number of Outputs	2 x Balanced Analog audio signals
Output impedance	100 ohm
Latency	
(In -> BN623 -> fibre -> BN623 -> Out)	< 2 uS

Optical Input/output Specs determined by SFP fitted. Some typical values are given here

Connector	2 x female LC
RX Wavelength	1200-1610 nm
RX Sensitivity	> -24 dBm @ 1.25 Gb/s
RX power max	> -1 dBm
TX Power	-2 dBm @ 1310/1510 nm
	0 dBm @ CWDM

See Ordering Information for the different multimode and single mode variants

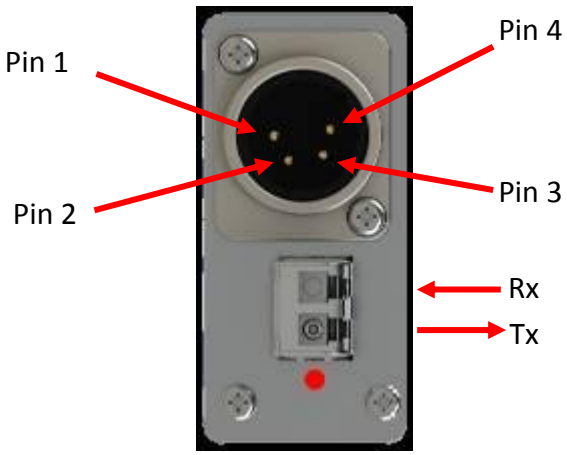
Physical specifications

Length	92 mm (excluding connectors and SFP)
Width	64 mm
Height	30 mm
Weight	200 g
Operating Temp	-30 to +70 dgC
Supply Voltage	4.5 to 17 V dc
Power	2.5 W

BN623 / BN723 power connections

4 pin XLR male

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



BC623 / BN623 / BN723 Data and Audio Connections

Female 44 pin "D" type socket

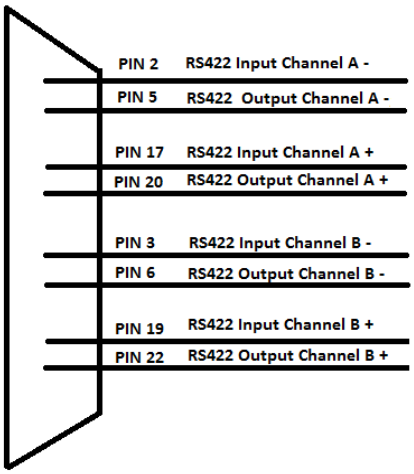
1	RS232 Input 1	16	RS232/422 Input 1 GND	31	GPI Input 1
2	RS422/485 Input 1 -	17	RS422/485 Input 1 +	32	RS232 Input 2
3	RS422/485 Input 2 -	18	RS232/422 Input 2 GND	33	GPI Input 2
4	RS232 Output 1	19	RS422/485 Input 2 +	34	GPI Output 1
5	RS422/485 Output 1 -	20	RS422/485 Output 1 +	35	RS232 Output 2
6	RS422/485 Output 2 -	21	RS232/422 Output 1 GND	36	GPI Output 2
7		22	RS422/485 Output 2 +	37	Audio Input ch 1 +
8	Audio Input ch 2 +	23	Audio Input ch 1 -	38	GPI Inputs/Outputs GND
9	RS232/422 Output 2 GND	24	Audio Input ch 2 -	39	
10		25		40	Audio Input ch 1 & 2 GND
11		26		41	Audio Output ch 1 +
12	Audio Output ch 2 +	27	Audio Output ch 1 -	42	Audio Output ch 1 GND
13		28	Audio Output ch 2 -	43	
14		29		44	
15	Audio Output ch 2 GND	30			

Note: on the BN723 the Audio signals will not be connected.

BC623 / BN623 / BN723 Fibre Connections

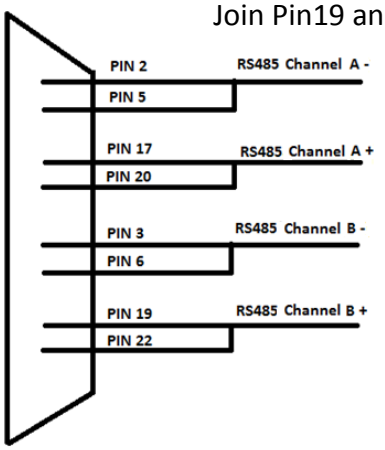
Ensure that the 'Tx' SFP port at each end of a link is connected to the 'Rx' port at the other end.

For an RS422-only system, follow the diagram below.

