# Digi XBee Application Note
# Migration from 9XStream to XBee-PRO XSC (S3B Hardware)

This guide will assist you in migrating from the 9XStream to the XBee-PRO XSC (S3B Hardware). Even though the function of these radios is basically the same, the following sections list some of the basic hardware and software differences between the radios. In addition, the guide lists what you need to consider when migrating from the 9XStream to the XBee-PRO XSC (S3B).

## Hardware Considerations

The following chart lists the major hardware differences between the 9XStream and the XBee-PRO XSC (S3B):

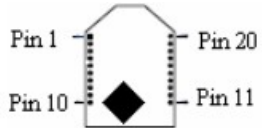| Considerations | 9XStream | XBee-PRO XSC (S3B) | Comments |
|---|---|---|---|
| Nominal Voltage | 5 VDC | 3.3 VDC | Power supply must be redesigned for 3.3V. |
| UART | 5 VDC | 3.3 VDC | Other microprocessors interacting with the unit must have voltage conversion or be redesigned to the same voltage level as the XBee. |
| TX Current Draw | 140 mA | 215 mA | 5V*140mA = 0.7Watts , 3.3V*215mA = 0.7Watts The current draw is higher, but it is the same power consumption. Power output can be reduced in software for lower current draw. |
| RX Current Draw | 50 mA | 26 mA | Improved |
| Power Output | 20 dBm | 24 dBm | Power output has increased, but is also software adjustable. |
| Sleep Current | 26 uA | 2.5 uA | Improved |
| FCC ID | OUR-9XSTREAM | MCQ-XBPS3B | Customer will need to change the label on the outside of their end product to show the appropriate FCC ID for the S3B. |
| IC ID | 4214A-9XSTREAM | 1846A-XBPS3B | Customer will need to change the label on the outside of their end product to show the appropriate IC ID for the S3B. |
| Dimensions | Same | Smaller | Redesign is needed to accommodate form factor change. (See pin compatibility chart below) |
| Pin Connection | Same | Different | Two 10 pin through hole connectors. (See pin compatibility chart below) |
| RF Connectors | RPSMA, MMCX, Wire | RPSMA, U.FL, Wire | MMCX connector is not supported. New connector is U.FL |

## Software Considerations

The following chart lists the major software differences between the 9XStream and the XBee-PRO XSC (S3B):

| Considerations | 9XStream | XBee-PRO XSC (S3B) | Comments |
|---|---|---|---|
| Wake Time | 40 ms | 40 ms | Time from pin sleep to when CTS asserts and is ready to transmit data. |
| Software/AT Commands | Same | Some added | Added commands like power level should be considered.  New commands are not required to be used for the interoperability of the radio. |
| RS-485 Modes | Supported | Supported | The XBee does support RS-485 mode, however, the development board does NOT. |
| RF Data Rates | Same | 9.6 kbps and 19.2 kbps | RF data rates other than 9600 and 19200 are not currently supported. |
| Australian (XH9) | Supported | Supported | 920 MHz version is supported on both radios. |

## Pin Compatibility

The XBee-PRO XSC (S3B) has a different footprint than the 9XStream.  The S3B has the XBee 20 pin footprint rather than the 11 pins found on the 9XStream.  The table below shows the pins on the 9XStream and the corresponding pins on the S3B:

| Signal Name | 9XStream Module Pins | XBee-PRO XSC (S3B) Module Pins |
|---|---|---|
| D02 / CTS / RS-485 Enable | 1 | 12 |
| DI3 / SLEEP | 2 | 9 |
| DO (Data Out) | 3 | 2 |
| DI (Data In) | 4 | 3 |
| DI2 / RTS / CMD | 5 | 16 |
| RESET | 6 | 5 |
| DO3 / RX LED | 7 | 4 |
| TX / PWR | 8 | 15 |
| CONFIG | 9 | 6 |
| VCC | 10 | 1 |
| GND | 11 | 10 |
| Pin Layout (Module Footprint) 9XStream (Bottom View) S3B (Top View) |  |  |
| Dimensions | 1.600" x 2.825" x 0.350" (4.06 cm x 7.18 cm x 0.89 cm) | 1.297" x 0.962" x 0.215" (3.29 cm x 2.44 cm x 0.546 cm) |

## Configuration

Both the 9XStream and the XBee-PRO XSC (S3B Hardware) are configurable via AT Command Mode and Binary Command Mode. Some of the new commands on the S3B are not available through Binary Commands. Some of the new features on the S3B are:

- MY (Source Address)
- MD (RF Mode)
- PK (RF Packet Size)
- PL (RF Power Level)
- RB (Packetization Threshold)
- RZ (DI Buffer Size)

All of these new features are described in more detail in the XBee-PRO XSC (S3B Hardware) product manual.