



TECHNICAL & OPERATIONS MANUAL

FOR

**BC2X1SW
Optical Switch**

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BC2X1SW

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General and Operational

The BC-SW21 is a two input, one output single mode fibre optic switch.

One of the two input channels is selected to the single output if the light level on the other falls below a preset threshold level. The threshold level can be preset over an input signal range of -30 to -15 dB in 1dB steps for each input channel via a hex type switch. If both signal levels are either above or below the preset threshold level then the switch defaults to select the main A channel input.

Optical inputs: 2 x FC single mode fibre optic connectors.

1310nm with input power range 0 dBm to -30dBm.

Optical output: 1 x FC single mode fibre optic connector.

Power input: +6V DC from the DIN41612 connector.

Signal status outputs for low input signal level indication are provided on the DIN41612 connector and by local LED indicators.

Optical Input

Wavelength 1200-1610 nm

Sensitivity > -20 dBm @ 1.485 Mb/s

> -25 dBm @ 270 Mb/s

Max I/P power > -1 dBm

Data rate Transparent

Optical Output

Connector 1 x female FC/PC, ST or SC

Wavelength 1310 nm, 1550 nm

Optical Power -14 dBm @ 850 nm

-6 dBm @ 1310 nm

-6 dBm @ 1510 n

The + 6 Volts DC input is filtered by C1 and fed to regulator IC1 Pin 1 The regulated +5V output is on IC1 pin 3, C2, C3 and C4 decouple this to ground. Power supply test points are, TP1 (+5V), and TP2 (Gnd).

The signal detect path for both channels is identical. Channel A is described below with part numbers for channel B shown in brackets,

The optical input from FC fibre optic connector on the card panel is fed to a 20%/80% light splitter. The 80% split goes to the switch input with the 20% split going to the light level detection circuit. The optical output from the switch is provided on the output FC fibre optic connector on the card panel.

PIN-diode detector IC2 (IC12) is fed to the transimpedance amplifier IC3 (IC13) which provides an output voltage which is dependent on the current flowing through the PIN diode detector R1 (R21) sets the transimpedance gain of this stage. IC6 (IC16) allows an 8dB adjustment to this output voltage by selection of an additional parallel feedback resistor R2 (R22) via the Hex switch SW1 (SW2). The voltage produced by this transimpedance section can be checked at TP3 (TP13).

After TP3 (TP13) R3 and R4 (R23 and R24) plus IC7c (IC17c) allow an additional 2dB adjustment via Hex switch SW1 (SW2), C7 (C17) provides some HF filtering to produce a voltage which is dependent on the average light level of the input signal. IC4 (IC14) is configured as a voltage gain stage with 4dB gain adjustment using R7 (R27) and IC7a (IC17a) to reduce the feedback resistance. The voltage produced by this section can be checked at TP4 (TP14). After TP4 (TP14) R8 and R9 (R28 and R28) plus IC7d (IC17d) allow an additional 1dB adjustment via Hex switch SW1 (SW2).

Comparator IC5 (IC5) is used to detect the above or below threshold condition, with VR1 (VR2) setting the detection threshold voltage, hysteresis is added to prevent nuisance switching by noisy or pathological video signals near the threshold using feedback via R44 and R43 (R46 and R45). Logic gates IC8 IC9 and IC10 produce a polarity dependent pulse to switch the latching type optical switch and relay RL1. If both inputs go above the threshold level or if both inputs are below the threshold level or if only input A is above the threshold level then input A will be routed to the output. (Input A has priority)

If only input B is above the threshold level then input B will be routed to the output.

The switched state can be checked at TP6.

Switch settings are average levels and do not including any hysteresis.

Switch Settings

SW1 Channel A (SW2 Channel B) Input Level threshold (@1310 nm):-

0	-15dBm
1	-16dBm
2	-17dBm
3	-18dBm
4	-19dBm
5	-20dBm
6	-21dBm
7	-22dBm
8	-23dBm
9	-24dBm
A	-25dBm
B	-26dBm
C	-27dBm
D	-28dBm
E	-29dBm
F	-30dBm

Other custom levels can be set by resistor value changes or VR1 (VR2) adjustment.



BC2X1SW -Component Overlay