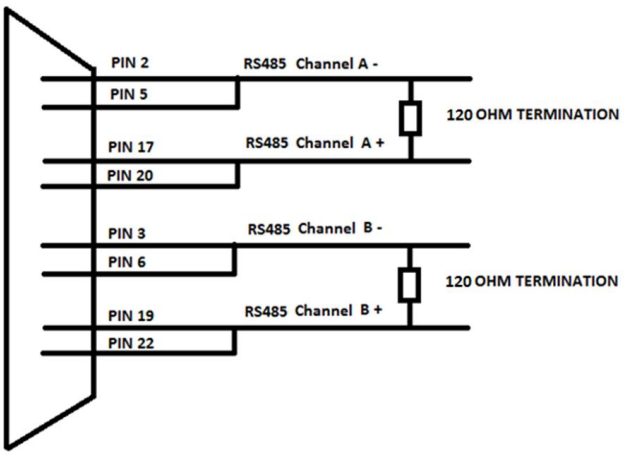


For RS485 without termination systems, follow the diagram below (typically used for very short distance transmitting or multi-drop RS485 systems).

Join Pin 2 and Pin 5 for RS485 negative input 1 (RS485_A-)
Join Pin17 and Pin20 for RS485 positive input 1 (RS485_A+)
Join Pin 3 and Pin 6 for RS485 negative input 2 (RS485_B-)
Join Pin19 and Pin22 for RS485 positive input 2 (RS485_B+)



For RS485 with termination systems, follow the diagram below (typically used for long distance transmitting or single RS485 transceiver systems)



These unit configurations can be set by using jumper links to link 2 adjacent pins.

Selection of SFP type for monitoring purposes (BC623 only)

BC623: J3 (BN623/723: J6 has no effect)	Link pins 1 to 2 for Non-MSA type (Video).
	Link pins 2 to 3 for MSA type SFP (Data) (Default).
	No link will disable SFP monitoring.

Selection of RS422 or RS485 for channel 1

BC623: J4 or BN623/723: J4	Link pins 1 to 2 for RS485 (Default).
	Link pins 2 to 3 for RS422

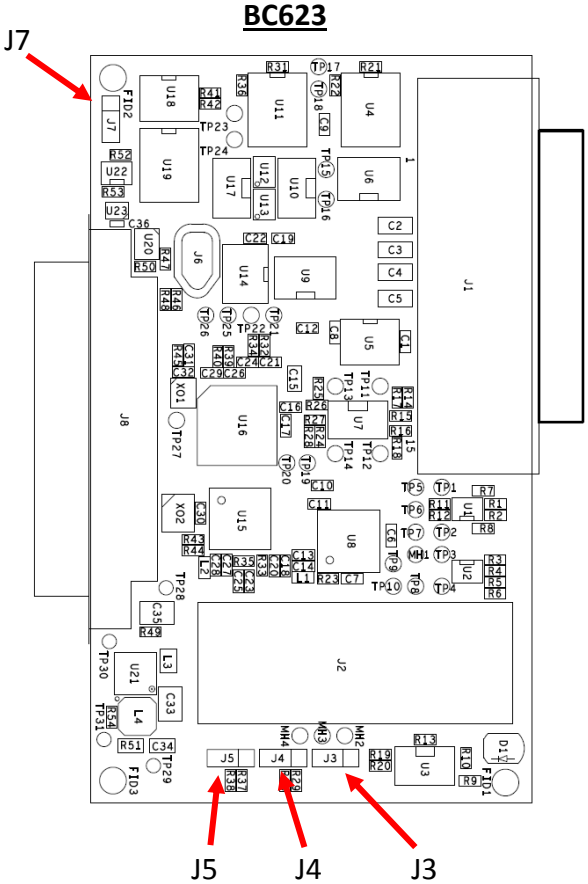
Selection of RS422 or RS485 for channel 2

BC623: J5 or BN623/723: J2	Link pins 1 to 2 for RS485 (Default).
	Link pins 2 to 3 for RS422

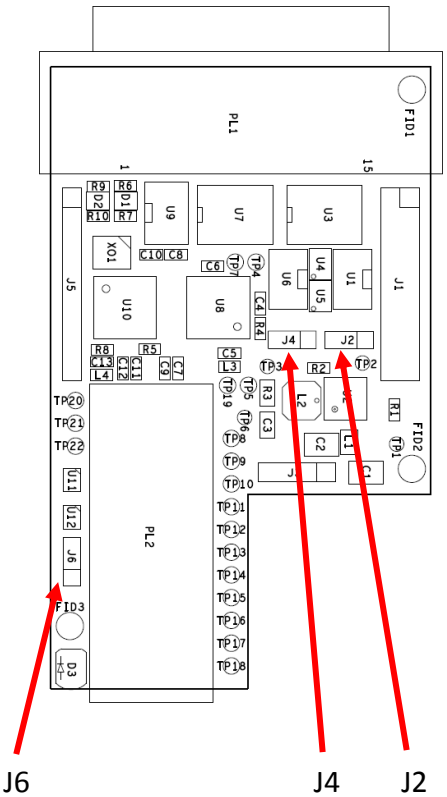
The I2C EEPROM write enable (Factory use only) (BC623 only)

BC623: J7	Link pins 1 to 2 to disable writes to eeprom (Default).
	Link pins 2 to 3 to enable writes to eeprom.
	No link has the same effect as linking pins 1 to 2 (disable writes).

