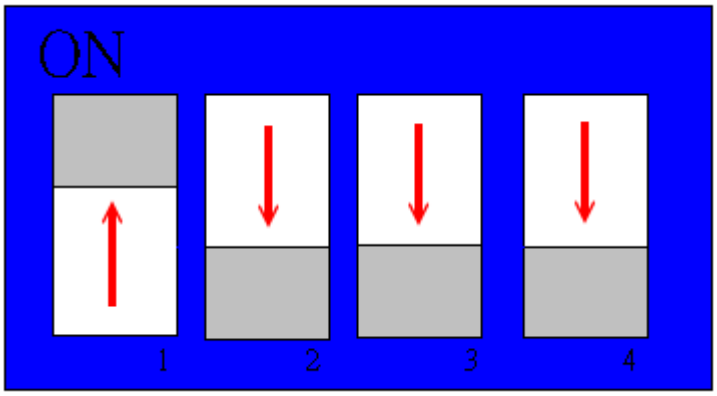


Figure 3.3 DIPswitch setting

The following is table of DIP Switch configuration.

DIP Switch Configuration

On/OFF	Pin 1	Pin 2	Pin 3	Pin 4
	CO/CPE Mode	Band	SNRM	Interleave / INP
On	CO Mode	High Band	9db	8ms / INP=2
Off	CPE Mode	Low band	6db	1ms / INP=0

Note:

1. The DIPswitch default values are OFF.
2. Please power off VDSL2 Bridge, before making any transmission mode configuration.

◆ PIN1:

ON: CO (Central Office) Mode or called Local Side, usually the CO device will be located at the data enter of enterprise to link to the backbone.
OFF: CPE (Customer Premises Equipment) Mode or called Remote Side, usually the CPE side will be located at factory, weather station, and train station as the long reach data receiver.

Tip:

When the VDSL2 Bridge operates at **CPE** mode, the DIPswitch 2, 3, 4 has **no function**.

◆ PIN2:

ON: High Band Mode (500KHz to 30MHz), and enable VDSL2 spectrum is 500KHz to 30MHz. It can pass through **ISDN** spectrum(0 ~ 499KHz are empty).
OFF: Low Band Mode (300KHz to 30MHz), the VDSL2 Bridge will auto-detect the cable length and auto choice speed mode.

◆ PIN3:

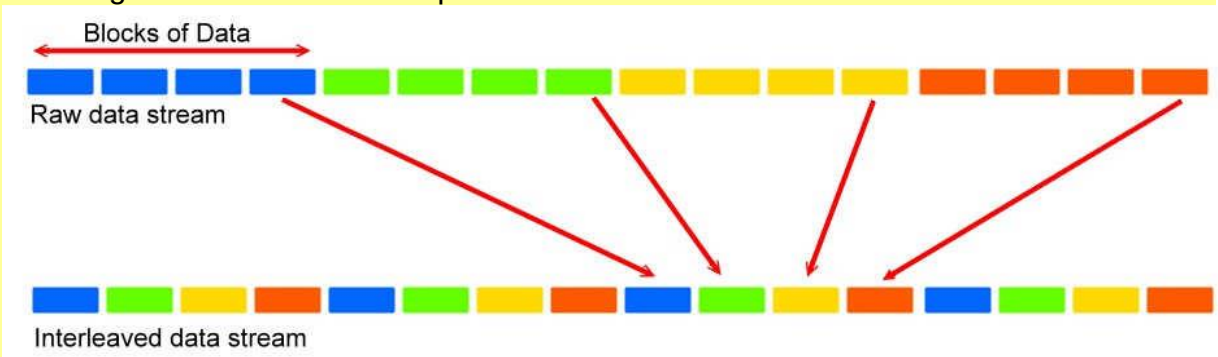
When SNR margin is selected, the system provide **6db/9db** SNR margin for across all usable loop length. Please note that the 6db SNR margin is for telecom standard. Generally speaking, the higher SNR value gets better line quality, but lower performance.

◆ PIN4:

ON: Interleaved mode has a maximum end to end latency of **8m** sec and **INP=2**.
When field environment has heavy noise, in order to obtain high link quality, user can config pin4 to “ON”, but this function will **reduce performance**.
OFF: Interleaved mode provides impulse noise protection for any impulse noise with duration less than **1ms**.

TIP(Reference Only):

Interleave delay function is used in digital data transmission technology to protect the transmission against noise issue
and data error.
If during transit more than a certain amount of data has been lost then the data cannot be correctly decoded. Short bursts
of noise on the line can cause these data packets to become corrupt and the bridge has to re-request data which in turn
can slow down the overall rate at which data is transmitted.
Interleaving is a method of taking data packets, chopping them up into smaller bits and then rearranging them so that
once contiguous data is now spaced further apart into a non continuous stream. Data packets are re-assembled by your
bridge.
The diagram below is an example of how interleaved traffic is transmitted.



If your line is particularly susceptible to bursts of noise then interleaving should improve your VDSL2 experience simply
because if you lose a whole batch of data then this could cause your bridge to loose sync with the exchange.
Using Interleaving, the bridge is able to re-assemble the data or if necessary just re-request the part of the data that it is
unable to recover. By increasing the interleave depth of each ports that are susceptible to noise, this will improve error
performance and stability of marginal lines.

INP (Impulse Noise Protection): Impulse noise in multicarrier communication systems behaves effectively as a modulating signal that controls the first moment of the background Gaussian noise. The composite noise, which is the aggregate of the Gaussian noise and impulse noise, has a probability density function that is conditionally Gaussian with non-zero average, hence referred to as biased-Gaussian. The BER-equivalent power of the composite noise source is defined as the power of

a pure Gaussian noise source that yields the same bit-error rate (BER). The BER-equivalent noise for a biased-Gaussian noise is simply the amplified version of the underlying Gaussian noise source. The amplification factor is derived from the characteristics of the impulse interference. Any bit-loading algorithm designed for Gaussian noise sources is also applicable to biased-Gaussian noise sources provided that the BER-equivalent SNR is used in place of the measured SNR.

SNRM (Signal to Noise Ratio Margin): It's very similar to a conversation at a party and it's dealt with in the same way; we naturally account for both distances from the other person and the amount of background noise. When we do we don't just talk loud enough to be heard, we speak a bit louder waiting for the idiot with the stupid, loud laugh to start up again. We add a bit extra on to make sure we're louder than the average change in background noise.
That ratio is a major factor in determining the connection speed, as the higher the ratio the higher the possible speed. The SNRM is a margin which by which the noise level can rise before connection is lost.