BC623



BN623,BN723



Note: Pin 1 is shown here as a square end on the connector.
The cards have additional annotations for these links.

Indicators:

Each unit has a dual-colour LED located next to the SFP socket.
On the BC623, the LED is labelled "S/L" for Signal Loss.
This LED indicates the state of the incoming fibre optic signal as follows:

green = Unit is successfully locking to its fibre-optic input signal.
red = Unit is not locked to a fibre-optic input signal.

External monitoring (BC623 only)
When fitted in a BC100 or BC160 frame, the BC623 reports its status as follows.

BC100/BC160 Frame Panel LEDs:

Ch A: green = SFP is detecting light at its input.
red = SFP reports Loss of Signal.

Ch B: green = Unit is successfully locking to its fibre-optic input signal.
red = Unit is not locked to a fibre-optic input signal.

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

"Overview" webpage:
CH A LED: green = SFP is detecting light at its input.
red = SFP reports Loss of Signal.

CH B LED: green = Unit is successfully locking to its fibre-optic input signal.
red = Unit is not locked to a fibre-optic input signal.

"Frame Information" webpage:
ch A signal: good = SFP is detecting light at its input.
fail = SFP reports Loss of Signal.

ch B signal: good = Unit is successfully locking to its fibre-optic input signal.
fail = Unit is not locked to a fibre-optic input signal.

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

CH A Sig: good = SFP is detecting light at its input.
fail = SFP reports Loss of Signal.

CH B Sig: good = Unit is successfully locking to its fibre-optic input signal.
fail = Unit is not locked to a fibre-optic input signal.

BC623:

BC623/M	Multimode Audio and Data Fibre Optic Transceiver Card. Provides 2 x analogue audio, 2 x RS232, 2 x RS422/485 and 2 x GPI over 2 fibres.
BC623/S/13/WB	Singlemode Audio and Data Fibre Optic Transceiver Card. Provides 2 x analogue audio, 2 x RS232, 2 x RS422/485 and 2 x GPI over 2 fibres. (1310 nm TX and Wideband receiver)
BC623/S/15/WB	Singlemode Audio and Data Fibre Optic Transceiver Card. Provides 2 x analogue audio, 2 x RS232, 2 x RS422/485 and 2 x GPI over 2 fibres. (1550 nm TX and Wideband receiver)
BC623/S/CWDM/WB	Singlemode Audio and Data Fibre Optic Transceiver Card. Provides 2 x analogue audio, 2 x RS232, 2 x RS422/485 and 2 x GPI over 2 fibres. (CWDM TX and Wideband receiver)
BC623	Audio and Data Fibre Optic Transceiver **Base Card**. Provides 2 x analogue audio, 2 x RS232, 2 x RS422/485 and 2 x GPI over 2 fibres. **Supplied with No Optics Fitted.**

BN623:

BN623/M	Multimode Audio and Data Fibre Optic Transceiver Module. Provides 2 x analogue audio, 2 x RS232, 2 x RS422/485 and 2 x GPI over 2 fibres.
BN623/S/13/WB	Singlemode Audio and Data Fibre Optic Transceiver Module. Provides 2 x analogue audio, 2 x RS232, 2 x RS422/485 and 2 x GPI over 2 fibres. (1310 nm TX and Wideband receiver)
BN623/S/15/WB	Singlemode Audio and Data Fibre Optic Transceiver Module. Provides 2 x analogue audio, 2 x RS232, 2 x RS422/485 and 2 x GPI over 2 fibres. (1550 nm TX and Wideband receiver)
BN623/S/CWDM/WB	Singlemode Audio and Data Fibre Optic Transceiver Module. Provides 2 x analogue audio, 2 x RS232, 2 x RS422/485 and 2 x GPI over 2 fibres. (CWDM TX and Wideband receiver)
BN623	Audio and Data Fibre Optic Transceiver **Base Module**. Provides 2 x analogue audio, 2 x RS232, 2 x RS422/485 and 2 x GPI over 2 fibres. **Supplied with No Optics Fitted.**
PS12	10 watt Plugtop PSU for the BlueNano Product Range. Fitted with 4 pin XLR. Power supply ordered separately. IEC Mains Leads not supplied.

BN723:

For BN723 data only versions, use the BN623 table above but replace BN623 with BN723.

All SFPs supplied by Bluebell will have LC connectors.

SFP Options

SFPs fitted to these modules must have the following characteristics:

- The SFP must be a transceiver.
- SFPs can be either MSA or non-MSA pinout. On the BC623, the card's jumper links must be set accordingly (see 'Configuration' section)

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.